Addressing the Mental Health Needs of Patients with Cancer

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He has no known conflicts of interest to disclose.

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Abstract

Background: This quality improvement project examined the effect an educational intervention focused on the psychosocial needs of cancer patients had on knowledge, attitudes, and behaviors (KAB) of a group of nurses. While nurses understand the physical toll of cancer, they may forget the impact cancer has on mental health. The project was guided by the Health Belief Model.

Methods: Consent was obtained from 15 participants working as nurse advocates for a large insurance company. Nurse advocates are tasked with improving the health of patients and connecting them to additional resources. A twenty-minute educational intervention focused on the impact cancer has on mental health and the benefit of multiple psychosocial supportive resources was delivered to the participants. Education included a comprehensive review of the resources available for cancer patients at the project site. Participants were then given 10 minutes to complete a retrospective post-then-pre survey, based on a Likert Scale.

Results: Statistically significant improvements in survey scores were observed in each of the three KAB domains. Statistical analysis confirmed improvements in survey scores were significant and not likely due to random variation. Participants also referred more patients into a cancer support program following the intervention.

Conclusion: A brief educational intervention was able to improve KAB scores among nurses. There was also an increase in the number of patients these nurses referred into a psychosocial supportive program. Nurses that better understand the mental health needs of cancer patients are more likely to connect them with psychosocial resources. This intervention will become part of standard training for new nurse advocates at the project site.

Keywords: Cancer, mental health, education

Addressing the Mental Health Needs of Patients with Cancer

Cancer has a devastating effect on the physical health of persons diagnosed with this terrible disease, however, it can also have a profound effect on the mental health of these patients and their families. There are so many unanswered questions when an individual is given a cancer diagnosis. Many will have health, occupational, financial, and relationship concerns. The distress and uncertainty faced by patients with cancer is likely to have a negative impact on their mental health. Being able to properly support these patients should be a goal of holistic nursing care.

Background and Significance

In 2017, the last year for which data was available, the Centers for Disease Control and Prevention (2020) reported there were 1,701,315 new cases of cancer reported in the United States, and 599,099 people died of cancer. Caruso et al. (2017) explain that psychiatric disorders such as depression, anxiety, cognitive disorders, and delirium will affect an average of 30-35% of cancer patients. The authors also explain that psychosocial syndromes such as demoralization, health anxiety, irritable mood, and spiritual conflict affects quality of life for cancer patients as well as their families. With cancer impacting the lives of so many people in the United States, it is important that we understand the effect this terrible disease has on mental health. In addition, we also need to understand what resources can be provided to individuals to lessen the impact that cancer has on their mental health. If this problem is not addressed, it can have impacts on the quality of life of cancer patients and their families, as well as financial implications from poorer health outcomes.

Purpose and Rationale

With all the detrimental effects that cancer can have on patients’ mental health, it is important that their psychological needs be addressed. This creates an opportunity for nurse advocates working for a large insurance company that interact with patients telephonically. A major part of their role is connecting patients with medical conditions, such as cancer, to additional resources in an effort to improve their health. It is important that nurse advocates understand the mental health needs of cancer patients and are familiar with the mental health resources already available at their company. Most people given a cancer diagnosis are not aware of the mental health resources available to them, so it is hugely important that nurse advocates identify their needs and connect them to resources during their cancer journey. The purpose of this paper is to describe a quality improvement project and intervention designed to make nurse advocates more aware of the impact cancer has on mental health, and appropriate resources they could provide to patients with cancer.

Epidemiological Data to Support Significance

Cancer occurs when there is an error in the way cells normally grow and divide as needed. This can cause cells to grow out of control and become cancerous. Every person has the potential to develop cancer in any part of their body. The American Cancer Society (2021) expects that one in three people will be diagnosed with some form of cancer in their lifetime. In 2021 in the United States, they estimated there were 1,898,160 new cases of cancer diagnosed, and 608,570 cancer deaths. With such sobering statistics, it is understandable that a cancer diagnosis can cause a patient to experience stress, uncertainty, anxiety, and deteriorating mental health.

Cancer symptoms and the cost of healthcare can lead to patients feeling overwhelmed. Patel et al. (2021) explain that cancer patients routinely experience acute symptoms such as fever, gastrointestinal disturbances, and uncontrolled pain. If these patients are being treated on an outpatient basis and can’t be seen by their care team quickly, they often end up in the emergency department for medical assessment and treatment. Medical staff at emergency departments may provide care that conflicts with the treatment plan of a patient's oncologist. Emergency department utilization is very expensive for both patients and insurance companies.

Because of the stigma that surrounds mental health, patients with cancer may not be forthcoming with information that would indicate their mental health is deteriorating. Deacon (2015) shares a personal account from a mental health nurse that suffered from both mental illness and advanced cancer. The author wrote that due to the stigma that surrounds mental health, her personal opinion was that admitting she had several episodes of depression was worse than grappling with a cancer diagnosis. This knowledge is an important reminder that cancer patients should feel they are in a non-judgmental environment where they can express their mental health honestly.

Providing Multiple Psychosocial Supportive Resources

Patients facing a new or ongoing cancer diagnosis may not be aware of the effect that cancer treatments can have on their mental health. It is difficult to define mental health, but certain concepts are noted as being indicators of positive mental health. These concepts include being in a desirable mental state, a capacity to work and love, positive psychology, emotional intelligence, subjective well-being, and resilience (Sadock et al., 2015). Patients may also be unaware of methods that exist that have been shown to improve both cancer and mental health outcomes. Kievisiene et al. (2020) found that art therapy and music therapy were effective options for patients with breast cancer to reduce negative emotional states. They noted these therapies could improve quality of life and were promising non-medicated treatment options for patients with cancer. Prakash et al. (2020) noted that breast cancer is one of the most common cancers among women in a vast majority of countries around the world. Their study found that educating patients regarding yoga practices such as breathing exercises, systematic relaxation, and alternate nostril breathing improved the quality of life in patients undergoing chemotherapy for breast cancer. These methods also helped to improve physical function and emotional function while reducing fatigue and insomnia.

Interventions such as art therapy, music therapy, and yoga have long been considered beneficial for mental health. This can be seen in their utilization at many inpatient psychiatric hospitals where patients are experiencing such distressing mental health symptoms that they interfere with basic functioning. A recent study on an inpatient population showed that just one single session of a yoga intervention had short-term mood benefits and enhanced overall perceptions of treatment (Chad-Friedman et al., 2019). According to an overview conducted to help guide psychologists interested in integrating yoga into psychotherapy (Kamradt, 2017), utilizing yoga practices can reduce certain forms of pain, improve quality of life, reduce stress, reduce anxiety and improve depression.

By identifying that cancer patients have unique mental health needs and connecting them to resources, many patients could benefit from the methods mentioned above. If cancer patients are connected to resources such as a case manager, their assigned case manager could explain the benefit of these therapies and find them providers or facilities in their area that are utilizing these methods. Connecting cancer patients to psychosocial resources could improve both their medical and mental health outcomes.

Standard Practice at Project Site

Standard practice for nurse advocates is to provide very little attention to the mental health needs of patients. Workload demands on nurses are increasing, and this is no different for nurse advocates working for a large insurance company. Liu et al. (2018) found that increasing workload on nurses can lead to work being left undone and poorer patient outcomes. With workload demands being high, it is possible for nurse advocates to neglect the mental health needs of the patients they interact with. Additionally, some nurses are so focused on the medical aspects of care they forget to consider the mental health aspects of patients' overall well-being. Because of the stigma that surrounds mental illness, nurses may feel uncomfortable asking patients about their mental health. Due to these factors, it is entirely possible that the mental health needs of cancer patients are not being properly addressed by nurse advocates working for a large insurance company.

