7-8-2022

Evaluation of an Education Program Implementation for Adults with Stage 4 and 5 Chronic Kidney Disease

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A Dissertation Submitted to The Graduate School at the University of Missouri-St. Louis
in partial fulfillment of the requirement for the degree
Doctor of Nursing Practice
With an emphasis in Family Nurse Practitioner

August 2022

Advisory Committee

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Abstract

***Problem*:** Patients with long-term medical conditions represent a significant public health issue. Therefore, patients diagnosed with a chronic illness must have a high level of health literacy (HL) to manage their condition effectively. This Quality Improvement (QI) project evaluated the impact of an existing education-based program for stage 4 and 5 chronic kidney disease (CKD) patients and its effect on laboratory values compared before and after an NP-led education program that included vascular access, and modality choices.

Methods: A retrospective chart review was completed on 20 patients with an inclusive diagnosis of CKD stage 4 or 5 from October 21, 2019, through January 21, 2020, using a descriptive observational design and paired sample t-test analysis.

***Results*:** The paired sample t-test revealed only two laboratory results: globular filtration rate (GFR) (Pre) M=16.15, SD=3.86, (Post) M=10.35 SD=3.86 t (19)5.949, p=.000 and phosphorus level (Pre) M=4.161, SD=1.288, (Post) M=5.26, SD=1.293 t (19) 2.796, P=.012.

showed a significant difference. All other remaining laboratory values did not reach a significant difference.

Implications for Practice: QI project findings revealed improving HL slows the course of CKD and prepares patients for optimum dialysis start. Therefore, future dialysis population studies should include all nephrology services as part of their scope. Additionally, a comprehensive instructional program for all chronic kidney disease patients is needed, not only for those in stages 4 and 5.

Chronic illnesses are a significant global health concern. For those diagnosed with a chronic illness, management of the disease is critical and requires patients to have a high degree of health literacy (Coskun & Bagcivan, 2021). Health literacy (HL) is the ability to comprehend and evaluate health information, such as taking medications and using medical devices at home correctly, along with making decisions about self-care and disease management (Coskun & Bagcivan, 2021).

Self-care practices are linked with better health outcomes in people with chronic diseases. Examples of self-care practices include medication adherence, phosphate control, tobacco usage, physical activity level, fast food consumption, and sugary beverage use, all of which require a high level of HL for effective management. In addition, it is projected that low HL levels contribute to 3% to 5% of the overall health costs each year (Morony et al., 2017). Understanding the connections between HL and self-care practices is critical for effectively implementing intervention methods to enhance health outcomes.

Unfortunately, low HL is prevalent in individuals with chronic kidney disease (CKD) and end-stage kidney disease (ESKD) (Wong et al., 2018). CKD is a common chronic illness that affects approximately 15% of the population in the United States (Wong et al., 2018). CKD is linked with an increased risk of cardiovascular disease (CVD), early death, and reduced quality of life. For CKD patients, self-management is a critical element of managing chronic illness. According to Wong et al. (2018), lifestyle modification may delay disease progression in CKD patients. Specifically, for stage four and five CKD patients, low HL leads to a lack of patient participation in choosing modality treatment choices, including transplantation, conservative treatments,

inadequate access placement, further deterioration of kidney function due to non-modified lifestyle changes, and non-adherence to medications, which leads to increased morbidity and mortality. Therefore, people with CKD need patient education on staying healthy and delaying disease progression. However, the current educational materials are complicated, difficult to explain, and ever-changing (Morony et al., 2017).

In a nephrology practice of chronic kidney disease in adults, there was an opportunity to evaluate a targeted educational program. Therefore, the purpose of this project was to perform a program evaluation of the education provided by a nurse practitioner in a nephrology practice of stage 4 and 5 chronic kidney disease patients regarding dialysis access placement, and decreased kidney function due to non-modified lifestyle, medication non-adherence, and modality treatment choices. The aim of the project was to determine if improvement of these variables occurred at a rate of 5-10% in the patient sample.

The study question developed for literature review was: Does implementing a nurse practitioner-based education program affect healthcare choices in stage four and five kidney disease patients?

Review of the Literature

A literature search was conducted to explore the effects of HL in chronic kidney disease patients. Summon, CINAL, PubMed, Medline, Google Scholar, and Scopus databases were searched. Key search terms were "health literacy" AND "chronic disease" AND "renal," resulting in 1,816 studies. Inclusion criteria were scholarly and peer-reviewed publications, journal articles, full text, males, and females 18 years of age and older and kidney disease. Exclusion criteria were studies before 2016, males and females

under the age of 18 years, diseases other than kidney disease. The search produced 107 relevant articles with duplicates removed. After further evaluation of the search terms and inclusion/exclusion criteria, nine articles were chosen for the review. Research findings indicate that HL may significantly affect the treatment given to kidney disease patients and can influence how knowledge of CKD affects patients' involvement in healthy lifestyle choices.

Coskun and Bagcivan (2021) completed a cross-sectional study to determine the link between HL and treatment adherence in chronically ill patients. The sample was composed of 200 inpatient and outpatients in an adult medicine department, all of whom took medication for a chronic illness. Using an 18-item questionnaire for sociodemographic and medical factors, the Adult HL Scale (AHLS), and the Morisky Medication Adherence Scale (MMAS), the researchers conducted a face-to-face 15–20minute interview. A Spearman's correlation analysis was used and found 39% of the patients with CKD had low adherence to treatment. At the same time, a 12.8 mean score indicated a moderate level of HL among study participants. The study showed a statistically significant and favorable association between the patients' HL ratings and their adherence to their treatment regimens (Coskun & Bagcivan, 2021).

More specifically, Wong et al. (2018) studied the relationship between chronic renal disease patients' HL and self-care habits with low incomes. In a retrospective cross-sectional design, the study included 137 patients with CKD. Researchers examined self-care behaviors such as medication adherence, cigarette use, physical activity, fast food, and sugary beverages consumption. Using a Chi-Square and ANOVA statistical analysis, the study found 26% of low-income CKD patients have poor HL. Furthermore, sufficient

HL is not linked with higher participation in all self-care activities uniformly to CKD treatment. According to Wong et al. (2018), correlations between self-care behaviors and HL are not always related to self-care practices exclusively. Still, illness knowledge, patient-provider interactions, and personal choice may be more significantly influenced than HL alone. In addition, the study discussed other factors that may contribute to non-adherence, such as numeracy. Numeracy is a broad term that refers to the capacity to utilize numbers in everyday life. Numeracy skills are fundamental in assisting patients in understanding nutrition labels as they may either enhance or reduce the patient's abilities to search for information, perform calculations, and interpret meanings (Wong et al., 2018).

