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Improving Compliance with Treatments for End-Stage Renal Disease Patients on Hemodialysis

Susan Blakeney

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IMPROVING COMPLIANCE WITH TREATMENTS FOR END-STAGE
RENAL DISEASE PATIENTS ON HEMODIALYSIS

by

Susan Blakeney

A Doctoral Project
Submitted to the Graduate School,
the College of Nursing and Health Professions
and the School of Leadership and Advanced Nursing Practice
at The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Nursing Practice

Approved by:

Dr. Carolyn Coleman, Committee Chair
Dr. Lisa Morgan, Committee Member

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ABSTRACT

According to Blumrosen et al. (2020), the dialysis population cost expenditure is greater than “seven percent of the Medicare budget at nearly \$40 billion a year” even though this population is “less than one percent of the Medicare population” (p. 1436). Additionally, the renal disease population is growing in the United States and internationally which contributes to rising healthcare costs around the globe (Levin, 2018).

The purpose of this Doctor of Nursing Practice (DNP) project was to identify the factors or reasons hemodialysis patients miss treatments or only stay for partial treatment. Hemodialysis patients are required to have treatments three times weekly. However, hemodialysis patients have a high incidence of missed or shortened treatments. The patient population who misses treatment are at risk of poor outcomes such as fluid overload, hospitalizations, and mortality.

Depression may be the reason for missed treatments. The retrospective quantitative review was conducted on each patient if they missed one or more treatments in a four-month window (Al Salmi et al., 2018). The practitioner-researcher collected data in the retrospective review to ascertain depression scores, previous treatments, or previous mental health treatment. The DNP researcher was searching to find the answer to improve this patient population outcomes.

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To Dr. Carolyn Coleman my chair-- thank you. To Dr. Lisa Morgan my committee member – Thanks for your support and encouragement.

DEDICATION

To my wonderful family—Thank you Harry and Carlee for supporting and encouraging me throughout the process of completing my Doctorate. I Love you both.
Thank you, God, for my many blessings.

TABLE OF CONTENTS

ABSTRACT ii

ACKNOWLEDGMENTS iii

DEDICATION iv

LIST OF TABLES viii

LIST OF ABBREVIATIONS ix

CHAPTER I - INTRODUCTION 1

 Background 2

 Significance 3

 Problem Statement 5

 Available Knowledge 5

 PICO 6

 Needs Assessment 6

 Synthesis of Evidence 7

 Systematic Review 8

 Systematic Review 9

 Systematic Review 9

 Depression Study in Veterans 10

 African American Perspective 11

 Dialysis Outcome Study 12

Induced Cardiac Risk	13
Benefits of Home Hemodialysis	13
Diabetic Kidney Disease.....	14
Cluster-Randomized Controlled Trial.....	14
Improving Global Kidney Expert Opinion	14
Social Determinants of Health	15
Rationale	16
Theoretical Framework.....	16
Specific Aims.....	17
DNP Essentials.....	18
Summary	19
CHAPTER II - METHODOLOGY	20
Introduction.....	20
Project Intervention.....	20
Population of Interest.....	21
Measures: Data Collection	21
Analysis.....	22
Ethical Considerations	22
Summary.....	23
CHAPTER III – RESULTS	24

Introduction.....	24
Summary.....	26
CHAPTER IV – DISCUSSION.....	27
Introduction.....	27
Strengths of the Project.....	27
Interpretation.....	27
Limitations	27
Implications for Future Practice.....	28
Conclusion	28
Summary.....	28
APPENDIX A – IRB Approval Letter.....	30
APPENDIX B – Data Collection Tool	31
APPENDIX C – Medical Records Representation Dialysis.....	32
APPENDIX D – Letters of Support.....	33
REFERENCES	35

LIST OF TABLES

Table 1 Sex of the Participants	24
Table 2 Correlations.....	25
Table 3 Depression Status of the Patients.....	26

LIST OF ABBREVIATIONS

<i>AACN</i>	American Association of Colleges of Nursing
<i>C-EMR</i>	Clinic electronic medical record
<i>D-EMR</i>	Dialysis electronic medical record
<i>CBT</i>	Cognitive Behavioral Therapy
<i>CDC</i>	Centers for Disease Control and Prevention
<i>CKD</i>	Chronic kidney disease
<i>DNP</i>	Doctor of Nursing Practice
<i>ESRD</i>	End stage renal disease
<i>IRB</i>	Institutional Review Board
<i>SPSS</i>	Statistical Package for the Social Sciences
<i>PHQ-9</i>	Patient health Questionnaire

CHAPTER I - INTRODUCTION

Diabetes is the leading cause of the end-stage renal disease (ESRD) in the United States and in “most countries around the world” (Snider et al., 2019). The cost of Medicare treatment for ESRD is more than 32 billion annually (Ahmadmehrabi & Tang, 2018). Additionally, the amount of people with ESRD in the United States is staggering.

According to Sullivan et al. (2019), almost 700,000 patients are undergoing renal replacement therapy. Also, according to the Centers for Disease Control and Prevention (CDC, 2021), the number of adults in the United States with chronic kidney disease (CKD) is greater than one in seven people; furthermore, nine out of ten patients with CKD do not know the disease is present and have no symptoms (CDC, 2021).

Consequently, 131,600 people progressed to ESRD and began treatment in 2018 (CDC, 2021). The ethnic adult percentages affected by CKD are 16% African American, 14%, Hispanic, 13% Asian, and 13% Caucasian (CDC, 2021).

