Constipation Management in Congestive Heart Failure Patients

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Date of Submission: July 23, 2020

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Abstract

Constipation within congestive heart failure patients admitted to the hospital poses a significant health burden, decrease in quality of life, and potential for complications. Based on a review of literature, nursing staff are the front line of patient care for these patients and can provide individualized nursing assessments that target constipation risk factors, potentially decreasing the risk and prevalence. A nursing led Cardiac Constipation Management Tool provides an effective means of risk assessment assigning appropriate categories of constipation risk, and ultimately leading to provider notification, designated constipation order set activation, and therefore decreased constipation rates. Upon admission the tool was used, identifying a total of seven CHF admits within the month of March. Five of these tools were identified as low risk, while two were identified as medium risk. Due to the impact of severe acute respiratory syndrome coronavirus 2, the sample size was small without any high-risk scores. This group was compared to the prior month of CHF hospital admissions without tool use to contrast constipation rates and outcomes. Data analysis demonstrated no statistical significance found between the two groups with both sets of patients having constipation and order set activation without regards to high-risk categories from the tool. Despite risk assessment scores, the tool brought awareness of constipation within the CHF population to patients and nurses alike with great promise towards future implications within the inpatient setting.

Keywords: Congestive heart failure, Constipation, Cardiac Constipation Management Tool

Constipation Management in Congestive Heart Failure Patients

Constipation is known to be a symptom, not a disease. The definition of constipation is a difficult one to pin down as it involves both objective and subjective measurements each individualized and unique from person to person. One factor that can be agreed upon in relation to constipation is that it is an uncomfortable symptom that overall impedes one's quality of life. Within an acute hospital setting, constipation becomes even more detrimental, potentially leading to pain, nausea, vomiting, electrolyte disturbances, bowel obstruction and bowel perforation, all which could increase hospital length of stay, increase costs and decrease overall patient satisfaction and outcomes. The rate of constipation within a hospital setting is said to be as high as 79% according to Myatt (2012). Within a busy cardiac unit, constipation is often overlooked until it becomes a significant problem, often being underestimated by staff and patients alike. This ultimately can lead to significant complications, patient distress, impaired healing, and reduced quality of life.

Overview

Background

At first glance, the issue of constipation seems minute in comparison to the challenges facing an acute care inpatient. Yet, the issue of constipation is one that can have a great impact on a patient's hospital stay and overall quality of health, and one that can also be recognized, prevented and treated early with the proper tools. Each patient admitted to an acute care facility is at an increased risk of constipation simply from a disrupt in their normal routine, not to mention lack of privacy, decreased mobility, immobility, dietary changes, use of opioids, or recent surgery (Zanik & Gray, 2015). Untreated constipation can lead to a variety of complications including pain, bloating, discomfort, obstruction, nausea, electrolyte disturbances,

impaction and perforation (Zanik & Gray, 2015). Each of these factors not only causes discomfort for the patient but can also lead to increased length of hospital stays, additional costs and possible surgical intervention (Smith, Stimson & Stevens, 2018). According to Myatt (2012), constipation related healthcare costs $6.9 billion in the United States annually.

Constipation can affect a more serious and unique population of the congestive heart failure (CHF) patients. CHF is a complex syndrome characterized by the inability of the heart to meet the body's metabolic demands (Buttaro, Trybulski, Polgar-Bailey, & Sandberg-Cook, 2017). Symptoms of heart failure include shortness of breath, persistent coughing, bronchospasm, or wheezing, edema, fatigue, anorexia, nausea, increased heart rate, and impaired thinking. Congestive heart failure is a progressive and deadly disorder with less than 50% of patients living past five years of diagnosis, and less than 25% living past ten years (Buttaro et al. 2017). Constipation becomes an issue due to the digestive system receiving less blood in order for the heart to pump more effectively. Assessment of quality of life is imperative due to the high symptom burden and unpredictability of this disease. Often times, these patients have exercise intolerance, spending less and less time being active and mobile, leading to a sedimentary life. There are also a series of restrictions on not only the physical, but mental and social aspects of life causing limitations in carrying out activities of daily living and overall decreasing a patient's quality of life. Constipation is a small aspect of this diagnosis, but one that could be prevented in order to better a patient's quality of life. For these reasons mentioned, a capstone project working towards implementation of a nurse driven tool to assess and treat constipation is in order within this specific population.

The proposed plan for this project is a nurse driven constipation recognition and prevention protocol/tool that can be implemented within the congestive heart failure population

in order to improve their hospital outcomes and overall quality of life. This tool would be initiated upon admission and used throughout their hospital stay. The proposed tool would allow nurses to act before the issue of constipation becomes a problem by assessing each patient's unique constipation-related risk factors and identifying a risk score associated with likelihood of constipation while in the hospital. This then would allow for proper notification to the provider for appropriate intervention and treatment to occur through prescription of the constipation order set and/or necessary medications. It is anticipated that a comprehensive risk assessment tool would provide clear guidelines for assessment, documentation, and notification to the provider in order to prevent constipation developing in the hospitalized cardiac patient.

Problem Statement

Congestive heart failure patients have an increased risk of complications associated with constipation. There was evidence to support the implementation of a nurse driven protocol in order to benefit the patient, unit and hospital as a whole through decreasing length of stay, post-operative complications, and improving overall quality of life. With this knowledge, the clinical question that was answered through this capstone project was, "Among congestive heart failure patients, would a nursing-based constipation recognition/prevention protocol be more effective than the current constipation protocol at identifying risk and reducing rates of constipation during the patient's hospital stay?".

Purpose Statement

The purpose of this capstone project was to implement a nurse driven constipation protocol aimed to properly assess risk, prevent, and treat constipation within the congestive heart failure population.

Outcomes

In order to implement a successful protocol, outcomes had to first be established. The first outcome included early identification of each CHF patient's individualized risk for constipation throughout his or her hospital stay. This was done through the use of a tool such as that of a modified constipation risk assessment tool (CRAT) titled the Cardiac Constipation Management Tool (CCMT) (Zanik & Gray, 2015). Nurses administered this assessment tool upon admission and used it to guide appropriate notification to providers. Through the use of an assessment tool such as this, it allowed nurses to focus on each individual patient along with the patient's own risk factors such as diagnoses, mobility, nutrition and medications upon admission. Based on the score of the CCMT tool, this then allowed nurses to classify patients as low, medium or high risk of constipation. Data was collected through the use of the modified CRAT tool which assesed rates of low, medium, and high-risk patients.

