Doctor of Nursing Practice Final Manuscripts

Theses and Dissertations

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Reducing Polypharmacy amongst home based older adults using patient centered education

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UNIVERSITY OF SAN DIEGO

Hahn School of Nursing and Health Science

DOCTOR OF NURSING PRACTICE

Doctor of Nursing Practice Portfolio

by

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Opening Statement

Purpose in Pursuing the DNP

I consider nursing an important aspect of healthcare that bridges the gap between the patients and the healthcare system. Nurses not only offer care but also help patients overcome a myriad of challenges during the healing process. When I joined this profession, I want to make real and positive changes for others. I have an inborn desire and seen to care for others and see their health improves. With every role, I undertake and with every patient that I interact with, I strive to make sure I leave them better than I found this. With an educational background in nursing, I have cared for many patients and even held leadership positions in my organization. However, I felt that I needed to do more to improve my professionalism and approach to healthcare issues.

My decision to pursue Doctorate in Nursing Practice (DNP) was informed by my desire to become an influential and important member of the nursing community. This is a good opportunity to improve my view of the world and how nurses contribute positively to the community in which we live. Since my clinical practice plans are centered on aging processes, I look to focus more on the life of older people in my project. I am particularly interested in the issue of polypharmacy and the interventions that can be implemented to reduce the negative impacts of this phenomenon. The project will contribute to the field of knowledge in nursing, particularly those who provide care for the elderly. It will aid in enhancing the kind of care provided to older adults to help them prevent or overcome challenges associated with polypharmacy. Throughout this program and project, I look forward to demonstrating my greatest skills in research, leadership, empathy, and collaboration. Achievement in this program will not just be a

personal goal, but a definitive moment of improving the approaches taken by nurses

when providing care in community settings.

Documentation of Mastery of DNP Program Outcomes

Final Manuscript

Reducing polypharmacy amongst home-based older adults using a patient

education program on medication safety

Evelyn Oluoha

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Abstract

Introduction: The purpose of this evidence-based practice Doctor of Nursing Practice (DNP) project was to identify and implement a patient education program on medication safety that can help reduce instances of polypharmacy among home-based elderly patients. This education program is pursued as an effective intervention in reducing polypharmacy in home-based older adults.

Background: Studies show that the majority of home-based older adults take at least one to five medications daily, increasing the risk of polypharmacy adverse medical outcomes. Effects of polypharmacy include medication non-adherence, increased risk of potentially inappropriate medication, drug-drug interactions, drug duplications, adverse drug reactions, and higher healthcare costs. Among home-based elderly patients, polypharmacy has a significant impact on their health outcomes. Although certain measures such as a reduction in the number of medications can be pursued, they may not be applicable at all times.

EBP Model/Frameworks: The evidence-based project is designed utilizing the Promoting Action on Research Implementation in Health Services (PARiHS) Framework. The three elements of the model, searching for evidence, identifying the context, and facilitating the implementation process will identify the impacts of the intervention.

Policy Interventions: Anonymous interviews were administered to older patients and their caregivers to identify issues related to drug-drug interactions and possible side effects. A follow-up interview was administered to determine the impacts of patient education on preventing polypharmacy and its side effects.

Evaluation/Results: The results demonstrated that as polypharmacy decreased, patient outcomes improved. Patients also reported an increase in their quality of life (QOL) over 6 months.

Implications for Practice: Patient-centered education on medication safety has the potential to reduce the impacts of polypharmacy in older adults. The evidenced-based project revealed that providing patients with proper information increases the safety of their medication administration by reducing medication errors and improving patient outcomes. Involving caregivers in the education program further leads to improved patient outcomes.

Conclusions: Future research can focus on the specific medication safety topics that can be provided in patient education at various stages of their care. Particularly, the impact of providing patient education opportunities at least twice or thrice a year.

Reducing Polypharmacy amongst Home-Based Older Adults Using Patient Education

Project Purpose

The focus of the projects is reducing polypharmacy amongst home-based older adults using a patient education program on medication safety. The project is informed by the need to address the problem that older home-based adults face in relation to taking more than one medication. By identifying an evidence-based intervention, issues such as adverse drug interactions can be reduced, improving the safety of the patient and ultimately having the potential to improve the quality of life among older adults.

Introduction

Polypharmacy is an umbrella term that refers to the simultaneous use of multiple medicines by a patient for their condition. Often defined as regularly taking five or more medicines, polypharmacy affects a majority of older adults above the age of 65 years (Rankin et al., 2018). While those admitted to healthcare facilities may have a nurse or caregiver to help in managing the medication, home-based older adults are often left to manage the medication by themselves. However, in both cases, older adults tend to deal with complex and chronic healthcare conditions that require attention. This also means taking high-risk medications, which increase the risk of drug-drug interactions and nonadherence to medication (Rankin et al., 2018).

According to Rankin et al. (2018), the aging population in the United States suffers from an increased prevalence of chronic conditions. This has seen a large portion of adults above the age of 65 years being on multiple medications. Tan, Cheng, and Siah (2019) further note that more than 80% of home-based older adults take at least one medication daily, with some up to 17. This means that they are exposed to the risk of regular use of at least five medications. Without proper medication management, older adults tend to suffer from effects such as non-

adherence and drug-drug interactions. Such effects can have significant impacts on both the patient outcome and their quality of life (Rankin et al., 2018).

Polypharmacy is common among home-based older adults because of having more than one comorbidity (Rankin et al., 2018). Some of the effects of polypharmacy include medication non-adherence, increased risk of potentially inappropriate medication, drug-drug interactions, drug duplications, adverse drug reactions, and higher healthcare costs. Among home-based elderly patients, polypharmacy is common and can have a significant impact so their health outcomes (Rankin et al., 2018). Therefore, measures are needed to enhance medication safety and reduce problems associated with polypharmacy

Problem Statement

The purpose of this project is to identify an intervention that will help reduce instances of polypharmacy among home-based elderly patients. Although certain measures such as a reduction in the number of medications can be pursued, they may not be applicable at all times (Pereira et al., 2019). This project recommends patient education on medication safety as means of imparting patients the knowledge to reduce instances of polypharmacy problems. Specifically, home-based older patients will be provided with medication safety and management skills to reduce the adverse effects of polypharmacy. The project seeks to answer the following question:

PICOT Question: In home-based older adults, does implementing a patient education program on medication safety compared to usual patient education practices reduce the adverse effects of polypharmacy within six months?

<center>**Literature Review**</center>

<center>**Evidence-Based Practice Model**</center>

The Promoting Action on Research Implementation in Health Services (PARiHS) Framework provides a method for implementing evidence-based practice by exploring interactions among three key elements. The first element is evidence, which involves searching for and identifying the best available evidence for research. The second element is context, which refers to the local environment where the practice change will take place. The third element is facilitation where organizational participants use their skills and knowledge to foster the implementation of practice change (Bergstrom et al., 2020).