ESRD is defined as usually slow but irreversible damage to the kidney that continues until kidney function is decreased and no longer able to remove toxins and fluid from the body “which may lead to high blood pressure” (CDC, 2021, p. 1). Diabetes is the major cause of ESRD; however, other causes are heart disease, hypertension, obesity, hereditary, and prior kidney damage. CKD has five stages of progression hence the fifth and final stage of chronic kidney disease in ESRD.

ESRD requires renal replacement therapy to sustain life. Patients choose their renal replacement therapy after education regarding the choices. The choices include in-center hemodialysis, home hemodialysis, and home peritoneal dialysis. In 2018, the incidence rate of end-stage renal disease grew by 2.3% to a total of 131,636 people from

the previous year; the number of people choosing hemodialysis at the hemodialysis outpatient unit increased to 113,000 (U.S. Renal Data System (USRDS), 2020).

Hemodialysis patients who miss treatments have an increased risk for hospitalization, inadequate dialysis, and cardiac complications. The mortality rate for hemodialysis patients was “192.9 per thousand patient-years in 2009 but decreased to 164.4% in 2018” (USRDS, 2020, p.1). However, most deaths for ESRD patients are due to cardiovascular disease with associated arrhythmias and sudden cardiac arrest (Ahmadmehrabi & Tang, 2018).

Background

The ESRD population is an intricate group of patients with multiple comorbidities. The hemodialysis patient may have diabetes, hypertension, heart disease, anemia, secondary hyperparathyroidism, previous stroke, depression, and thyroid disease. In addition, hemodialysis patients may have multiple medications for each comorbidity such as three or more blood pressure medications, three or four phosphorus binders as well as other medications for comorbidities. The hemodialysis patients have many lifestyle changes, for example, dietary restrictions, fluid restrictions and travel to the dialysis unit three times weekly.

The fluid restrictions are 40 ounces of fluid a day which includes any fluid or food that melts. High potassium foods are limited because high serum potassium may cause irregular heart rhythm which can lead to hospitalization or death. For example, a list of some of the foods to avoid are oranges, bananas, milk, watermelon, tomatoes, nuts, dried foods, etc. In addition, foods high in phosphorus are also limited. The only cola that

patients can drink is sprite or clear cola and the only dark cola is “Barque’s” root beer due to the high phosphorus content in the other dark colas.

Hemodialysis patients are required to have hemodialysis treatments three times weekly for an average of three to five hours in dialysis treatment. A portion of hemodialysis patients is noncompliant with their dialysis treatments. The dialysis treatment missed may be one of the three treatments weekly or signing off early from their three weekly treatments. The hemodialysis patients are also non-compliant with medications including phosphorus binder medication and medication to treat secondary hyperparathyroidism. The patient population has a complex self-care regime and multiple restrictions which is life-changing and maybe part of the reason for missed treatments.

Furthermore, according to Pena-Polanco et al. (2017), 25% of hemodialysis patients frequently have depression. Hemodialysis patients undergo life changes such as possible job loss which results in the loss of insurance and possible health decline which requires family support. (Pena-Polanco et al., 2017). Also, hemodialysis patients may develop side effects with the phosphorus binder which is needed to reduce phosphorus in the blood. Finally, the dialysis treatment can cause cramps and weakness after the session which may contribute the patients to hopelessness regarding life changes.

Significance

Noncompliance with hemodialysis treatments is a powerful indicator of unfortunate outcomes with ESRD patients. The hemodialysis population has an increased occurrence of hospitalizations at “1.73 per patient-year” which is two times higher in comparison to other chronic diseases with comparable “age groups and comorbidities as

well as readmission rates at 35%” (Blumrosen et al., 2020, pp. 1435-1436). Hemodialysis removes metabolic wastes from the body.

However, when patients are noncompliant with dietary restrictions and gain excessive fluid between treatments, the process of hemodialysis or the elimination power must increase to remove the toxic waste. As a result, according to Wang et al. (2017), “bone demineralization, pulmonary edema, metabolic disorder, cardiovascular damage” (p. 102) can occur. Patients who miss dialysis treatments also risk poor outcomes due to inadequate dialysis.

According to the USRDS (2020), the prevalence of ESRD was 3.4 times higher in African Americans than Caucasian people. Furthermore, the prevalence of African Americans undergoing hemodialysis at the outpatient dialysis units was 72% compared to 57% Caucasian people on hemodialysis at the outpatient dialysis units (USRDS, 2020). Caucasian people on hemodialysis have higher mortality rates than African Americans on hemodialysis (USRDS, 2020). ESRD cause mortality was attributed to “arrhythmia/cardiac arrest or sudden cardiac death by 44.2% in 2018” (USRDS, 2020, p. 11).

Depression is prevalent in the ESRD population. Depression is also a contributing factor for noncompliance with hemodialysis treatments (Pena-Polanco et al., 2017). In addition, ESRD patients with multiple co-morbidities have decreased health status. (Pena-Polanco et al., 2017). This population of patients have decreased appetites, and many have low albumins which contribute to their decreased health. Thus, the provider will add a new medication for appetite however, the new medication adds to the plethora of medications the population has to take daily.

Problem Statement

The purpose of this project was to create and implement a project that was evidenced based to ascertain the answer for improving compliance with dialysis patients. Hemodialysis patients have a complicated treatment plan that has many restrictions. The restrictions have recurrent episodes of noncompliance. Improving noncompliant patient compliance is the goal with hemodialysis treatments. Equally important for hemodialysis patients was decreased hospitalizations due to fluid overload. Therefore, healthcare cost is decreased which in turn decreases the risk for poor outcomes for the patient population.

