Summer 8-13-2020

Decreasing Bias and Improving Education on Non-Invasive Colorectal Screening Methods

Sara H. Hughes
University of Texas at Tyler, sHughes24@patriots.uttyler.edu

Decreasing Bias and Improving Education on Non-Invasive Colorectal Screening Methods

A Paper Submitted in Partial Fulfillment of the Requirements

For NURS 5382: Capstone

In the School of Nursing

The University of Texas at Tyler

by

Sara Hughes

August 9, 2020

Contents

Acknowledgments

I would like to thank everyone that has helped me to reach this point in my academic career; Dr. Colleen Marzilli & Dr. Melinda Hermanns for the incredible support that they have provided as well as the feedback and direction that shaped this project. I am so grateful for the University of Texas at Tyler staff and professors for their dedication to their students. I would also like to thank mentors that have helped guide this project and assisted me in sorting through my ideas. And finally, I would like to thank my family for supporting me along this journey and being patient as I spent so much time away from them and working on academics. I would also like to thank my family for being my main motivation for continuing my education, challenging myself to do more, and advancing my career. My hope is that my children see the hard work that I have put in and use it as motivation for themselves in their own life.

Executive Summary

It is estimated that in 2020, nearly 148,000 Americans will be diagnosed with colorectal cancer and 53,200 Americans will die from colorectal cancer (Siegel et al., 2020). One- half of all cases and deaths are due to modifiable risk factors such as diet and smoking and it has been shown that early screening and detection can greatly decrease the morbidity and mortality of colorectal cancer yet colorectal cancer related deaths still ranks among the leading causes of cancer-related deaths in the United States and the world. Early detection of colorectal cancer is crucial to reducing mortality and although this is known, the incidence of colorectal cancer diagnoses continues to increase annually in some age groups. Providers must ensure that education is being provided to patients about colorectal cancer and the benefits of early colorectal screening and detection. There are many options available to patients to detect

colorectal cancer and the healthcare team must be supportive of the modality chosen by the patient. This benchmark project's goal is to educate patients and providers on the importance of colorectal screening and the many methods available to patients. It is also important to decrease bias among physicians against the non-invasive colorectal screening methods. The goal is not to discredit the gold standard of colorectal screening, colonoscopy, but instead to allow the provider and patient to make an informed decision on a more patient personalized and less-invasive modality if colonoscopy is first refused. This could result in more patients adhering to a colorectal screening regimen that otherwise would not because colonoscopy was the only method offered to them. It is important to note that although colonoscopy is the gold standard for colorectal screening, colonoscopy is only beneficial to the patient if it is completed.

Decreasing Bias and Improving Education on Non-Invasive Colorectal Screening Methods

1. Rationale for the Project

This change project focuses on two main points: Providing education and evidence to reduce bias against non-invasive colorectal screening methods and educating patients on all colorectal screening methods available to them. By taking into consideration, all of the patient's specific needs and characteristics, physicians and practitioners are able to provide more patient-centered care in which the patient is an active member in their health. This is directly correlated with increased adherence to intervention chosen. Colorectal cancer is the third most common cause of cancer in men and women in the United States and the second leading cause of cancer-related deaths (CDC, 2020). Colorectal cancer is a preventable disease, yet only half of American adults complete colorectal screening in their early fifties (CDC, 2020). When patients think of colorectal screening, they tend to think about colonoscopy. Although, colonoscopy is

still the gold standard for detecting colorectal cancer, there are five other methods available as a screening modality. Three of the six methods are completely non-invasive and are able to be completed at home. With so many options for screening, why is colorectal cancer still so prevalent and why do only half of U.S. adults comply with recommendations. The chosen PICOT question that kickstarted this project was as follows: In patients 50 and older with an average risk for colon cancer (P), is non-invasive colorectal screening (I) compared to regular screening colonoscopies (C) more accurate in diagnosing colorectal cancer (O)? With the question provided, comparison can be made between the non-invasive methods such as fecal DNA testing with invasive methods such as colonoscopy. However, the lack of compliance with screening seems to fall, not with the accuracy of results of the methods, but instead with the lack of knowledge about the non-invasive methods and the bias that physicians and primary care providers have against them. Although comparisons of invasive and non-invasive colorectal screening methods are reviewed, this discovery led to a project that focused less on the comparison and more on providing education and raising awareness. As advanced practice nurses, it is our responsibility to provide evidence based care to our patients including, educating our patients on all of the options that are available to them to best suit their specific needs.