The PARiHS model helps to address the issue of polypharmacy because it identifies the key elements that interact to influence the successful implementation of evidence-based practices. This depends on the kind of evidence available, the context of the care setting, and the facilitation process (Avital, 2019). In the current project, practice innovations will be a product of the available evidence and the differing perspectives of all recipients of the practice change. The major strength of the PARiHS model is that it explicitly utilizes facilitation as a factor that impacts the integration of research findings into practice (Hunter et al., 2020). Using this approach means bridging the gap between the problem being addressed and the available best practices.

The PARiHS model is a fit for this DNP project because it allows the assessment of the context of polypharmacy amongst home-based older adults to identify the enablers and barriers of the intervention. This will be critical in including the outcomes of the implementation and achieving the desired goals. The major challenge of this framework is that it does not address the development of new knowledge in practice (Avital, 2019). This means that the implementation

<center>3</center>

of the patient education program on medication safety will be purely based on available evidence or knowledge. This can limit the exploration of the topic in detail, but will still provide a background for further research. Another weakness of the model is that it only focuses on unit set at the expense of a system-wide environment (Avital, 2019). The findings will only apply to the unit or community under study, and further research on the intervention may be needed before application to the wider healthcare system.

Prevalence of Polypharmacy in Older Adults

The portion of the aging population suffering from chronic conditions has increased significantly in the United States. Similarly, polypharmacy has become a common phenomenon as many of these patients are on multiple medications. With over 13% of the population comprising adults over 65 years and the number increasing, the effects of polypharmacy are a major concern (Rankin et al., 2018). Many elderly patients experience polypharmacy to some degree with others experiencing major polypharmacy. The trend is an indication of the increased need for expanding the roles of pharmacists through medication therapy management. It also necessitates improving the knowledge of patients on medication management (Rankin et al., 2018).

The use of multiple prescription drugs, which is also known as polypharmacy is increasingly common. However, the elderly are seen to have the largest share of the problem. Polypharmacy disproportionately affects older adults, with about 30% of older adults in the US taking five or more drugs simultaneously compared to only 10% of the rest of the population. The phenomenon further drives rates of comorbidities up to 61% of adults over the age of 65 years who have two or more chronic conditions compared to only 26% of all adults (Quinn & Shah, 2019). Among the most commonly used drugs include ibuprofen, acetaminophen, and

aspirin. Although these drugs are readily available on the counter, they contribute significantly to adverse drug reactions in older adults. The more drugs a patient takes, the greater the risk of adverse drug reactions and interactions (Rankin et al., 2018).

Impacts of Polypharmacy

Polypharmacy has significant impacts on patients and their quality of life. Pereira et al. (2019) note that high-risk medication can increase the risk of medication nonadherence and drug-drug interactions. Drug-related morbidity has become a substantial healthcare issue in the United States, with adverse drug reactions being a significant cause of death (Quinn & Shah, 2019). When polypharmacy is combined with an aging population, it may lead to the prescribing of potentially inappropriate medication. These are not only ineffective for the condition of the patient but can also lead to a higher risk of developing adverse drug events, such as drug-disease interactions. Drug-drug interactions, and medication non-adherence because of increased pill burden (Pereira et al., 2019). Ultimately, these factors can lead to negative health implications, including functional and cognitive decline.

The addition of medication is usually aimed at improving the health of the patient, but it can also put them at an increased risk of potential drug-disease interactions or drug-drug interactions. This can manifest as a decline in the therapeutic effect of the drug, comprised treatment outcomes, or increased occurrence of adverse drug reactions (Sheikh-Taha & Asmar, 2021). Although many adverse drug effects are preventable, they can lead to increased hospitalization due to problems such as hypotension, anemia associated with bleeding, gastrointestinal bleeding, and syncope. The development of such issues can also prompt additional medication interventions that further exacerbate the use and burden of medication on older patients. Exposure to multiple drugs usually exposes patients to an additive risk of every

drug's potential adverse outcomes. In severe cases, the drug-drug interactions can be life-threatening or require intervention to prevent or minimize the severe adverse effects. Similarly, the number of drugs prescribed can predict the potential harm that medication can have on the patient (Quinn & Shah, 2019).

Methods to control polypharmacy

Various methods can be used to control polypharmacy and improve patient outcomes. Depending on the level of intervention needed, the control can be professional, financial, organizational, or regulatory. Professional interventions target professionals to improve their prescribing practices and consumers to improve their use of medication (Soler & Barreto, 2019). On the other hand, financial intervention focuses on issues such as professional reimbursement, penalties, and incentives. Organizational interventions aim at changing the structure and delivery of healthcare while regulatory interventions change the provision of healthcare regulatory frameworks. In the case of elderly patients, both professional and organizational interventions are needed to control the effects of polypharmacy (Soler & Barreto, 2019).

Essential regular medication reconciliation and multidisciplinary team review are used to identify and reduce medication-related problems (Rodrigues & Oliveira, 2016). Certain tools are also used to decrease the use of high-risk and low-benefit medication to help in prescribing. In addition, various tools, criteria, scoring systems, and algorithms have been developed for use in various long-term care settings. Although many of the tools are designed for healthcare settings, they can also be used in individual and home-based situations. (Tan, Cheng & Siah, 2019) The methods and tools are also limited in that not all are adequately validated. The tools also have varying levels of evidence to support their use in different settings (Tannenbaum et al., 2017).

Methodology/Policy Intervention

The purpose of the project is to identify an intervention that will help reduce instances of polypharmacy among home-based elderly patients. A pre-intervention interview was conducted at the start of the project to assess the current attitudes and understanding of the participants to take multiple medications. In particular, The Patients' Attitude Towards Deprescribing (PATD) questionnaire was administered as a pre-test. Those taking more than five medicines were included as participants in the project. A total of 10 patients were recruited to participate in the project.

Patient education regarding medication management and polypharmacy was then implemented as an intervention. The patient education program was a combination of youtube videos and group discussions on medication management. The participants learned about effective strategies for medication management and the kind of support readily available. The detailed education program took place over six months with the aim of improving their medication management knowledge. A teaching session was held at least once a month for the six months, allowing the participants to build on the knowledge shared previously. The participants were also provided with brochures and other materials to improve their overall understanding of the topics covered. This ensured that the participants were equipped with the necessary information to manage their medications better at the end of the six months.

At the end of the six months, a post-test interview was administered to determine the impacts of patient education on preventing polypharmacy and its side effects. The PATD questionnaire was used to collect the data and understand the perspectives of the patients regarding their medication. The tool was useful in identifying how the teaching program had impacted the attitudes and views of the patients regarding polypharmacy. Therefore, it was used

as the basis for determining whether the intervention was effective in reducing the impacts of

polypharmacy.