The second outcome measurement came after an appropriate classification was made. Through the use of a CCMT, a patient's constipation risk rating of "high" then should have lead to a provider notification. Through appropriate notification to the provider with high risk ratings, the nurse could have been able to ask for the constipation order set to be put in place. This would have then allowed the providers to acknowledge the high likelihood of constipation before it occurred and allowed for nursing staff to administer the necessary medications based on the order set. The measurement and goal to assess rates of constipation after use of this tool was performed through the use of nursing documentation on which medications were administered and individual patient outcomes.

The third outcome that was measured consisted of how many constipation order sets were prescribed based on the results of the tool. Through the use of these outcomes, both early identification and intervention was promoted in order to improve overall health outcomes of the

congestive heart failure population.

Review of the Literature

Literature was reviewed to analyze current research on constipation protocols and/or tools in the congestive heart failure population. Search terms researched were broken into several themes: population, problem, and intervention. For the population category, search phrases included: “congestive heart failure”, “CHF”, and “heart failure”. The problem phrases included: “constipation”, “risk of constipation”, and “constipation complications”. Finally, for the intervention component, the search phrases included: “nursing constipation protocol” and “constipation protocol”. The search terms were placed into a total of three different databases which included Cumulative Index of Nursing and Allied Health Literature (CINAHL), Health Business Elite and Cochrane Database of Systemic Reviews (Appendix A).

Two main criteria of “heart failure” and “constipation” yielded the most relevant studies to analyze. Together, these two phrases yielded a total result of 3,906 articles between the three databases. Limiters were then placed on the search including articles needing to be full text, in English language, and publish date between the years of 2009-2019. Exclusion criteria included articles being of the wrong topic, wrong subject matter, duplicate articles, and articles not relating to nursing role within congestive heart failure and constipation. Many of the articles would discuss CHF patients, but would lack constipation as a detailed topic within the article. Inclusion criteria was also established which encompassed focusing on the topic of constipation in the CHF patient. Once the limiters, inclusion, and exclusion criteria were applied, the literature search whittled down to only four articles. For the purpose of the search trail and literature matrix, a total of six articles were ultimately used from other similar search criteria that included the phrases noted above (Appendix B).

Study designs varied with level of evidence. Five articles presented with evidence from the opinion of authorities and/or expert committees (level 7), one cohort study (level 4), (Ackley, Swan, Ladwig, & Tucker, 2008). The six articles found for the intended capstone project will next be discussed through the use of comparison and contrasting, along with identification of key themes: unique care needs of CHF patients, nursing role, and early and holistic assessment/appropriate tools.

Synthesis of Evidence

Unique care needs of congestive heart failure patients. In order to better understand the problem within this capstone of constipation, a deeper look into the unique population of the cardiac surgical patient is needed. Of the six articles reviewed, three discussed the specific risk factors associated with congestive heart failure patients in relation to constipation. Findings from the reviewed studies have shown that symptoms such as fatigue, shortness of breath, decreased exercise intolerance, peripheral edema, lack of appetite and fluid restriction can lead to development of constipation. Other identified constipation risk factors within this population include medications such as diuretics used for fluid overload and morphine used for breathlessness can both decrease peristalsis in the bowel leading to constipation.

Heart failure is a chronic, progressive disease and overtime predisposes a patient to various adverse health outcomes. Wleklik et al. (2017) discuss nutritional status being one of the most important factors contributing to the worsening of heart failure and ultimately leading to constipation. The prevalence of malnutrition within the heart failure population is as high as 69% regardless or age, sex, or the heart's ejection fraction. It was found in a group of elderly patients ages 65 and older with heart failure, that micronutrient intake was below the recommended levels for fiber and magnesium which both promote healthy bowel movements (Wleklik et al.

2017). Other risk factors specific to this population include exercise intolerance in relation to performing basic activities of daily living such as cooking and daily walks. Decreased activity levels also lead to decreased gut peristalsis, slowing digestion times and bowel movement activity.

Nursing Role. Nurses play a vital role in patient care and advocacy. Often times, many providers are unaware of certain components of a patient's hospital stay until information has been relayed by the nurse. This is stressed within three of the six articles how nurses can positively impact a CHF patient's hospital stay through prompt recognition and notification to the provider of a patient's risk of constipation. Nursing staff are stressed to form bonds with their CHF patients and to have a depth of knowledge of the congestive heart failure diagnosis. This in turn helps to be proactive in the care that will be needed. Successfully supporting the patient with advanced heart failure who is experiencing gastrointestinal symptoms requires a holistic approach with being able to assess the whole individual and anticipate needs such as nutrition, fluid balance, and early mobility (MacCallum & Hughes, 2010).

Literature also focuses on the important role of the nursing staff to collaborate with other specialties including physicians, physical therapy, dietary, occupational therapy and cardiac rehab in order to meet the needs of the congestive heart failure patient while admitted. This in turn helps to use evidence-based findings for prompt treatment of constipation.

Early and Holistic Assessment/Appropriate Tools. Processes for implementing a protocol for screening constipation upon admission within this population have not been well established. However, within five of the six articles, the mention of early and holistic assessment for constipation was highly stressed throughout. A comprehensive nursing assessment which focuses on the patient's physical, emotional, and psychological components in regards to

constipation is indicated with any new CHF admission. Often times, CHF patients face a multitude of risk factors that compile to increase the likelihood of constipation development. By initiating an early and holistic assessment, nurses may decrease both psychological and physiological stress associated with constipation and decrease the chances of a delayed hospital discharge (Hunter, 2016). Timing of early screening tools help to be proactive in constipation management in order to prevent this from becoming a complication throughout the hospital stay.

One tool that has been used to assess for constipation is that of the Constipation Risk Assessment Tool (CRAT) (Zanik & Gray, 2015). This is a tool provided upon admission within general medical units which takes into considerations patient's individual risk factors, similar to the one created for this capstone. The CRAT tool offers a broad range of questions for a variety of diagnoses, whereas the CCMT offers a focus on CHF specific factors. Ultimately, more evidence of tool use is needed, but what has been provided proves nurses are ones who are able to perform a timely and thorough constipation assessment in order to recognize and prevent constipation early.

Summary of Evidence

Through an extensive synthesis of literature, it is evident that a nursing-based protocol is needed in order to properly assess, prevent, and treat constipation in this unique population. It is emphasized throughout the majority of the articles that nurses hold responsibility when caring for a congestive heart failure patient to provide holistic care at all times and to prevent complications from arising. The literature also highlights the unique challenges that congestive heart failure patients face, along with the risks for constipation and potential associated complications. There are screening tools available in order to best manage constipation in this population and evidence that nurses should be at the forefront.