Hemodialysis is required three times weekly to remove fluid and waste. The in-center hemodialysis patients are connected to a machine to clean the patient's blood through a dialysis filter that mimics the kidney. In contrast, normal kidneys in a patient work daily cleaning the patients' blood automatically. As a result, non-compliant patients are at risk of poor outcomes even if only one hemodialysis treatment is missed due to inadequate dialysis. This Doctor of Nursing Practice (DNP) was focused on addressing the question to find out if depression was the reason for missed dialysis treatments, or do patients miss dialysis treatments due to behavior patterns.

Available Knowledge

“Non-adherence is highly prevalent among chronic hemodialysis patients and is associated with poor quality of life, depression, and malnutrition” (Ibrahim et al., 2015, p.1). The hemodialysis patients gain knowledge through educational interventions to improve compliance; however, the behavior change only lasts for a short time frame before reoccurrence (Murali et al., 2019).

PICO

Among hemodialysis patients who are non-compliant with hemodialysis treatments (P), how does treatment for depression affect compliance with dialysis treatments (I) compared to hemodialysis patients who do not have treatment for depression (C) will have improved compliance with treatments (O).

Needs Assessment

According to Salim et al. (2018), the incidence rate for hemodialysis patients in Mississippi was 1,682 in 2016. “Blacks have a fourfold prevalence rate of hemodialysis treatments” which is more than Caucasians (Blumrosen et al., 2020, p.1435). The adult hemodialysis in center units includes patient ages between 18 and 95 years old. The poverty rate is high in Mississippi (Salim et al., 2018). In addition, some patient insurances do not cover all the medication prescribed or may cover the required medication, but the copay is too expensive. A few of the reasons possibly associated with missed treatments include “heavy pill burden, lower socioeconomic status, depression, and poor health literacy (Murali et al., 2019 p. 20).

According to Al Salmi et al. (2018), among hemodialysis patients in the United States, 20-24% of the patients missed one or more of their treatments. Noncompliant patients are in all ten hemodialysis units. The hemodialysis patients missing one treatment in a “four-month window are at risk poor outcomes according to the missed treatment risk >5%”, (Al Salmi et al., 2018 p. 634). Consequently, this population of hemodialysis patients have an increased risk of death or hospitalization.

Depressive symptoms are also frequently found in the hemodialysis population. According to Nadort et al. (2019), the symptoms do not resolve without treatment.

Therefore, the depressive symptoms can also contribute to missed dialysis treatments (Nadort et al., 2019). Depressed symptoms can decrease happiness, and wellbeing for this population because of the life changes associated with ESRD on hemodialysis (Nadort et al., 2019).

Synthesis of Evidence

An electronic database search was performed to find articles for the DNP project in CINAHL, EBSCOhost, Medline, Consumer Health Complete, Google Scholar, Science Direct, Psych Behavior Sciences, and the Cochrane Library. The search parameters included *noncompliance or nonadherence, hemodialysis treatments*. Other search criteria included *depression, chronic kidney disease, hemodialysis, end-stage renal disease*. Filters were utilized for full-text articles, peer-reviewed articles, and the English language.

The initial search revealed 15,622 articles. Therefore, articles were discarded if involving pediatric patients or patients under eighteen as well as any articles not related to the project which narrowed the number down to 1,436. In addition, the articles were saved if the articles revealed insight into factors related to noncompliance or outcomes to noncompliance in hemodialysis. Articles were reviewed for evidence-based practice and interventions to improve compliance with hemodialysis patients. The articles were narrowed down to 50. Finally, the articles were narrowed to the geography filter for the United States or the US thus African Americans would be included in the studies. The total number of articles used was 16. The following reveals the synthesis of evidence.

Systematic Review

According to Murali et al. (2019), a few of the reasons possibly associated with missed treatments include “heavy pill burden, lower socioeconomic status, depression, and poor health literacy” (p. 20). The interventions' first article is a systematic review and analysis with four different interventions to synthesize. The first intervention is “educational/cognitive” which explains the reasons for compliance with dialysis treatments to the patient population; the second intervention is “counseling/behavioral” which focuses on the attitudes and the abilities of the patient population to take charge of their own health (Murali et al., 2019, p. 4).

The third intervention is “psychologic/affective” which focuses on the patient population’s reactions to social underpinning (Murali et al., 2019, p. 4). The final intervention is “mixed interventions” which combines different interventions to find improvement to compliance (Murali et al., 2019, p. 4). Additionally, many behavior theories were used in the randomized trials (Murali et al., 2019).

The *Cochrane Risk Bias Tool* and *PRISMA* checklist were used in the review and analysis of randomized controlled trials (Murali et al., 2019). In addition, the randomized analysis revealed an insufficiency of uniform compliance measures pre- and post-intervention which may cause “variations in adherence” (Murali et al., 2019, p. 3). In addition, some trials had a lower number of participants included in the randomized trials which may increase the risk of selection bias regarding adherence (Murali et al., 2019).

Finally, the results of the study analysis revealed the interventions improved compliance for a short period, then a recurrence of noncompliance returned (Murali et al.,

2019). In addition, the “education intervention did not translate” into long-term compliance. However, according to Murali et al. (2019), cognitive behavioral therapy may be the best hope in this patient population.