2. Literature Synthesis.

While providing information and insight to the above PICOT question, the literature reviewed consisted of twelve relevant articles including four cohort studies, four systematic reviews with two also being a meta-analysis, one qualitative study, one descriptive study, one meta-analysis, and one randomized, controlled trial. The variety of studies reviewed contributed in supporting the need for a change project related to the topic previously discussed as well as

made aware the need for more information regarding non-invasive colorectal screening versus invasive colorectal screening to prevent colorectal cancer. This review discusses the accuracy, the cost-effectiveness for patients and providers and convenience of non-invasive methods available to patients. The use of non-invasive methods could allow providers to capture patients that "slip through the cracks" because of the intimidation that comes with colonoscopy. A significant point to keep in mind is that colonoscopy is no good in prevention of colorectal cancer if it is not performed. In review of the literature, many points are made that suggest a change project should be implemented to provide not only a more evidence based type of care to patients but also a more patient-centered type of care. These include the following: Diagnostic performance of non-invasive methods, cost-effectiveness of non-invasive methods, quality improvement due to non-invasive methods, convenience of non-invasive methods, education regarding non-invasive screening methods, and the likelihood of a patient being compliant with colorectal screening when they are supported and options are provided. The discussion of these topics has led to an evidence-based change project that the project team strongly believes could increase rate of adherence and completion of colorectal screening by improving education among patients and decreasing bias of non-invasive colorectal screening methods among physicians and practitioners.

Evidence shows that early diagnosis is key in decreasing colorectal cancer mortality rates, yet there are still a large number of patients that forego screening for a number of reasons leaving one-third of eligible adults in the United States unscreened (Eckmann, Ebner & Kisiel, 2020). The number one reason being the intimidation of colonoscopy. Colonoscopy is still considered the gold standard for screening for colorectal cancer but how do healthcare providers accommodate the patients that are not willing to have a colonoscopy performed due to

invasiveness, inconvenience, and cost. Colonoscopy procedures also include risks that could deter patients from following through with completion of screening (Eckman et al., 2020). Research suggests that non-invasive methods such as tests that screen for circulating microRNA's show high accuracy for detection of colorectal cancers and in combination with other screening methods could improve diagnostic performance overall in the detection of colorectal cancer (Marcuello et al., 2019). Fecal immunochemical testing, one of the more common methods used in screening, shows effectiveness in detecting colorectal neoplasms and colorectal cancer when compared to all other non-invasive methods and colonoscopies, suggesting that when colonoscopy is not an option, providers can be confident in another method of screening (Robertson et al., 2017). Non-invasive methods have also been shown to improve quality of colonoscopy in regards to the amount of time taken to complete a colonoscopy which correlates to the number of polyps or neoplasms found (Johnson et al., 2017). An increase in compliance on the patient's end with diagnostic colonoscopy has also been shown after receiving a positive non-invasive test such as fecal immunochemical test or multi-target stool DNA test (Eckman et al., 2020). Providing education and encouragement that changes the mindset of the public and pushes the importance of early detection of colorectal cancer, along with yearly reminders for screening is likely to help with patient adherence of colorectal screening (Kew & Koh, 2019). Here is where personalization of patient care and using practical methods comes into play. With cost being a major patient concern, Wong, Ching, Chan, and Sung (2015) discuss the cost-effectiveness of fecal immunochemical testing versus the gold standard, colonoscopy. Providing information related to cost could help healthcare providers prescribe interventions that are more customized to the patient. When providing care for patients, providers want to be able to trust that the tests that are chosen are accurate and beneficial for the patient even if cost-

effectiveness is a positive attribute of the intervention (Brenner & Chen, 2017). Non-invasive colorectal screening methods tend to be more cost-effective and convenient for patients who may not have the means or live in an area that does not provide procedures such as colonoscopy which promotes individualizing the patient's care. A study performed on Alaskan natives that lived in an area where endoscopy was limited provided data that could allow physicians to confidently trust in the results of non-invasive screening methods for patients that this type of method may benefit (Redwood et al., 2016). The most important point to make in support of this change project is education. Proper education for not only patients but providers as well, could increase the use of beneficial methods for colorectal screening such as the non-invasive methods made available. There seems to be a bias towards non-invasive methods that physicians seem to carry and with non-invasive methods being fairly new, that bias is understandable. Again, colonoscopy is considered the gold standard of care but when a patient refuses colonoscopy, a back-up plan must be in place. Education or "re-education" for providers on non-invasive methods for colorectal screening could increase the rates of compliance of colorectal screening among patients (Melki et al., 2019). Continuation of education and outreach to patients who are in need of colorectal screening could also positively impact the number of patients that adhere to completion of colorectal screening (Singal et al.,2017).