Additionally, in more current research conducted by Dinh et al. (2020), HL was further explored as multidimensional with functional, communicative, and critical thinking components. A cross-sectional study of 600 patients with at least two chronic diseases were assessed with a nine domain HL Questionnaire (HLQ). Domains One through Five considered participants' views about healthcare providers' assistance, their ability to control their health actively, their social support for managing their health, and their ability to evaluate health information. Domains Six through Nine assessed the difficulties of interacting with healthcare professionals, navigating the healthcare system, obtaining reliable information, and comprehending health data. "Ability to actively interact with healthcare provider" received the highest score, while "Ability to find excellent health information" and "Understanding health information well enough to know what to do" received the lowest scores. The study concluded having numerous

chronic illnesses makes it challenging to comprehend and manage daily healthcare treatments (Dinh et al., 2020).

Morony et al. (2017), conducted a study connecting HL with readability ratings for 26 printed materials aimed at CKD patients. Instruments used for evaluating patient materials were the Suitability Assessment of Materials (SAM) and Patient Education Materials Assessment (PEMAT). These tools assessed content, language, style, visual aids, layout, cultural sensitivity (SAM only), numerical information (PEMAT only), reader engagement, and action steps. Materials were broken down into actionability, readability, and importance of images. Readability was rated at a 5th-grade level and scored high with the PEMAT tool. However, the actionability and significance of images were poorly labeled with both instruments. In one example, Morony et al. (2017) discussed images of seemingly healthful foods rich in potassium (bananas and oranges) and information regarding potassium restriction placed together in educational materials. Therefore, anyone who has been exposed to conventional health messages urging them to eat more fruit and vegetables might easily miss the idea that they should restrict these items in their diet (Morony et al., 2017). Overall, 57% of the graphics in the educational materials provided no meaning to the printed text. In fact, 12% contradicted the text completely (Morony et al., 2017).

Furthermore, low HL is linked with poor vascular access choices, resulting in adverse clinical outcomes. Mazarova et al. (2017) conducted a retrospective review by linking the HL of adult patients receiving hemodialysis greater than six months to permanent vascular access placement, hyperkalemia, hyperphosphatemia, and intradialytic weight gains. It is necessary for patients receiving hemodialysis to make

difficult decisions about their vascular access and nutrition to maintain their health. Patients who have a permanent hemodialysis vascular access via a central venous catheter (CVC) are at greater risk for mortality, infection, and cardiovascular events as compared to those who have an arteriovenous fistula (AVF) or arteriovenous graft (AVG). According to the findings of this research, more than half of patients who undergo hemodialysis may not comprehend all the information given by their healthcare team. Of 56 patients who participated in the study, 66 percent of them had a CVC, with one-third having selected this method of access on their own. Mazarova et al. (2017) found that patients with poor HL eligible for vascular access (fistula or graft) and CVC are more likely to choose CVC than fistula or graft placement. In other words, patients with poorer HL chose the CVC access for hemodialysis, despite the greater risk of health concerns than fistula (Mazarova et al., 2017).

Additionally, in a more recent study in 2020, Murali et al. and colleagues completed a cross-sectional study to compare the HL profiles of individuals with dialysis-dependent end-stage kidney disease (ESKD) with non-dialysis chronic kidney disease (CKD). Two hundred twenty-three individuals participated in the research, with 109 suffering from ESKD and 114 suffering from CKD. In addition to using the nine domain HLQ tool as explored by previous studies, a cognitive and depression screening was utilized. According to the research, 37.1% of ESKD patients had a better overall health-related quality of life HL ratings in social support than 19.5% of the CKD patients. Still, all other HL categories, including contact with healthcare professionals, were comparable to those with CKD. Consequently, according to the research findings, ESKD patients were shown to have substantially more significant levels of cognitive impairment and

depression than CKD patients despite regular contact with healthcare experts (Murali et al., 2020).

This project used the Levin et al. (2013) guideline to define CKD as abnormalities of the kidney structure or function that have been present for 43 months. Kidney damage is a broad term that encompasses a variety of deviations seen during clinical examinations that may be insensitive and non-specific for the etiology of the illness but may precede loss of kidney function. Glomerular filtration rate (GFR) is often regarded as the most accurate overall indicator of renal function. A GFR of less than 60 ml/min/1.73m2 is referred to as reduced GFR, and a GFR of 15 ml/min/1.73m2 is referred to as kidney failure. Acute kidney injury (AKI) may develop in individuals with chronic kidney disease (CKD) and accelerate the progression to renal failure. In addition, proteinuria is a blanket word that refers to abnormally high protein levels in the urine. An abnormal loss of plasma proteins can cause proteinuria because of increased glomerular permeability to large molecular weight proteins (albuminuria or glomerular proteinuria), and insufficient tubular reabsorption of usually filtered low-molecular-weight proteins (tubular proteinuria), increased plasma concentrations of low-molecular-weight proteins (overproduction proteinuria, such as immunization proteinuria) (Levin et al., 2013).

Additionally, the clinical guideline by Cheung et al. (2021) served as a resource for evaluating optimum blood pressure goals. Adults with high blood pressure and chronic kidney disease (CKD) should be treated to achieve a goal of systolic blood pressure (SBP) of less than 120 mm Hg, as measured by standardized office measurement (Cheung et al., 2021).

This quality improvement project adds to and enriches the existing work of improving HL for CKD patients. The evidence-based framework to guide this project is the Plan-Do-Study-Act (PDSA) model. PDSA is a four-stage problem-solving methodology used for process improvement and change implementation (Melnyk & Fineout-Overholt, 2018).

The common suggestions from this literature evaluation emphasized the need to enhance CKD patient education and evaluate current procedures to ensure that outcomes are fulfilled. Interventions, tests, and clinician assessment procedures for CKD HL adult patients are among the gaps in the research. According to the literature, continued improvement toward HL and identification of barriers lead to an opportunity to delay disease progression and decrease mortality.

Methods

The primary outcomes included data related to laboratory values (estimated glomerular filtration rates, hemoglobin, albumin, calcium, phosphorus, potassium, albuminuria, proteinuria, and blood pressure) pre and post-targeted educational program. The secondary outcome was the use of the SAM and PEMAT instruments to evaluate the written education provided by the NP to CKD patients in stages four and five in the education program. Additional data collected was vascular access types and modality choices.

Design

This quality improvement project used a retrospective data collection review design to evaluate the education program. A quantitative data collection of laboratory test values, including estimated glomerular filtration rate, hemoglobin, albumin, calcium,

phosphate, potassium, albuminuria, and proteinuria and blood pressures up to one month before the start of the educational program, as well as one-month post education program data was performed via retrospective chart review. Additional quantitative data was obtained via the SAM and PEMAT instruments regarding the patient education material handouts used by the nurse practitioner who performed the patient education.

Setting

This project took place in a physician-owned adult nephrology practice with approximately 1400 patients in a large metropolitan area in the Midwest. The practice employs ten people consisting of four nephrologists, one nurse practitioner, one office manager, three medical assistants, and two front desk receptionists.

