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Increasing Providers' Adherence to Ordering Urine Microalbumin Tests

Florence Fadele

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Increasing Providers' Adherence to Ordering Urine Microalbumin Tests

Florence Idowu Akangbe-Fadele

Presented in Partial Fulfillment of the
Requirements for the Degree of
Doctor of Nursing Practice

Nova Southeastern University
Health Professions Division
College of Nursing

**Nova Southeastern University
Health Professions Division
College of Nursing**

This project, written by Florence Fadele under direction of Dr. Deirdre Krause, project chair, and approved by members of the project committee, and has been presented and accepted in partial fulfillment of requirements for the degree of

DOCTOR OF NURSING PRACTICE


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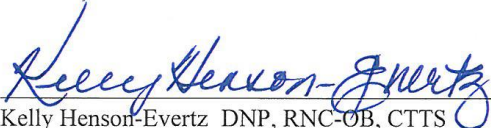
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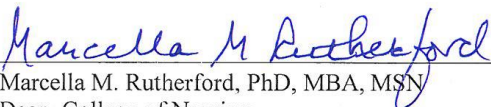
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Abstract

Currently, a microalbumin urine test is an annual test for diabetic patients recommended by the American Diabetes Association, but primary care providers are not ordering the tests. This may be, in part, attributable to the fact that there are no guidelines for ordering microalbumin urine tests. The purpose of this capstone project was to assess providers' compliance in identifying the need for the microalbumin urine test for patients with diabetes, to develop evidence-based guidelines for monitoring and ordering microalbumin urine tests, and to evaluate providers' compliance. Rogers's theory of the diffusion of innovation provided the framework for this capstone project. A quantitative, descriptive design using a non-parametric paired t-test was used. Data was collected pre- and post-evidence based practice guidelines implementation in electronic health records. The mean monthly percentage of diabetic patients given microalbumin urine tests pre-implementation was 66.86 (SD = 4.25; 95% CI = (64.17, 69.56)). The mean monthly percentage of diabetic patients given microalbumin urine tests post-implementation was 73.53 (SD = 2.58; 95% CI = (70.32, 76.73)). SPSS version 23 (IBM Corp., Armonk, NY). The two sample t-test was statistically significant, $t(15) = -3.232$, $p = 0.006$. The introduction of evidence-based practice guidelines for ordering microalbumin urine tests improved provider compliance.

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The successful completion of the project is to the glory of God.

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Increasing Providers' Adherence to Ordering Microalbumin Urine Tests

Chapter 1: Nature of the Project and Problem Identification

Diabetes mellitus is a disease that affects people throughout the world. Diabetic nephropathy is one of the major complications of diabetes mellitus. Early detection of disease complications and prompt intervention can slow the progression of kidney damage caused by diabetes. Approximately one in three adults with diabetes and one in five adults with high blood pressure have chronic kidney disease (Centers for Disease Control and Prevention, 2014). The National Institute of Diabetes and Digestive and Kidney Disease (NIDDK) recommends a set of guidelines for early detection of kidney disease, including measuring blood and urine levels to detect changes in kidney function to enable appropriate early intervention. The NIDDK guidelines state that people who have been living with type 1 diabetes for over five years and those who have type 2 diabetes must be screened annually for albuminuria (NIDDK, 2012a). The urine albumin-to-creatinine ratio (UACR) test, also known as the microalbumin test, has been identified as an important test for detecting early kidney damage. A microalbumin test result greater than 30 mg/d is considered abnormal (NIDDK, 2012a). Treatment can be initiated quickly, preventing further kidney damage with early intervention. However, despite the recommendation of an annual microalbumin urine test to detect early kidney disease, a large number of patients with diabetes have not received orders for this test from their primary care providers (Kundu, D., Roy, A., Mandal, T., Bandyopadhyay, U., Ghosh, E., & Ray, D. 2013).

This chapter describes the capstone project problem, purpose, objectives,

theoretical framework, nursing practice, health care outcome, literature review, and methodology.

Problem Statement

Currently, microalbumin urine tests are an annual screening test required by the American Diabetes Association (ADA); however, only 30% compliance with providers ordering the test over a five-year period was found at a community health clinic.

Purpose Statement

The purpose of this capstone project was to assess providers' compliance in ordering microalbumin urine tests for patients with diabetes, to develop evidence-based practice (EBP) guidelines for monitoring and ordering microalbumin urine tests, and to evaluate whether or not this increased providers' compliance.

Project Objectives

The objectives of this project were as follows:

- Objective 1: Collaborate with clinic healthcare providers and executives, including clinic managers and the information technology department director.
- Objective 2: Assess existing practices at the community clinic pre-guideline implementation.
- Objective 3: Develop evidence-based, standardized microalbumin testing guidelines.
- Objective 4: Implement the use of guidelines into electronic health records (EHR).
- Objective 5: Evaluate providers' compliance in ordering microalbumin urine tests in EHR post-guideline implementation.

