Early Identification of Chronic Kidney Disease Using a Nurse-Led Screening Protocol for At Risk Elderly Patients: A Best Practice Implementation Project

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BACKGROUND

Chronic kidney disease (CKD) remains a global health threat resulting in debilitating effects on patients and society. However, early treatment of CKD can prevent progression into end-stage kidney disease.

In the United States (US), it is estimated that 37 million adults have CKD, which is more than one in seven American adults (CDC, 2021). CKD is also the ninth leading cause of mortality (CDC, 2020). Additionally, in 2017, Medicare costs for CKD were recorded at $84 billion (America's Health Rankings, 2021). Medicare also reported that patients with CKD 65 years and older accounted for 20% of the Medicare spending in that age group (NIDDK, 2016).

CKD in its early stages is asymptomatic and may go unnoticed until its advanced stage (NIDDK, 2016). In the most advanced stage (CKD 5), only dialysis and kidney transplant can prolong the life of patients (Gaitonde et al., 2017).

The primary care setting, including home health care, is the frontline for providing CKD testing and education. Primary care providers are well placed to monitor renal function and manage modifiable risk factors proteinuria (Fraser & Blakeman, 2016).

However, competing demands, challenges in interpreting diagnostic results, and the complexity of CKD interfere with the early recognition and diagnosis of CKD in primary care (NIDDK, 2018). Moreover, poor awareness about CKD by patients and providers, inadequate screening and risk-stratifying, and lack of evidence-based interventions propagate suboptimal CKD care (Foti & Chang, 2020). Hence, CKD often goes undetected in primary care (NIDDK, 2018).

The usual practice at the project site do not include early CKD screening and CKD prevention education for high-risk patients. Thus, in most cases, patients receive CKD education and treatment once they have become symptomatic and their disease is in an advance stage.

PURPOSE, AIM, AND OBJECTIVES

The DNP project will involve early CKD screening and management to homebound elderly patients ≥60 years old diagnosed with diabetes and hypertension.

The overarching aim of this DNP project is to save lives and reduce healthcare costs due to CKD progression by early screening and management of CKD among patients in a primary care home health agency.

The following objectives will be met within the timeframe of the DNP project.

1. Create an evidence-based early CKD screening and management protocol.
2. Educate an inter-professional team to enhance the knowledge and acceptance of the new CKD screening and management protocol.
3. Evaluate providers' knowledge before and after the education session for improved understanding of CKD.
4. Increase in billing via CPT codes for early CKD screening and management by at least 10% at the project site through a billing report via NextGen.
5. Evaluate providers' compliance with the new CKD screening and management protocol with a chart audit via NextGen.

METHODS

The Institute for Healthcare Improvement's (IHI's) model for improvement (MFI) underpinned the project.

The DNP project was held in a primary care home health agency in San Bernardino, in Los Angeles County, California.

The direct participants were home-based primary care providers consist of 12 family nurse practitioners (FNPs), 3 medical doctors (MDs), and 2 physician assistants (PAs). The indirect participants were the patients seen by the population of interest, who are 60 years old and above and diagnosed with diabetes and/or hypertension. Exclusions include patients not diagnosed with diabetes or hypertension, younger than 60 years old, and those not seen during the implementation timeframe.

The proposed intervention was drafted using the most current KDIGO guidelines on CKD screening and management (Ikilzer et al., 2020; Shilpak et al., 2021). This DNP project will include a five-week implementation phase and an evaluation to occur following the implementation (Figure 1).

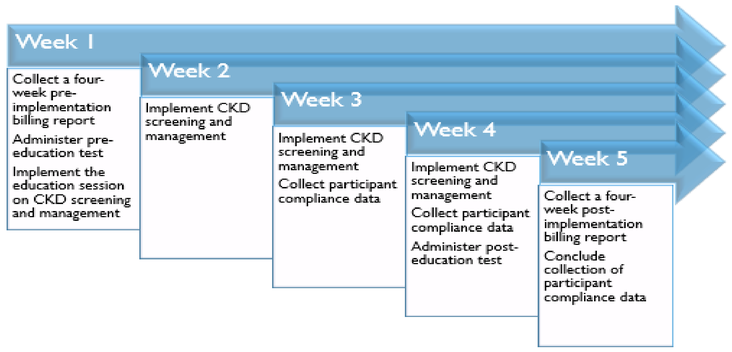

Figure 1
The Five-Week Timeline of the Project

The impact of the DNP project was evaluated in three ways – billing summary, education tests, and chart audit. The billing summary collected CPT codes for CKD screening and CKD management performed four weeks before and after the education session and generated by the billing department via NextGen. The education test was administered as a paper and pencil test that evaluated the participant's knowledge of CKD screening and management before and after (week 4) the education session. The chart audit via Practice Fusion checked for participant compliance to CKD screening and management protocol from weeks 3 to 5.

A statistician from Touro University Nevada (TUN) was consulted to determine the relevance and applicability of the proposed statistical analyses. Data was analyzed using the Statistical Package for Social Services (SPSS) version 27 software.

A paired *t*-test for pre- and post-billing summary examined if the DNP project implementation had any impact on the total CPT codes billed at post-intervention. Another paired *t*-test for pre-and post-education test scores determined if improved knowledge on CKD screening and management at post-education is statistically significant. Descriptive statistics established participant compliance with the new CKD screening and management protocol.

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RESULTS

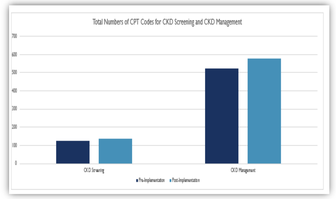

Figure 2
Comparison of the Total CPT Codes for CKD Screening and CKD Management Pre- and Post-Implementation

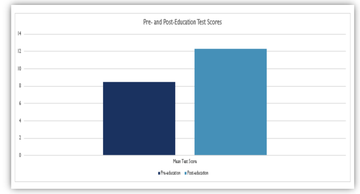

Figure 3
Comparison of the Pre- and Post-Education Test Scores

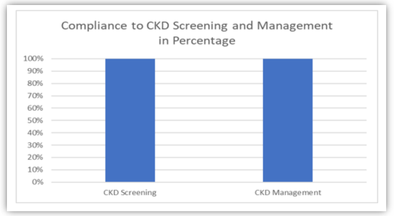

Figure 4
Participant Compliance to the New CKD Screening and Management Protocol

There was a 10.32% increase in CPT codes for CKD screening and 10.10% in CPT codes for CKD management. The paired *t*-test found a statistically significant difference in the mean CPT codes for CKD screening pre- and post-implementation, $t(16) = -3.79$, $p = 0.002$. The paired *t*-test also found a statistically significant difference between the total CPT codes for CKD management at pre- and post-implementation, $t(16) = -3.50$, $p = 0.003$.

The paired *t*-test revealed a significant mean difference between the pre-and post-implementation evaluation test scores, $t(16) = -10.74$, $p < 0.001$.

All participants complied with the new CKD screening and management. The audited charts showed all participants had at least one CPT code for CKD screening and CKD management.

CONCLUSIONS

The project enhanced the participants' knowledge of and compliance to the CKD screening and management. The project also increased the billing of CKD screening and management procedures.

The project will continue to be implemented at the project site.

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