3. Project Stakeholders

The greatest stakeholders impacted by this proposed change are the patients that it will affect but also providers who will be implementing the actual change. Owners or CEO's of the clinic will also be stakeholder's as well as gatekeepers who will grant permission for the proposed change project to be conducted. Interprofessional involvement will include staff within the facility that directly or indirectly provide care to the patients. The whole team's assistance will

be beneficial in providing education on colorectal cancer and the importance of screening. All that are involved with the project must be able to agree on the same goal of increasing patients that adhere to colorectal screening with the likelihood of decreasing the mortality and morbidity of colorectal cancer for the project's continued success.

4. Implementation Plan

The change project proposed to improve education and decrease bias to ultimately improve patient adherence to colorectal screening will be implemented in clinics in rural counties such as Nacogdoches County, Shelby and Panola County. Using clinics in several rural counties will allow for a larger sample population of both providers and patients who are of age for colorectal screening according to screening guidelines and provide a larger number of patients that non-invasive methods could greatly benefit. This will also allow for a wide variety of provider beliefs and patient circumstances. Data will be obtained within the clinics and among providers through questionnaires and health records with consent. Questionnaires will be provided before implementation to assess bias and thoughts among providers and this information will be recorded. Next bias and barriers will be assessed. To effectively have all staff involved and actively participating in the proposed change project, barriers of any kind should be assessed and eliminated before implementation (Hockenberry, Brown, & Rodgers, 2015, p. 206). Bias that providers or physicians currently have must be assessed as well as their willingness to participate in the change. Bias of the physicians and unwillingness for change could present as a barrier to the project and in an effort to minimize these barriers, communication regarding provider thoughts on the topic should be discussed and strong evidence will be provided. Another barrier that many busy clinics will possess is time. Time constraints and lack of resources should be evaluated at the start of the project and minimization of these barriers will need to be specific to

the clinic in which the project is taking place. All barriers should be discussed prior to implementation of patient education. Resources will consist of the previously cited evidence based literature, a questionnaire to evaluate before and after thoughts and biases of non-invasive screening methods, and clinical staff to provide data on patients that are meeting criteria and meeting or not meeting guidelines for colorectal screening before and after education. Providers, whether that be physicians, surgeons or nurse practitioners will carry out the change promoted in this project. At the end of this stage of implementation, providers will have agreed to offer another non-invasive colorectal screening method to patients that refuse the first recommendation of colonoscopy. The first two phases of implementation focus on assessing and decreasing barriers and developing an open communication with physicians that will allow for the actual change to be implemented. Next, patients will become the focus. Patient data will be evaluated to determine the number of patients that are foregoing colorectal screening. Education will be provided on the importance of early detection of colorectal cancer and the recommended guidelines. If colonoscopy is refused, another less or non-invasive method will offered and education will be provided and encouraged. Evidence and knowledge is fundamental in providing effective care but taking into consideration the patient's beliefs and values about their care is essential to providing individualized, patient-centered care (Long, Gallagher-Ford, & Overholt, 2015, p. 176). Follow-up and persistence in reaching out to the patients by the office staff and/or physician will be critical to this project and promote adherence to screening discussed and chosen. Data will be assessed periodically to evaluate an increase in patient adherence.

5. Timetable

Phase 1: Approval & Assessment of barriers (1-2 weeks)

- Step 1: Gain stakeholder support and approval for change
- Step 2: assess and eliminate barriers that could prevent successful implementation of change project

Phase 2: Provider Education (1-2 weeks)

- Step 1: Assess data before implementation of change (provider thoughts and beliefs) through questionnaire
- Step 2: Provide evidence to providers and encourage them to offer a non-invasive screening method when colonoscopy is refused
- Step 3: after education and evidence given to providers, re-evaluate beliefs and discuss lingering concerns through questionnaire

Phase 3: Patient Education (around 8 weeks)

- Step 1: evaluate data -- number of patients who meet criteria to be screened that are foregoing colorectal screening (the number of patients that are "slipping through the cracks") to assess need for implementation
- Step 2: implement change by educating patients and offering non-invasive method when colonoscopy is refused
- Step 4: Reach out to patients via email, phone calls, reminder letters, etc. to promote adherence
- Step 3: Evaluate data – (should see increase in number of patients who adhered to guidelines for colorectal screening and completed colorectal screening, whether that be through an invasive method or non-invasive method)

6. Data Collection Methods

Due to the COVID-19 pandemic, the actual implementation of this project was delayed. This benchmark project will be implemented into facilities as soon as it is safe to do so. To warrant the implementation of the proposed project, data needed would include the total number of patients that meet screening criteria within the clinic and the number of patients that have completed screening colonoscopy or some other method of colorectal screening which could be obtained through health record with patient and provider consent. Another important piece of data would include how often patients are offered a non-invasive screening method when colonoscopy is refused and the provider's thought and beliefs about non-invasive methods. This information will be obtained through questionnaire.