Findings and Data Analysis

The data collected from the interviews can be used to indicate whether polypharmacy

decreased and patient outcomes improved over a 6-month intervention. Table 1 presents a

summary of the responses from the interview post-intervention:

Table 1: Interview Results

PATD questions	Strongly Agree	Agree	Unsure	Disagree	Strongly Disagree
1. I feel that I am comfortable taking a large number of medications.	4 (40%)	4(40%)	1 (10%)	0 (0%)	1 (10%)
2. I am comfortable with the number of medications that I am taking.	3 (30%)	6 (60%)	1 (10%)	0 (0%)	0 (0%)
3. I believe that all my medications are necessary.	1 (10%)	4 (40%)	3 (30%)	1 (10%)	1 (10%)
4. If my doctor said it was possible, I would be willing to stop one or more of my regular medications	3 (30%)	3 (30%)	1 (10%)	1 (10%)	1 (10%)
5. I would like to reduce the number of medications that I am taking.	2 (20%)	3 (30%)	2 (20%)	2 (20%)	1 (10%)
6. I feel that I may be taking one or more medications that I no longer need.	1 (10%)	0 (0%)	4 (40%)	3 (30%)	2 (20%)
7. I would accept taking more medications for my health conditions.	1 (10%)	1 (10%)	5 (50%)	3 (30%)	0 (0%)
8. I have a good understanding of the reasons I was prescribed each of my medications	2 (20%)	5 (50%)	2 (20%)	1 (10%)	0 (0%)
9. Having to pay for less medications would play a role in my willingness to stop one or more of my medications.	2 (20%)	3 (30%)	3 (30%)	2 (20%)	0 (0%)
10. I believe one or more of my medications is giving me side effects.	3 (30%)	6 (60%)	0 (0%)	1 (1%)	0 (0%)

Compared to the pre-intervention data collected at the start of the study, a significant

improvement was noted in terms of polypharmacy and the attitudes of the patients toward

medication. Patients became more willing to understand the purpose of the medication, and its

importance to their health, and more confident in how they managed their medications. Table 2 shows a comparison of the data collected pre-and post-intervention.
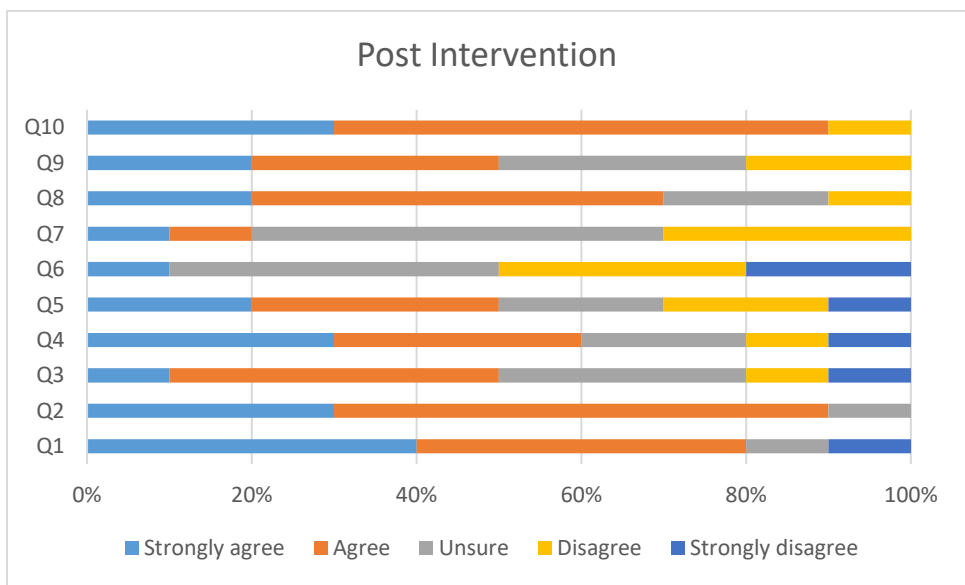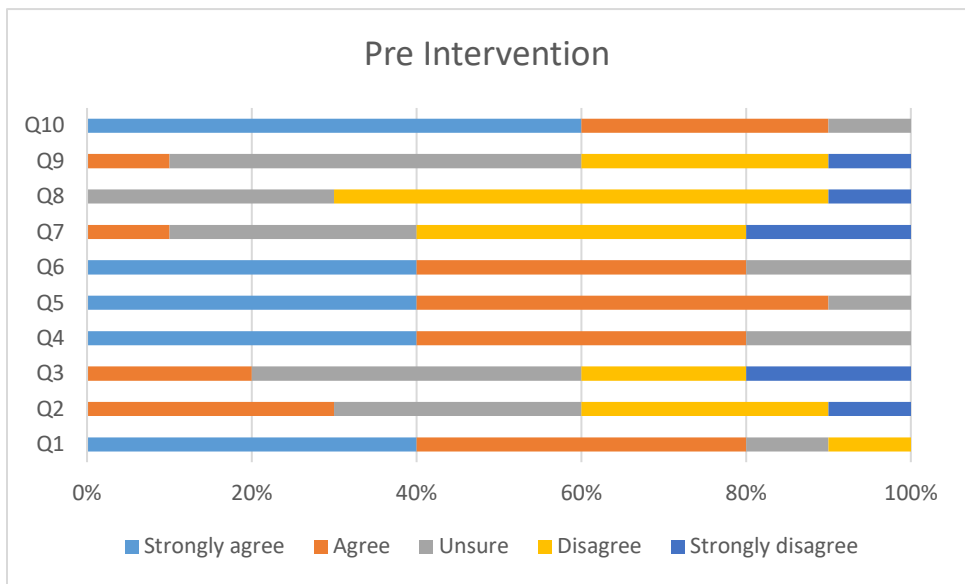
Table 2: Pre-Intervention vs. Post-Intervention Data

Pre Intervention										
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Strongly agree	4 (40%)	0 (0%)	0 (0%)	4 (40%)	4 (40%)	4 (40%)	0 (0%)	0 (0%)	0 (0%)	6 (60%)
Agree	4 (40%)	3 (30%)	2 (20%)	4 (40%)	5 (50%)	4 (40%)	1 (10%)	0 (0%)	1 (10%)	3 (30%)
Unsure	1 (10%)	3 (30%)	4 (40%)	2 (20%)	1 (10%)	2 (20%)	3 (30%)	3 (30%)	5 (50%)	1 (10%)
Disagree	1 (10%)	3 (30%)	2 (20%)	0 (0%)	0 (0%)	0 (0%)	4 (40%)	6 (60%)	3 (30%)	0 (0%)
Strongly disagree	0 (0%)	1 (10%)	2 (20%)	0 (0%)	0 (0%)	0 (0%)	2 (20%)	1 (10%)	1 (10%)	0 (0%)