Positive Mental Health Outcomes

Patients have the greatest opportunity to heal when all their needs are met, this includes mental health needs. Kunikata et al. (2021) found that improving the severity of mental illness improved clinical outcomes. The study authors additionally found that improving mental health can reduce direct medical costs. This is important information for insurance companies to consider since there is often financial pressure in the American healthcare system to improve outcomes and reduce medical costs. Vaingankar et al. (2020) also found that a relationship exists between mental disorders and health outcomes. By improving mental health, overall physical health and quality of life is improved. According to Vaingankar et al. (2020), "Findings thus highlight the significance of incorporating mental health promotion and interventions in clinical populations" (p. 1). Supporting the mental health needs of cancer patients could improve their clinical outcomes, reduce overall costs, and improve their quality of life.

Internal Evidence

To begin this project, two interviews were conducted at the project site, a department of nurse advocates working for a large insurance company. A nurse advocate and subject matter expert felt that mental health resources for cancer patients were being overlooked (C. Grace, personal communication, October 21, 2020). A clinical manager that directly oversees the employees of the department agreed that there is a long history of overlooking the mental health needs of patients. She stated that many nurses focus on the medical aspects of care but fail to remember the mental health aspects of care (H. Tollefson, personal communication, October 27, 2020). Financial incentives are provided to nurse advocates in the department for connecting patients with major medical conditions to resources that could improve their health. Both interviewees mentioned nurse advocates may be unaware of what resources cancer patients could be connected to in order for nurse advocates to earn incentives. There was a sense from these interviews that the department had not placed an emphasis on the value of mental health resources for patients.

Interest in this problem led to an inquiry of current evidence to determine ways to effectively support the mental health needs of cancer patient. This inquiry has led to the clinically relevant PICOT question, “Among patients with cancer (P), how does providing multiple psychosocial supportive resources (I), compared to standard practice (C), impact overall mental health outcomes (O)?”

Evidence Synthesis

Search Strategy

A thorough literature review was conducted utilizing the following databases: Cumulative Index of Nursing and Allied Health Literature (CINAHL), PsychINFO, PubMed, and the Cochrane Library. PsychINFO was heavily utilized due to the emphasis of a mental health intervention in the PICOT question. CINAHL was chosen for its emphasis on literature that is impactful to the nursing profession. The initial searches included key terms from every component of the PICOT question. Key terms and synonyms included: *cancer, oncology, neoplasm, chemotherapy, identify, assessment, evaluate, screen, survey, mental health, mental illness, psychiatric, depression, and anxiety.* Certain combinations of search terms yielded articles that were unrelated to the PICOT question. Additionally, finding articles with a high level of evidence was difficult. Initial searches yielded 1,610 articles on CINAHL, 10,149 articles on PsychINFO, 35,238 articles on PubMed, and 1,031 articles from the Cochrane Library.

Key terms needed to be refined and exclusion criteria applied. Using the advanced search option, literature was filtered to only include peer-reviewed journal articles from roughly the past decade, going as far back as the year 2010. The most useful key terms to find articles related to the PICOT question were: *(oncology or cancer) and (mental health screening or mental health assessment).* Using the above criteria yielded 73 articles in CINAHL, 46 articles in PsychINFO, 189 in PubMed, and 496 articles from the Cochrane Library. Many of the articles found in this pared down search were cohort studies. In order to find articles of a higher level of evidence that focused on mental health topics, the key terms "*randomized control trial*" were added to the search on PsychINFO. This resulted in 29 articles on PsychINFO that contained high level evidence applicable to the PICOT question. Articles were filtered out due to their titles, and some were discarded because the patient population being studied was too narrow and may have an impact on generalizability.

Critical Appraisal

Careful review of the titles and abstracts of the final yield of research was conducted. Inclusion criteria limited the final body of research to articles that had a positive outcome due to the intervention studied, research that examined patients with cancer and not nurses or other caregivers of these patients, and articles that were not case studies or expert opinions. This review provided 18 useful journal articles. Rapid critical appraisal was conducted on these 18 articles in order to extract 10 studies applicable to the PICOT question that contained the highest level of evidence. The final 10 studies include seven randomized control trials, one systematic review, and two cohort studies (See Appendix A, Table 1).

Foundation of Research for this Project

The majority of the studies utilized a web-based or telehealth platform for their intervention (See Appendix B, Table 2). Most studies used just one platform, but two studies reached patients using two platforms. There were a wide variety of interventions employed; these included counseling or emotional support, patient education, patient surveys, provider training or education, self-paced learning modules, and symptom monitoring. Only one study examined employing just one intervention. All other studies utilized multiple different interventions at the same time in an effort to improve the mental health of cancer patients. The argument could be made that this makes it difficult to determine precisely which interventions were the most useful, since multiple interventions were being implemented at the same time. However, only the studies that tested multiple interventions being used at the same time reported statistically significant improvement in mental health indicators. Many variables were examined to determine mental health outcomes; these included quality of life scores, general mental health variables, depression scores, anxiety scores, and healthcare utilization. The majority of studies measured two mental health variables to determine outcomes. One study was able to show that interventions could reduce emergency room utilization, and two studies showed that their intervention could increase utilization of mental health resources. Lastly, eight different assessment tools were used to measure outcomes; these included the Behavioral Health Status Scale, the Center for

Epidemiological Studies-Depression Scale, the European Organization for Research and Treatment of Cancer Core Questionnaire, the Hospital Anxiety and Depression Scale, the Profile of Adaptation to Life Clinical Scale, the Patient Health Questionnaire-9, the Pediatric Index of Emotional Distress, and surveys conducted by researchers.

The final 10 studies reported on research conducted in four different countries, on participants living in a total of nine different countries (See Appendix A, Table 1). Not every study was able to show that their interventions improved the measured outcomes. Two studies reported that their interventions did not statistically improve any of their outcome variables, two studies reported that their interventions were effective at improving half of their outcome variables, and one study reported their interventions improved two out of three outcome variables (See Appendix B, Table 2).

Conclusions and Discussion Regarding Research

The evidence showed that many different interventions have the potential to positively impact the mental health of patients with cancer. Interventions were able to improve mental health variables in patients from nine different countries, with various types of cancer, in outpatient and inpatient settings, and in patients of various ages. The greatest positive impact on the mental health of this population was seen when multiple interventions were employed at the same time, often three to five psychosocial supportive resources. Evidence also showed that web-based and telehealth interventions can have a positive impact on the mental health of cancer patients.

Theory Application

Any researcher, provider, or nurse wishing to implement an intervention to improve the mental health of patients with cancer should first look to health behavior theories. Health behavior theories represent a combination of approaches, methods, and strategies from social and behavioral sciences that can be used to improve patient health (Maddox-Brown, 2016). These theories draw on observations from psychology, sociology, social psychology, anthropology, communications, nursing, economics, and marketing. Evidence suggests that interventions developed with the guidance of a theoretical foundation are more effective (Maddox-Brown, 2016). One of the difficulties in attempting to improve the mental health of cancer patients is that patients may not understand the impact that cancer has not just their bodies, but also their minds. This is where the Health Belief Model was utilized to guide the development of an effective intervention. The Health Belief Model was developed to understand why patients did or did not use preventive services offered by public health departments in the 1950s (Maddox-Brown, 2016). The model evolved to address other areas of healthcare where patients can decide to take advantage of additional care being offered to them. The Health Belief Model theorizes that a patient's beliefs about whether or not they are at risk for a health problem, and their perceptions of the potential value of taking action, influences their readiness to take action (Maddox-Brown, 2016). This model can be applied to patients with cancer and interventions that could be developed to improve their mental health. Cancer patients' beliefs about whether they are at risk of deteriorating mental health, and their perceptions about the value of accepting additional care that could improve their mental health, will dictate their readiness to accept additional care. The intervention for this project was developed with the guidance of the Health Belief Model (See Appendix C, Figure 1).