Theoretical Foundation

The theoretical framework selected for this capstone project was Roger's diffusion of innovation theory.

Rogers' Diffusion of Innovation Theory

The underpinning for Everett Rogers' 1962 theory of the diffusion of innovation came from observing the adoption of newly developed hard corn varieties by farmers in Iowa. An innovation is a new idea communicated to members of a group. Diffusion is the process by which an innovation is communicated and accepted. There are various stages of acceptance involving early adopters and late adopters and those who have a hard time accepting a new innovation. The theory is further analyzed as below.

Theory selection support. Rogers' theory of the diffusion of innovation provided the framework for this capstone project. According to Rogers' theory, people become aware of the importance of innovation, such as microalbumin urine tests, and then make a decision about whether or not to adopt it or, in this case, to comply with requirements to order the tests. An increase in the number of microalbumin urine tests ordered by providers indicates acceptance and compliance with new guidelines. Rogers' theory consists of four distinct stages as outlined in Table 1.

Table 1

Stages in the Diffusion of Innovation

Knowledge stage	Persuasion stage	Decision stage	Final stage
Presentation of evidence-based practice for ordering microalbumin urine tests for diabetes patients.	Emails to remind providers and medical assistants. Persuasion of clinic managers to participate and to remind health care providers at the clinic to comply. Electronic Health Records (EHR) alerts for providers. Medical assistants mail reminders to patients.	Implementation of Evidence Based Practice (EBP) in EHR to monitor compliance. Reinforce knowledge if not successful.	Evaluate providers' use of guidelines regarding urine test. Compare pre and post guidelines for compliance.

Application of theory. According to Pearcey and Draper (1996), Roger's theory of innovation diffusion was not specifically designed for any area but provides a useful framework for health care practice changes. The theory of innovation diffusion also helps to identify hindrances to changes. Pearcey and Draper noted that there was a lack of utilization of research findings in disseminating preoperative discharge instructions to patients in a hospital ward. The innovation of protocol for hospital ward staff to follow when disseminating preoperative discharge instruction was not new to the staff, but the plan was to identify and determine where changes could be made. There were four days of persuasion and the decision to try out. The new protocol for the dissemination of preop discharge instructions was accepted and carried out successfully for three months.

Pearcey and Draper acknowledged that Roger's innovation diffusion was a very useful tool in their project. They noted that even the innovation of a new idea did not succeed past three months.

Although most providers understand why microalbumin urine tests are necessary for patients with diabetes, the tests are not always ordered. A lack of reminders and insufficient emphasis on its importance decrease the frequency of ordering the test. There

is a need to set up reminders and guidelines for ordering the test.

Knowledge stage. This phase is critical because providers become aware of new guidelines. The dissemination of EBP guidelines for ordering microalbumin urine tests by the clinicians serve as a reminder to order the test. The first step was to use email (see Appendix A) to communicate to all providers the importance of ordering microalbumin urine tests, including that microalbumin urine tests can detect kidney disorders earlier than the estimated glomerular filtration rate blood test. During this stage, it also helped to set up reminders for providers and medical assistants.

Persuasion stage. This stage is when the providers may be convinced by the evidence to order microalbumin urine tests more frequently. It was the expectation that a well-informed provider would be convinced to use the EBP guidelines and remember to order the test.

Decision stage. In this stage, providers decided whether to accept or reject the new recommendation. The number of diabetic patients who received microalbumin urine tests were counted 2–3 months after the EBP guidelines were introduced.

Final stage. During this stage, I evaluated providers' compliance in ordering the microalbumin urine test. The data was compared before and after using the EBP guidelines in EHR. The healthcare organization continues to monitor compliance and project success.

Significance of Health Care Practice and Outcome

This project supported the clinic and its providers by increasing awareness of the importance of microalbumin urine tests for diabetic patients in order to monitor and prevent target organ damage to the kidney. Providers demonstrated increased adherence

to the guidelines by ordering microalbumin urine tests more frequently. The project benefited diabetic patients by preventing target organ damage when providers followed the guidelines, ordered microalbumin urine tests appropriately, and initiated proper treatment to slow the progression of kidney damage as necessary.

Nursing Practice

The findings from this project will reflect the competency and leadership skills of an advanced, doctoral-prepared nurse in applying EBP guidelines for ordering microalbumin urine tests for diabetics, testing theories, and putting results into action to improve human health in the medical setting.

The identified steps for ordering the microalbumin urine test influenced nursing practice by increasing their adherence to ordering this test and assisting in the implementation of evidence-based practices for ordering this test. These changes in nursing practice can be preventative for kidney complications of end target organ damage and improve patients' quality of life and quality of care.