Post Intervention										
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Strongly agree	4 (40%)	3 (30%)	1 (10%)	3 (30%)	2 (20%)	1 (10%)	1 (10%)	2 (20%)	2 (20%)	3 (30%)
Agree	4 (40%)	6 (60%)	4 (40%)	3 (30%)	3 (30%)	0 (0%)	1 (10%)	5 (50%)	3 (30%)	6 (60%)
Unsure	1 (10%)	1 (10%)	3 (30%)	2 (20%)	2 (20%)	4 (40%)	5 (50%)	2 (20%)	3 (30%)	0 (0%)
Disagree	0 (0%)	0 (0%)	1 (10%)	1 (10%)	2 (20%)	3 (30%)	3 (30%)	1 (10%)	2 (20%)	1 (10%)
Strongly disagree	1 (10%)	0 (0%)	1 (10%)	1 (10%)	1 (10%)	2 (20%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

The results indicated that the majority of the participants were willing to cut down on the number of medications if the doctor accepts (Q4 and Q5). This would mean a reduction in the number of medications taken at a time, which would further reduce the impacts of polypharmacy. All the participants were high functioning and understood the reasons for their medications (Q1 and Q8). This was also a good indication that the education provided enhanced their understanding of the medication and its importance to their health. The results also revealed that the cost of their medication was not a reason to cut down the number of their medications (Q9). Although the majority of the participants were comfortable with the number of medications they were taking, they were not willing to add more medications to their list (Q7). A visual summary of the findings pre- and post-intervention is indicated below:

Table 3:Pre-Intervention vs. Post-Intervention Graphical Representation

Pre Intervention

Q10, Q9, Q8, Q7, Q6, Q5, Q4, Q3, Q2, Q1 (0% to 100%)

Legend: Strongly agree, Agree, Unsure, Disagree, Strongly disagree

Post Intervention

Q10, Q9, Q8, Q7, Q6, Q5, Q4, Q3, Q2, Q1 (0% to 100%)

Legend: Strongly agree, Agree, Unsure, Disagree, Strongly disagree

Based on the data collected, the attitude of the patients towards medication improved during the six months of the patient education program. Patients shows that they understood the reasons behind taking the medication and became more comfortable with taking the medications. With a clear understanding of the medications, they became more adherent and better at the management of the medication. While the patients were willing to cut down the number of

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medications if the doctor accepts, the cost of medications was not a driving factor. On the

contrary, the majority of the patients felt comfortable taking a large number of medications.

Conclusion

Patient-centered education on medication safety is an effective intervention in reducing

the impact of polypharmacy among home-based older adults. The project revealed that providing

patients will proper information will increase the safety of their medication, reduce medication

errors, and improve patient outcomes. The patients understood the reasons behind taking the

medications and became more comfortable with taking a large number of medications at a time.

The findings of this study suggest the provision of education opportunities to older patients to

improve their attitudes towards medication, improve their understanding, and reduce instances

and impacts of polypharmacy. Future research in this field can focus on the specific medication

safety topics that can be provided in patient education at various stages of their care. Particularly,

the impact of providing patient education opportunities at least twice or thrice a year.

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Concluding Essay

When I started the DNP program, I envisioned a period of personal and professional growth. I set specific milestones and what I wanted to achieved every half year. While some of the goals changes during this period, my ultimate objective was to complete the program and make a significant impact to my life and that of others. Over the course of the program, I focused more on the principles of research and importance of evidence-based practice in healthcare. I started questioning how they impact my approach to practice and the best way to improve how I provide care or even knowledge.

I am proud of the much that I have achieved in this program and the firm foundation I have laid for my career. I have gained useful knowledge and valuable skills that allow me to take even more challenging roles in the workplace. The entire research process and presenting my findings in a report have made me a better professional. I can communicate more effectively with other members of interdisciplinary team, and make connections between concepts more easily. Although my research focused on polypharmacy in home-based older adults, I was able to explore other important topics vital in the provision of healthcare to the elder. Undoubtedly, education plays an important role in improving the quality of care delivered and the approach patients use in taking care of themselves.

Looking forward, my aim is to improve myself even further and become a better professional. With the knowledge that I have gained, I am now better suited to take more challenging roles, offer solutions affecting nursing, and identify areas that may require academic interventions. One of the things that remain clear is that nurse practitioners have a huge role to play in healthcare. This includes going beyond the traditional care giver role to taking up more

responsibilities in leadership and management. I am more committed to this and I feel that I have

prepared enough.

Appendix A: Poster Presentation
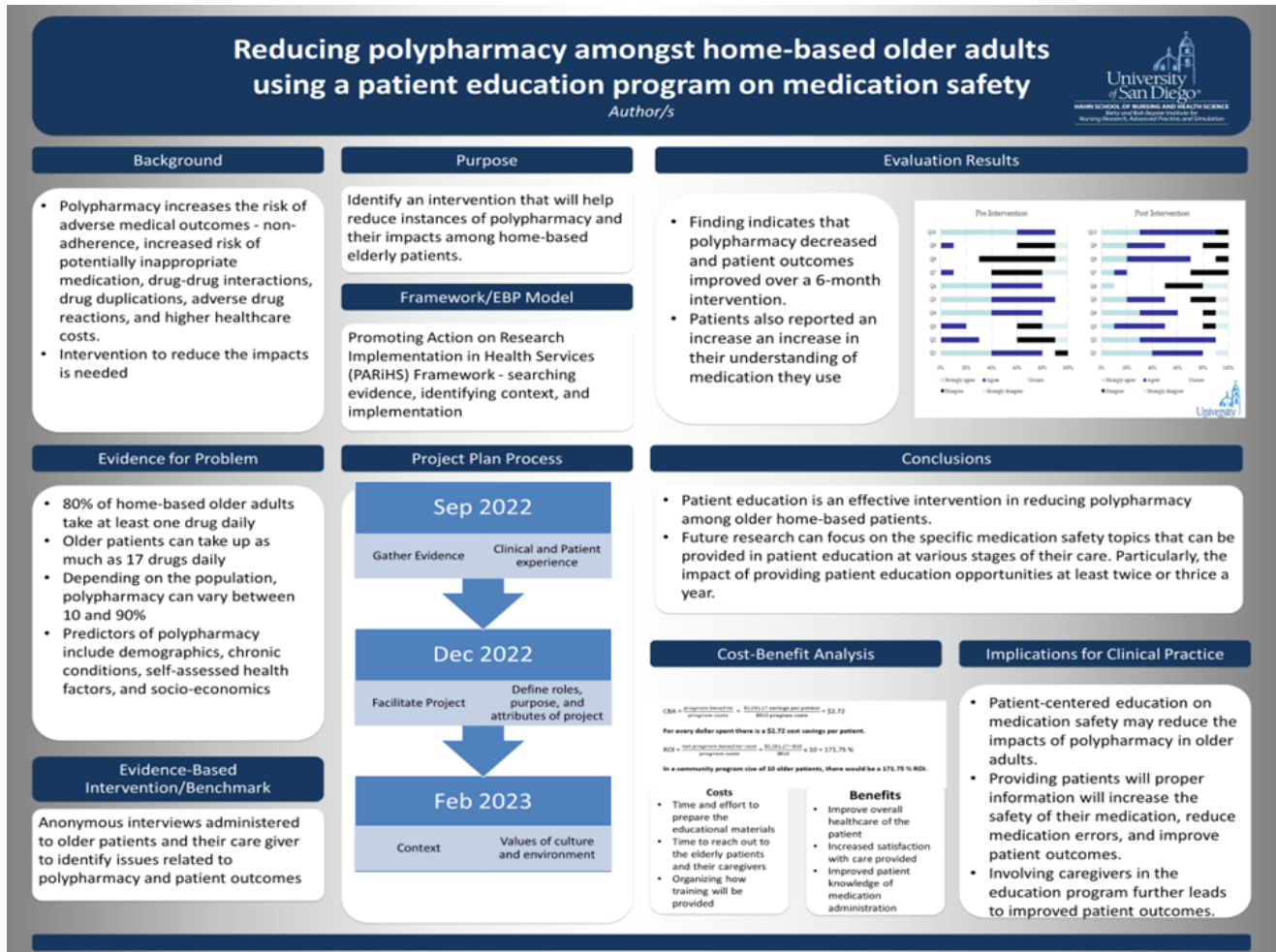
Appendix B: PowerPoint Stakeholder Presentation