Theoretical Framework

The framework in which this project was based off of was that of the "Relationship-Based Care: A Model for Transforming Practice" (Appendix C). The model was developed by a seasoned nurse named Mary Koloroutis in 2004, in hopes to transform nursing back to the basic purpose of caring for and connecting with other human beings through a healing and supportive environment (Butts & Rich, 2018).

The Relationship-Based Care Model (RBC Model) is focused on a caring and healing environment which is vital to the overall quality of patient care (Wooley, Perkins, Laird, Palmer, Schitter, Tarter, George, Atkinson, McKinney & Woolsey, 2012). There are six core components to this model in which the patient and his or her family members are at the center of all components. The six key components consist of leadership, teamwork, professional nursing practice, patient care delivery system, resources and outcome measurements (Butts & Rich, 2018). Along with the six key components that make up the model, there are three crucial relationships that must occur in order for this framework to be effective and for potential change to take place. The three relationships consist of the nurse's relationship with the patient and his or her family, the nurse's relationship with one's self, and finally the nurse's relationship with other colleagues (Wooley et al, 2012). Together with the six core components and three crucial relationships, nurses can implement effective change to overall improve a patient's hospital stay and quality of life.

Within the RBC Model, there are elements that help to implement change and transform the patient care delivery environment. Nurses can do this through inspiration, infrastructure, education and evidence (Butts & Rich, 2018). These elements are key to implement change and get all members of a team on board from the level of patients and their family members, to

nurses, and even upper level management that must be involved to make change occur. This framework also provides assumptions that help to describe the benefits of using this model. One of the assumptions that stands out in order to implement change for a proposed capstone tool states that people are more willing to change when they have a shared vision along with having an infrastructure that supports the new change (Butts & Rich, 2018).

This framework provided a great foundation for this project which focused on a nursing lead constipation prevention and treatment protocol. With any new implementation protocol, there must be support from multiple levels including patients, nurses, and management. Through utilization of the six key components of the RBC Model, this capstone project was supported by empowering nurses, utilizing unit resources, and transitioning evidence into practice for better patient outcomes. This theoretical framework model not only helped to implement a new tool for constipation amongst CHF patients, but also allowed for nurses to continue their growth in holistic patient care. By basing the proposed capstone project around the key components of this framework, one can be sure to keep patients at the forefront of practice while still allowing for nurses to gain personal growth and experience in education, resources, and leadership.

Organizational Assessment

Within the facility where this project will be implemented, constipation is an ongoing issue house wide. Rates of constipation within the inpatient setting have been on the rise due to many factors including lack of recognition from nursing staff, delayed prevention and treatment, lack of set constipation guidelines and protocols, and gaps in knowledge in relation to the severity of constipation as a whole. There is currently no specific constipation protocol in place throughout the health system. The current means of constipation assessment and intervention includes documentation each shift tracking if the patient has had a bowel movement, along with

the date and description. There is an area to chart if the patient has gone more than two days without a bowel movement in which constipation is diagnosed. At this point the nurse notifies a physician for proper intervention to occur. The electronic medical record also generates a report to the unit charge nurse detailing specific at-risk patients and prompting a constipation intervention. Another form of constipation awareness is that of a constipation order set. This is an order set that any physician can order for their patients, regardless of his or her admitting diagnosis. The order set includes a variety of medications that prompt bowel movements including stool softeners, oral osmotics, laxatives, suppositories and enemas. These medications are scheduled as either a daily or twice daily mediation, along with "as needed" or "PRN" use that is up to the nurse to administer. Potential barriers with this order set include the lack of recognition from nursing staff of when to administer the PRN medications. The PRN orders do not come with detail of when and how often to use them which identifies a potential barrier or gap in nursing knowledge, comfortability level, or awareness of constipation as a serious issue. This order set is also not consistently prescribed, often times leaving it up to the bedside nurses to request it from the physicians once the patients are already experiencing discomfort from constipation.

Through these examples stated above, this Midwestern acute care facility has demonstrated readiness to change in regards to constipation recognition, prevention, and treatment. One of the most important key stakeholders within this conversation is with the team of palliative care advanced practice providers and physicians that will be involved and awaiting the results of the assessment for implementation of a future action plan. This group had initial interest in the subject matter of this project, and support the development and assessment of outcomes for this patient population. Another important stakeholder for the success of this

project is the cardiac unit bedside nurse. The nurses on the floor have one of the largest tasks as being the ones to implement the proposed tool to patients throughout their stay. Other key players consist of the cardiac unit charge nurses as they will be the ones to ensure the tool is being passed out appropriately in each CHF admission packet and that it is being completed during daily CHF rounds. One of the last important stakeholders include the physicians who will be notified upon diagnosis of a "high risk" score of constipation, and asked to initiate the constipation order set.

Awareness and education for staff will first be conducted through use of the cardiac unit-based council which meets once every other month. This group of nurses are responsible for being frontrunners in protocol changes, advancements, and new policies that take place on the floor. The tool would first be introduced to this group in order to address necessary questions, help to provide nursing comradery towards the tool, and be "super users" to help ensure it is being completed properly. Next, the tool would be discussed in the cardiac unit charge nurse meeting which takes place once a month. The charge nurses of the unit make daily patient assignments, lead patient rounds, and are considered the leaders of the floor which is why it is necessary to discuss the tool with them as a group before implementation. Lastly, the tool will be emailed to all nurses on the floor prior to implementation with a description and example of its use. Permission from management has already been obtained to attend the appropriate meetings and email the floor in regards to tool implementation.

Methodology

The proposed project involved a practice intervention with goals and objectives revolving around creating a nursing lead tool that properly assessed risks and prevented constipation rates in the CHF population. The aim of the protocol was to prevent constipation by allowing nursing

to properly assess each individual upon admission in order to implement appropriate interventions once notifying a provider. The tool that was used in this protocol is the Cardiac Constipation Management Tool (CCMT) based off of the Constipation Risk Assessment Tool (CRAT). Using this tool allowed for more individualized patient care as it warranted for an assessment of patient specific risk factors such as mobility, diet, bowel history, and patient reported symptoms. Constipation related interventions and orders were standardized based upon the risk level assigned by the CCMT and notification of the provider. Evaluating risk levels and prevalence of constipation in congestive heart failure patients was the focus of this project.