Systematic Review

In contrast, according to Tao et al. (2020), compliance with dialysis treatments is a partnership between the patient and the provider. Similarly, to the previous study, the interventions were “cognitive behavioral therapy as well as counseling, family support, and educational interventions” (p. 2835). In contrast, the study was focused on one combined intervention “psycho-social and educational” (Tao et al., 2020 p. 2835). In comparison to prior article synthesis, the intervention analysis revealed improved compliance in treatment by focusing on one individual at a time (Tao et al., 2020). The intervention was adjusted for each patient by talking to the patient one-to-one during an educational session resulted in improved compliance outcomes (Tao et al., 2020).

Similarly, the *PRISMA* guidelines were used in the review and analysis of the randomized trials in the study. According to Tao et al. (2020) risk of bias was found in some of the reviews in the study. However, publication bias was not identified due to the “funnel plots” (Tao et al., 2020, p. 2840).

Systematic Review

Similarly, according to Blumrosen et al. (2020), the patients’ reasons for noncompliance were transportation, weather, and behavior patterns. Three interventions were used in the study. Similarly, to the previous study “therapeutic alliance” was used in the interventions to engage the African Americans through an agreement between the “patient and the provider” to establish the goals and behavior to choose the desired

intervention (Blumrosen et al., 2020, p. 1436). The first intervention was “automated messaging” which included a text or phone message three times weekly to remind non-compliant patients to go to dialysis treatment however no theory was associated with the intervention (Blumrosen et al., 2020, p. 1440).

The second intervention was “improving patient experience” using diffusion-of innovation-theory and a multidisciplinary team care approach with a questionnaire at the beginning and end of the intervention to obtain information regarding patient satisfaction (Blumrosen et al., 2020, p. 1440). The third intervention was focused on combining a compliant patient with a non-compliant patient using social cognitive theory for “peer to peer for a quality improvement program through positive feedback and rewarding” (Blumrosen et al., 2020 p. 1439). All three interventions may improve treatment compliance except leaving dialysis early or stopping before prescription time is completed (Blumrosen et al., 2020).

In comparison to all the previous studies in this analysis, the systematic review inclusion criteria were specific and included only studies with more than 25% African Americans and specific designs “quasi-experimental and experimental” (Blumrosen et al., 2020, p. 1437). Only three studies were used for synthesis with one randomized trial and two pre-post single-armed intervention studies which may increase the risk of bias (Blumrosen et al., 2020, p. 1437). However, according to (Blumrosen et al. (2020), all three interventions may improve compliance.

Depression Study in Veterans

Similarly, according to Pena-Polanco et al. (2017), the hemodialysis patient population has many “symptoms, of which depression is particularly common, affecting

up to 25% of the patients” p.298). The hemodialysis patients may show benefit from “antidepressant medication and cognitive behavioral therapy” (p.298). A cluster-randomized trial evaluated five interventions (Pena-Polanco et al., 2017, p. 299). In contrast to previous studies, this study was done at a Veterans Center with African American men.

Depression scores were obtained monthly for approximately one year. Five interventions were offered to the patients with a positive Patient Health Questionnaire (PHQ-9) score (Pena-Polanco et al., 2017). The first intervention was increasing the dose of current medication; the second intervention was prescribing a different medication (Pena-Polanco et al., 2017). The third intervention was prescribing a depression medication, or a second medication was started; the fourth intervention was referring the patient to a mental health professional or setting up a follow-up appointment with the mental health professional (Pena-Polanco et al., 2017).

However, the hemodialysis population may refuse treatment with depression medications or referral to mental health facility even with positive (PHQ-9) scores (Pena-Polanco et al., 2017). The results of the trial were astounding, seventy-seven percent of the trial participants would not accept any treatment for depression. Furthermore, some of the depression medications may not be effective in hemodialysis patients (Pena-Polanco et al., 2017).

African American Perspective

Similarly, according to Haynes et al. (2017), African Americans are generally resistant to accepting mental health treatment than other “racial and ethnic groups in the rural South” (p. 573). The barriers to treatment are “stigma of mental health, and low

mental health literacy” (Haynes et al., 2017, p. 577). In contrast, the participants in the qualitative study were mostly African American women who recommended three interventions to help with mental health which was “increasing social support, improving mental health literacy and promoting emotional wellness” (Haynes et al., 2017, p. 573).

Other barriers are “mistrust and fear of treatment” (Haynes et al., 2017, p. 573). According to Haynes et al. (2017) in contrast, the barriers may improve by using telemedicine for mental health treatment which would keep the participant anonymous (Haynes et al., 2017, p. 573). Additional similar barriers are “social inequities, racism, unemployment and poverty” which may contribute to depression (Haynes et al., 2017, p. 576).

Dialysis Outcome Study

According to Al Salmi et al. (2018), hemodialysis patients who are non-compliant with hemodialysis treatments were studied in a prospective observational study. The study included four hemodialysis in-center units in the United States for compliance; a comparison study was done in Japan, Sweden, and multiple other countries (Al Salmi et al., 2018). In comparison, the results of the study revealed the most compelling finding was mortality detected in the noncompliant patients with only one treatment missed in four months (Al Salmi et al., 2018).

Furthermore, the patients had more hospital visits and emergent visits due to non-compliance (Al Salmi et al., 2018). Similarly, some of the reasons patients did not go to dialysis treatment were health literacy, young patients, and transportation (Al Salmi et al., 2018). Out of twenty countries in the study, the United States had the most amount of

noncompliance and increased risk in comparison to the other nineteen countries in the study (Al Salmi et al., 2018).

Induced Cardiac Risk

According to Ahmadmehrabi and Tang (2018), the cardiac risk is increased in the ESRD population. Like previous studies, the hemodialysis population has high mortality due to cardiac complications (Ahmadmehrabi & Tang 2018). The cardiac issues may be caused by several factors. ESRD patients are lacking in erythropoietin which causes anemia (Ahmadmehrabi & Tang, 2018).

