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Fantastic Four

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Executive Summary

Introduction of the Problem

Heart disease has been the leading global cause of death for men and women for over two decades (WHO, 2020). The diagnosis of Heart Failure with Reduced Ejection Fraction (HFrEF) is received by approximately 650,000 new individuals each year and places each individual at a 50% risk of mortality within the first five years of diagnosis (Gottlieb, 2016; Yancy et al., 2013). This disease process will claim one in four lives annually (CDC, 2021). Given the statistics of the frequency of diagnosis and significant mortality rate, there has been a remarkable effort placed into combating the disease process and detrimental effects of HFrEF. Guideline Directed Medication Therapy (GDMT) was developed and proven in research to decrease the mortality of those diagnosed with HFrEF (Green & Khan, 2021). However, in an evaluation of the use of GDMT, the number of individuals receiving the proper combination and dosing was staggeringly low.

This project's primary focus was on educating the Heart Center nurses to increase their knowledge of the recommended pharmacological regimens and promote appropriate GDMT use. The secondary focus of this project was to assist nurses in recognizing the significance of GDMT therapy and to promote adherence on both the provider and patient side of this complex condition.

Literature Review

The American College of Cardiology Foundation (ACCF) and the American Heart Association (AHA) together researched and developed what is known as Guideline Directed Medication Therapy for HFrEF patients (Gottlieb, 2016). These medications form the crucial foundation for HFrEF therapy and include renin-angiotensin-aldosterone system inhibitors

(angiotensin converting enzyme inhibitor [ACEI]; angiotensin receptor blocker [ARB]) or an angiotensin receptor-neprilysin inhibitor (ARNI) and β -blockers, mineralocorticoid-receptor-antagonists, and sodium-glucose cotransporter-2 inhibitors (SGLT2) (Bauersachs, 2021; Dixit et al., 2021; Greene et al., 2018, Heidenreich et al., 2022). The combination of these medications, known as the fantastic four, offer a staggering 73% reduction in mortality over a two-year time period (Greene & Khan, 2021). However, in the literature review, it was noted that the number of individuals receiving the proper combination and dosing was staggeringly low at approximately 25% globally (Balakumaren et al., 2018, Green et al., 2018, Komaja et al., 2017). As a result, this literature review focused on the evidence-based guideline directed medication therapy and educational instruments to increase nursing knowledge.

Project Methods

The purpose of this project was to provide education to increase nursing knowledge of guideline directed medical therapy (GDMT) for patients with heart failure with reduced ejection fraction (HFrEF). A clinical evaluation of a rural central Illinois cardiac clinic showed a lack of GDMT being successfully initiated and appropriately dosed in patients suffering HFrEF. Through further investigation, it was also discovered that this site does not offer any specific nursing education on GDMT of HFrEF patients. This gap in education and best practice was the spark that generated this educational project.

A literature review of the updated guidelines was performed and an educational PowerPoint was developed by the authors and in conjunction with cardiology. Active learning strategies were researched for the most effective implementation techniques. The project was then presented to the Heart Center nursing staff to educate on the mechanism of action of each medication, how they work synergistically, and the importance of combination therapy with

proper dosing. Pre and post tests were distributed to staff to evaluate the effectiveness of the education provided. Testing was completed through a QR code which linked to Qualtrics for data analysis. The pretest was presented first, followed by the PowerPoint presentation, and completion of the in service was the posttest. The educational in service on GDMT for HFrEF patients was implemented to prepare for this practice change. Southern Illinois University Edwardsville's IRB determined this was not a human research project.

Evaluation

The objective for this project was to increase nursing knowledge of GDMT in HFrEF patients. The outcome of the pre and post-tests showed a statistically significant increase in knowledge following the implementation of this project. The total number of Heart Center nurses was eleven. The pretest had an average score of 78.3%. The most frequently missed questions were regarding the mortality rate following the diagnosis of heart failure and the percentage in reduction in mortality over a two-year time span when patients have appropriate quadruple therapy. On the pretest, these questions scored 18% and 36% respectively. On the posttest examination, while almost all questions showed improvement, these two lowest scoring questions showed the most improvement increasing to 90.9% percent correct.

The educational goal for improvement in nursing knowledge was set at 20% from pretest to posttest scores. Upon analysis, the posttest scored an average of 96.6% The lowest scoring questions mentioned above increased by 73% and 55% respectively. Nursing staff then ranked their confidence and understanding on a scale of one to five on the following three questions; the effects of GDMT on the HFrEF population, medications used in GDMT, and the mechanism of action of each medication. On the pretest analysis of these three questions, the minimum answer was one, which represented strongly disagree. The average pretest answer for all three questions

was three, which represented neither agree nor disagree. On the posttest analysis the minimum answer was three. The average posttest answer for all three questions was four, which represented agree.

Through implementation, the authors discovered that presentation of the material using a variety of learning techniques including visual, auditory, kinesthetic adaptations of the education, and interactive discussion was a successful way to educate the Heart Center nurses. The limitations of this stage included shift coverage, reaching all nurses, and poor communication among Heart Center management with authors and staff to schedule and implement the project.

Impact on Practice

Upon review of the project presentation and pre and post testing analysis, the overall project revealed a positive learning outcome. The immediate impact on practice will be an increase in knowledge for the Heart Center nurses, which will promote evaluation of GDMT through our front line staff. This project has an immediate implementation time as the education delivered to the nurses will extend to each patient they encounter. From the literature, the estimated cumulative effect of appropriate quadruple therapy is a 73% relative reduction in mortality over a two-year time span (Greene & Khan, 2021). The long term impact would be an anticipated reduction in mortality, cardiovascular risk, overall hospitalizations, and hospitalization for heart failure as proper treatment is implemented.

Conclusion

Overall, there was a 18.3 % increase in nursing knowledge regarding GDMT, implying this project was successfully developed and implemented to the Heart Center nurses. These staff members will be utilizing this knowledge during triage and evaluation of patients presenting to the Heart Center and monitoring for proper quadruple therapy and dosing.

For future projects, a retrospective design could be used to look at the pre-implementation vs post implementation percentage of GDMT compliance. Furthermore, an analysis of GDMT use with chart audits would provide important data specific to the patients at the individual location being served.

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