Implementation Framework

The implementation framework of a quality improvement project was used to guide the development of this project and its intervention. A quality improvement project requires the combined effort of health care staff and related stakeholders to identify and remedy problems in their health care delivery system (Silver et al., 2016). The quality improvement project must start by forming an improvement team that understands care problems in the organization. This project assembled a nurse advocate, a subject matter expert, and a clinical manager with knowledge of the care problems in the department at a large insurance company. Individuals who might have a vested interest in the project should be identified and included. This project included other nurse advocates in the department that were interested in addressing the care problems faced by cancer patients. The next step in a quality improvement project is setting goals for improvement, creating measures to determine that improvement in-fact occurs, and testing the new intervention to ensure changes were made versus current standard process (Silver et al., 2016). Goals were set for how this project hoped to make improvements to standard practice. A survey tool was developed to test the intervention, and a method was used to ensure nurse advocates improved after project implementation versus standard practice.

This quality improvement project was additionally guided by the Plan-Do-Study-Act Model (Brown et al. 2018). During the “Plan” phase, improvement goals were made, an intervention was developed, a prediction was made regarding outcomes, and preliminary information was gathered. In the “Do” phase, the intervention was implemented and data gathered. The “Study” phase involved statistical analysis of the data post-intervention compared to pre-intervention. Lastly, the “Act” phase involved dissemination of the evidence and adoption of the intervention as part of standard practice at the project site. (See Appendix D, Figure 2).

Methods

Ethical Considerations and Human Subject Protection

There were no foreseeable physical, social, legal, or economic risks, discomforts, or inconveniences associated with participation in this project greater than those associated with everyday types of activity. No individual identifying information was collected from participants to protect them from a loss of anonymity. Participants were not required to follow-up at a later time, so linking participants to previous survey responses was not required. No sensitive information was collected from participants except for four demographic questions that were non-invasive in nature. Vulnerable populations such as pregnant women, undocumented individuals, and Native Americans may have been represented among the participants, however, these special populations were not the target of the project.

The Arizona State University Institutional Review Board approved the social behavioral protocol for this project with expedited review on September 30, 2021. The project site did not have its own internal institutional review board. Therefore, no additional approvals were needed for this project.

Population and Setting

Participants in this project were registered nurses working as nurse advocates for a large insurance company. They were required to be at least 18 years of age, scheduled to work during the planned project implementation, willing to participate, and not a member of management. As members of management do not routinely interact with patients at the project site, it was determined this could impact results. The setting was the department the nurse advocates are employed in, a unique team that strives to improve the health of patients that call in with questions typically regarding benefits and claims. The nurse advocates assist patients with their concerns while learning clinical information about them, and then attempt to connect these patients with services to improve their overall health. All nurse advocates work virtually from home across six different states using telehealth and web-based interactions. They are adept users of telephonic and virtual technologies.

Project Description and Timeline

A twenty-minute educational intervention was developed to present to the nurse advocates at the project site in the form of a PowerPoint presentation. The educational intervention focused on the impact cancer has on mental health and the benefit of multiple psychosocial supportive resources. Education included a comprehensive review of the resources available for cancer patients at the project site, and how to determine the most appropriate resource for each patient. The educational component of this project was developed using the findings from the research evaluated (See Appendix A, Table 1). Available resources available at the insurance company were compiled using internal job and training aids at the project site. The length of time was determined due to time constraints of the department for educational sessions, as several nurses would be diverted from answering patient phone calls at one time.

Recruitment for the project began September 30, 2021 utilizing emails that were sent out to every nurse advocate in the department. The project was implemented on October 14, 2021. The educational intervention was delivered to 15 participants simultaneously using Microsoft Teams software. All nurses could see the PowerPoint presentation on their computer screens at the same time.

There was no funding for this project. All time spent planning, developing, implementing, and analyzing this project were done utilizing the project coordinator’s own time as part of his degree program. The only cost to the project site was the normal rate of pay received by the nurse advocates from the company during their participation time.

Instrumentation, Data Collection, and Data Analysis

A nine-question knowledge, attitudes, and behaviors (KAB) survey was developed by adapting a questionnaire utilized in research work by Mahendran et al. (2014). The authors of this study developed a KAB questionnaire to test the effectiveness of an educational intervention delivered to nurses regarding the psychosocial needs of cancer patients. First developed by Johnston et al. (2003), KAB questionnaires have been shown to have high construct validity (Cronbach's alpha >0.7) and are able to test changes in each of the three categories.

The participants were given 10 minutes to complete the survey after the intervention using Microsoft Forms. The survey employed a retrospective post-then-pre design. They were asked to answer questions related to their knowledge, attitudes, and behaviors immediately after the educational intervention. Response options were on a Likert scale ranging from "strongly agree" to "strongly disagree." Participants were then asked to answer the same questions from the reference of how they felt before the educational intervention. Retrospective post-then-pre surveys have been shown to be valid and often more reliable than standard pre-tests and post-tests given at different times (Howard et al., 1979).

Management at the project site agreed to provide referral rate data on a specific psychosocial resource at the company, a cancer support program. Data was provided for the group of participants regarding how many patients they referred into the cancer support program in October 2021, the month the project was implemented. Data was also provided for the following two months. This project aspired to observe a positive change in KAB survey scores following the intervention, and an increase in cancer support program referrals. It is the hope of the project coordinator that the results of this project can be added to the body of knowledge regarding education for nurses regarding the psychosocial needs of patients.

Data analysis was performed using Intellectus Statistics software. Descriptive statistics analysis, two-tailed paired samples *t*-tests, and two-tailed Wilcoxon signed rank tests were performed.

Results

Survey Questions

The knowledge, attitudes and behaviors (KAB) survey had nine questions that assessed the participants in three domains. The participants were asked to answer the questions post-intervention, and then reflect and answer the questions regarding how they felt pre-intervention. Below are the questions from the survey in Table 1.

Table 1

KAB Survey Questions

Question	Domain	Post-Intervention Label	Pre-Intervention Label
Chronic stress affects a substantial portion of cancer patients	Knowledge	Post-K1	K1
Depression affects a substantial portion of cancer patients	Knowledge	Post-K2	K2
Stress and depression can worsen cancer prognosis	Knowledge	Post-K3	K3
I feel confident in providing emotional support for patients	Knowledge	Post-K4	K4
Referring cancer patients to psychosocial resources is important	Knowledge	Post-K5	K5
Multiple psychosocial resources may benefit the mental health of cancer patients more than just one resource	Knowledge	Post-K6	K6
I believe that little can be done to help cancer patients with emotional problems	Attitudes	Post-A1	A1
I believe that emotional problems in cancer patients need less attention than their cancer treatment	Attitudes	Post-A2	A2

I ask patients whether they are facing psychological and/or social problems	Behaviors	Post-B1	B1

Demographics

The most frequently observed educational level of the participants was a bachelors degree in nursing (*n* = 10, 66.67%). The majority of the participants did not hold a special certification (*n* = 10, 66.67%). The most frequently observed age ranges were 18 to 29 years old and 30 to 39 years old, each with an observed frequency of 4 (26.67%). The most frequently observed ethnicity was White (*n* = 9, 60.00%). Frequencies and percentages are presented in Table 2.