Consequently, “anemia promotes cardiac ischemia” (Ahmadmehrabi & Tang, 2018, p. 259). Other factors associated with cardiac complications in hemodialysis patients are chronic volume overload, and platelet abnormalities (Ahmadmehrabi & Tang, 2018). As a result, left ventricular hypertrophy can also increase the risk of cardiac ischemia (Ahmadmehrabi & Tang 2018).

According to Wang et al. (2017), the meta-analysis of nursing interventions was reviewed to evaluate for improved compliance with treatments. The interventions were behavioral, educational, and cognitive like previous studies in this paper (Wang et al. (2017). However, the measures were not consistent resulting in difficulty to replicate Wang et al. (2017). Additionally, the other interventions were not found to have significant differences (Wang et al., 2017).

Benefits of Home Hemodialysis

According to Salim et al. (2018), the hemodialysis in center units in Mississippi has a large population of patients. However, the home hemodialysis population is only 2% in Mississippi. (Salim et al., 2018). The benefits of home hemodialysis are dialysis

treatments every day which may decrease left ventricular hypertrophy and mortality (Salim et al., 2018). Mississippi is a rural state with a large population of people living in poverty. In comparison, noncompliance reasons are “impaired quality of life, depression, and post dialysis fatigue” (Salim et al., 2018, p. 80).

Diabetic Kidney Disease

According to Snider et al. (2019), this study was done to check the effectiveness of a biomarker to obtain an early diagnosis of Diabetic kidney disease (DKD). “DKD is a complication from diabetes” (p. 2). Patients with diabetes and ESRD have a “4.5 times mortality risk than diabetes alone” (Snider et al., 2019, p. 2). The biomarker was found to be effective in diagnosing DKD earlier, therefore DKD progression could be decreased (Snider et al., 2019).

Cluster-Randomized Controlled Trial

According to Snider et al. (2019), this study was done to check the effectiveness of a biomarker to obtain an early diagnosis of Diabetic kidney disease (DKD). “DKD is a complication from diabetes” (p. 2). Patients with diabetes and ESRD have a “4.5 times mortality risk than diabetes alone” (Snider et al., 2019, p. 2). The biomarker was found to be effective in diagnosing DKD earlier, therefore DKD progression could be decreased (Snider et al., 2019).

Improving Global Kidney Expert Opinion

According to Levin, (2018), the prevalence of chronic kidney disease is creating a large burden throughout the world due to the increasing incidence of chronic kidney disease. Therefore, a conference was held for the global experts to discuss ways to improve CKD outcomes (Levin, 2018). Nephrologists and other experts collaborate for

the improvement of kidney treatment. A meeting was coordinated to research and explore to “improve global kidney health” (Levin, 2018).

Social Determinants of Health

Non-English-speaking patients on hemodialysis have cultural language barriers. The plan of care is discussed through an interpreter or family member with the patients’ permission. Health literacy is also a barrier for patients living in poverty and decreased education. Mental health literacy is also a barrier to care in African Americans. The dialysis population is impacted by cultural disparities and decreased access or gap in care.

One example of a gap in care is mental health care. Dialysis patients are not accepted at some mental health centers locally due to insurance. The dialysis patients can be seen at county facilities on a first-come basis, stand in line then show insurance information. At this point, the mental health center will set up an outpatient appointment for a later date.

However, transportation can be a barrier for mental health treatment with hemodialysis patients seeking care because of transportation issues. Patients must travel sometimes 30 minutes or an hour to the mental health facility. The second appointment is for the history and evaluation. The third trip is for the appointment with the provider, which means the patients may travel and pay for transportation three times before they see a provider.

Patients who live in rural areas have difficulty with transportation to and from dialysis. The dialysis treatment centers are in the rural areas of Mississippi; however, some patients still may travel 20 to 30 minutes to the dialysis center. Patients who do not qualify for transportation services rely on family for transportation. Furthermore, some

patients have transportation for dialysis but not for appointments that are not related to dialysis. As a result, appointments for counseling are difficult due to transportation unless the family takes the patient to the appointments.

Rationale

The synthesis evidence supports adequate evidence to correlate with depression as the cause of noncompliance in hemodialysis patients. The hemodialysis patient population is at risk of poor outcomes due to missing only one treatment in four months (Al Salmi et al., 2018). Finding the best intervention to treat the patients with depression may decrease noncompliance. This patient population has an increased risk for hospitalization and mortality due to missing dialysis treatments.

The research synthesis did reveal multiple interventions for noncompliance. The interventions were similar, and some were repetitive but overall did not show the best evidence. Compliance measures are lacking in African American or Black Americans in the United States. The African American or Black American patient population needs more evidence to decrease the noncompliance in the hemodialysis patients.

Theoretical Framework

Social Cognitive Theory (SCT) was the framework for this DNP project. Albert Bandura developed SCT in the mid-1970s (Middleton et al., 2018). SCT explains how patients have a constant relationship between the “individual and the environment” (Adefolalu, 2018, p. 2). The premise of “cognitive theory is learning” in addition, behavior is developed by “social acquisition of knowledge” (Adefolalu, 2018, p.2). Patients can create change by controlling the way they behave with thought processes and actions (Adefolalu, 2018).