Health Care Outcomes

Being a leader, the ability to influence providers to accept EBP standards of care in ordering urine microalbumin tests will have an impact on healthcare outcomes. Providers' acceptance and compliance with this standard of care will reduce the cost burden of kidney damage to the patients and the health care system. The project has already improved health care outcomes at the local level as the providers increased their compliance in ordering urine microalbumin tests, which reduced the risk of target organ damage and the cost of hospitalizations for kidney failure and related costs.

The scientific evidence gathered from the findings of this project may influence health care outcomes by increasing providers' adherence to guidelines for ordering the microalbumin urine test for diabetic patients and through the implementation of the evidence-based practice test guideline in the EHR within the health care organization.

Health Care Delivery

The Doctorate of Nursing Practice (DNP) program provides graduates with the ability to apply advanced clinical skills to prevent disease and improve the health of patients. The project affected health care delivery by introducing guidelines in practice setting and reinforcing knowledge about the importance of the test in preventing target organ damage.

Providers' increased awareness of the importance of the microalbumin urine test improved their compliance with delivery of preventative care. The providers became aware of the benefits of detecting kidney disorders earlier than the blood test for estimated glomerular filtration rate can.

Health Care Policy

The organization provides quarterly incentives to providers who meet certain criteria for preventative patient care. Rewarding providers who deliver high-quality care encourages other providers to remember to do more for diabetes patients, paying attention to diabetic care and ordering urine microalbumin for diabetic patients. The policy of the clinic is now as follows:

- Providers order microalbumin urine tests for diabetic patients once yearly.
- If the test shows abnormal results, providers repeat the test at least two more times within three months.

- Providers treat patients to prevent further kidney damage or, if there is an indication of Stage III kidney disease, they refer patients to nephrology.

A DNP-prepared nurse must be able to demonstrate leadership skills by critically analyzing health care policies that affect consumers and organizations. The increase in awareness among health providers that microalbumin urine tests help identify kidney damage in diabetic patients may influence health care policy at both the local and national levels. The expectation is that findings from this project will lead to a change in the health care policies of clinics and a reduction in health care costs. Early identification of kidney disease will help reduce treatment expenses as fewer patients will need dialysis for kidney complications. The cost benefit of this test may also lead to a change in policy regarding whether the frequency of the testing should increase from annually to biannually.

The increase in awareness of the value of the microalbumin urine test by health providers has influenced health care policy at local, state, and national policies.

Summary

The ability of a DNP-prepared graduate to apply newly developed skills and to lead in any health care setting has bridged the gaps and biases that exist in various health care industries. DNP-prepared advanced-practice nurses have the necessary skill set to function efficiently and expertly, to advocate for changes in health care policy, and to lead in always-changing health care settings. The microalbumin urine test plays a major role in the early detection of kidney damage. When providers adhere to ordering the microalbumin test for diabetic patients to prevent and monitor for kidney complications,

the result is proper management of the disease and a positive health care outcome for patients and organizations.

Chapter 2: Literature Review

Microalbumin

Microalbumin is the excretion of albumin in urine as permeated by the glomeruli. The presence or loss of albumin in urine indicates the onset of kidney damage. According to the Office of Disease Prevention and Health Promotion, one of the goals of Healthy People 2020 is to “increase the proportion of persons with diagnosed diabetes who obtain an annual urinary microalbumin measurement” (2014, p. 1) to 36.6%. In 2007, the percentage of Medicare beneficiaries who were diagnosed with diabetes and received the test was 33.3%; by 2012, this number exceeded the target and rose to 42.4% (USDHS, 2014). Although significant improvement was achieved, this rate of test administration falls short of the current recommendation of the ADA, which is an annual measurement of urinary microalbumin for patients with type 1 diabetes that has lasted for five years and when patients with type 2 diabetes are first diagnosed (2016). Sacks (2011) made a similar recommendation: annual testing for individuals five years after the diagnosis of type 1 diabetes and at the time of type 2 diabetes diagnosis. The Affordable Care Act has required the Secretary of Health and Human Services to develop national priorities for standardized quality measurement reporting, to invest in patient safety, and to reward providers for high-quality care (National Conference of State Legislatures, 2011).

For this study, a systematic literature search was performed in the Nursing and Allied Health, MEDLINE, Google Scholar, and Cumulative Index to Nursing and Allied Health Literature databases. The keywords used for the search were ordering

“microalbumin urine test” and “provider compliance”. The most common findings from the articles discovered in the search were an increase in orders for microalbuminuria urine tests, prevention of microalbuminuria, and provider compliance with ordering tests for microalbuminuria.

The following five papers provided strategies for increasing provider compliance and guidelines for ordering microalbumin urine tests.