Sample

This project used a convenience sample of adult patients aged 18 years and older diagnosed with CKD four and five seeking care from the practice and were educated by the nurse practitioner. Patients younger than 18 years of age without a diagnosis of CKD 4 or 5 were excluded. The desired sample size was approximately 20 patients consisting of 10 prior to the education program and 10 who completed the APRN educational program.

Data Collection/Analysis

Retrospective de-identified patient data was collected during the project period. The NP education was implemented in October 2019. After IRB approval, a chart review of 10 patients who were seen by the NP before and ten patients who were seen by the NP after the implementation education occurred. All data collected were de-identified using

an alphanumeric system. Therefore, a unique alphanumeric identifier was created and applied to each patient for deidentification purposes. The identifier was a combination of the patient's first and last initials and date of birth (eight digits -month/day/year), generating a unique ten-digit identifier. A master list of coded identifiers and patient names was stored in a password-protected file on the primary investigator's clinic-provided laptop.

Additionally, demographic variables of age, race, gender, zip code, and insurance were included in the data collection. Other clinical data variables included were vascular access type and modality choice. All data collected was stored on the student PI's password-protected computer. The effects of the educational program were assessed by the SAM and PEMAT tools. Data was analyzed for descriptive statistics analysis using IBM SPSS Statistics version 28. After the descriptive statistical analysis was completed, relationships between variables were explored, and the paired sample t-test was used for further data analysis.

Approval Process

Formal, written approval was sought and obtained from the participating physician practice Medical Director on September 14, 2021. In addition, further approval was obtained from the University of Missouri-St. Louis (UMSL) Institutional Review Board (IRB) prior to implementation.

Procedures

Evaluation of an NP provided education program was a QI project selected by the physician practice and led by the Doctor of Nursing Practice (DNP) candidate. Prior to

data collection, PEMAT and SAM health literacy screening tools were utilized to evaluate the education materials in current practice. Each of the 20 patients' data (10 before education and ten who received the education), including demographics and pre and post-intervention lab results, were transferred into a spreadsheet and analyzed using descriptive statistics and analyzed for relationships.

Results

Demographics

The sample included 20 patients (*n*=20) aged 45 to 85 years, with a mean of 64 years (SD=10.08). There were nine female (45%) and 11 male (55%) participants. The most predominant race/ethnicity was African American (55%), followed by Caucasian (40%). The most common zip codes were 62002, 63033, and 63130 (10%) (See Appendix A, Table 1).

Data Analysis

A retrospective chart review of 20 CKD stage 4 and 5 kidney disease patient encounters from October 21, 2019, through January 21, 2020, showed that 20 patients completed the education program. Ten (50%) of the participants (n=20) obtained an AVF, four (10%) received a CVC, two (10%) were awaiting AVF maturity, and six (30%) patients had not yet obtained vascular access (See Appendix C, Figure 1). A paired-sample t-test was used to assess the influence of the patient education program results from the specific laboratory tests performed. The findings revealed a statistically significant difference in GFR and phosphorus levels. Patients' GFR values were significantly lower after completing the education program, and a similar comparison

may be made between pre-and post-phosphorus (See Appendix B, Figure 1, Figure B2, Table 1). Further analysis revealed no significant variations in the remaining blood lab results. (See Appendix B, Figure 1, Figure 2, Table 1) Furthermore, there was no statistically significant change in systolic or diastolic blood pressures. Specifically, pre blood pressure systolic compared to post blood pressure systolic data is presenting in the following: Appendix E, Figure 1, Figure 2, Figure 3, Figure 4, and Table 1.

Lastly, pre albuminuria (M=86.97, SD=74.703, *n*=3) compared to post albuminuria (M=473.27, SD=410.361, *n*=2) and pre-proteinuria (M=181.0, SD=169.0, *n*=2) compared to post proteinuria (M=193.5, SD=156.5, *n*=2) data results were inconclusive. Statistical testing would not yield beneficial results due to many missing albuminuria and proteinuria instances; therefore, data analysis was not obtained.

The PEMAT and SAM tools were given to five nurses familiar with dialysis patients to evaluate two of the educational materials used. One of the materials was used to educate participants on access type, and the other was used to educate patients on treatment modality choices. The PEMAT tool evaluated the understandability and actionability of the education provided by the NP. For educational on access types, PEMAT-P (printed) score percentages for understandability was 100% by all five nurses compared to treatment modality choices, scored at 66%, 77%, and three were scored at 88%. In actionability, the vascular access choice material scored at 60% and four at 80% compared to treatment modality choices with one at 80% and four at 60% (See Appendix F, Figure 1. Additionally, PEMAT-AV (audio-visual) understandability scores were one at 81% and four at 90% for access type compared to treatment modality choices, scoring one at 88%, two at 63%, and two at 75%. All five nurses scored both education handouts

at 100% for actionability (See Appendix F, Figure 2). Lastly, the SAM tool scoring for access types was 88%, 92%, 93%, and two 95% compared to treatment modality choice education results with two scoring 89% and three scoring 92% (See Appendix F, Figure 3).

Discussion

Implementation of this QI effort accomplished the purpose of evaluating education regarding HL and disease progression. Descriptive data were collected during the first phase of a PDSA cycle to understand the demographics and laboratory data comparison. A second PDSA cycle may be able to obtain more data appropriate for further univariate statistical tests. Additionally, results showed participants who were African Americans, males and lived in north St. Louis and Illinois Counties had a greater prevalence of kidney disease. In addition, CKD is more frequent among African American men than in any other ethnicity or race. Focusing on this population in a subsequent PDSA cycle may also be useful.

Patients with chronic kidney disease often progress to end-stage renal failure, and once substantial loss of renal function occurs, it tends to progress independently of the underlying kidney disease. A reduction in the GFR has been shown to correlate with the amount of kidney damage present. As a result, GFR values decline in individuals with chronic kidney disease who progress from stage four to stage five and eventually to end-stage renal disease. Further, renal disease development may be accelerated if calcium and phosphate metabolism disorders are present. Several variables, including hyperphosphatemia, influence the course of renal failure. As the phosphorus levels were elevated from the early stages of CKD, the nurse practitioner educated the participants on

low phosphorus diets and phosphate binding medications to lower blood phosphorus levels. Participants were educated on low phosphorus diets and phosphate binding medicines for reducing blood phosphorus levels when their phosphorus levels rose in the early stages of CKD. Laboratory testing on hemoglobin, albumin, calcium, and potassium, on the other hand, found no statistically significant changes, indicating that the patients' health had not worsened.

The presence of hypertension alone is a risk factor for the progression of renal failure in adults. In addition, high blood pressure directly contributes to the advancement of renal failure in patients with chronic kidney disease. In other words, the greater the amount of hypertension a person has, the more severe their kidney illness becomes. The data demonstrate that systolic and diastolic blood pressures are lower after the educational session, but they are still higher than the recommended goal of less than 120 systolic.