The four ways to influence self-efficacy are performance mastery and is defined a strategic plan to do away with negative thinking in exchange for positive thoughts to reinforce the need for compliance (Adefolalu, 2018). Vicarious experience is defined as compliance with treatments after witnessing a reward given to another patient for compliance with treatment (Adefolalu, 2018). Verbal persuasion is defined as the patient maintains compliance in the long run by positively reinforcing compliance (Adefolalu, 2018). Physiological symptoms are defined as reactions associated with patients such as difficult situations, stressors, or other social determinants of health that may increase the risk of non-compliance with treatments (Adefolalu, 2018, p. 2).

According to Adefolalu (2018), self-efficacy is influenced by a desire to be compliant with treatments for change to occur (Adefolalu, 2018). However, if the patient does not desire change, then patients are not sure compliance is possible (Adefolalu, 2018). The behavioral theory of compliance is reinforced by a reward or praise from by a provider.

Specific Aims

This DNP project was focused on addressing the question to find out if depression is the reason for missed dialysis treatments. A quantitative retrospective review was obtained on previous treatments or no treatment for depression. Thus, research for evidence-based interventions was used in the previous treatment of depression compared to no treatment of depression. The measurable objection was improved compliance with hemodialysis treatments with depression treatment. In addition, the practitioner-researcher used a data collection tool to obtain measurable outcomes from previous treatments for depression.

DNP Essentials

Four DNP Essentials were a priority and aligned with this project. The DNP essentials were I, III, VI, and VII (American Association College of Nursing [AANC], 2017).

DNP Essential I is Scientific Underpinnings for practice. This essential allowed incorporation of nursing science as a framework for the project through the social cognitive theory. Social cognitive theory encourages the patient to be proactive in self-health care which will strengthen healthcare delivery and outcomes (AANC, 2017).

DNP Essential III is Clinical Scholarship and Analytical Methods for Evidence-based Practice. The DNP program increased knowledge for ascertaining the best evidence-based practice. Leadership skills were used to implement and translate evidence-based research into practice and improve outcomes for the patient population (AANC, 2017).

DNP Essential VI is Interprofessional Collaboration for Improving Patient and Population Health Outcomes. The DNP graduate developed leadership and collaborative skills. Therefore, the DNP graduate used the skills to enhance the interprofessional partnership for the patient population (AANC, 2017).

DNP Essentials VII is Clinical Prevention and Population Health for Improving the Nation's Health. The DNP graduate was searching for evidence-based interventions to increase outcomes for the hemodialysis patient population. The DNP researcher was searching to find the evidence to decrease gaps in care and improve the patient population and overall health (AANC, 2017).

Summary

The synthesis of evidence revealed several interventions as well as inequities for noncompliance with the hemodialysis patient population. The literature review revealed depression and depressive symptoms for this patient population. The retrospective chart review of interventions did yield more evidence for depression treatment. Consequently, the evidence can improve outcomes for the population.

CHAPTER II - METHODOLOGY

Introduction

The DNP project was performed to find the evidence-based intervention for compliance. The outpatient hemodialysis patients missed hemodialysis treatments or skipped part of the three times weekly dialysis treatments. The DNP student researcher investigated to see if depression was the cause of non-compliance with the hemodialysis treatments at the outpatient dialysis units. In addition, the investigator reviewed previous depression measures found in the retrospective chart review.

Hemodialysis patients who missed one or more of the three times weekly required hemodialysis treatments in four months were at risk for poor outcomes. In addition, the hemodialysis patients who skipped more than one hour of the three times weekly prescribed hemodialysis treatments in four months were at risk of poor outcomes.

Project Intervention

The DNP project was performed at the outpatient hemodialysis units. A retrospective chart review was ascertained to find the patients who miss one or more of the three times weekly hemodialysis treatments in four months. The data was placed on the student investigator data collection tool. In addition, the patients who shortened hemodialysis treatments by one or two hours of the hemodialysis treatments in four months were placed on the student investigator data collection tool. The missed hemodialysis treatments and partial treatments were obtained through the retrospective chart review from the dialysis electronic medical record (D-EMR).

Positive PHQ-9 depression scores were obtained from the D-EMR. The Clinic electronic medical record (C-EMR) was used to obtain previous depression measures.

The variables were mediation, counseling, cognitive behavioral therapy, or no previous depression treatment.

Therefore, the depression measures used for the depressed hemodialysis patients who were non-compliant with hemodialysis treatments were placed on the Data Collection Tool. Then, the depressed hemodialysis patient's treatment compliance was compared to the hemodialysis patients with no depression treatment. The data from the retrospective chart review was compared to the data from patients who do not have treatment for depression and miss or skip treatments. The DNP student was the only investigator.

Population of Interest

The patient population inclusion criteria were any hemodialysis patient who misses one or more of the required three times weekly hemodialysis treatments. Additionally, patients who shortened their treatment by one or more hours in four months were also in the inclusion criteria. The demographic information for the hemodialysis population were patients ages from 18 to 90. Other data was any race, sex, or ethnic group. The patient demographic data was included in the study. The patient's identity and the setting were deactivated.

Exclusion criteria for the DNP project included anyone under 18, any prisoners, or non-English speakers. Patients who are vulnerable such as from nursing homes will not be included. Finally, HIV patients were also excluded.

Measures: Data Collection

The DNP student researcher was the only investigator to obtain a retrospective review on sixty patients. The depressed patient's information was obtained for previous

depression treatment. The variables were medication, counseling, cognitive behavior therapy, and depression treatment. The variables were reviewed and added to the practitioner-created data collection tool. The C-EMR was used to obtain medication information. The D-EMR was used to obtain demographics such as patient age, race, and ethnicity. Each patient had a separate data collection tool.