Table 2

Demographics of Participants (n = 15)

Variable	*n*	%
Education		
Bachelor’s Degree in Nursing	10	66.67
Associate Degree in Nursing	4	26.67
Nursing Diploma	1	6.67
Missing	0	0.00
Special Certifications		
Not Applicable	10	66.67
Certified Case Manager (CCM)	1	6.67
Certified Perioperative Nurse (CNOR)	1	6.67
Wound, Ostomy, and Continence Certification (WOC)	1	6.67

Table 2

Demographics of Participants (n = 15)

Variable	*n*	%
Chemotherapy/Immunotherapy Certification	1	6.67
Inpatient Obstetrics Certification	1	6.67
Missing	0	0.00
Age		
18 to 29 years old	4	26.67
30 to 39 years old	4	26.67
40 to 49 years old	3	20.00
50 to 59 years old	3	20.00
60 to 69 years old	0	0.00
70 to 79 years old	1	6.67
Missing	0	0.00
Ethnicity		
White	9	60.00
American Indian or Alaska Native	2	13.33
Hispanic or Latino	1	6.67
Black or African American	3	20.00
Missing	0	0.00

Note. Due to rounding errors, percentages may not equal 100%.

Knowledge

Among the post-intervention survey questions that assessed knowledge, the observations for Post-K1 had an average of 4.67 (*SD* = 0.49, SE_M = 0.13, Min = 4.00, Max = 5.00). The observations for Post-K2 had an average of 4.87 (*SD* = 0.35, SE_M = 0.09, Min = 4.00, Max = 5.00). The observations for Post-K3 had an average of 4.80 (*SD* = 0.41, SE_M = 0.11, Min = 4.00, Max = 5.00). The observations for Post-K4 had an average of 4.47 (*SD* = 0.64, SE_M = 0.17, Min = 3.00, Max = 5.00). The observations for Post-K5 had an average of 4.87 (*SD* = 0.35, SE_M = 0.09, Min = 4.00, Max = 5.00). The observations for Post-K6 had an average of 4.80 (*SD* = 0.41, SE_M = 0.11, Min = 4.00, Max = 5.00). The summary of these statistics can be found in Table 3.

Table 3

Summary Statistics for Post-Intervention Knowledge Survey Questions

Question	*M*	*SD*	*n*	SE_M	Min	Max
Post-K1	4.67	0.49	15	0.13	4.00	5.00
Post-K2	4.87	0.35	15	0.09	4.00	5.00
Post-K3	4.80	0.41	15	0.11	4.00	5.00
Post-K4	4.47	0.64	15	0.17	3.00	5.00
Post-K5	4.87	0.35	15	0.09	4.00	5.00
Post-K6	4.80	0.41	15	0.11	4.00	5.00

Among the pre-intervention survey questions that assessed knowledge, the observations for K1 had an average of 4.20 (*SD* = 0.41, SE_M = 0.11, Min = 4.00, Max = 5.00). The observations for K2 had an average of 4.20 (*SD* = 0.68, SE_M = 0.17, Min = 3.00, Max = 5.00). The observations for K3 had an average of 4.27 (*SD* = 0.70, SE_M = 0.18, Min = 3.00, Max = 5.00). The observations for K4 had an average of 3.80 (*SD* = 1.15, SE_M = 0.30, Min = 2.00, Max = 5.00). The observations for K5 had an average of 4.40 (*SD* = 0.51, SE_M = 0.13, Min = 4.00, Max = 5.00). The observations for K6 had an average of 4.33 (*SD* = 0.72, SE_M = 0.19, Min = 3.00, Max = 5.00). The summary statistics can be found in Table 4.

Table 4

Summary Statistics for Pre-Intervention Knowledge Survey Questions

Question	*M*	*SD*	*n*	SE_M	Min	Max
K1	4.20	0.41	15	0.11	4.00	5.00
K2	4.20	0.68	15	0.17	3.00	5.00
K3	4.27	0.70	15	0.18	3.00	5.00
K4	3.80	1.15	15	0.30	2.00	5.00
K5	4.40	0.51	15	0.13	4.00	5.00
K6	4.33	0.72	15	0.19	3.00	5.00

Two-Tailed Paired Samples t-Tests

Two-tailed paired samples *t*-tests were conducted to examine whether the mean differences of (Post-K1 and K1), (Post-K2 and K2), (Post-K3 and K3), (Post-K4 and K4), (Post-K5 and K5), and (Post-K6 and K6) were significantly different from zero. The results of the two-tailed paired samples *t*-tests were all significant based on an alpha value of .05 and *t*(14), indicating the null hypothesis can be rejected. The summary statistics can be found in Table 5.

Table 5

Summary Statistics for Two-Tailed Paired Samples t-Tests of Knowledge Survey Questions

Post and Pre Question	*t*(14)=	*p*=
Post-K1 and K1	3.50	.004
Post-K2 and K2	3.57	.003
Post-K3 and K3	2.78	.015
Post-K4 and K4	3.16	.007
Post-K5 and K5	3.50	.004
Post-K6 and K6	2.43	.029

Two-Tailed Wilcoxon Signed Rank Tests

Two-tailed Wilcoxon signed rank tests were conducted to examine whether there was a significant difference between (Post-K1 and K1), (Post-K2 and K2), (Post-K3 and K3), (Post-K4 and K4), (Post-K5 and K5), and (Post-K6 and K6). The results of all the two-tailed Wilcoxon signed rank tests were significant based on an alpha value of .05, indicating that the differences between mean post and pre knowledge survey scores were not likely due to random variation. The summary statistics can be found in Table 6.

Table 6

Summary Statistics for Two-Tailed Wilcoxon Signed Rank Tests of Knowledge Questions

Post and Pre Question	*V*=	z=	*p*=
Post-K1 and K1	28.00	-2.65	.008
Post-K2 and K2	36.00	-2.64	.008
Post-K3 and K3	21.00	-2.27	.023
Post-K4 and K4	28.00	-2.43	.015

Post-K5 and K5	28.00	-2.65	.008
Post-K6 and K6	15.00	-2.07	.038

Attitudes

Among the post-intervention survey questions that assessed attitudes, the observations for Post-A1 had an average of 1.53 (*SD* = 1.06, SE_M = 0.27, Min = 1.00, Max = 5.00). The observations for Post-A2 had an average of 1.47 (*SD* = 1.06, SE_M = 0.27, Min = 1.00, Max = 5.00). The survey question in this domain were reverse-coded, therefore, lower mean survey scores post-intervention were desirable. The summary statistics can be found in Table 7.

Table 7

Summary Statistics for Post-Intervention Attitudes Survey Questions

Variable	*M*	*SD*	*n*	SE_M	Min	Max
Post-A1	1.53	1.06	15	0.27	1.00	5.00
Post-A2	1.47	1.06	15	0.27	1.00	5.00

Among the pre-intervention survey questions that assessed attitudes, the observations for A1 had an average of 2.07 (*SD* = 1.22, SE_M = 0.32, Min = 1.00, Max = 5.00). The observations for A2 had an average of 2.00 (*SD* = 1.25, SE_M = 0.32, Min = 1.00, Max = 5.00). The summary statistics can be found in Table 8.