According to the findings, 50 percent of those who had hemodialysis with an AVF were adequately prepared for a successful start. Even though 10% of the population is awaiting AVF maturity, it is still advantageous to have an access surgically inserted before beginning dialysis treatments. The 30 percent who lacked an access at the time were not deemed ready to start dialysis treatment allowing more time for adequate access placement. (See Appendix B, Figure 1)

Patients with CKD have low health literacy which is linked to worse health outcomes, such as quicker kidney deterioration and more significant mortality. The PEMAT tool determines whether a patient will be able to use educational materials effectively. Understandability investigates how well people with varying degrees of

health literacy can grasp and explain essential concepts in patient education materials. Actionability investigates how people's health literacy skills may influence what they can do in response to the information provided. The higher the PEMAT score, the more understandable or actionable the content is. When it comes to understanding and actionability, a range that obtains a score of 90% is more coherent than a material that receives a lower score of 60%. Likewise, the SAM tool is a time-saving method for evaluating printed health-related instructional materials. According to the overall score, 70-100 percent is regarded as outstanding, while 40-69 percent is sufficient, and 0-39% is considered unsuitable material. Both tools were proven acceptable by healthcare professionals as adequate educational materials scoring from 60% to 100%.

Comparing baseline data with data acquired after implementing an education program was a significant strength of this project. Limitations were the small sample size and short time frame for the study. Recommendations for future dialysis population studies should look at the impact of low health literacy on referral to nephrology services, dialysis modality selection, dialysis quality metrics, dialysis adverse events, and success with home therapies, such as peritoneal dialysis. Future initiatives should involve wider dissemination of the educational program to all CKD patients, not just those in stages four and five, to assist this QI effort. In addition, proteinuria is a critical factor in renal disease, and reduction efforts should be included in therapeutic measures to halt CKD progression.

Conclusion

The evaluation of an educational program for patients with CKD in stages four and five highlighted the influence of healthcare choices. Due to the unique nature of this

study, further PDSA cycles and data collection should occur to conduct ongoing quality assurance analyses. Overall, the QI project successfully identified the need to address HL in patients with chronic diseases, particularly those diagnosed with CKD, within the demographic of interest. The findings are encouraging since the subject's demonstrated commitment to lifestyle adjustments and preparation for an appropriate start to dialysis treatment regimens. However, further education should emphasize the importance of obtaining routine albumin and protein urine collections to analyze kidney function further.

Due to advancements in medicine, patient education must adapt to ensure that people have the information necessary to maintain their health. This quality improvement initiative's effective execution and outcomes demonstrated the advantages and significance of a doctoral-prepared, qualified nurse. The Doctor of Nursing Practice (DNP) degree equips nurses with the skills and knowledge required to make significant contributions to the advancement of health and patient care. As a result, a DNP-prepared nurse is well-versed in healthcare system complexity, patient needs, leadership, change, and the relevance of nursing.

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Appendix A

Table 1

Demographic Characteristics of Participants, N=20

Characteristics	*n*	%	M	SD
Age	20		64.85	10.085
Gender				
Female	9	45.0		
Male	11	55.0		
Race/Ethnicity				
African American	11	55.0		
Caucasian	8	40.0		
Hispanic/Latino	1	5.0		
Zip codes				
62002	2	10.0		
63033	2	10.0		
63130	2	10.0		