Mock Stakeholder Presentation

Reducing Polypharmacy Amongst Home-based Older Adults Using A Patient Education Program On Medication Safety

Evelyn Oluoha, BSN, RN, DNP-Student, Family Nurse Practitioner

Dr. Michelle Kabakibi DNP, FNP-C, AGNP-C

University of San Diego

Background & Significance

- More than 80% of home-based older adults take at least one drug daily, with some up to 17.
- **Effects of polypharmacy** include **medication non-adherence**, increased risk of potentially inappropriate medication, drug-drug interactions, drug duplications, **adverse drug reactions**, and **higher healthcare costs**.
- Polypharmacy is common in home-based elderly patients and can have a significant impact on their health outcomes.

PICO(T) Question

P: Home-based older adults

I: Medication safety patient education

C: Usual patient care

O: Reduced adverse effects of polypharmacy

T: Six months

- **Question**: In home-based older adults (P), does implementing a patient education program of medication safety (I) compared to usual patient education practices (C) reduce adverse effects of polypharmacy (O) within six months (T).

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Framework/EBP Model

Promoting Action on Research Implementation in Health Services (PARiHS) Framework.

- Searching for evidence
- Identifying the context
- Facilitating the implementation process to identify the impacts of the intervention.

PARIHS FRAMEWORK

PERCEPTIONS OF EVIDENCE

ORGANIZATIONAL CULTURE & CLIMATE

SUCCESSFUL IMPLEMENTATION OF EVIDENCE BASED PRACTICE

FACILITATION

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Nursing Research, Advanced Practice, and Simulation

Synopsis of the Evidence

Author(s) Name of article	Evidence Ranking (use Melnyk pyramid)	Summary of Evidence – key bullet points
Albert et al. (2021) How do elderly outpatients manage polypharmacy including DOAC - A qualitative analysis highlighting a need for counselling	Level 4	Elderly patients develop manifold medication management strategies, which can inspire future medication users
Fried et al. (2017) Health outcomes associated with polypharmacy in community-dwelling older adults: a systematic review	Level 1	Data are mixed regarding the relationship between polypharmacy, considered in terms of number of medications, and adverse outcomes in community-dwelling older persons.
Pereira et al. (2019) Polypharmacy Among Home-Dwelling Older Adults: The Urgent Need for an Evidence-Based Medication Management Model	Level 3	Older adults frequently depend on complex medication regimens and polypharmacy, which can lead to potentially devastating and debilitating medication-related problems
Rankin et al. (2018) Interventions to improve the appropriate use of polypharmacy for older people.	Level 1	It is unclear whether interventions to improve appropriate polypharmacy, such as reviews of patients' prescriptions, resulted in clinically significant improvement
Rodrigues et al. (2016) Drug-drug interactions and adverse drug reactions in polypharmacy among older adults: an integrative review	Level 1	Drug-drug interactions (DDI) and adverse drug reactions (ADR) are significant issues in older adults polymedicated.
Tan et al. (2019) A systematic review and meta-analysis on the effectiveness of education on medication adherence for patients with hypertension, hyperlipidaemia and diabetes	Level 1	Through education, health literacy is improved, thus improving medication adherence.
Tannenbaum et al. (2017) Reduction of inappropriate benzodiazepine prescriptions among older adults through direct patient education: the EMPOWER cluster randomized trial	Level 3	Direct-to-consumer education effectively elicits shared decision making around the overuse of medications that increase the risk of harm in older adults.

Project Implementation Timeline (optional)

Sep 2022

Gather Evidence | Clinical and Patient experience

↓

Dec 2022

Facilitate Project | Define roles, purpose, and attributes of project

↓

Feb 2023

Context | Values of culture and environment
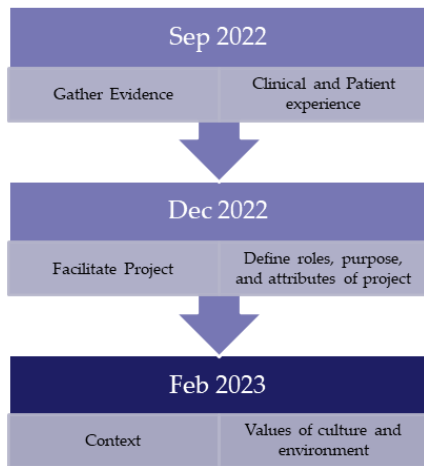
**Timeline designed to match Promoting Action on Research Implementation in Health Services (PARiHS) Framework.