Table 8

Summary Statistics for Pre-Intervention Attitudes Survey Questions

Variable	*M*	*SD*	*n*	SE_M	Min	Max
A1	2.07	1.22	15	0.32	1.00	5.00
A2	2.00	1.25	15	0.32	1.00	5.00

Two-Tailed Paired Samples t-Tests

Two-tailed paired samples *t*-tests were conducted to examine whether the mean differences of (Post-A1 and A1), and (Post-A2 and A2) were significantly different from zero. The results of the two-tailed paired samples *t*-tests were both significant based on an alpha value of .05 and *t*(14), indicating the null hypothesis can be rejected. The summary statistics can be found in Table 9.

Table 9

Summary Statistics for Two-Tailed Paired Samples t-Tests of Attitudes Survey Questions

Post and Pre Question	*t*(14)=	*p*=
Post-A1 and A1	-2.48	.027
Post-A2 and A2	-2.48	.027

Two-Tailed Wilcoxon Signed Rank Tests

Two-tailed Wilcoxon signed rank tests were conducted to examine whether there was a significant difference between (Post-A1 and A1) and (Post-A2 and A2). The results of both the two-tailed Wilcoxon signed rank tests were significant based on an alpha value of .05, indicating that the differences between mean post and pre attitudes survey scores were not likely due to random variation. The summary statistics can be found in Table 10.

Table 10

Summary Statistics for Two-Tailed Wilcoxon Signed Rank Tests of Attitudes Questions

Post and Pre Question	*V*=	z=	*p*=
Post-A1 and A1	0.00	-2.33	.020
Post-A2 and A2	0.00	-2.33	.020

Behaviors

For the post-intervention survey question that assessed behaviors, the observation for Post-B1 had an average of 4.60 (SD = 0.51, SE_M = 0.13, Min = 4.00, Max = 5.00). The summary statistics can be found in Table 11.

Table 11

Summary Statistics for Post-Intervention Behaviors Survey Question

Variable	*M*	*SD*	*n*	SE_M	Min	Max
Post-B1	4.60	0.51	15	0.13	4.00	5.00

For the pre-intervention survey question that assessed behaviors, the observation for B1 had an average of 3.86 (SD = 1.03, SE_M = 0.27, Min = 2.00, Max = 5.00). The summary statistics can be found in Table 12.

Table 12

Summary Statistics for Pre-Intervention Behaviors Survey Question

Variable	*M*	*SD*	*n*	SE_M	Min	Max
B1	3.86	1.03	14	0.27	2.00	5.00

Two-Tailed Paired Samples t-Test

A two-tailed paired samples *t*-test was conducted to examine whether the mean difference of Post-B1 and B1 was significantly different from zero. The result of the two-tailed paired samples *t*-test was significant based on an alpha value of .05, $t(13) = 3.68$, $p = .003$, indicating the null hypothesis can be rejected.

Two-Tailed Wilcoxon Signed Rank Test

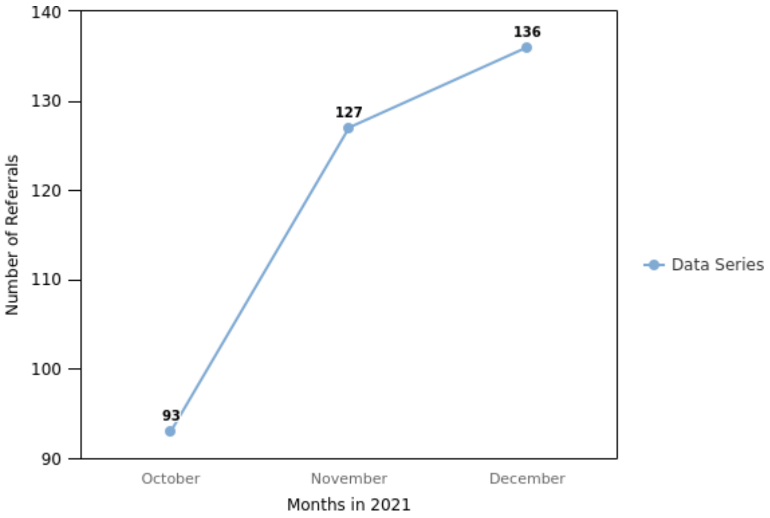
A two-tailed Wilcoxon signed rank test was conducted to examine whether there was a significant difference between Post-B1 and B1. The results of the two-tailed Wilcoxon signed rank test were significant based on an alpha value of .05, $V = 36.00$, $z = -2.64$, $p = .008$. This indicates that the differences between Post-B1 and B1 are not likely due to random variation.

Cancer Program Referral Rates

The participants referred 93 patients into the Cancer Support Program at the project site in October of 2021. The following month, November of 2021, they referred 127 patients into the Cancer Support Program. Finally, the participants referred 136 patients into the Cancer Support Program in December of 2021. See Graph 1 below.

Graph 1

Cancer Program Referrals Made by Participants



Sustainability

Upon reviewing the results of this project, management at the site decided to incorporate the educational intervention as part of standard training for the department. Newly hired nurse advocates receive 12 weeks of training, and opportunities existed for additional education. Management hopes that this project and its results can be an example regarding the importance of providing holistic nursing care in the department. They also feel the concepts of this project are translatable and useful for when nurse advocates assist other patients with major medical conditions, not just cancer. The clinical manager of the department has decided to submit the findings from this project to an internal learning community for various types of practitioners employed by the company. The clinical manager expects that other disciplines can gain insight from this project and apply it to other patient focused areas within the company.

Results Summary

The educational intervention employed in this project was able to positively impact the participants' mean survey scores in each of the three categories; knowledge, attitudes, and behaviors (KAB). Additionally, the participants referred more patients into the cancer support program than they previously had done before the intervention. Correlations between demographics and survey scores were explored, but no statistically significant relationships were observed.

Discussion and Conclusion

The results of this quality improvement project reflect what others have published in the literature; educational interventions can positively impact nurses' KAB scores and affect how they care for patients (Mahendran et al., 2014). Nurse advocates at the large insurance company became more aware of the effect cancer can have on mental health. They also became more aware of psychosocial resources at the company that can help support cancer patients. These results have the potential to impact patients that are covered by the insurance company. Patients will be better supported by additional psychosocial resources offered by the company, which may increase their satisfaction with the health insurance plan. Consumers of the health plan that are satisfied tend to stay with the insurance company during open enrollment, if their employer offers plans provided by different carriers.

This project was limited by the amount of time the project site was willing to devote to an educational intervention. Performance in the department is heavily monitored, and the expectation is that patients will not wait on hold longer than two minutes when calling the insurance company. Because of this, management was only willing to devote 30 minutes of time for the delivery of the educational intervention and survey completion by the participants. Additionally, due to privacy concerns, the department was unwilling to provide cancer program referral rates for each individual participant. The referral rates were therefore reported for the participant group as a whole. To ensure the long-term effectiveness of this project, further study should be conducted to see if results were sustained after longer periods of time, such as at six months or one year. A longer follow-up period could determine if additional educational interventions are needed to sustain results.

This project was able to produce meaningful results with one brief educational intervention; positively impacting nurses and the patients they assist. Addressing the mental health needs of patients with cancer is hugely important, but the techniques utilized in this project can be applied to any number of other major medical conditions. Our physical health impacts our mental health in ways we don’t always comprehend. Thankfully, nurses that understand this relationship can advocate for their patients and encourage them to take advantage of additional resources to support their mental health.