Note. Output obtained using IBM SPSS Statistics for Windows Version 28.0

Appendix B

Figure 1

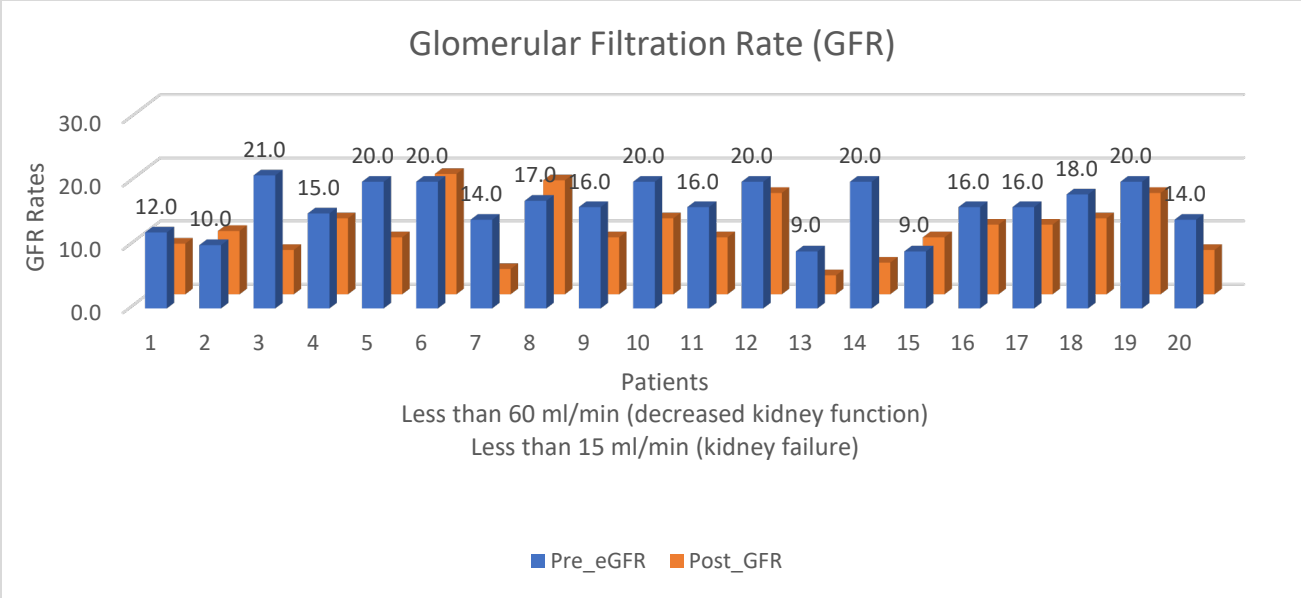


Figure 2

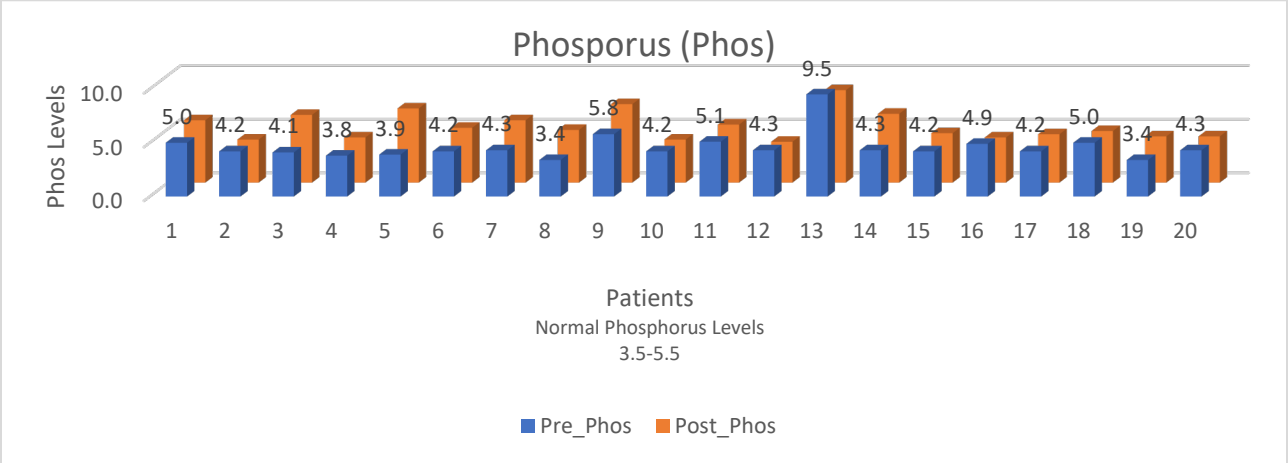


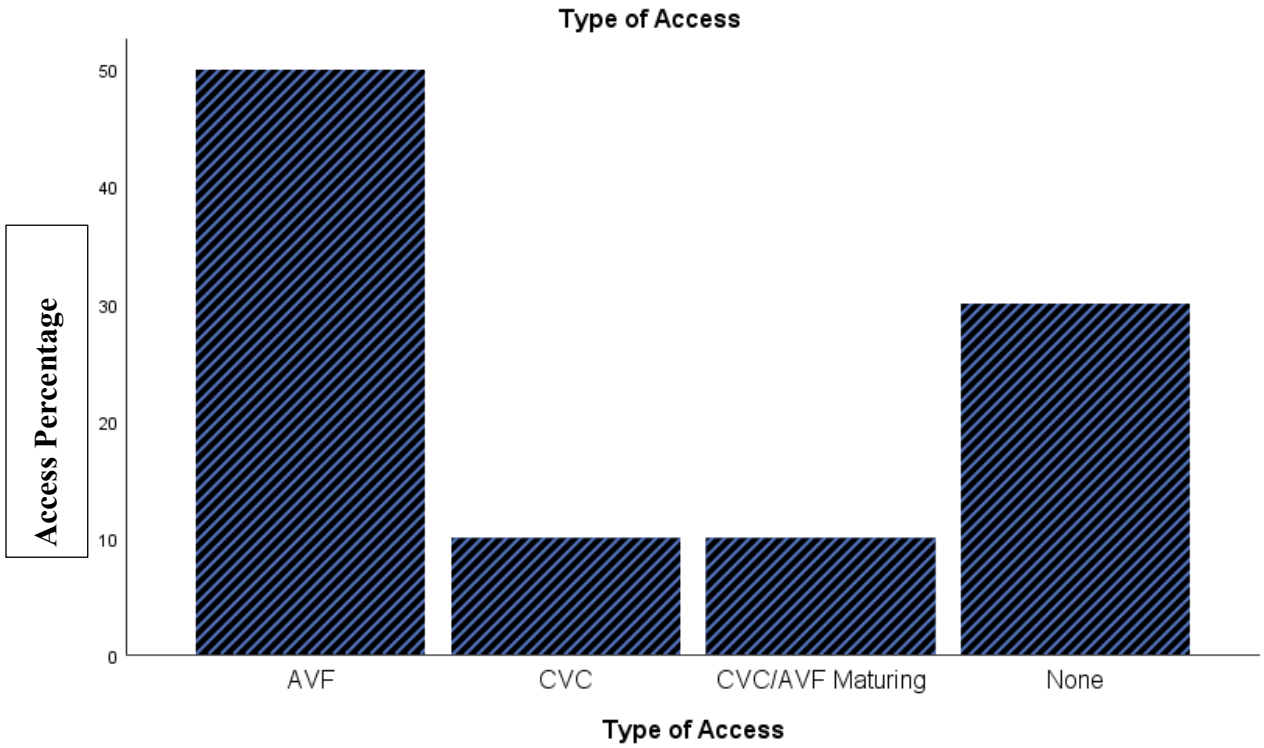
Table 1

Blood Laboratory Values with Significant Differences

Lab Values	Pre-Education	Post-Education	Independent Samples t-Test (Two-Tailed
Glomerular Filtration Rate	M=16.15, SD=3.86	M=10.35, SD=3.86	t (19) 5.949, P=.000
Phosphorus	M=4.161, SD=1.288	M=5.26, SD=1.293	t (19) 2.796, P=.012