Analysis

The statistical method for the DNP project was quantitative and a t-test was used to compare the depressed patients with the non-depressed patients. The data was collected on each patient and documented on an individual data collection tool. The student researcher compared depressed patients to non-depressed patients who miss two or more of the three times weekly hemodialysis treatments or shorten one to two hours of the hemodialysis treatments in four months. The data was collected and placed in an Excel spreadsheet and the appropriate data was placed into the SPSS software to obtain the statistical analysis.

The previous depressed measures were valid and reliable. The measures were medication, counseling, and cognitive behavioral therapy. These variables were analyzed using statistical analysis through the SPSS software. Therefore, the treatment variables showed the types of therapy used and outcomes from the treatment.

Ethical Considerations

Patient safety was upheld by using the code of ethics to ensure the patients are not harmed. The patient's health information was kept safe and locked away to maintain personal and health information. Both the C-EMR and the D-EMR were password protected. The data was stored in a locked filing cabinet. Furthermore, the office door

was locked, and the keys were with the investigator. Patient identity was deactivated. The DNP researcher had the responsibility to uphold integrity and professionalism. As part of the training for the research project, the researcher completed the Collaborative Institutional Training Initiative program on human subjects.

Summary

Chapter II revealed a preview of the next steps for the DNP project. Measures and variables were explained. The statistical method for the project was discussed. In addition, the ethical treatment of the patients was outlined. The investigator explained precautions for keeping patient health data safe.

CHAPTER III – RESULTS

Introduction

The DNP project research did not begin until the Institutional Review Board (IRB) Protocol # 22-085 at The University of Southern Mississippi provided the protocol and nursing approval was granted for the project. The process steps to start were essential to obtain the data needed. The first step was finding the patients with missed or partial treatments through the retrospective chart review in the D-EMR. The amount of missed and partial treatments was placed on the data collection tool.

The next step was placing the demographic data on the data collection tool. Then, the previous depression measures were obtained from the C-EMR and placed on the data collection tool. The data was then placed on the Excel spreadsheet. The statistical analysis was changed to the 2-step t-test using the SPSS software for correlation of the depressed patients and the non-depressed patients.

After all the data was collected the next step was the evaluation of the results. The demographic data revealed 29 males and 31 female. Ethnicity was 46 black and 14 white.

Table 1

Sex of the Participants

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Male	29	48.8	48.3	48.3
Female	31	51.7	51.7	100.0
Total	60	100.0	100.0	

The average age of the participants was 56.5 with a minimum age of 33 while the oldest was 85. The race demographic revealed 23.3% white participants and 76.7% black participants. The depressed patients who missed hemodialysis treatments more than two times and shortened the treatment one or more times in four months were 35%. The total number of patients who were not depressed but missed or shortened their hemodialysis treatments in four months was 65%.

Hence, the patients testing negative for depression were compared to the patients who were not depressed. The results showed that the depressed patients were less likely to miss the hemodialysis treatments than the patients who were not depressed. The statistical analysis of the correlation is significant at the 0.05 level.

Table 2

Correlations

Spearman's rho.		Missed Appointments	Depression status of the patients
Missed appointments	Correlation Coefficient	1.000	-.261
	Sig. (2-tailed)		.044
	N	60	60
Depression status of the patients	Correlation Coefficient	-.261	1.000
	Sig. (2-tailed)	.044	
	N	60	60

Table 3

Depression Status of the Patients

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Positive	21	35.0	35.0	35
Negative	39	65.0	65.0	100.0
Total	60	100.0	100.0	

The previous depression medication variables found in the retrospective chart review revealed several different medications. The medications used were Bupropion, Escitalopram, Sertraline, Paroxetine, Citalopram, and Venlafaxine. The medications used more often were Sertraline and Bupropion. The counseling variable revealed six referrals for counseling and one refusal for counseling.

The depression measure CBT was not found in the retrospective chart review. The last variable was no depression treatment and the student investigator found three patients that refused any treatment. Both the depressed patients and the non-depressed patients missed hemodialysis treatments ranging from two to 20 times in four months.

Summary

The DNP project revealed unexpected results of the PICO. The results showed opposite results of the PICO. The results may have been skewed due to the sample size. The previous treatments measure results were expected. The medication variable results showed multiple medications used to treat depression. The counseling variable revealed six participants did have counseling for depression. In addition, cognitive behavior therapy was not used and three people refused any depression treatment.

CHAPTER IV – DISCUSSION

Introduction

The findings of the DNP Project were not expected. Out of the 60 patients reviewed most of the patients were not depressed. The data revealed multiple missed treatments for the hemodialysis population. The results of the project showed that depressed patients were less likely to miss dialysis.

Strengths of the Project

One strength of the project was some hemodialysis patients agreed to take medications for depression and a few patients did go to counseling. Another strength of the project was the previous depression measures used for previous patients. The medications and counseling were used more often to find the best evidence-based interventions for change.

Interpretation

The statistical analysis of the project revealed depressed patients were less likely to miss hemodialysis treatments than nondepressed. Depressed patients were more likely to go to dialysis because of the depression treatment. Some of the patients were taking medication or had counseling.

Limitations

One of the limitations was the small sample size. A larger sample of patients may give a better answer. The retrospective chart review of missed treatments could also be reviewed further back than four years.

Implications for Future Practice

The study can be replicated with a larger sample size of 1,000 patients. The larger sample size will reveal more data. More studies need to be performed to find the answer for skipped and missed hemodialysis treatments in this population.