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Appendix A

Table 1

Quantitative Evaluation Table

Citation	**Theoretical/ Conceptual Framework**	**Design/ Method/ Purpose**	**Sample/Setting**	**Variables**	**Measurement/ Instrumentation**	**Data Analysis**	**Results/ Findings**	**Level of Evidence; Application to practice/ Generalization**
Citation (Abernethy et al., 2010) **Country** United States **Funding** Duke Comprehensive Cancer Center, Pathfinders National, and an Outcomes Research service agreement with Pfizer, Inc. **Bias** Primary author receives consulting payments from Pfizer, Inc.	EBP Evaluate a comprehensive psychosocial intervention for cancer patients	**Design** Phase 2 pilot study 3-month post-intervention survey **Purpose** Examine the acceptability and feasibility of Pathfinders for women with metastatic breast cancer.	**N=** 50 **Demographics** Adults with metastatic breast cancer receiving chemotherapy White 76% Black 20% Female 100% Mean age 51 College 50% **Setting** Academic oncology center **Exclusion** Gender, Non-English speaking, life expectancy <6 months **Attrition** 16%	**IV1:** Pathfinder psychosocial program **DV1:** Helpfulness **DV2:** PCM Quality of life and symptoms **Definitions** PCM: Patient care Monitor	**Tools used to measure variables:** Electronic surveys: Patient Care Monitor review of systems, Functional Assessment of Chronic Illness Therapy – Breast Cancer	Paired t test, 95% confidence interval, Bonferroni approach to adjust significance levels, McNemar's test, two-sided significance level of 0.05	**DV1:** 93% of participants found intervention helpful **DV2:** Significant in quality of life scores P<0.05 PCM Distress (mean change [SE]=−3.42 [1.21]); PCM Despair (−4.53 [1.56]); PCM Quality of Life (2.88 [0.97]); and FACT-G Emotional Wellbeing (2.07 [0.46])	**Level of Evidence** 4-Cohort study **Strengths** Findings were significant, participants reported finding intervention helpful **Weakness** Lower level of evidence (cohort study) **Feasibility** Not generalizable due to female only study. Would be limiting to narrowly focus on breast cancer patients for DNP project.

Key: **CI-** confidence interval; **CRC-** colorectal cancer; **DV**-dependent variable; **EBP-** Evidenced Based Practice; **EORTCCQ-** European Organization for Research and Treatment of Cancer Core Questionnaire; **GAD-7-** Generalized Anxiety Disorder screener-7; **HADS**- Hospital Anxiety and Depression Scale; **IV**- independent variable; **N-** number of participants; **PHQ-9-** Patient Health Questionnaire-9; **PI-ED-** Pediatric Index of Emotional Distress; **RCT**- randomized control trial

Citation	**Theoretical/ Conceptual Framework**	**Design/ Method/ Purpose**	**Sample/Setting**	**Variables**	**Measurement/ Instrumentation**	**Data Analysis**	**Results/ Findings**	**Level of Evidence; Application to practice/ Generalization**
Citation (Agboola et al., 2015) **Country** United States **Funding** Not stated **Bias** None declared	Extending longevity of cancer patients by focusing on better defining, capturing, and maintaining health-related quality of life.	**Design** Systematic Review of RCTs **Purpose** Systematically assess the literature published from 2006-2014 to find the effect of supportive telehealth interventions on pain, depression, and quality of life in patients with cancer.	**N=** 3789 **Demographics** Participants of 20 different trials, all having various forms of cancer **Setting** Studies published in the following countries: U.S. 65% Australia 10% S. Korea 10% Sweden 5% Finland 5% Norway 5% **Exclusion** Title and abstract of studies, identical trials, nonrandomized studies, trials not related to the subject, trials only reporting the study protocol. **Attrition** Not stated	**IV1:** Supportive telehealth interventions **DV1:** Pain **DV2:** Depression **DV3:** Quality of life	**Tools used to measure variables:** Methodological quality of studies assessed using Cochrane Collaboration Risk of Bias tool	Mean changes, odds ratios, effect sizes, and p values.	**DV1:** Two of three studies reported an improvement in pain **DV2:** Four of ten studies demonstrated significant improvement in depression outcomes **DV3:** Three of eight studies reported improved quality of life outcomes	**Level of Evidence** 1-Systematic Review **Strengths** Effectiveness of interventions assessed in different countries, interventions were diverse but all implemented using telehealth **Weakness** Studies examined were only conducted in high-income countries, the five databases searched did not include a search of grey literature **Feasibility** Relatively generalizable given the larger number of participants with various forms of cancer. Data is valuable given that telehealth is utilized at DNP project site.

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice/ Generalization
Citation (Barrera et al., 2020) **Country** Canada **Funding** The Canadian Cancer Society Research Institute **Bias** The authors had no financial disclosures or disclaimers	Pediatric Preventive Psychosocial Health Conceptual Model (PPPHM) of Psychosocial Risk	**Design** RCT **Purpose** Investigate the effects of providing family psychosocial screening information to the treatment team on depressive symptoms of caregivers of children newly diagnosed with cancer, the pediatric cancer patients themselves, and their siblings.	**N=** 122 caregivers **N=** 36 patients **N=** 25 siblings **Demographics** Caregivers of children newly diagnosed with cancer, children newly diagnosed with cancer, and their siblings. Female 80% White 61% Asian 25% **Setting** SickKids Hospital in Toronto, ON and Women and Children's Hospital in Vancouver, BC **Exclusion** Patient had to be between 0 to 16 years of age, could not have a serious illness, expected to live at least one year post diagnosis. **Attrition** Not stated	**IV1:** Providing family psychosocial screening information to treatment team **DV1:** Caregiver depression **DV2:** Caregiver anxiety **DV3:** Patient depression **DV4:** Patient anxiety **DV5:** Sibling depression **DV6:** Sibling anxiety	**Tools used to measure variables:** HADS PI-ED	T tests, multivariable regression with mixed models and maximum likelihood estimation, ANOVA, chi-squire tests.	**DV1:** Not significant **DV2:** Not significant *When corrected for psychosocial risk factors, intervention did show significant improvement for anxiety & depression in caregivers **DV3:** Not significant **DV4:** Not significant **DV5:** Not significant **DV6:** Not significant	**Level of Evidence** 2-RCT **Strengths** Low cost of study, focus not just on oncology patients but the effect of diagnosis on the entire family **Weakness** Small sample sizes, participants had to speak English, limited statistical power, findings were inconclusive, families were not stratified by psychosocial risk **Feasibility** Not generalizable due to study focus on pediatric cancer patients and their families. Would be limiting to focus on pediatric cancer patients for DNP project.