Appendix C

Figure 1



Appendix D

Figure 1

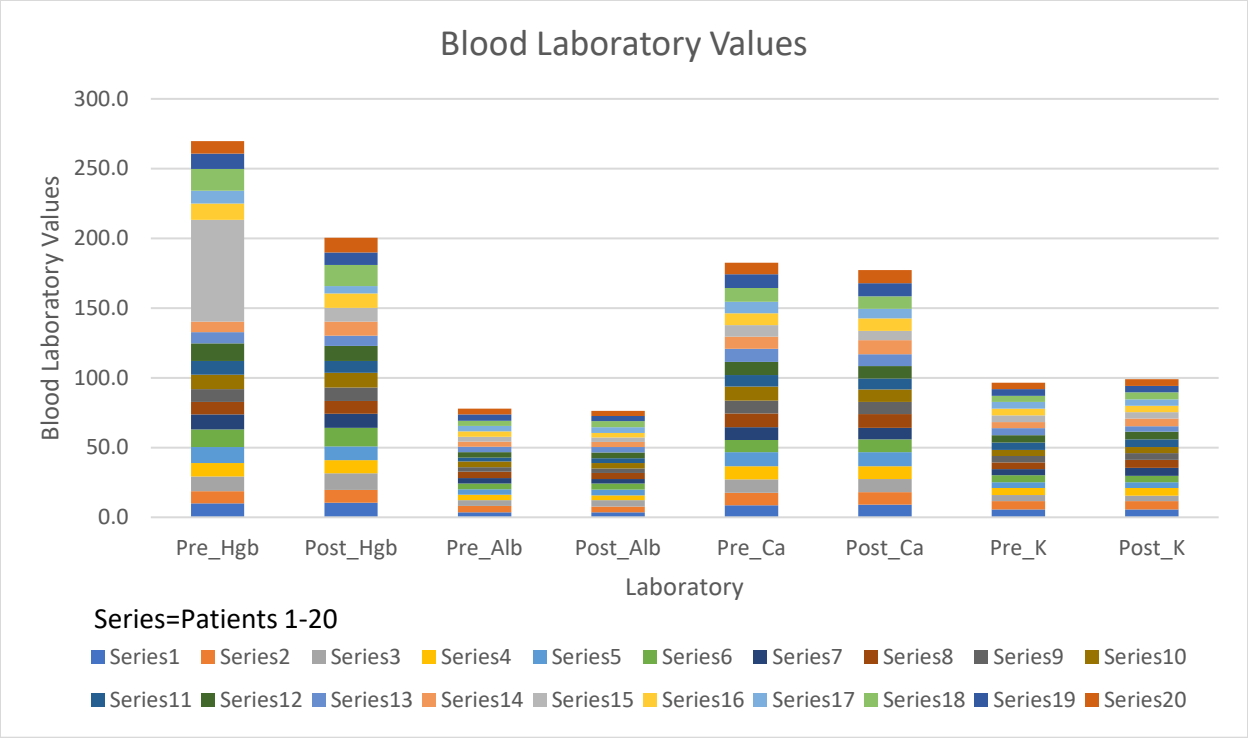


Table 1

Blood Laboratory Values with No Significant Differences

Laboratory Values	Pre-Education	Post-Education	Independent Sample t-Test (Two-Tailed)
Hemoglobin (Hgb)	M=13.48, SD=14.12	M=10.02, SD=2.02	t (19) = 1.094, P=0.287
Albumin (Alb)	M=3.89, SD=.4115	M=3.815, SD=3.815	t (19) = 0.796, P=0.436
Calcium (Ca)	M=9.130, SD=0.6721	M=8.865, SD=0.9410	t (19) = 1.465, P=0.159
Potassium (K)	M=4.83, SD=0.475	M=4.95, SD=0.595	t (19) = -1.045, P=0.309