Knudsen et al. (2012) noted a lack of proper ordering of microalbumin urine tests. Of 2,057 diabetic patients who visited their general practitioner in Denmark during a 12-month period, only 57% received a microalbumin urine test, whereas 97.6% had their plasma evaluated for renal problems. The researchers remarked that this was probably due to poor knowledge of the importance of the microalbumin urine test in early detection of kidney disorders. The authors concluded that giving feedback to individual providers would improve the frequency of their ordering the test.

Anabtawi and Mathew (2013) performed a two-step, two-year project to improve microalbuminuria screening. Step 1 involved the introduction of an electronic system that evaluated compliance. Step 2 took place the following year, during which the providers were assessed for improvement. During step 1, 69% of the patients with diabetes were screened, and during step 2, the percentage rose to 84.8%. The authors concluded that the success of the study was due to EHR reminders combined with quality control monitoring, which significantly improved provider compliance.

Umar-Kamara and Tufts (2013) noted significant improvement in the post-intervention quality of test ordering in their evaluation of providers' adherence to recommended standards of care. The intervention involved EHR reminders for providers

and letters from providers to patients, suggesting following up with a laboratory test. During the 12 post-intervention weeks, urine microalbumin test ordering increased by 28% ($p < .001$).

In a retrospective chart review, Munroe (2015) found that 1 of 60 reviewed charts included an order for microalbumin urine testing. Munroe recommended an increase in the measure of quality improvement in ordering the test and stated that there was room for improvement.

Kundu et al. reviewed the relevant literature and mentioned several studies in which albuminuria was an early sign of changes in renal function, concluding that “Microalbumin is still a largely unrecognized risk factor, and a large proportion of individuals are not screened regularly” (2013, p. 219).

Albuminuria is “an important marker of diabetes nephropathy and a risk factor for cardiovascular disease” (Ruilope et al., 2010, p. 424). Ruilope et al. noted that early detection and intervention could prevent kidney damage. They noted that microalbuminuria signals systemic damage to the glomerular filtering section of the kidneys and the epithelial lining of the outer cells of the kidneys. The researchers recommended treatment for the prevention of microalbumin and concluded that there was no established treatment for preventing microalbumin. The researchers suggested that keeping patients’ blood pressure under control by using certain medications and keeping blood glucose under control will slow the progression of microalbuminuria.

Summary

Raising awareness among providers about the importance of ordering microalbumin urine tests while presenting EBP guidelines and supporting evidence for the standard of care suggested in the literature review will improve health care for diabetic patients.

After reviewing the literature, there were the following suggestions for successful monitoring and ordering of microalbumin urine tests.

- Providing individual and group feedback to acknowledge successful monitoring and ordering of microalbumin urine tests (Knudsen et al., 2012).
- Combining electronic health record reminders with quality control of the ordering of microalbumin urine tests (Anabtawi & Mathew 2013).
- Sending reminder letters from providers to patients for follow-ups with that included microalbumin urine tests (Umar-Kamara & Tufts, 2013).

This capstone project applied most of the suggestions above and included other strategies, such as posters and gift cards, to encourage provider participation. The expectation was to increase provider compliance and raise the percentage from 30% to at least 60% at the project site.

Chapter 3: Methodology

Microalbumin urine tests provide information about kidney function and are used to detect early kidney disease. The American Diabetes Association (2016) published an updated guideline for microalbumin urine tests, recommending that annual urinary measure of patients with type 1 diabetes with five years' or more duration and type 2 diabetic patients starting at diagnosis.

Although many clinics have similar guidelines, providers still lack compliance in ordering the test for diabetes patients. Initiating evidence-based guidelines on the importance of microalbumin urine tests have played a significant role in increasing urine test ordering (Knudsen et al., 2012).

Project Design

This project obtained descriptive statistical data with the help of the information technology analyst at the clinics. Initially, the data collection included a retrospective review of providers' compliance with ordering microalbumin urine tests over the past five years. A four- to eight-week period of EHR reminders and emails to providers regarding the ordering of the test were followed by a period of data collection to evaluate the change in provider compliance.

Setting. The project was set in a small, inner city with ten clinic units supervised by an organization that cares for patients with new and chronic diabetes. The staff included osteopaths, medical doctors, physicians' assistants, nurse practitioners, transcriptionists, medical assistants, office managers, billing clerks, and receptionists.

Under the clinic's standard of care for diabetes, patients should be seen every three months.

Inclusion criteria. The participants included MDs, RNs, ARNPs, and PAs caring for patients who were diagnosed with type 1 or type 2 diabetes.

Exclusion criteria. Exclusion criteria included providers who had not, in the past five years, cared for a patient diagnosed with type 1 or type 2 diabetes.