7. Cost/Benefit Discussion

The implementation of this project into facilities is low to no cost. Since this project focuses on the education of providers and patients and relies on staff that is already in place, there should be no cost to the facility. There is however, a cost that could affect the patients depending on the type of insurance that the patient has. Some insurance companies will pay for a non-invasive colorectal screening method but if the result is positive and further screening is needed such as colonoscopy, the colonoscopy will not be covered. This leaves the patient with a large expense that could prevent the patient from following through with their colorectal screening. This is an issue that will need to be discussed with the patient before making a decision and something they will want to find out from their insurance company. Cost will be assessed on a patient to patient basis and not included in the final evaluation of this project. Cost will effect intervention chosen for patient but this project is assessing completion and adherence of colorectal screening for adults that meet the criteria to be screened.

8. Evaluation

Evaluation of the project will be assessed and determined successful if there is an increase in patient completion of colorectal screening and bias towards non-invasive colorectal screening methods is decreased. If barriers assessed in the beginning of the implementation of this project prevent this project from being implemented, education and strong evidence-based literature to providers can still be provided. Evaluation of this project will be updated as the project is implemented and data is received. Again, due to the current COVID-19 pandemic, the project implementation is delayed and results will be made available when it is safe to implement.

9. Conclusions/Recommendations

The development and ongoing improvement of non-invasive colorectal screening methods is an asset to healthcare. With colorectal cancer still leading in cancer-related deaths, providers must make an effort to change the trend. Regardless of when this benchmark project is able to be implemented, it is always recommended that all members of healthcare educate and inform themselves on the most recent evidence-based practice regarding patient care. Colorectal cancer is often times a treatable disease when diagnosed early and treated aggressively. It is the providers responsibility to ensure that patients are taking ownership of their health and making informed decisions based on evidence that could save their life. Stool DNA tests, FIT tests, and other non-invasive colorectal screening methods are efficient in diagnosing colorectal cancer and should be utilized when colonoscopy is refused or is not an option leading us to our ultimate goal: Capturing those patients that would have “slipped through the cracks” if only one option was provided to them and by doing this, decreasing the mortality and morbidity of colorectal cancer.

References

Brenner, H., & Chen, H. (2017). Fecal occult blood verses DNA testing: Indirect comparison in a colorectal screening population. *Clinical Epidemiology, 9* 377-384. doi: 10.2147/CLEPs136565

Colorectal Cancer Statistics. (2019, May 28). *Center of Disease Control and Prevention.* from https://www.cdc.gov/cancer/colorectal/statistics/.

Dang, D., Melnyk, B.M., Fineout-Overholt, E., Ciliska, D., DiCenso, A., Cullen, L.,…& Stevens, K. R. (2015). In Models to guide implementation and sustainability of evidence-based practice. In Fineout-Overholt, E., & Melnyk, B. M., (Eds.), *Evidence-Based Practice in Nursing & Healthcare: A Guide to Best Practice* (pp. 183). Philadelphia, PA: Wolters Kluwer Health.

Eckmann, J. D., Ebner, D. W., & Kisiel, J. B. (2020). Multi-Target stool DNA testing for colorectal cancer screening: Emerging learning on real-world performance. *Current Treatment Option in Gastoenterology,* 18, 118-119. doi: 10.1007/s11938-020-00271-5

Guo, F., Chen, C., Schotker, B., Holleczek, B., Hoffmeister, M., & Brenner, H. (2019). Changes in colorectal cancer screening use after introduction to alternative screening offer in Germany: Prospective cohort study. International Journal of Cancer, 146, 2423-2432. doi: 10.1002/ijc.32566

Hockenberry, M. J., Brown, T. L., & Rodgers, C. C. (2015) Implementing evidence in clinical settings. In Models to guide implementation and sustainability of evidence-based practice. In Fineout-Overholt, E., & Melnyk, B. M., (Eds.), *Evidence-Based Practice in Nursing & Healthcare: A Guide to Best Practice* (pp. 206). Philadelphia, PA: Wolters Kluwer Health.