Appendix E

Figure 1

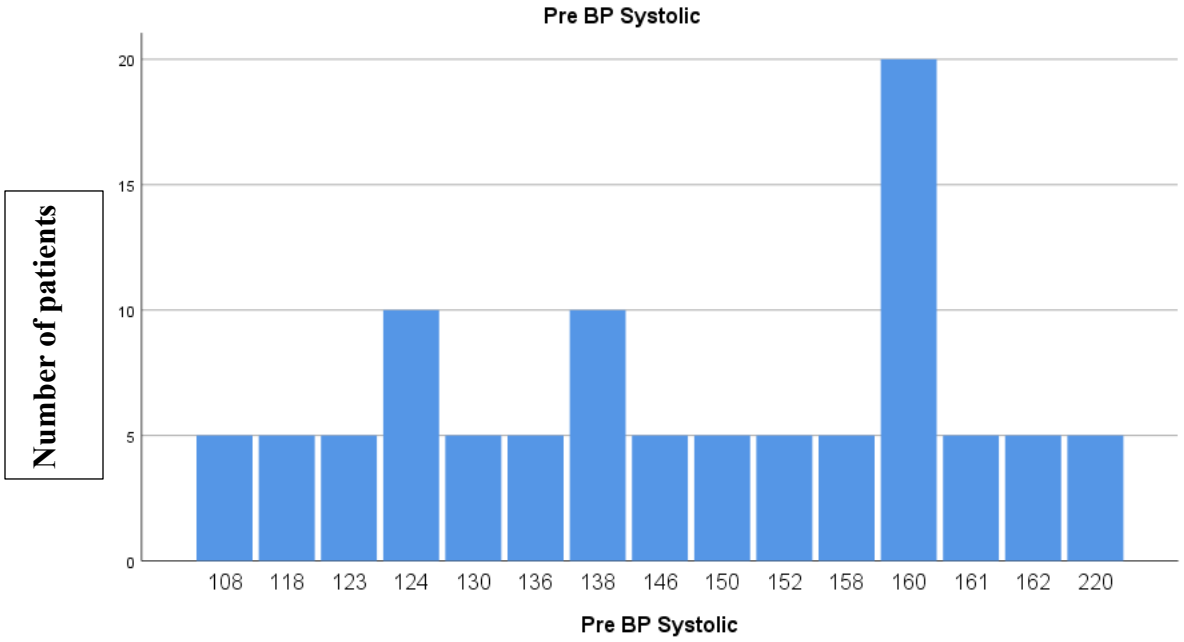


Figure 2

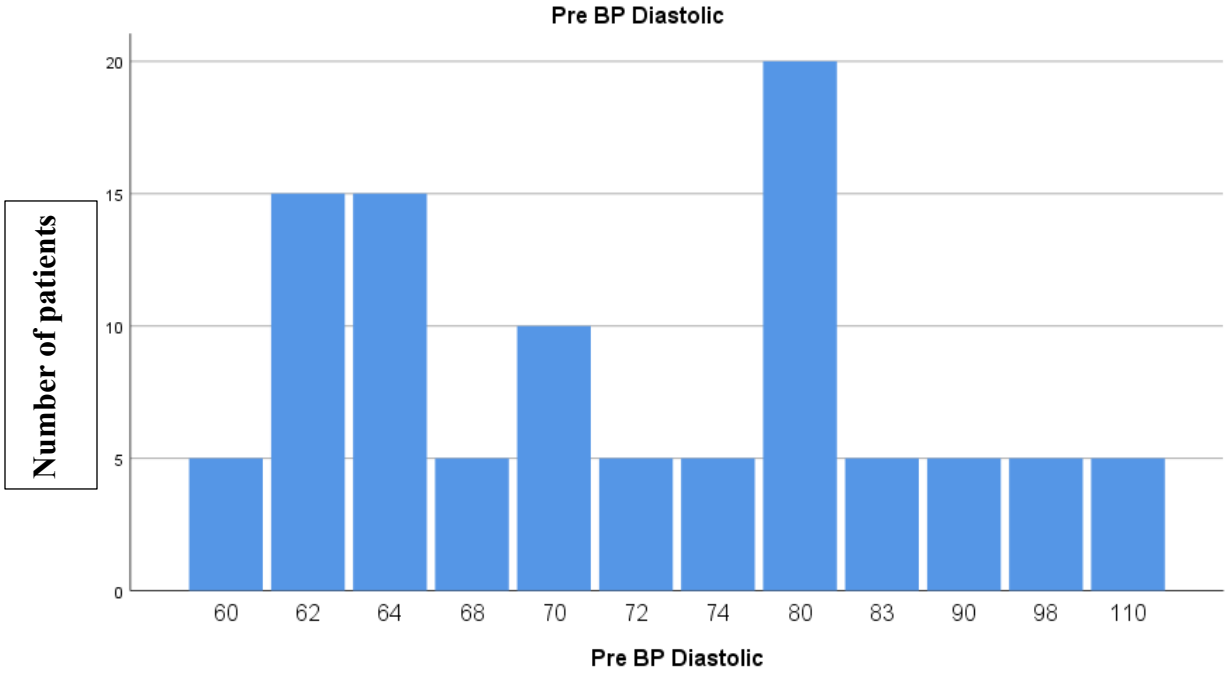


Figure 3

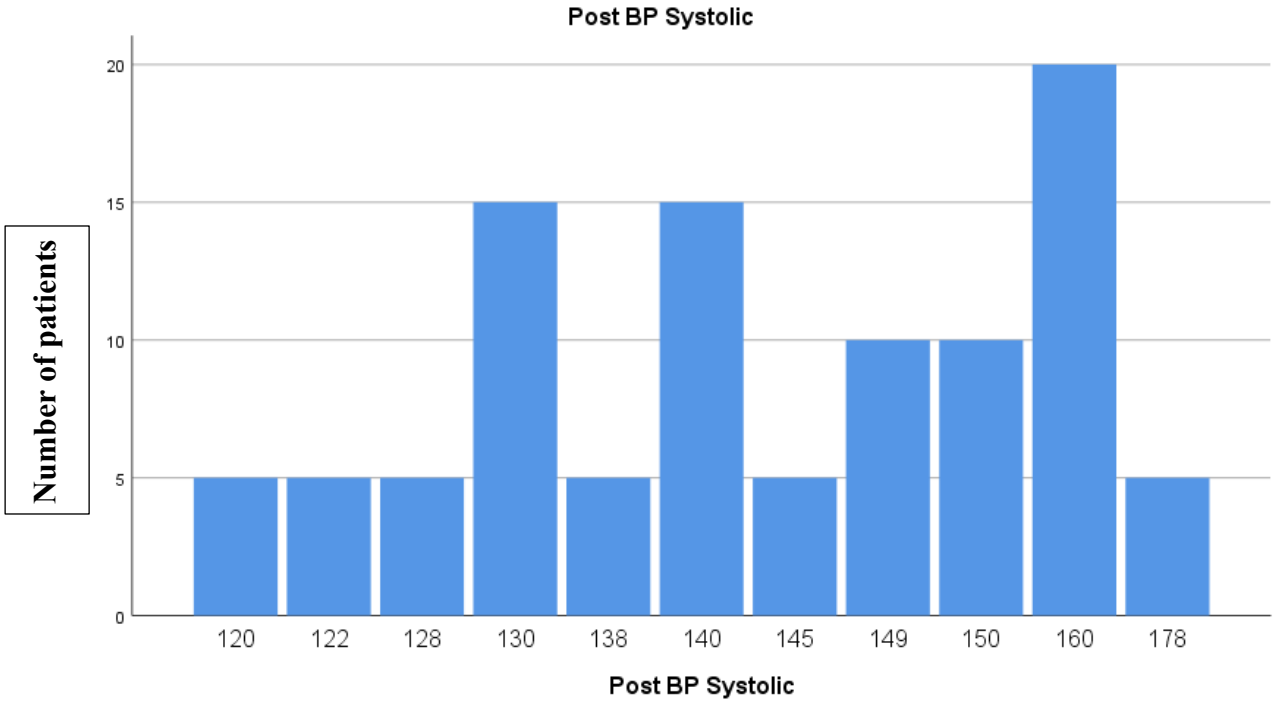


Figure 4

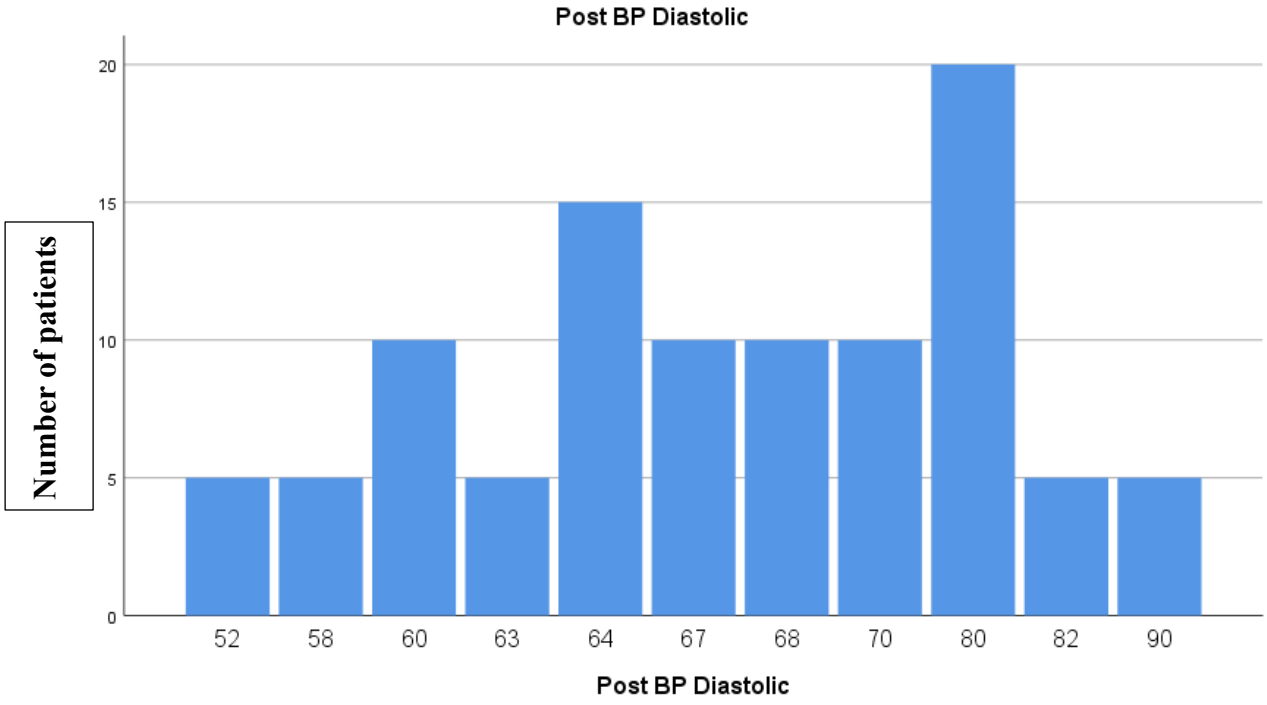


Table 1

Blood Pressure Results of Participants

Blood Pressure (BP)	Pre-Education	Post-Education	Independent Sample t-Test (Two-Tailed)
Systolic Blood Pressure	M=146.40, SD=24.217	M=143.95, SD=15.028	t (19) = 0.566, P=0.578
Diastolic Blood Pressure	M=74.65, SD=13.268	M=69.35, SD=9.697	t (19) =1.731, P=0.100