Ethical considerations. Permission from the Nova Southeastern University institutional review board was processed after departmental approval of the project. The plan was to obtain data that was de-identified with the help of the information technology department at the clinic. The project posed minimal or no risk to the subjects because the collected data was retrospective and de-identified. Data gathering did not directly involve any individual subject or provider. We obtained written permission from the site to obtain data through the IT department for analysis of providers' compliance with ordering urine microalbumin tests.

Project phases/objectives. The objectives of this project were as follows:

Objective 1: Collaborate with clinic healthcare providers and executives, including clinic managers and IT department director.

Objective 2: Assess existing practices at the community clinic prior to guideline implementation.

Objective 3: Develop EBP microalbumin urine testing guidelines.

Objective 4: Implement guidelines into EHR.

Objective 5: Evaluate providers' compliance in ordering microalbumin urine tests after the guidelines have been implemented.

The developed guidelines included the following:

- Providers should order microalbumin urine test for diabetic patients once yearly.
- Medical assistants should identify the patient, provide a clean container for a urine sample, process and label containers with patients' names, and send the containers out to a laboratory for analysis. No test preparation by the patients is necessary before collection.
- If the test has abnormal results, the provider should repeat the test at least two more times within three months.
- Providers should treat patients whose test results are abnormal in order to prevent further kidney damage. If there is an indication of Stage III kidney disease, patients should be referred to nephrology.
- Implement guidelines into the electronic health records within four weeks.
- Evaluate providers' compliance with ordering urine microalbumin in EHR within 12 weeks.

Timeline.

The estimated timeline for the capstone project was as follows:

Our collaboration with providers, medical staff, and office staff at the clinic took five months. Assessment of the existing practices took two weeks. Developing evidence-based guidelines took another two weeks. Evaluating providers' compliance took approximately 12 weeks.

Resources/budget.

The estimated cost of this capstone project was \$731.50, which included travel to the clinics, a subscription to the website Grammarly to assist with writing emails and

paperwork, posters, and appreciation of medical staff to remind patients to come in for a urine test.

Table 2

Project Resources and Budget

Category	Item	Description	Quantity	Total
Printing material	Paper	Multi-purpose printing paper	\$5 x 2	\$10
	Ink	Black/color ink cartridge	\$45 x 2	\$ 90
Announcement material	Posters	Hard cardboard for posters	\$10 x 8	\$80
Grammarly subscription	Software	Monthly/quarterly	\$13/mo. x 8	\$104
Weekly thank you for medical staff	Edibles	Cookies	\$20 x 8	\$160
		Danish & coffee	\$40 x 1	\$ 40
	Appreciation token for staff	Gift cards	\$10 x 15	\$150
Travel	Fuel (60 miles round trip)	3 gal. gas	\$2.50/gal. \$7.50 per round trip	\$7.5 x 13 = \$97.50
Total costs				\$731.50

Outcome measures for the objectives of the project were as follows:

- Objective 1: Collaborate with clinic healthcare providers and executives, including clinic managers and IT department director.
 - *Outcome measure:* The employee buy-in, support and assistance from stakeholders was obtained.
- Objective 2: Assess existing practice at the community clinic pre-guideline implementation.
 - *Outcome Measure.* I obtained permission to assess EHRs for existing guidelines, if any.
- Objective 3: Develop EBP microalbumin urine testing guidelines.

- *Outcome Measure.* The evidence-based guidelines were developed and approved by stakeholders.
- Objective 4: Implement guidelines into her.
 - *Outcome Measure.* The EBP guidelines were implemented in EHRs. I measured the monthly percentage of patients who were given the test using data gathered by the IT department from EHRs.
- Objective 5: Evaluate providers' compliance in ordering microalbumin in EHR post-guideline.
 - *Outcome Measure.* I continuously measured the monthly percentage compliance in EHR.

Summary

This goal of this project was to increasing provider compliance with ordering microalbumin urine tests. Ethical approval and permission to undertake the project were granted by Nova Southeastern University IRB and the project site's board of directors. The project created minimal or no risk for the human subjects. The project was carried out in multiple steps and completed in three to four months. The objectives were measured by evaluating the outcomes. The project costs were reasonable.

Chapter 4: Results and Discussions

Urine microalbumin tests measure kidney function and also serve as indicators of early kidney complications in diabetic patients. Ordering urine microalbumin tests has not been a routine process by primary care providers; therefore, there was no standard order in the EHR for this important test. Although there are other ways to monitor kidney functions in diabetic patients, the least painful and least expensive is to perform microalbumin urine tests once a year.

The ADA and the NIDDK recommend annual urine microalbumin tests for diabetic patients. Primary care providers at health care organizations must comply with EBP guidelines for ordering urine microalbumin tests annually and improve the quality of care for diabetic patients. The higher the compliance, the better the primary care providers can meet state and federal government regulations for meaningful uses and incentives.