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Pre Intervention

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Strongly agree	4 (40%)	0 (0%)	0 (0%)	4 (40%)	4 (40%)	4 (40%)	0 (0%)	0 (0%)	0 (0%)	6 (60%)
Agree	4 (40%)	3 (30%)	2 (20%)	4 (40%)	5 (50%)	4 (40%)	1 (10%)	0 (0%)	1 (10%)	3 (30%)
Unsure	1 (10%)	3 (30%)	4 (40%)	2 (20%)	1 (10%)	2 (20%)	3 (30%)	3 (30%)	5 (50%)	1 (10%)
Disagree	1 (10%)	3 (30%)	2 (20%)	0 (0%)	0 (0%)	0 (0%)	4 (40%)	6 (60%)	3 (30%)	0 (0%)
Strongly disagree	0 (0%)	1 (10%)	2 (20%)	0 (0%)	0 (0%)	0 (0%)	2 (20%)	1 (10%)	1 (10%)	0 (0%)

Post Intervention

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Strongly agree	4 (40%)	3 (30%)	1 (10%)	3 (30%)	2 (20%)	1 (10%)	1 (10%)	2 (20%)	2 (20%)	3 (30%)
Agree	4 (40%)	6 (60%)	4 (40%)	3 (30%)	3 (30%)	0 (0%)	1 (10%)	5 (50%)	3 (30%)	6 (60%)
Unsure	1 (10%)	1 (10%)	3 (30%)	2 (20%)	2 (20%)	4 (40%)	5 (50%)	2 (20%)	3 (30%)	0 (0%)
Disagree	0 (0%)	0 (0%)	1 (10%)	1 (10%)	2 (20%)	3 (30%)	3 (30%)	1 (10%)	2 (20%)	1 (10%)
Strongly disagree	1 (10%)	0 (0%)	1 (10%)	1 (10%)	1 (10%)	2 (20%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

Reducing polypharmacy amongst home-based older adults using a patient education program on medication safety — Author/s (University of San Diego)

Cost-Benefit & ROI

Implementation of a Patient Education Program of Medication Safety for Home-Based Older Adults

$$CBA = \frac{program\ benefits}{program\ costs} = \frac{\$2,201.17\ savings\ per\ patient}{\$810\ program\ costs} = \$2.72$$

For every dollar spent there is a $2.72 cost savings per patient.

$$ROI = \frac{net\ program\ benefits - cost}{program\ costs} = \frac{\$2,201.17 - 810}{\$810} \times 10 = 171.75\ \%$$

In a community program size of 10 older patients, there would be a 171.75 % ROI.

**Calculations based on:
- Program cost – Education development, facility cost, staff salary, educational material
- Program benefits – Time saved by patients and their caregiver in the administration of medication

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Implications for Clinical Practice & Sustainability

- Patient-centered education on medication safety can reduce the impacts of polypharmacy in older adults.
- Providing patients with proper information will
  - Increase the safety of their medication
  - Reduce medication errors
  - Improve patient outcomes
  - Improve patient attitudes towards medication
  - Improve patient understanding of their medication

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Conclusion

- Implementing a patient education program of medication safety can reduce adverse effects of polypharmacy
- Future research can focus on the specific medication safety topics
- It is important to focus on topics, which are effective for patient education at various stages of their care.
- The impact of providing patient education opportunities at least twice or thrice a year is also ideal

Key References

Albert, V., Baumgartner, P. C., Hersberger, K. E., & Arnet, I. (2021). How do elderly outpatients manage polypharmacy including DOAC - A qualitative analysis highlighting a need for counselling. *Research in social & administrative pharmacy : RSAP*, S1551-7411(21)00285-0. Advance online publication. https://doi.org/10.1016/j.sapharm.2021.07.027

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Tannenbaum, C., Martin, P., Tamblyn, R., Benedetti, A., & Ahmed, S. (2017). Reduction of inappropriate benzodiazepine prescriptions among older adults through direct patient education: the EMPOWER cluster randomized trial. *JAMA internal medicine*, 174(6), 890–898. https://doi.org/10.1001/jamainternmed.2014.949

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Appendix C: PATD Questionnaire

Table 2

Responses to PATD items 1-10 (n = 100), n (%)

	N = 100				
	Strongly agree	Agree	Unsure	Disagree	Strongly disagree
1. I feel that I am taking a large number of medications	73 (73)	8 (8)	2 (2)	14 (14)	3 (3)
2. I am comfortable with the number of medications I am taking	54 (54)	11 (11)	10 (10)	22 (22)	3 (3)
3. I believe that all my medications are necessary	68 (68)	11 (11)	4 (4)	7 (7)	9 (9)
4. If my doctor said it was possible, I would be willing to stop one or more of my regular medications	78 (78)	7 (7)	1 (1)	12 (12)	2 (2)
5. I would like to reduce the number of medications I am taking	74 (74)	8 (8)	2 (2)	11 (11)	3 (3)
6. I feel that I may be taking one or more medications that I no longer need	9 (9)	2 (2)	6 (6)	57 (57)	25 (25)
7. I would accept taking more medications for my health conditions	61 (61)	10 (10)	2 (2)	25 (25)	2 (2)
8. I have a good understanding of the reasons I was prescribed each of my medications	83 (83)	2 (2)	3 (3)	12 (12)	0 (0)
9. The cost of medications impacts my willingness to stop one or more of them	18 (18)	0 (0)	1 (1)	76 (76)	3 (3)
10. I believe one or more of my medications is causing side effects	35 (35)	5 (5)	2 (2)	43 (43)	14 (14)

Appendix D: USD IRB Approval

January 24, 2023

Evelyn Oluoha
Hahn School of Nursing & Health Science

Re: Exempt - Initial - IRB-2023-50, Reducing polypharmacy amongst home-based older adults using a patient education program on medication safety

Dear Evelyn Oluoha:

The University of San Diego Institutional Review Board (USD IRB) has rendered the decision below for IRB-2023-50: Reducing polypharmacy amongst home-based older adults using a patient education program on medication safety.

Decision: Exempt. This study may start no earlier than January 23, 2023.

Selected Category: Category 4. Secondary research for which consent is not required: Secondary research uses of identifiable private information or identifiable biospecimens, if at least one of the following criteria is met:

(i) The identifiable private information or identifiable biospecimens are publicly available;

(ii) Information, which may include information about biospecimens, is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained directly or through identifiers linked to the subjects, the investigator does not contact the subjects, and the investigator will not re-identify subjects;

(iii) The research involves only information collection and analysis involving the investigator's use of identifiable health information when that use is regulated under 45 CFR parts 160 and 164, subparts A and E, for the purposes of "health care operations" or "research" as those terms are defined at 45 CFR 164.501 or for "public health activities and purposes" as described under 45 CFR 164.512(b); or

(iv) The research is conducted by, or on behalf of, a Federal department or agency using government-generated or government-collected information obtained for nonresearch activities, if the research generates identifiable private information that is or will be maintained on information technology that is subject to and in compliance with section 208(b) of the E-Government Act of 2002, 44 U.S.C. 3501 note, if all of the identifiable private information collected, used, or generated as part of the activity will be maintained in systems of records subject to the Privacy Act of 1974, 5 U.S.C. 552a, and, if applicable, the information used in the

research was collected subject to the Paperwork Reduction Act of 1995, 44 U.S.C. 3501 et seq.