Key: **CI-** confidence interval; **CRC-** colorectal cancer; **DV**-dependent variable; **EBP-** Evidenced Based Practice; **EORTCCQ-** European Organization for Research and Treatment of Cancer Core Questionnaire; **GAD-7-** Generalized Anxiety Disorder screener-7; **HADS**- Hospital Anxiety and Depression Scale; **IV**- independent variable; **N-** number of participants; **PHQ-9-** Patient Health Questionnaire-9; **PI-ED-** Pediatric Index of Emotional Distress; **RCT**- randomized control trial

Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice/ Generalization
Citation (Dau et al., 2020) **Country** Canada **Funding** 2018 Seed Grant from the Canadian Centre for Applied Research in Cancer Control **Bias** The study authors stated they had no competing interests to declare	Wilson's Second Model of Information Behaviour	**Design** Cross-sectional study **Purpose** Assess the health information needs regarding treatment and psychosocial impacts of patients undergoing CRC treatment and those that have completed treatment.	**N=** 1041 **Demographics** Adults diagnosed with CRC White 87.7% Female 59.6% College 76.2% **Setting** Participants recruited internationally from online cancer support groups and oncology clinics in Vancouver, Canada. **Exclusion** No access to online survey, <18 years of age, not diagnosed with CRC **Attrition** 0%	**IV1:** Undergoing cancer treatment **DV1:** General information needs about CRC combined two questions that captured 14 items including survival information, risk of cancer for family members, sexual activity, fertility, work/employment, and mental health.	**Tools used to measure variables:** 12-page online survey broken into four sections to assess demographics, health information needs, quality of life, and health status. Information needs were considered met if 50% of participants indicated they did not require additional health information in that category.	Multivariable linear regression models and SAS 9.4 for the data analysis.	**DV1:** **General info:** The average met health information needs was 49% overall, 44% for patients undergoing treatment and 51% for patients that completed treatment. Over 50% in both groups reported unmet information needs in psychosocial areas including mental health. CI for patients undergoing treatment was (0.00 to 0.25). CI for patients that completed treatment was (0.00 to 0.13).	**Level of Evidence** 4- Cohort Study **Strengths** Study authors worked with research partners to develop a more effective survey. **Weakness** Lower level of evidence (cohort study). Survey had to be completed online, survey only available in four languages, and participants were largely recruited on social medica platforms. This may have affected the demographics of participants. **Feasibility** Potentially generalizable to patients with other forms of cancer. Areas of focus on this survey could also be areas of focus for DNP project.

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice/ Generalization
Citation (Fann et al., 2016) **Country** United States **Funding** National Institute of Nursing Research **Bias** The authors reported no conflicts of interest	Universal distress screening and provision of comprehensive psychosocial care that is integrated into the routine care of patients with cancer.	**Design** RCT **Purpose** Determine if a web-based intervention that facilitated self-care and communication with health care providers could improve psychosocial outcomes for patients undergoing cancer treatment.	**N=** 581 **Demographics** Adult patients starting cancer therapy **Setting** Comprehensive cancer centers in Seattle, WA and Boston, MA **Exclusion** Non-English speaking, <18 years of age, non-ambulatory **Attrition** Not stated	**IV1:** Usual education plus self-care instruction for symptoms and quality of life issues, communication coaching, and the opportunity to track symptoms and quality of life between clinic visits (Web-based). **DV1:** Depression **DV2:** Social, emotional, and role functioning	**Tools used to measure variables:** PHQ-9, EORTCCQ	Intervention effect on depression was assessed on the pattern of no/mild or moderate/severe depression (PHQ9 ≥ 8) by using McNemar's test. All P-values were 2-sided for which a value of <0.05 was considered statistically significant and a value of 0.05 to 0.1 was considered a nonsignificant trend.	**DV1:** The PHQ-9 score was lower by an estimate of 0.60 (95% CI, 0.08-1.12, P = .02) in the intervention group. **DV2:** There was a trend toward higher functional scores in social and role functioning in the intervention group, suggesting that the intervention group improved functional scores by estimates of 3.01 (95% CI, −0.63-6.66, P = .10) in social and 3.40 (95% CI, −0.30-7.10, P = .07) in role functioning. No significant difference in emotional functioning score was observed between the 2 study groups (P = .43).	**Level of Evidence** 2-RCT **Strengths** Participants included patients of both genders with any type of cancer from cancer centers on opposite sides of the United States. **Weakness** Small sample size, depression assessed by self-report allowing the possibility for under-reporting of symptoms, participants had to have access to the internet and a computer, and demographics not listed in study. **Feasibility** Generalizable to most adult patients with cancer. Intervention tool utilized in this study could potentially be used at DNP project site.

Key: **CI-** confidence interval; **CRC-** colorectal cancer; **DV**-dependent variable; **EBP-** Evidenced Based Practice; **EORTCCQ-** European Organization for Research and Treatment of Cancer Core Questionnaire; **GAD-7-** Generalized Anxiety Disorder screener-7; **HADS**- Hospital Anxiety and Depression Scale; **IV**- independent variable; **N-** number of participants; **PHQ-9-** Patient Health Questionnaire-9; **PI-ED-** Pediatric Index of Emotional Distress; **RCT**- randomized control trial

Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice/ Generalization
Citation (Nelson et al., 2019) **Country** United States **Funding** Silbermann Foundation, Muriel Duenewald Lloyd Inspiration Fund, the National Cancer Institute, and the CALGB Foundation **Bias** Assumed selection bias based on demographics	Coping paradigm of Folkman and the developmental stages of life as outlined by Erikson	**Design** RCT **Purpose** Feasibility, tolerability, and acceptability of CARE by examining the rates of eligibility, acceptance, and adherence.	**N=** 59 **Demographics** Adults with cancer receiving cancer treatment White 90% Female 53% Mean age 76 College 81% **Setting** 2 Northeastern comprehensive cancer centers **Exclusion** Non-English speaking, minimal scores on Distress Thermometer or HADS **Attrition** 19%	**IV1:** CARE Intervention **DV1:** Feasibility **DV2:** HADS scores **Definitions** CARE: Cancer and Aging: Reflections for Elders	**Tools used to measure variables:** HADS	Cohen's d, ANCOVA	**DV1:** Feasible based on attrition being less than the established cutoff of 80% **DV2:** Mean total HADS scores compared with control At 2 months: (d = 0.46 [CI: –0.07 to 0.99], P = 0.02) At 4 months: (d = 0.42 [CI: –0.16 to 0.99], P = 0.09)	**Level of Evidence** 2-RCT **Strengths** Conducted at multiple sites, high level of evidence **Weakness** Could not reliably compare longitudinal groups, some relevant variables not addressed **Feasibility** Limited generalizability due to demographics. Would be difficult to implement at DNP project site.

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Citation	**Theoretical/ Conceptual Framework**	**Design/ Method/ Purpose**	**Sample/Setting**	**Variables**	**Measurement/ Instrumentation**	**Data Analysis**	**Results/ Findings**	**Level of Evidence; Application to practice/ Generalization**
Citation (O'Hea et al., 2020) **Country** United States **Funding** National Institutes of Health, National Institute of Mental Health **Bias** None reported	Clinicians have a vital role in mitigating the negative emotional and behavioral aspects of cancer and treating symptoms of anxiety and depression which may help reduce the human cost of cancer.	**Design** Multi-site RCT **Purpose** Examine MHADRO's effect on patient outcomes, health care utilization, and oncology provider documentation and behaviors. **Definition** MHADRO: Mental Health and Dynamic Referral for Oncology	**N=** 836 **Demographics** Adults with a past or current cancer diagnosis Hispanic 4.2% Female 85.9% Married 64.8% College 69.3% **Setting** Three comprehensive cancer centers in MA, NJ, and TX **Exclusion** Altered mental status, hostile behaviors, physical symptoms that would interfere with participation, factors precluding follow-up visits, <18 years of age. **Attrition** Not stated	**IV1:** Web-based psychosocial assessment and resource program (MHADRO) **DV1:** Patient psychosocial outcomes **DV2:** Health care utilization **DV3:** Oncology provider documentation and behaviors	**Tools used to measure variables:** The Behavioral Health Status (BHS) scale was used. The BHS is a global measure of mental health, which assesses subjective well-being, anxiety, and depression. Chart reviews were also conducted.	Characteristics were compared by group assignment (MHADRO intervention vs. control) using chi-squared tests (or Fisher's exact test when cell sizes were <5) for categorical variables and Student's t-test for continuous variables (with a Satterthwaite adjustment when equality of variances significantly differed between groups).	**DV1:** Intervention was not effective in improving psychosocial health outcomes, either overall or for the individual components of the BHS score. **DV2:** Patients that accepted a dynamic referral to see a mental health provider had fewer hospital admissions compared to the patients that declined (overall type 3 $\chi 2=6.48$, $p=0.04$). **DV3:** Providers of patients in the intervention group were more likely to document psychosocial symptoms and history, refer patients to mental health services, and encourage support groups.	**Level of Evidence** 2-RCT **Strengths** Intervention was able to be implemented at three busy clinical oncology practices. **Weakness** The intervention did not improve psychosocial outcomes of patients. Authors postulated a more intensive intervention may be needed. **Feasibility** Limited generalizability as the majority of participants were females undergoing breast cancer treatment. A similar web-based assessment would be feasible at the DNP project site.