Results

The project was enacted in two phases, planning and implementation/evaluation, with data collection for analysis. The purpose of the project was to determine if providers' compliance in ordering urine microalbumin tests (i.e., the monthly percentage of diabetic patients given microalbumin urine tests) was statistically significantly different during the planning phase than during the implementation/evaluation phase. I made this determination using a two-sample t-test, and a p-value less than 0.05 indicated significance. All analyses were conducted using SPSS (Version 23, IBM).

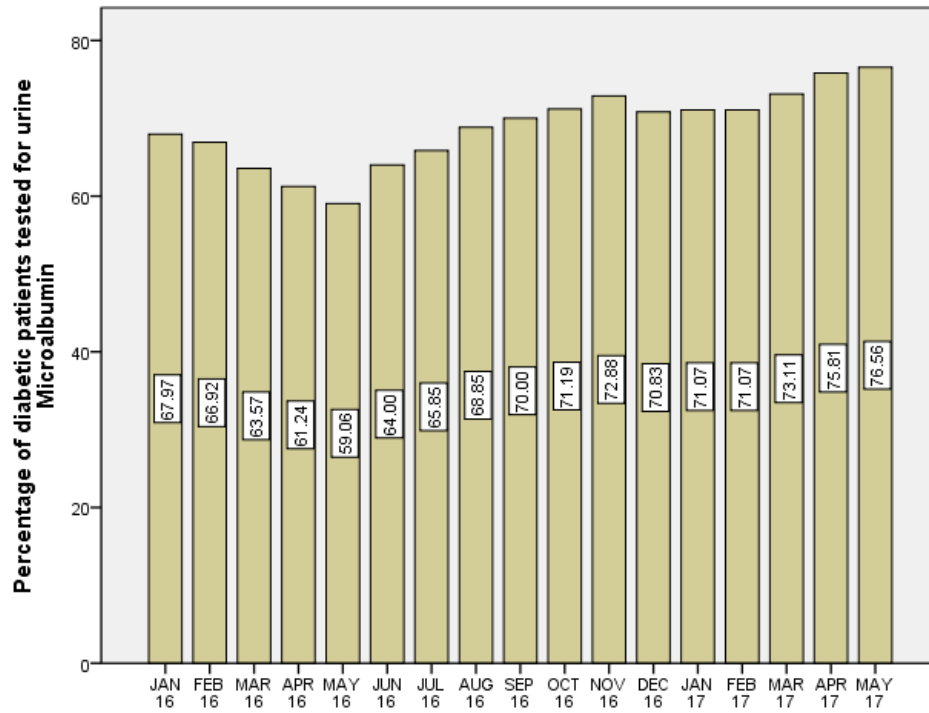


Figure 1. Percentage of diabetic patients tested for urine microalbumin.

The bar chart indicates the monthly percentage of diabetic patients tested for urine microalbumin, which is also represented in Table 2.

Table 3

Descriptive statistics of monthly percentage of diabetic patients tested for urine microalbumin

	N	Mean (SD)	95% CI	Median	Min	Max	Q1	Q3
Planning phase	12	66.86 (4.25)	(64.17, 69.56)	67.45	59.06	72.88	63.67	70.63
Implementation/ evaluation phase	5	(73.53, 2.58)	(70.32, 76.73)	73.11	71.07	76.56	71.07	76.18

Note. SD = standard deviation; CI = confidence interval; Q1 = the first quartile; Q3 = the third quartile.

The table above shows the monthly percentage of diabetic patients tested for urine microalbumin.

In the planning phase, the mean monthly percentage of diabetic patients tested for urine microalbumin was 66.86 [SD = 4.25; 95% CI = (64.17, 69.56)]; in the implementation/evaluation phase, the mean monthly percentage of diabetic patients tested for urine microalbumin was 73.53 [SD = 2.58; 95% CI = (70.32, 76.73)]. The results of the two-sample t-test indicated that there was a statistically significant difference in the monthly percentage of diabetic patients tested for urine microalbumin between the planning phase and the implementation/evaluation phase [$t(15) = -3.232$, $p = 0.006$].