Johnson, D. H., Kisiel, J. B., Burger, K. N., Mahoney, D. W., Devens, M. E., Ahlquist, D. A., & Sweetser, S. (2017). Multitarget stool DNA test: Clinical performance and impact on yield and quality of colonoscopy for colorectal cancer screening. *Gastrointestinal Endoscopy*. , 85(3), 657-665. doi: 10.1016/j.gie.2016.11.012

Kew, G. S. & Koh, C. J. (2019). Strategies to improve persistent adherence in colorectal cancer screening. Gut and Liver (1-7). doi: 10.5009/gnl19306

Long, L.E., Gallagher-Ford, L., & Fineout-Overholt, E. (2015) Integration of patient preferences and values and clinician expertise into evidence-based decision making. In Models to guide implementation and sustainability of evidence-based practice. In Fineout-Overholt, E., & Melnyk, B. M., (Eds.), *Evidence-Based Practice in Nursing & Healthcare: A Guide to Best Practice* (pp. 176). Philadelphia, PA: Wolters Kluwer Health.

Marcuello, M., Sanchon, S. D., Moreno, L., Lozano, J. J., Bujanda, L., Castells, A., & Gironella, M. (2019). Analysis of a 6-Mirna signature in serum from colorectal cancer screening participants as non-invasive biomarkers for advanced adenoma and colorectal cancer detection. *Cancers*. 11, 1542. doi: 10.3390/cancers11101542

Melki, G., Ghrewati, M., Mohamed, H., Barham, S., Kapoor, A., Ayoub, F.,…& Baddoura, W. (2019). Re-Educating residents about non-invasive colorectal cancer screening:

An approach to improving colon cancer screening compliance. *Gastroenterol Res, 12*(6), 312-314. doi: 10.41740/gr1205

Redwood, D. G., Asay, E. D., Blake, I. D., Sacco, P. E., Christensen, C. M., Sacco, F. D.,…Ahlquist, D. A. (2016). Stool DNA testing for screening detection of colorectal neoplasia in Alaska native people. *Mayo Clinic Proceedings, 91*(1), 61-70. doi:10.1016/j.mayocp.2015.10.008

Robertson, D. J., Lee, J. K., Boland, C. R., Dominitz, J. A., Giardiello, F. M., Johnson, D. A., …Rex, D. K. (2017). Recommendations on fecal immunochemical testing to screen for colorectal neoplasia: A consensus statement by the US Multi-SocietyTask Force on colorectal cancer. *Gastroenterology, 152*(5), 1217-1237. doi: 10.1053/j.gastro.2016.08.053

Seigal, R . L., Miller, K. D., Sauer, A. G., Fedewa, S. A., Butterly, L. F., Anderson, J. C.,…Jemal, A. (2020). Colorectal cancer statistics, 2020. *CA Cancer Journal, 70*, 145-164. doi: 10.3322/caac.21601

Singal, A. G., Gupta, S., Skinner, C. S., Ahn, C., Santini, N. O., Agrawal, D.,…Halm, E. A. (2017). Effect of colonoscopy outreach vs fecal immunochemical test outreach on colorectal cancer screening completion. *JAMA*, 318(9), 806-815. doi: 10.1001/jama.2017.11389.

Wong, M. C. S., Ching, J. Y. L., Chan, V. C. W., & Sung, J. J. Y. (2015). The comparative cost-effectiveness of colorectal cancer screening using faecal immunochemical test vs. colonoscopy. *Scientific Reports. , 5*(13568), 1-9. doi: 10.1038/srep13568.

Zhai, R. L., Xu, F., Zhang, P., Zhang, W. L., Wang, H., Wang, J. L., …Wang, G. B. (2016). The diagnostic performance of stool DNA testing for colorectal cancer: A systematic review and meta-analysis. *Medicine, 95*(5), 1-1314. doi: 10.1097/MD.0000000000002129

Appendix A

Provider Questionnaire

1. What are your thoughts on colonoscopy versus non-invasive screening methods such as stool DNA or FIT testing?

2. How likely are you to recommend a non-invasive screening method to a patient that refuses colonoscopy? On a scale of 1-5, 5 being very likely.

3. Do you believe that non-invasive colorectal screening methods are effective in detecting colorectal cancer in patients that are eligible for one of these methods?

4. Do you feel that you have a bias against non-invasive colorectal cancer? Can you explain those feelings?