Setting

The health system where this project took place is an acute care hospital with 420 inpatient beds. This hospital serves the needs of the community within an midwestern city and surrounding small towns with specific core values relating to patient centered care, respect, excellence and teamwork. The patient population and demographics vary widely in relation to age, race, gender, ethnicity and diagnoses. Services offered here include a wide range from cardiovascular surgery, neurosurgery, women's health, cancer care, gastroenterology, orthopedics and comprehensive diagnostic services. The facility has approximately 22,000 inpatients a year.

The specific unit where this project took place is the medical/surgical cardiac unit. On the medical cardiac side of the unit there are a total of 36 beds. The patients on this side of the unit are being treated for diagnoses such as congestive heart failure, rhythm issues, and myocardial infarctions. The other side of the unit has 17 beds and cares for patients preparing for or recovering from thoracic surgery. Often times, the congestive heart failure patients reside on the medical side, but can be on the surgical side as well.

Another unique component to the organization mentioned above is that of the Magnet designation that the hospital holds. A Magnet recognition represents the gold standard in nursing which is an important component in regards to the proposed new initiative which allowed nurses to help drive the change of constipation reduction. This also aligned with the health facility's core values of patient centered care and teamwork in which the aim is to exceed patient expectations in relation to care while working as one.

Sampling

The specific sample this protocol included was any patient admitted to the cardiac floor with a primary diagnosis of congestive heart failure exacerbation within the month of February. This included both new diagnoses of CHF and those with an established case. Common characteristics of this sample included patients experiencing symptoms of shortness of breath, peripheral edema, persistent cough, and significant fatigue, all which contribute to poor quality of life and impact constipation. Both female and male genders were affected and were included within this project, along with all ages and ethnicities. Questions within the CCMT were ones that would be assessed within a nurse's head to toe assessment; therefore, acceptance of participation was not necessary.

This target population could be easily followed throughout their admission due to an existing focused CHF program in place on the unit. This program consists of CHF based specialist who follow these patients from admission through discharge due to high readmission rates, gaps in patient education, and hospital reimbursement. The team of CHF specialists consist of nurses, social workers, care managers, dieticians, and nurse educators all who round on each CHF patient daily through their stay. The cardiac unit fully supported this proposed project as it was able to help address and prevent another issue those with heart failure commonly faced.

Implementation Procedures

The pre-intervention phase began in December of 2019 with staff education. Education was first provided to members of the cardiac unit-based council (UBC) who meet once every other month. The CCMT tool was introduced along with room for questions or suggestions for implementation, along with overall goals of this project. This group of UBC nurses acted as key stakeholders who helped to create positivity and compliance in relation to implementation of this tool. The tool was then introduced to the cardiac unit charge nurses during their monthly meeting which also took place in December of 2019. This group of nurses was responsible for passing out and collecting the completed tools, along with being present during daily CHF rounds. For all other staff who were not able to attend either meeting, an email was sent regarding the protocol's information in early January 2020. The staff was informed of implementation start date after IRB approval of March 2020 lasting for a total of three weeks.

The intervention phase began in March of 2020. Upon each CHF exacerbation admission, a packet was given to the patients with information regarding symptom management, diet, medications, and resources. For three weeks in March, the Cardiac Constipation Management Tool was present in the folders as a hard paper copy to be completed upon each admission by the bedside nurse. Filling out the CCMT with each new admission was ensured during daily CHF rounds by the unit charge nurse. During rounds, the CHF team presented to the patient's room for report given by the bedside nurse in front of the patient. This helped to ensure the questionnaire was filled out in a timely manner with each new admission. Once the tool was complete, the bedside nurse then turned it in to a designated folder at the charge nurse station. The completed tools were picked up once a week during the three weeks of implementation in order to assess if being properly used and filled out.

Within the intervention phase, each patient was assigned a risk score of low, medium, or high in relation to likelihood of constipation development. The bedside nurse had no further instruction from the tool for intervention based on a low or medium risk score, other than to follow through with routine practices such as early mobility, encouraging fluids, and fiber intake. However, if the patient were to score a high-risk score, the nurse would have then been prompted through the tool to notify the physician. There was a specific text of what to say to the physician in regards to the high likelihood of constipation, as the CCMT is not a known tool. In the event of a high-risk score, the nurses would have expressed the concern for constipation with the new admit and asked for the constipation order set to be prescribed. It would have then been up to the provider if he or she would have prescribed the order set or any other necessary medications. There was a section on the tool that allowed nurses to check if the provider was notified, along with the order set being prescribed, or any other constipation medications. This would then be addressed and evaluated within the post-intervention phase of the project.

The post-intervention phase began in April of 2020 once three weeks of project implementation was complete. Use of the electronic health record (EHR) in collaboration with the CHF Clinical Quality Specialist was used in order to analyze constipation rates within the CHF population during the month of March. This data was then compared to rates of constipation within the CHF population during the month of February for proper analysis. The use of FIN numbers was used to track CHF admissions within the months of February and March in order to compare constipation before and after tool implementation. Along with constipation rates, the prescription and use of the constipation order set and/or any constipation medications was analyzed as well.

Intervention

The intervention that took place was a change in practice through use of a nurse driven constipation protocol. The intervention consisted of use of a new tool that nurses administered to congestive heart failure patients upon admission to the hospital. The intervention took place in the form of an assessment tool questionnaire titled the Cardiac Constipation Management Tool. Bedside nurses on the cardiac unit administered the CCMT to patients meeting the inclusion criteria. The proposed constipation protocol took place over three weeks in the Spring of 2020, following approval from the institutional review board (IRB). Patient confidentiality was maintained through use of FIN numbers.

Measurement Instrument

In order to measure the outcomes of this capstone project, the following instrument of the Cardiac Constipation Management Tool (CCMT) was used. The designated tool was one based off of an established tool earlier discussed titled the CRAT tool (Zanik & Gray, 2015). The Cardiac Constipation Management Tool was created by the investigator of this project in order to assess the CHF population more accurately than the generalized CRAT tool. The CCMT differs from the CRAT in eliminating the admitting diagnosis component, as the CCMT will only assess congestive heart failure patients.

The tool first assessed basic demographic information including the patient's admission date, FIN number, and date of the last bowel movement. The FIN number was used to track the CHF patients during the data analysis portion of the project where the investigator reviewed EHR information to evaluate outcomes. Below the demographic portion, the tool then turned into a detailed questionnaire that had assigned risk scores to indicate a patient's likelihood of constipation occurring.