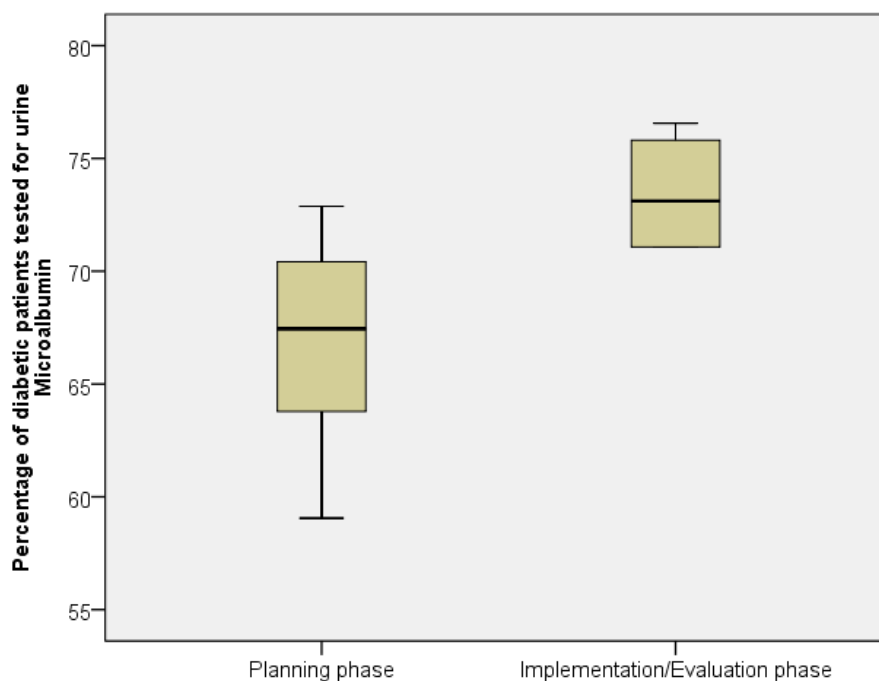


Figure 2. Percentage of diabetic patients tested for microalbumin.

Figure 2 is a box plot of the monthly percentage of diabetic patients tested for urine microalbumin during the planning phase and the implementation/evaluation phase. In the box plot, the top of the rectangle indicates the third quartile (Q3), the horizontal line near the middle of the rectangle indicates the median, and the bottom of the rectangle indicates the first quartile (Q1). The upper vertical line extends from the top of the rectangle to indicate the maximum value, and the lower vertical line extends from the bottom of the rectangle to indicate the minimum value.

The mean monthly percentage of diabetic patients tested for urine microalbumin in the implementation/evaluation phase was statistically significantly higher than that in the planning phase. I conclude that the introduction of evidence-based practice guidelines for ordering urine microalbumin tests in the EHR improved provider compliance.

Discussion of Findings

A retrospective evaluation of providers' compliance in ordering microalbumin test at a health care organization between 2010 and 2015 was approximately 30%. In order to ensure accuracy in data collection, EHRs were used to gather data for the project. There was an accumulated monthly compliance percentage score in the EHRs gathered from the planning stage starting and ending in January 2016 to the implementation/evaluation stage from January 2016 to May 2017.

The patients benefited from early intervention and prevention of progression of kidney disease to kidney failure. Providers were assisted in initiating patient education by early detection of kidney disorders that included tight blood glucose control and other treatment plans to prevent further kidney damage.

The findings from this project informed a health care organization that primary care providers can improve the quality of care for diabetic patients by increased compliance in ordering urine microalbumin tests, as recommended by the ADA. The success of this project was based on team support, electronic mail reminders, project presentation, poster advertisement, and recall of diabetic patients for follow-up appointments.

Expected/Unexpected Findings. The expected findings of this project included an increase in providers' compliance and improved quality care for diabetic patients at the health care organization, which decreased early progression of kidney complications. The unexpected findings were that when tests are ordered in the EHR, providers and medical assistants must review and finalize the orders. Otherwise, the urine microalbumin test will not be marked as completed in the patient's EHR. This situation was caught and

addressed, and the clinic managers sent reminders to medical assistants on a monthly basis to make sure that the test was reviewed and completed by providers.

Strengths/Limitations of the Project

The strengths of the project were the team effort, the support from stakeholders, and the professional collaboration that moved the project forward. A limitation of the project was provider instability. A significant number of providers were lost on a yearly basis from the clinics. The loss of providers affects patients' continuity of diabetic care. It was difficult to measure individual provider compliance, and the opportunity to find out if a provider might be negatively effecting the compliance rate for the group was missed.

Implication for Practice

Nursing practice. The findings from this project will reflect the competency and leadership skills of an advanced, doctoral-prepared nurse in applying evidence-based practice guidelines for ordering microalbumin urine tests for patients with diabetes, testing theories, and putting results into practice to improve human health.

The identified steps for ordering the microalbumin urine test influenced nursing practice by increasing providers' adherence to ordering this test and assisting in the implementation of EBP guidelines for ordering this test. These changes in nursing practice can prevent kidney complications and improve patients' quality of life and quality of care.

Health care outcomes. As a leader, the ability to influence providers to accept the EBP guidelines will impact healthcare outcomes. Providers' acceptance and compliance with this standard of care will reduce the cost burden of kidney damage to the patient and the health care system.