Appendix F

PEMAT & SAM Total Scores

Figure 1

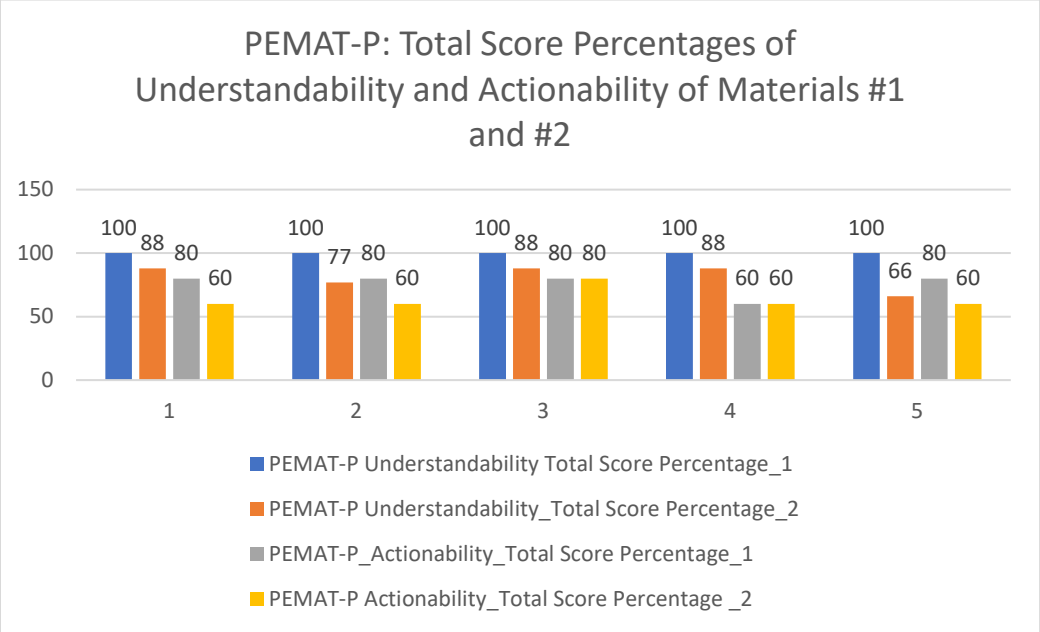


Figure 2

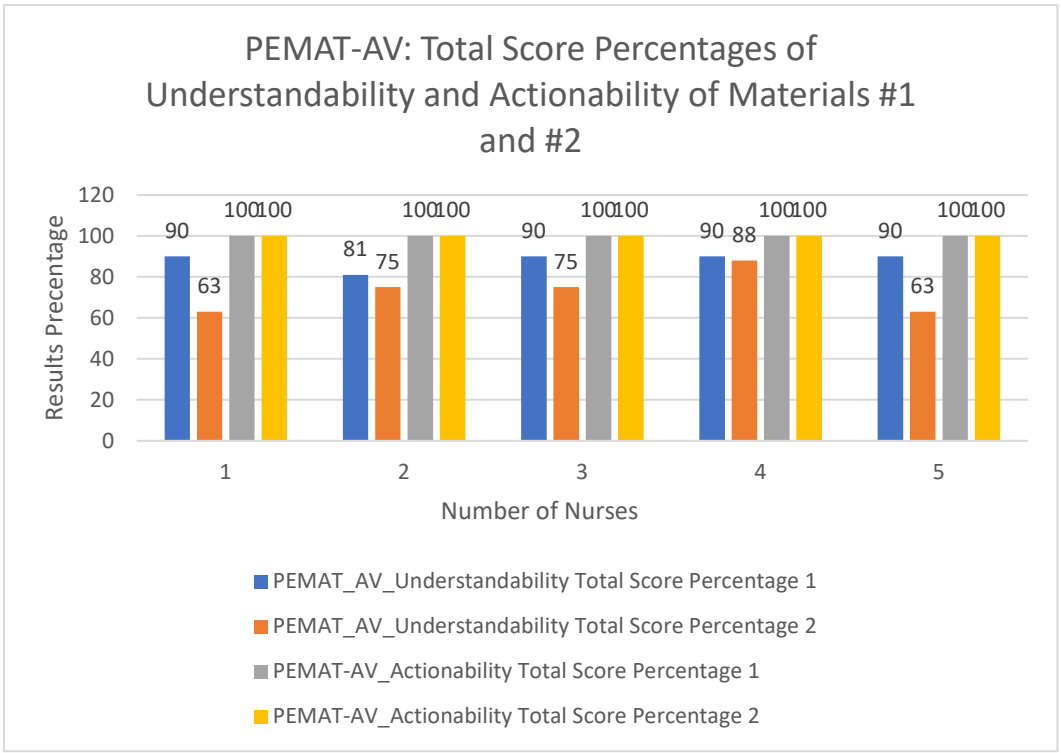
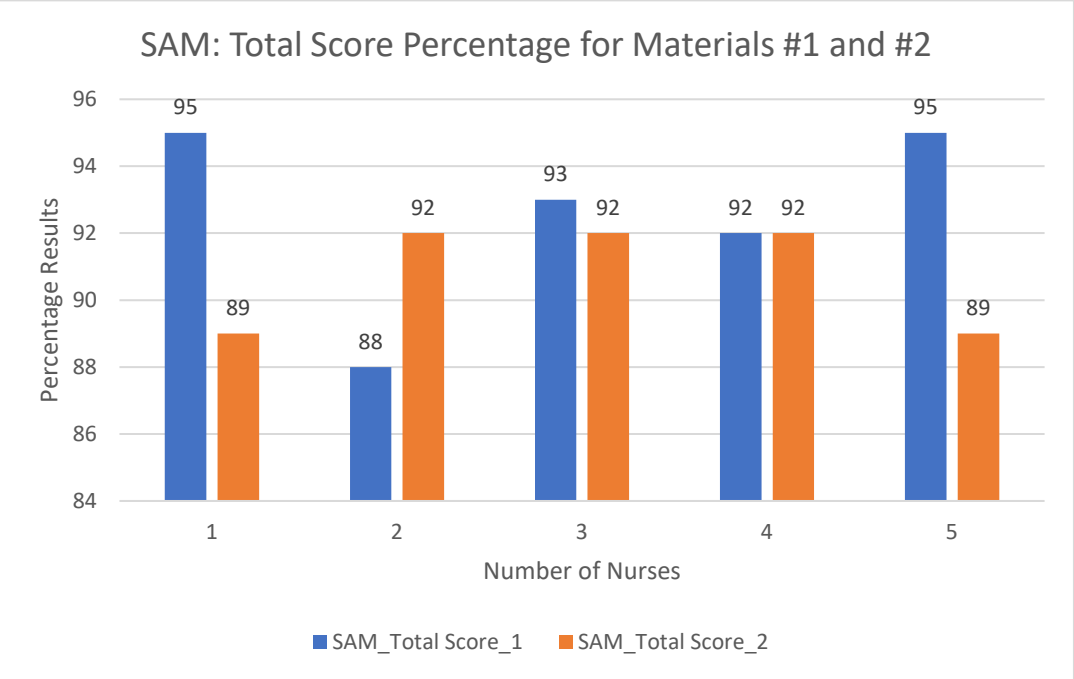


Figure 3


SAM: Total Score Percentage for Materials #1 and #2
Percentage Results
96
94
92
90
88
86
84
95
89
88
92
93
92
92
92
95
89
1
2
3
4
5
Number of Nurses
SAM_Total Score_1
SAM_Total Score_2