The first area that the tool assessed was the patient's admitting mobility which is a crucial factor to a patient's risk for constipation. The patient received a score based on mobility level with activity levels ranging from independent to bedrest. Diet was the next area that was assessed, followed by diagnoses. The diagnoses portion was in addition to the CHF component in order to individualize the tool as much as possible. The diagnoses portion asks if the patient had a history of chronic constipation or was postoperative which would have both increased the incidence of constipation in addition to the CHF diagnosis. The next area was patient stated symptoms, followed by medications that increased the prevalence of constipation. All of the factors within this questionnaire section of the tool had significant impact on risk factors for constipation previously discussed throughout this proposal.

Once the questions were answered and the total score had been tallied, the nurse then established the patient's constipation risk score. The scores ranged from low risk of constipation (<8), moderate risk (8-14), and high risk (>14). If the patient scored a low or moderate risk score, the nurse documented this on the tool and no further action was needed. The tool would further focus on high risk scores which indicated constipation most surely would occur if action was not taken.

Instructions on the tool indicated that any patient who was considered high risk must proceed with notifying the admitting physician of the concern of constipation developing. Since this tool was self-made, the provider was not aware of the CCMT tool or risk scores. Due to this, the nurse would have a prompt to follow to ease this portion of communication. The nurse was supposed to express his or her concern along with the patient's in relation to high risk of constipation while admitted. The nurse would then ask if the provider would like to order the constipation order set to prevent constipation from becoming a problem. The established

constipation order set included medications for preventing and treating constipation which included stool softeners, laxatives, suppositories, and enemas that were either scheduled or placed “as needed”. The provider would have decided to prescribe the order set, refuse, or simply order specific medications. The tool had a portion that asked if the provider was notified upon high risk scores, if the constipation order set was prescribed, or specific medications. This information was then used to evaluate outcomes in order to assess constipation in relation to proper notification, order set prescription, and medications administered during data analysis. Once the tool was filled out in its entirety, the nurse then returned the completed tool to the designated folder in a locked file cabinet at the nurse’s station to maintain confidentially since FIN numbers were used.

Data Collection Procedures

Following IRB approval, data was collected in a retrospective review from CCMT completed forms and audit of the electronic health records of congestive heart failure patients admitted in February and March. This was done to compare data from CHF patients admitted prior to CCMT implementation in February to CHF patients admitted in March with tool use. The completed CCMT tools with FIN numbers were utilized to identify which records to review within the EHR for constipation rates, order set and medication data from the month of March. The FIN numbers of CHF patients from February were obtained with permission from the Compliance Officer to analyze constipation rates, order sets, and constipation medications administered prior to screening tool use. The intended start date for tool data collection will be March 9th, 2020 and end March 31st, 2020. The final set of tool data was analyzed after three weeks of implementation on the cardiac floor. Data was reviewed periodically every week throughout the time frame of the project in order to assess quality and quantity of the tools being

returned. Once three weeks of tool data collection occurred, the investigator then collected data over the course of one day through use of the EHR.

The first use of data that was collected assessed that appropriate risk scores were assigned to patients, along with high risk scores being reported to providers. The data was also assessed if the constipation order set was prescribed along with specific medications, and patient bowel movement activity. Patient identifiers were kept minimal to FIN number only, and were kept securely protected with access only to the investigator at all times. The researcher, an employee of the health organization where this will take place, had all necessary permission to obtain patient FIN numbers and access electronic health records in regards to this project.

Ethical Considerations/Protection of Human Subjects

Institutional Review Board (IRB) approval was obtained prior to initiating the capstone project. The integrity of the data was maintained through paper documentation that was kept in a locked file cabinet at the charge nurse station while at the acute care facility. Once data analysis occurred, the data was secured on a password protected computer with the only access being that of the investigator. Those that had access to the survey data included the investigator and the bed side nurses on the cardiac unit who administered the assessment tools. The nurses consisted of bachelors trained registered nurses who underwent education and training prior to tool administration to ensure that data was extracted correctly. There was no greater than minimal risk for the participants involved with the proposed project. The assessment tool questionnaires were non-invasive questions that are asked throughout a nurse's daily assessment. The participants posed to have significant benefits from this project including improvement of well-being and decreased stress through constipation assessment and management. Personal identifiers that were used consisted of patient FIN numbers in order to audit in the EHR for

constipation data. Other personal data collected on the screening tool consisted of date of admission. This proposal did not require any informed consent because again, the questions being assessed were within a nurse's daily verbal and physical assessment. This capstone project did not pose any conflict of interest with the investigator's place of employment. The investigator did not have any financial gain or change of employee status, all together eliminating any personal biases.

Data Analysis

Data analysis occurred through use of the Excel spreadsheet software. The data analysis was based on previously stated outcomes. The first outcome that was addressed was appropriate constipation risk level assignments given to each patient through use of the assessment tool. This was analyzed through rates of low, medium, and high-risk scores with the means of descriptive statistics through the measure of variability of the sample. The second outcome that was measured was rates of provider notification for the high-risk constipation scores along with constipation order set entry. Had any high-risk scores occurred, this outcome would have been measured with using descriptive statistics through the use of charts that show number of physicians notified compared to number of order sets activated. The last result measured consists of overall constipation rates between two groups of the designated population. This was measured and analyzed in comparison to rates of the designated population the month prior to project implementation with the rates of constipation within the month of tool implementation together making up group 1 and group 2. This data set was analyzed with inferential statistics with an independent sample Z-test that assessed the two independent groups in each month to determine whether there is statistical significance found with use of the Cardiac Constipation Management Tool.

Results

Results of this project were based on the three outcomes previously discussed. A total of seven tools were filled out throughout the three weeks of project implementation which coincided with the only seven CHF patients admitted to the unit during this time. This was skewed due to recent events of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic. Outcome number one looked at assessing whether proper risk score assignments were made of low, medium, or high-risk of constipation. With this outcome, data interpretation consisted of a description of process, as no form of validation could be made with this section of the tool. Of the seven completed tools, five were considered low risk and two were considered medium. There were zero high-risk score constipation tools completed. Upon examination of completed forms and risk scores, the seven risk scores were interpreted correctly therefore meeting outcome number one of proper risk score assignment.

The second outcome was to measure physician notification with high-risk score groups and constipation order set activation. Since there were zero patients within the high-risk category, there was then zero notifications made to physicians based on the tool criteria. Therefore, this outcome was not met.