Findings: Thank you for addressing prior IRB review feedback.

Research Notes: N/A

Internal Notes:

The USD IRB requires annual renewal of all active studies reviewed and approved by the IRB. Please submit an application for renewal prior to the annual anniversary date of initial study approval.
If an application for renewal is not received, the study will be administratively closed.

Note: We send IRB correspondence regarding student research to the faculty advisor, who bears the ultimate responsibility for the conduct of the research. We request that the faculty advisor share this correspondence with the student researcher.

Applications for full review must be submitted at least two weeks prior to the next scheduled monthly IRB meeting; see https://www.sandiego.edu/irb/updates/ for specific deadlines. You may submit an IRB application for expedited or exempt review at any time.

Sincerely,

Truc T. Ngo, PhD
IRB Administrator

Office of the Senior Vice President and Provost
Hughes Administration Center, Room 212
5998 Alcalá Park, San Diego, CA 92110-2492
Phone (619) 260-4553 • Fax (619) 260-2210 • www.sandiego.edu

Appendix E: Letter of Support

SACRED HEART CHURCH OF OCEAN BEACH
4776 Saratoga Avenue
San Diego, CA 92107-9990

January 5, 2023

To: Institutional Review Board, University of San Diego
From: Rev. Thomas RJ Kiely, Parish Priest
Re: DNP Project Titled: "Reducing Polypharmacy amongst home-based older adults using a patient education program on medication safety."

Sr. Evelyn Oluoha has our support to begin her scholarly practice project at Sacred Heart Parish community as part of her coursework for the Doctor of Nursing Practice (DNP) Program at the University of San Diego. Sr. Oluoha has agreed to work under close guidance. She will cleanse all data of any older adults or institutional identifiers of the expected IRB low risk study, and we understand that she will request to use this experience for publications and professional presentations.

If you have any questions, please do not hesitate to contact me at 619 224-2746 or email at trcelts@gmail.com or frthomask@sacredheartob.org.

Sincerely,

Rev. Thomas RJ Kiely, Parish Priest
Parish Administrator

www.sacredheartob.org

Appendix F: Outcomes Exemplars

AACN DNP Essentials/NONPF Competencies/USD DNP Program Outcome Exemplars

AACN DNP Essentials & NONPF Competencies	USD DNP Program Objectives	Exemplars Provide bulleted exemplars that demonstrates achievement of each objective
DNP Essential I: Scientific Underpinnings for Practice **NONPF: Scientific Foundation Competencies** *The scientific foundation of nursing practice has expanded and includes a focus on both the natural and social sciences including human biology, genomics, science of therapeutics, psychosocial sciences, as well as the science of complex organizational structures. In addition, philosophical, ethical, and historical issues inherent in the development of science create a context for the*	**2.** Synthesize nursing and other scientific and ethical theories and concepts to create a foundation for advanced nursing practice.	**Fall 2020** • **DNPC 611**: Utilized Iowa Model to guide PICO question in the EBP project that seeks to determine the effectiveness of patient education compared to home adjustments in preventing falls among older adults when they leave hospital • **APNC-520:** Managed an evidence-based literature review for 12 distinct pathophysiological conditions for clinical class presentations • Completed collaborative institute Training Initiative (CITI Program) • Completed Adverse Childhood event (ACE) Training • Completed the Basic Life Support (BLS) certification. **Summer 2021** • **DNPC- 630:** researched the Servant Leadership model for implementation in clinical practice in Scholarly Practice • **DNPC- 610**: researched the MBSR therapy practice and determined when and where it

application of the natural and social sciences.		may be most useful in practice and where and when it should not be used in Reflective Practice.
DNP Essential II: **Organizational & System Leadership for Quality Improvement & Systems Thinking** **NONPF: Leadership Competencies/Health Delivery System Competencies** *Advanced nursing practice includes an organizational and systems leadership component that emphasizes practice, ongoing improvement of health outcomes, and ensuring patient safety. Nurses should be prepared with sophisticated expertise in assessing organizations, identifying system's issues, and facilitating organization-wide changes in practice delivery. This also requires political skills, systems*	**5.** Design, implement, and evaluate ethical health care delivery systems and information systems that meet societal needs and ensure accountability for quality outcomes.	**Spring 2021** • **DNPC-626**: Applied principles of strategic planning to evaluate strengths, weaknesses, opportunities, and threats to a selected healthcare organization. Created strategic action plan to achieve goals. • Created strategic action plan to achieve goals (DNPC 626) **Summer 2021** • **DNPC -610** – Studied the Benefits of mindfulness practices- stress reduction, gaining insight, enhancing performance and awareness through our mind.

thinking, and the business and financial acumen needed for the analysis of practice quality and costs.		
DNP Essential III: Clinical Scholarship & Analytical Methods for Evidence-Based Practice **NONPF: Quality Competencies/Practice Inquiry Competencies** *Scholarship and research are the hallmarks of doctoral education. Although basic research is viewed as the first and most essential form of scholarly activity, an enlarged perspective of scholarship has emerged through alternative paradigms that involve more than discovery of new knowledge. These paradigms recognize: (1) the scholarship of discovery and integration*	**4.** Incorporate research into practice through critical appraisal of existing evidence, evaluating practice outcomes, and developing evidence-based practice guidelines.	**Spring 2021** • **APNC-523**: Gathered and presented information regarding the use of Ginger and its associated formularies as CAM therapy. **Fall 2021** • **DNPC622***: **Case Conference Presentation:** Synthesized and evaluated the knowledge of genetics, environmental stressors, cellular injury, in the evaluation of patients with Marfan syndrome. Evaluated subjective and objective clinical findings to formulate differential diagnoses for patients with Marfan syndrome. Evaluated current therapies and investigational interventions for Marfan syndrome. Evaluated clinical outcomes of practice, practice patterns, and systems of care within a practice setting, health care organization, or community for early detection and screening. • **EBP Synthesis & Pathogenesis Presentation & Manuscript:** Synthesized and evaluated the knowledge of genetics, environmental stressors, cellular injury, inflammation of joints with Patients with Marfan syndrome. Evaluated subjective and objective

"reflects the investigative and synthesizing traditions of academic life"; (2) scholars give meaning to isolated facts and make connections across disciplines through the scholarship of integration; and (3) the scholar applies knowledge to solve a problem via the scholarship of application that involves the translation of research into practice and dissemination and integration of new knowledge.		clinical findings to formulate differential diagnoses for patients with Marfan syndrome. Evaluated current therapies and investigational interventions for patients with Marfan syndrome. Evaluated clinical outcomes of practice, practice patterns, and systems of care within a practice setting, health care organization, or community for Marfan syndrome. • Performed multiple literature searches, reviews, and synopses regarding disease pathogenesis, assessment, and risk assessment for multiple diseases/conditions. **Spring 2023** • **DNPC 630 –** Implemented a Stakeholder presentation on the result of the retrospective chart review to the Administrator and leaders of UC san Diego Health Regional Burn Center and submitted the project to the 16th Annual E-poster Conference.
DNP Essential IV: Information Systems/Technology & Patient Care Technology for Improvement & Transformation of Health Care **NONPF: Technology & Information Literacy Competencies**	**7.** Incorporate ethical, regulatory, and legal guidelines in the delivery of health care and the selection, use, and evaluation of information systems and patient care technology.	**Fall 2020** • **DNPC625**: Obtained Biomedical Research Human Certification Basic/Refresher Course through. **Spring 2021** • **HCIN-540**: Developed a clear understanding of health care informatics and how it is effectively used to provide increased quality of care to patients in Health Care Informatics.