The project has improved health care outcomes at the local level, as providers increased compliance in ordering microalbumin urine tests and thereby reduced the risk of target organ damage and the cost of hospitalization for kidney failure and related costs. The scientific evidence gathered from the findings of this project may influence health care outcomes by increasing providers' adherence to guidelines for ordering microalbumin urine tests for diabetic patients and through the implementation of the EBP guidelines within the health care organization.

Health care delivery. The DNP program provides graduates with the ability to apply advanced clinical skills for disease prevention and improvement of patient health. The project affected health care delivery by introducing current guidelines in a practice setting and reinforcing knowledge about the importance of microalbumin urine tests in preventing organ damage.

Future research. A recommendation for future research is to obtain permission to review individual provider compliance and then compare improvement from pretreatment to posttreatment of the patient. A monthly email reminder, poster advertisements, and celebrations of success with incentives encourage health care providers to participate and improve quality of care for diabetic patients.

Summary

Microalbumin urine tests are important for diabetic patients, as well as being inexpensive and highly recommended by the ADA. The federal government set a target goal for this valuable urine test that health care organizations must attempt to achieve. The goal is 37% of diabetic patients will receive an annual microalbumin urine test by 2020. The health care organization met the goal and currently has a mean value of 74%

and needs continue complying. Health care providers must familiarize themselves with the EHR to make sure that diabetes patients receive annual microalbumin urine tests.

Health care organizations must continue to encourage primary care providers to participate in promoting quality care and continue to offer incentives for projects. The use of the EHRs could not be overemphasized as it helps assess, implement, and evaluate the care provided. The EHRs also have data to identify problems that need to be addressed and resolved to improve the quality of care delivered to the patients. For a DNP graduate, leadership in health care industries is an invaluable skill for which they have been prepared by the DNP program. Being able to lead this project to a successful outcome is attributed to the efforts of all involved and the Nova Southeastern University DNP program.

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Appendix A

IRB Approval Document



MEMORANDUM

To: **Florence Fadele**
College of Nursing

From: **Jo Ann Kleier, Ph.D., Ed.D.,**
Center Representative, Institutional Review Board

Date: **January 19, 2017**

Re: **IRB #: 2017-28; Title, "Providers Adherence to Ordering Urine Microalbumin for Diabetic Patients"**

I have reviewed the above-referenced research protocol at the center level. Based on the information provided, I have determined that this study is exempt from further IRB review under **45 CFR 46.101(b) (Exempt Category 4)**. You may proceed with your study as described to the IRB. As principal investigator, you must adhere to the following requirements:

- 1) **CONSENT:** If recruitment procedures include consent forms, they must be obtained in such a manner that they are clearly understood by the subjects and the process affords subjects the opportunity to ask questions, obtain detailed answers from those directly involved in the research, and have sufficient time to consider their participation after they have been provided this information. The subjects must be given a copy of the signed consent document, and a copy must be placed in a secure file separate from de-identified participant information. Record of informed consent must be retained for a minimum of three years from the conclusion of the study.
- 2) **ADVERSE EVENTS/UNANTICIPATED PROBLEMS:** The principal investigator is required to notify the IRB chair and me (954-262-5369 and Jo Ann Kleier, Ph.D., Ed.D., respectively) of any adverse reactions or unanticipated events that may develop as a result of this study. Reactions or events may include, but are not limited to, injury, depression as a result of participation in the study, life-threatening situation, death, or loss of confidentiality/anonymity of subject. Approval may be withdrawn if the problem is serious.
- 3) **AMENDMENTS:** Any changes in the study (e.g., procedures, number or types of subjects, consent forms, investigators, etc.) must be approved by the IRB prior to implementation. Please be advised that changes in a study may require further review depending on the nature of the change. Please contact me with any questions regarding amendments or changes to your study.

The NSU IRB is in compliance with the requirements for the protection of human subjects prescribed in Part 46 of Title 45 of the Code of Federal Regulations (45 CFR 46) revised June 18, 1991.

Cc: **Deirdre Krause**

Appendix B

Monthly Data Score for Collection of Urine Microalbumin in EHR

	Number of diabetic patients tested monthly	Number of diabetic patients seen monthly	Percentage of diabetic patients tested monthly
Jan-16	87	128	68.0%
Feb-16	87	130	66.9%
Mar-16	82	129	63.6%
Apr-16	79	129	61.2%
May-16	75	127	59.1%
Jun-16	80	125	64.0%
Jul-16	81	123	65.9%
Aug-16	84	122	68.9%
Sep-16	84	120	70.0%
Oct-16	84	118	71.2%
Nov-16	86	118	72.9%
Dec-16	85	120	70.8%
Jan-17	86	121	71.1%
Feb-17	86	121	71.1%
Mar-17	87	119	73.1%
April-17	94	124	75.8%
May-17	98	128	76.2%