The final outcome assessed overall rates of constipation comparing February's admissions of CHF patients without the CCMT tool to the March group of CHF admits and use of CCMT tool. As noted above, the number of CHF admits were significantly decreased in regards to SARS-CoV-2-pandemic with a small total of seven patients admitted. In the month of February, there was a total of 24 CHF patients admitted to the cardiac unit and included in the retrospective analysis. Of the 24 February admits, nine had constipation which again was defined as greater than two days without a bowel movement. Of the seven March admits with tool use,

four had constipation despite being classified as low or medium-risk scores. When working with a statistician, a statistical analysis of a Z-sample test was complete in order to compare two separate populations. The sample estimates from the data collected in March with constipation was .5714 (57% with constipation), and February with .3750 (38% with constipation). Data resulted in an *x-squared* value of .2415, *df*= 1. *A p-value* was determined based on the data set which was $p = .6231$ which was not considered significant likely due to the low sample size. This indicated an unmet outcome of outcome number three, which hoped to find a significant difference in constipation rates between the two samples of before and after CCMT tool use. A bar graph was used to show the differences in constipation rates between the two sample populations (Appendix D).

Discussion

Outcome number one consisted of proper assignment of constipation risk scores using the CCMT tool. Based on the results of the tool and data analysis, this outcome was met. Of the seven tools filled out by the cardiac unit nurses for the March CHF admissions, all seven were filled out properly. Each patient's risk score was calculated based on individual risk factors present on the tool and tallied to identify a risk score of low, medium or high-risk scores. There was a total of five low risk scores assigned with scores ranging from 0-8, along with two moderate risk assignments with scores ranging from 8-14. There were zero high-risk scores which would have been 14 or greater. In regards to the moderate and low risk scores, this could indicate that many of the CHF admissions were pro-active about bowel risk factors prior to admission, which then changed based on the later outcome discussions which indicated four of the seven had constipation at some point during his or her hospital stay.

Outcome number two was designated for high-risk score use only with having a provider notification made in order to discuss high likelihood of constipation development. With this provider notification, the nurse would also have asked for a constipation order set activation. Since there were zero patients admitted who fell under the high-risk category, there was then no providers notified. Upon chart audit, it did appear that of the seven CHF March admits, two of them did have the constipation order set in place despite tool use. This then indicates a couple of different scenarios regarding constipation. One being that the provider could have automatically placed the order set upon patient admission, which some providers chose to do regardless of constipation risk score. Another scenario is that the tool could have been used on admission identify a low, or medium risk score, but then the patient changed categories throughout their hospital stay leading to a greater increased risk of constipation. The nurse could have identified this throughout the hospital stay and asked for a constipation order set, or the provider could have identified it and placed it themselves. Along with two constipation order sets being activated despite risk scores, there were also four patients who did have constipation medication orders within their health record without the whole constipation order set. This also indicates that constipation was addressed at some point either in a pro-active or re-active manner allowing for nurses to administer medications to prevent or reduce the complications of constipation. Even though the tools did not have any high-risk scores, there was still evidence that the nurses and providers addressed constipation mechanisms at some point throughout the March CHF patient's hospital stay.

The final outcome discussed assessing overall constipation rates between CHF patients in February without the CCMT tool, and March with the CCMT tool. There was a total of 24 CHF admissions in February, and of those nine developed constipations throughout their stay. In

comparison to March which had seven total admissions, with four developing constipation. Through the statistical analysis, there was shown to be no real significance in relation to the constipation rates and tool usage, largely due to the small and uneven population sizes. When conducting the chart audit, it was found that the February admissions had a total of nine with the constipation order set in place. These findings indicate that despite CCMT tool usage and risk scores, constipation as addressed by the nurse and provider at some point during the patient's stay. It is unable to be confirmed whether constipation was addressed with order set activation or medication prescription in a pro-active manner or re-active manner, along with constipation developing before or after these mechanisms were in place. The hope was to have a significant difference in constipation rates from the February group to the March group showing a decreased incidence of constipation with tool usage in March. However, again because of the unanticipated SARS-CoV-2 pandemic, there was an usually small population of CHF patients making it difficult to compare and contrast groups. There were also no high-risk patients which again made it difficult to fully assess tool effectiveness. The tool did however, bring awareness of constipation risks to all nurses assessing the risk factors and hopefully was addressed daily throughout the patient's stay.

Limitations

This project presented many limitations in relation to implementation largely due to SARS-CoV-2 pandemic. One of the limitations consisted of a decreased CHF population being admitted in order to preserve room in the hospital for the anticipated SARS-CoV-2 pandemic influx. The decreased amount of CHF admissions impacted the number of tools that could be completed leaving the researcher with a very small sample size of seven. Another limitation to the project was a shorter time length of three weeks of project implementation instead of the

planned four weeks. This shortened time frame was due to IRB approvals taking longer than anticipated and needing to stay within a strict time frame to not fall out of the approved window for EHR audits. With both the slightly shorter implementation phase and the decreased number of CHF admits, the small sample created difficulty for tool variation, comparison, data analysis, and result interpretation. The final project limitation pertained to the strict CCMT tool guideline of provider notification with high-risk scores only. Due to the above factors, there were zero high-risk scores, and therefore zero provider notification creating difficulty in data analysis and interpretation specifically with outcome number two.

Plan for Sustainability

In terms of sustainability for long term use, this project and tool would take some refurbishing. After reviewing the project and tool in it's entirety, small adjustments should be made in order to be more effective and promote more active constipation prevention strategies. The first plan for sustainability would be to allow a longer time frame of implementation in order to allow the tool to reach more CHF admissions and allow for a larger sample size. This would coincide with allowing for the tool to be implemented during a time frame when the SARS-CoV-2 pandemic would also not be such a new barrier as well, allowing for the normal census of CHF admissions to be possible. Another plan for sustainability would be to adjust the CCMT tool towards a higher sensitivity to constipation risk factors. Instead of having provider notification with just the high-risk scores, the tool should be adjusted to allow for provider notification for moderate scores, if not even low scores as well in order to actively screen and prevent for constipation with all CHF admissions. Another idea towards this concept would be to adjust the scoring with reducing the total number needed for each category, again allowing for more active prevention methods. With these suggestions, the nurse driven constipation assessment and

CCMT tool would be more effective, reaching potentially a greater number of patients and providers.

Implications for Practice

Future implications consist of streamlining the CCMT tool to be used for all inpatients, no matter the admitting diagnosis to limit the impact of unnecessary hospital related constipation. This would allow for all patients admitted to the hospital to have a constipation assessment provided early within the process to eliminate the reactive approach of providing the constipation order set or necessary medications. The CCMT tool could be adjusted to include all diagnoses in order to reach all inpatients, nurses and providers. If the tool could be streamlined for all hospital admissions, this could save patients the unnecessary complications and discomforts related to hospital constipation, along with reduce hospital costs, and decrease patient's length of stay.