DNP graduates are distinguished by their abilities to use information systems/technology to support and improve patient care and health care systems, and provide leadership within healthcare systems and/or academic settings. Knowledge and skills related to information systems/technology and patient care technology prepare the DNP graduates apply new knowledge, manage individual and aggregate level information, and assess the efficacy of patient care technology appropriate to a specialized area of practice along with the design, selection, and use of information systems/technology to evaluate programs of care, outcomes of care, and care systems. Information systems/technology provide a mechanism to apply budget and productivity tools, practice information systems and decision supports, and web-		**Fall 2021** • **DPNC 602 & APNC 521.** Pragmatically applied in the clinical and simulation lab setting the fundamental theories and latest evidence-based practices of Primary Care in an adult population internal medicine clinic including screening, physical assessments, diagnoses, and treatments. • **DNPC602** Studied evidence-based therapies and practices for disease processes/screening for health conditions including hypertension, health screening for diverse populations at USD simulation lab and at the clinic setting.

based learning or intervention tools to support and improve patient care.		
DNP Essential V: Health Care Policy for Advocacy in Health Care **NONPF: Policy Competencies** *Health care policy, whether created though governmental actions, institutional decision-making, or organizational standards, creates a framework that can facilitate or impede the delivery of health care services or the ability of the provider to engage in practice to address health care needs. Engagement in the process of policy development is central to creating a health care system that meets the needs of its constituents. Political activism and a commitment to policy development are central elements of DNP practice.*	**3.** Demonstrate leadership in collaborative efforts to develop and implement policies to improve health care delivery and outcomes at all levels of professional practice (institutional, local, state, regional, national, and/or international).	**Spring 2021** • **DNPC-648**: Developed an understanding of the role in which policy determines health policy and the importance of actively participating in the process as a nurse leader in Health Policy Analysis. **Spring 2021** • DNPC-648: Analyzed federal and state health policy bills; evaluated strengths and weaknesses of policies; developed a policy brief, stakeholder analysis and policy alternatives; deepened understanding of norms, compromise; and made recommendations for adoption and appropriation of funds for bill to address systematic racism within public health in Health Policy Analysis.

DNP Essential VI: **Interprofessional Collaboration for** **Improving Patient & Population** **Health Outcomes** **NONPF: Leadership** **Competencies** *Today's complex, multi-tiered* *health care environment depends on the* *contributions of highly skilled and* *knowledgeable individuals from multiple* *professions. In order to accomplish the* *IOM mandate for safe, timely, effective,* *efficient, equitable, and patient-centered* *care in this environment, health care* *professionals must function as highly* *collaborative teams. DNPs have* *advanced preparation in the* *interprofessional dimension of health*	**1.** Demonstrate advanced levels of clinical practice within defined ethical, legal, and regulatory parameters in designing, implementing, and evaluating evidenced-based, culturally competent therapeutic interventions for individuals or aggregates. **3.** Demonstrate leadership in collaborative efforts to develop and implement policies to improve health care delivery and outcomes at all levels of professional practice (institutional, local, state, regional,	**Fall 2022** •Collaborated with the "Care of the whole Person Initiative" leaders of the Scared Heart Parish community in improving the health of the older adults living in their own homes. (DNPC630) **Spring 2023** •Over 1080 clinical hours that provided the opportunity to provide care for patients that are medically underserved, where I was able to collaborate with physicians, nurse practitioners, physician assistant, psychiatrist, social work, and other specialties (NPTC 604,605, 608, 609)

care that enable them to facilitate collaborative team functioning and overcome impediments to interprofessional practice. DNP graduates have preparation in methods of effective team leadership and are prepared to play a central role in establishing interprofessional teams, participating in the work of the team, and assuming leadership of the team when appropriate.	national, and/or international).	
DNP Essential VII: Clinical Prevention & Population Health for Improving Nation's Health **NONPF: Leadership Competencies** *Consistent with national calls for action and with the longstanding focus on health promotion and disease prevention in nursing, the DNP*	**6.** Employ a population health focus in the design, implementation, and evaluation of health care delivery systems that address primary, secondary, and tertiary levels of prevention.	**Fall 2020** • **DNPC 625**: In collaboration with a student colleague, an epidemiologic approach was utilized to develop a secondary screening approach for Sickle Cell Anemia in Africans and African Americans. **Summer 2021** • **DNPC-610**: Reviewed mindfulness and emotional intelligence, illustrated how when these are implemented in professional and personal lives helps one to remain focused on work.

graduate has a foundation in clinical prevention and population health. This foundation enables DNP graduates to analyze epidemiological, biostatistical, occupational, and environmental data in the development, implementation, and evaluation of clinical prevention and population.		

DNP Essential VIII: Advanced Nursing Practice NONPF: Independent Practice/Ethics Competencies *The increased knowledge and sophistication of healthcare has resulted in the growth of specialization in nursing in order to ensure competence in these highly complex areas of practice. The reality of the growth of specialization in nursing practice is that no individual can master all advanced roles and the requisite knowledge for enacting these roles. DNP programs provide preparation within distinct specialties that require expertise, advanced knowledge, and mastery in one area of nursing practice. A DNP graduate is prepared to practice in an area of specialization within the larger domain of nursing.*	1. Demonstrate advanced levels of clinical practice within defined ethical, legal, and regulatory parameters in designing, implementing, and evaluating evidence-based, culturally competent therapeutic interventions for individuals or aggregates.	**Spring 2023** Utilized a validated questionnaire (PATD) to conduct an evidence-based practice project on "Reducing Polypharmacy amongst the older adults living in their homes using a patient centered education on medication safety" • IRB approval required for final EBP project ensured ethical and legal parameters were identified and considered (DNPC 630) **Spring 2023** • Provided evidence based, culturally competent care to patients during clinical hours (NPTC 604, 605, 608, 609)

KM 5/31/16KM 5/31/16