Conclusion

The purpose of the project was to find the answer to improve the overall health of hemodialysis patients. Noncompliance with hemodialysis treatments leads to mortality risk. In addition, this population of patients also misses blood pressure medications and phosphorus binders. The noncompliance leads to complications such as hospital visits and readmissions. Missing dialysis treatments may cause fluid overload, pulmonary edema, elevated potassium, and anasarca. More studies can be done to find the answer to improving compliance with hemodialysis.

Summary

The literature revealed information regarding depression and missed treatments in multiple articles showing depression and depressive symptoms were in many of this population. Other articles in the literature review discussed patients who refused medication or treatment related to social determinants of health or culture. In addition, treatment bias for this population may play a role in patients admitting depression or depressive symptoms. The intervention for compliance was needed in this population of patients who miss or skip part of the dialysis treatments to improve outcomes. The project results were unexpected and need to be redone at a future date with a much larger sample size. The larger sample size will give additional data for interpretation.

Also, the investigator should add a variable for social determinants of health, cultural needs, and socio-economic status in the data.

APPENDIX A – IRB Approval Letter

Office of
Research Integrity



118 COLLEGE DRIVE #5116 • HATTIESBURG, MS | 601.266.6756 | WWW.USM.EDU/ORI

NOTICE OF INSTITUTIONAL REVIEW BOARD ACTION

The project below has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services regulations (45 CFR Part 46), and University Policy to ensure:

- The risks to subjects are minimized and reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered involving risks to subjects must be reported immediately. Problems should be reported to ORI via the Incident submission on InfoEd IRB.
- The period of approval is twelve months. An application for renewal must be submitted for projects exceeding twelve months.

PROTOCOL NUMBER: 22-085
PROJECT TITLE: Improving Compliance with Treatments for End Stage Renal Disease on Hemodialysis
SCHOOL/PROGRAM: Leadership & Advanced Nursing
RESEARCHERS: PI: Susan Blakeney
Investigators: Blakeney, Susan~Coleman, Carolyn~
IRB COMMITTEE ACTION: Approved
CATEGORY: Expedited Category
PERIOD OF APPROVAL: 08-Feb-2022 to 07-Feb-2023

Donald Sacco

Donald Sacco, Ph.D.
Institutional Review Board Chairperson

APPENDIX B – Data Collection Tool

Identification # _____

Age _____ Sex _____ Race _____

PHQ-9 scores _____

Intervention 1 Medication _____

Intervention 2 Counseling _____

Intervention 3 Cognitive Behavioral Therapy _____

Intervention 4 No Treatment _____

APPENDIX C – Medical Records Representation Dialysis



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Karen Pitts, CNP
Sheri Sorrells, CNP

Chief Dialysis Officer
Tammy Gargis
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The University of Southern Mississippi
Graduate School for the Degree of Doctor of Nursing Practice
Hattiesburg, MS

Letter for Staff Representative for Medical Records

The Doctor of Nursing Practice (DNP) project will be performed to find the evidence-based depression intervention for dialysis treatment compliance. A retrospective chart review will be ascertained for patients who miss one or more to the three times weekly hemodialysis treatments in four months. In addition, shortened hemodialysis treatments by one or two hours of the hemodialysis treatments in four months. Previous PHQ9 scores will be obtained from the dialysis electronic medical record. Patients with missed and shortened treatments and previous positive PHQ9 scores placed on the investigator created data collection tool. The clinic electronic medical record will be used to obtain previous depression measures. The variables are medication, counseling, cognitive behavioral therapy, or no previous treatment. The measures used will be placed on the data collection tool.

Susan Blakeney understands the process for retrospective chart review and has approval from USM IRB.

Hattiesburg clinic Nephrology supports Susan Blakeney's plan and approves the project, including recruitment of participants and data collection the Hattiesburg clinic Dialysis units.

Sincerely,

Sheri Dykes RNCNN

APPENDIX D – Letters of Support



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Chief Dialysis Officer
Tammy Gargis
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The University of Southern Mississippi
Graduate School for the **Degree** of Doctor of Nursing Practice
Hattiesburg, MS

I have reviewed Mrs. Susan Blakeney's proposal to carry out a research project at the Hattiesburg Clinic dialysis units. I understand that Susan is conducting this project as part of the requirements for Doctor of Nursing Practice program at the University of Southern Mississippi and will have the opportunity to present the research findings in other venues.

I understand that the Institute Review Board for the use of human subjects in research (IRB) at USM is concerned with protecting the confidentiality, privacy, and well-being of research participants. Further, it is my understanding that Mrs. Blakeney will additionally be advised on this project by her academic advisor and the USM field liaison, both of whom will have regular contact with Mrs. Blakeney.

Mrs. Blakeney is fully aware of the Health Insurance Portability and Accountability Act (HIPPA) and will also be compliant with the policies and procedures of Hattiesburg Clinic. I do not have any reservations or concerns about the research study to be performed by Mrs. Blakeney based on the proposal, and the conversations we have had and her knowledge of Hattiesburg Clinic.

Hattiesburg Clinic Nephrology supports Mrs. Blakeney's plan and approves of the project, including recruitment of participants and data collection through the Hattiesburg Clinic Dialysis units.

Sincerely,


Dr. Allen Gersh

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DIALYSIS HATTIESBURG CLINIC

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Hattiesburg clinic Nephrology supports Susan Blakeney's plan and approves the project, including recruitment of participants and data collection the Hattiesburg clinic Dialysis units.

Sincerely,

Sheri Sorrells RN CNP

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