Conclusion

In conclusion, this project addressed the issue of constipation within the congestive heart failure population. CHF patients face a complex diagnosis and multitude of side effects in relation to the disease. Constipation is one complication that can be prevented through proper assessment and early intervention. The Cardiac Constipation Management Tool aimed to prevent constipation through individualized screening questions, risk score assignment, appropriate notification to providers and order set entry. Findings from this project hoped to assist in limiting the impact of constipation on congestive heart failure patients, along with all inpatients admitted to the hospital. This helped to bring awareness to constipation before it becomes a problem and allowed bed side nurses to be at the forefront of assessment and prevention of constipation in the congestive heart failure population.

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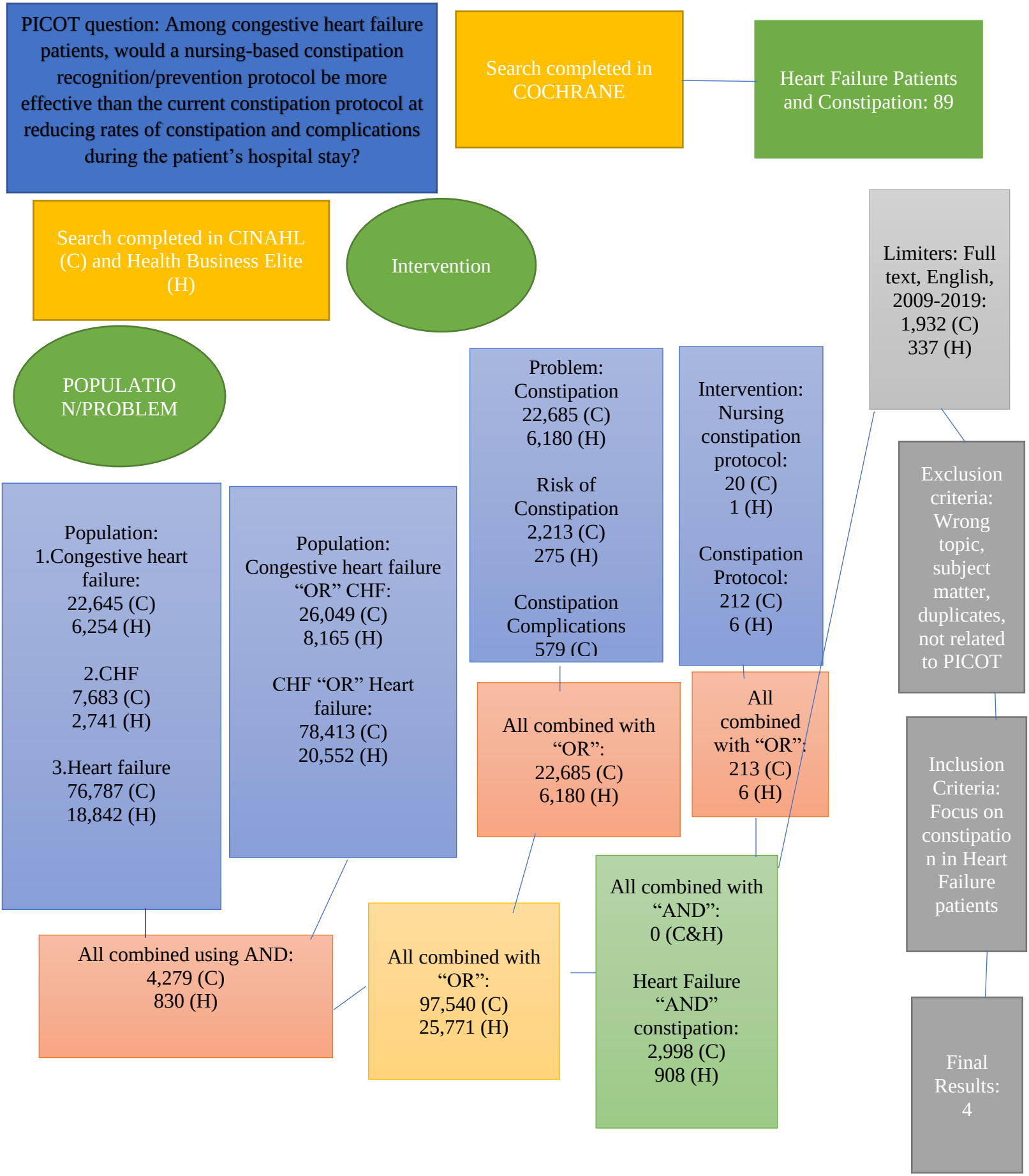
Appendix A


PICOT question: Among congestive heart failure patients, would a nursing-based constipation recognition/prevention protocol be more effective than the current constipation protocol at reducing rates of constipation and complications during the patient's hospital stay?
Search completed in COCHRANE
Heart Failure Patients and Constipation: 89
Search completed in CINAHL (C) and Health Business Elite (H)
Intervention
POPULATIO N/PROBLEM
Limiters: Full text, English, 2009-2019: 1,932 (C) 337 (H)
Problem: Constipation 22,685 (C) 6,180 (H)
Risk of Constipation 2,213 (C) 275 (H)
Constipation Complications 579 (C)
Intervention: Nursing constipation protocol: 20 (C) 1 (H)
Constipation Protocol: 212 (C) 6 (H)
Exclusion criteria: Wrong topic, subject matter, duplicates, not related to PICOT
Population: 1.Congestive heart failure: 22,645 (C) 6,254 (H)
2.CHF 7,683 (C) 2,741 (H)
3.Heart failure 76,787 (C) 18,842 (H)
Population: Congestive heart failure "OR" CHF: 26,049 (C) 8,165 (H)
CHF "OR" Heart failure: 78,413 (C) 20,552 (H)
All combined with "OR": 22,685 (C) 6,180 (H)
All combined with "OR": 213 (C) 6 (H)
Inclusion Criteria: Focus on constipation in Heart Failure patients
All combined using AND: 4,279 (C) 830 (H)
All combined with "OR": 97,540 (C) 25,771 (H)
All combined with "AND": 0 (C&H)
Heart Failure "AND" constipation: 2,998 (C) 908 (H)
Final Results: 4

Appendix B

Reference Matrix

PICOT Question:

Among congestive heart failure patients, would a nursing-based constipation recognition/prevention protocol be more effective than the current constipation protocol at identifying risks and reducing rates of constipation during the patient's hospital stay?

Citation/Level of Evidence	Participant/ Setting/ Sample Size	Purpose/Background	Methods/Design & Limitations	Findings/Summary/Strengths/ Weakness	Applicability to Own Research
Hunter, R. (2016). Nursing management of constipation in the medical-surgical setting. *Academy of Medical Surgical Nurses. 23(2):* 4-9. Evidence from the opinion of authorities and/or reports of expert committees, Level VII, (Ackley, Ludwig & Tucker, 2008).	This was a position/opinion paper, so there was no sample or setting size.	The purpose of this article was to describe the nurses role in recognition and prevention of constipation within the inpatient setting.	There were no methods or designs to this article.	The summary of this article describes how nurses play a key role in prevention and treating constipation through comprehensive nursing assessment, timely interventions, and patient advocacy. This stressed how not only assessment is important, but also the importance of articulating assessment findings to physicians in a timely manner in order to collaborate on best treatment options. This in turn will decrease physical and psychological stress on the patient and decrease length of stay.	This article supports my research because it identifies nursing being at the forefront in constipation identification and assessment. This also applies to my intended capstone as it states providers should be notified and proper treatment should be discussed in a collaborate effort.
MacCallum, A., & Hughes, S. (2010). Gastrointestinal symptoms in end-stage heart failure. *British Journal of Cardiac Nursing. 5(8):* 362- 367. Evidence from the opinion of authorities and/or reports of expert committees, Level VII, (Ackley, Ludwig & Tucker, 2008).	This was an opinion/position paper so there was no sample or setting size.	The purpose of this article was to give an overview of congestive heart failure gastrointestinal related symptoms and what nurses can do to support this population.	There were no methods or designs to this article.	The summary of this article includes nurses needing to take a proactive approach when caring for heart failure patients in relation to diet and gastrointestinal needs. Many medications such as diuretics and morphine used in CHF can cause constipation along with the patient being easily fatigued and less mobile.	This article can be used within my research as it provides great background and discussion in regards to constipation risk factors within the CHF patients. It also addresses the need for nurses to take a proactive approach which would support the proposed capstone tool.

Mitchell, A. (2019). Carrying out a holistic assessment of a patient with constipation. *British Journal of Nursing. 28(4):* 230-232. Evidence from the opinion of authorities and/or reports of expert committees, Level VII, (Ackley, Ludwig & Tucker, 2008).	This was an opinion/position paper so there was no sample or setting size.	The purpose of this scholarly article was to discuss the importance of providing a holistic assessment for patients with constipation.	There were no methods or designs to this article.	The summary of this article includes nurses and patients alike, providing a holistic assessment for the ongoing treatment and management of constipation. This includes areas such as mobility, diet, fiber intake, psychological condition, anxiety, bowel diagnosis history, medications and patient reported symptoms. Identifying risk factors in turns helps to recognize a cause of constipation, and therefore further prevent and treat.	This article supports my research because it discusses the importance of assessing many factors of a patient's life including mobility, diet, reported symptoms, associated diagnosis and medications which are the components of the proposed tool.
Smith, A., Stimson, C., & Stevens, P. (2018). High-intensity bowel protocol for trauma patients. *Journal of Trauma Nursing. 25(3):* 207-210. Evidence from well-designed case-control or cohort study, Level IV, (Ackley, Ludwig & Tucker, 2008).	The setting included a Level 1 trauma center from two different time periods with a hospital length of stay greater than three days. There was a total of 282 patients included in this study with group one (166) representing the standard bowel protocol and group two (116) representing the high-intensity bowel protocol.	The purpose of this study was to determine whether a high-intensity bowel protocol initiated upon patient's admission decreased the length of stay and created more hospital days with a bowel movement compared with the standard hospital bowel protocol.	The method of this study included a retrospective analysis using a trauma registry during two different time periods. Independent T-tests were calculated and compared between the two groups. Limitations in this study included lack of education to the patient by nursing for reason of medication administration and potential refusal of prescribed protocol.	Overall, this study found that implementation of the high-intensity bowel protocol upon admission to the hospital demonstrated more days with bowel movements. However, this did not make a significant difference of length of stay. Strengths of this study included a large sample size with two different time periods analyzed. Weaknesses included description of what traumas patients were facing and if they were all of the same severity.	This study could be used for future research as it demonstrates the need to implement a bowel protocol on admission, before the issue of constipation can become a problem. This study also demonstrates the need for scheduled medications for nurses to use and administer in order to prevent a gap in knowledge and motivation.

Wleklik, M., Jankowska, B., Andreae, C., & Regulska, B. (2018). The role of nutritional status in elderly patients with heart failure. *Journal of Nutritional Health and Aging. 22(5):* 581-587. Evidence from the opinion of authorities and/or reports of expert committees, Level VII, (Ackley, Ludwig & Tucker, 2008).	This was an opinion/position paper so there was no sample or setting size.	The purpose of this paper was to discuss the importance of nutritional status in relation to heart failure patients.	There were no methods or designs to this article.	This article discussed the importance of a thorough screening of a nutritional assessment in regards to the heart failure population. Nutritional status, intake and appetite should become a routine part of an overall health assessment of heart failure patients in order to prevent complications such as constipation.	This article could help with future research and capstone implementation by providing evidence in relation to specific congestive heart failure patient needs to prevent and treat constipation.
Zanik, K., & Gray, L. (2015). Who hasn't had to deal with unanticipated constipation in the acute care setting? CRAT: Constipation Risk Assessment Tool- why it works. *Journal of Stomal Therapy Australia. 35(5):* 12-18. Evidence from the opinion of authorities and/or reports of expert committees, Level VII, (Ackley, Ludwig & Tucker, 2008).	This was an opinion/position paper so there were no distinct sample or setting. The authors did launch this tool within a 60-bed facility in Broome Regional Hospital. The author then randomly selected 50 inpatient medical records to assess pre and post implementation of this tool.	The background of this article consisted of developing a new CRAT tool to be used in the acute care setting and to assess the impact on constipation rates.	There were no distinct methods or design to this article. The author described using the tool on hospitalized inpatients, and then auditing 50 random charts to assess pre and post implementation of the CRAT tool in relation to constipation.	Findings of this article discussed that nurse documentation of bowel activity increased from 8% to 75% indicating that more attention was given to GI activity with inpatients. This article also discussed that a team approach to education and support is recommended when using this tool and that nurses can be better equipped by using this tool to recognize and prevent constipation with their patients.	This article supports my capstone project as this is a potential tool that could be used to implement change from a nursing standpoint in relation to constipation.

Appendix C


RELATIONSHIP-BASED CARE
Leadership
Teamwork
Interprofessional Practice
Care Delivery
System Design
Evidence
PATIENT & FAMILY
HEALING CULTURE
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Appendix D