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Citation	**Theoretical/ Conceptual Framework**	**Design/ Method/ Purpose**	**Sample/Setting**	**Variables**	**Measurement/ Instrumentation**	**Data Analysis**	**Results/ Findings**	**Level of Evidence; Application to practice/ Generalization**
Citation (O'Hea et al., 2014) **Country** United States **Funding** National Institutes of Health, National Institute of Mental Health **Bias** Dr. Boudreaux also does consulting work for Polaris Health Directions, joint owner of the licensing rights for some of the intellectual property described in this study.	A better understanding of psychological distress in patients with cancer is imperative as untreated psychological distress may result in significant negative outcomes. High rates of psychological distress may have the potential to affect survival rates in oncology patients.	**Design** RCT **Purpose** Examine the effect that a computerized psychosocial assessment and intervention program had on cancer patients accepting referrals to see a mental health provider.	**N=** 836 **Demographics** Adults with a past or current cancer diagnosis White 90.7% Black 4.9% Female 86% Married 65% Mean age 59 **Setting** Three comprehensive cancer centers in MA, NJ, and TX **Exclusion** Not a resident of the treatment center state, no working phone, <18 years of age, altered mental status, severe illness, unable to participate in follow-ups. **Attrition** Not stated	**IV1:** Computerized psychosocial assessment and intervention program **DV1:** Acceptance of a dynamic referral to see a mental health specialist	**Tools used to measure variables:** The Behavioral Health Status (BHS) scale was used. The BHS is a global measure of mental health, which assesses subjective well-being, anxiety, and depression.	Basic descriptive statistics, multiple linear regression, ensured a model with predictors significant at the $p<0.05$ level.	**DV1:** 27.3% (N=50) of patients in the control group accepted a dynamic referral to see a mental health specialist	**Level of Evidence** 2-RCT **Strengths** Larger sample size, patients with various forms of cancer included in study **Weakness** Patient attitudes toward computerized screening and assessment were not assessed, very few of the study participants were from minority groups. **Feasibility** Generalizable to other patients with various forms of cancer, a similar computer based screening tool would be beneficial at the DNP project site.

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Citation	Theoretical/ Conceptual Framework	Design/ Method/ Purpose	Sample/Setting	Variables	Measurement/ Instrumentation	Data Analysis	Results/ Findings	Level of Evidence; Application to practice/ Generalization
Citation (Singer et al., 2017) **Country** Germany **Funding** German Federal Ministry of Health **Bias** Authors declared there was no conflict of interest	Structured care models that include a combination of distress screening, feedback, and structured clinical pathways for care provision lead to improved involvement of mental health care professions.	**Design** Cluster-randomized trial with two parallel arms. **Purpose** Determine whether a stepped care model improves referrals to mental health services, improves well-being, and increases utilization of outpatient mental health services.	**N=** 1012 **Demographics** Adult patients admitted to hospital oncology wards Female 44.4% Mean age 63.4 **Setting** Oncology wards of the University Medical Centre in Leipzig, Germany **Exclusion** Insufficient command of the German language, <18 years of age, no written informed consent. **Attrition** 40% for intervention group and 47% for control group	**IV1:** Stepped care model implemented on oncology wards of intervention group patients. **DV1:** Referral to mental health services **DV2:** Emotional well-being of patients **DV3:** Utilization of outpatient mental health services. **Definition:** Stepped care model included three steps. Step1: Each patient screened for distress Step 2: Clinicians talked with patients with severe distress about screening results and explored their wishes for support Step 3: If patient and doctor agreed further support was needed, patient was referred to mental health services	**Tools used to measure variables:** HADS, PHQ-9, GAD-7, EORTCCQ	Analysis employed mixed-effects multivariate regression modeling, odds ratio (OR) calculated with 95% confidence intervals (CIs) for the comparison of patients who received stepped care versus standard care regarding referral using multilevel mixed effects binary logistic regression.	**DV1:** 19% more patients in the intervention group were referred to mental health services. (N = 442; 6 wards; odds ratio [OR] 10.0; P < .001). **DV2:** Not significant between intervention and control group. (N = 234, β −0.3; P = .71). **DV3:** After stepped care, patients with psychiatric comorbidity went more often to psychotherapists (OR 4.0, P = .05) and to psychiatrists (OR 2.3, P = .12) versus the control group.	**Level of Evidence** 2-RCT **Strengths** Two parallel arms to the study, randomization was performed externally, patients with many difference cancers and at multiple stages were included **Weakness** High attrition rate mostly due to patients being discharged from hospital, care provided may have been too short in duration to result in immediate effects **Feasibility** Generalizable to other inpatient cancer patients. Somewhat feasible for DNP project site as referrals to mental health services can be made.

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Citation	**Theoretical/ Conceptual Framework**	**Design/ Method/ Purpose**	**Sample/Setting**	**Variables**	**Measurement/ Instrumentation**	**Data Analysis**	**Results/ Findings**	**Level of Evidence; Application to practice/ Generalization**
Citation (Willems et al., 2016) **Country** The Netherlands **Funding** Open University of the Netherlands, Maastricht University **Bias** Authors reported there were no conflicts of interest	Cancer survivors are expected to adopt an active role in managing their health and well-being, but many express low self-efficacy in managing distress and fatigue. The Intervention Mapping Protocol was also utilized.	**Design** RCT **Purpose** Evaluate the short-term effects of a web-based intervention (Cancer Aftercare Guide) on quality of life, anxiety and depression, and fatigue.	**N=** 462 **Demographics** Adult cancer survivors Female 80.85% Mean age 56.26 College 66.49% Breast cancer 71.28% In a relationship 85.11% **Setting** Discharged patients from 21 different hospitals across the Netherlands. **Exclusion** Non-Dutch speaking, <18 years of age, serious medical or psychiatric illness, had not successfully completed cancer treatment, had any signs of cancer recurrence. **Attrition** 11.5%	**IV1:** Web based intervention (Cancer Aftercare Guide) **DV1:** Quality of life **DV2:** Anxiety and Depression **DV3:** Fatigue	**Tools used to measure variables:** EORTCCQ, HADS, and Checklist Individual Strength tool	Independent t-tests, analysis of variance, chi-squared tests, logistic regression analysis, multilevel linear regression analysis, Cohen's *d* and Cohen's f^2	**DV1:** Significant effect on increasing emotional (B=3.47, p =0.022, f2 =0.013, d= 0.15) and social functioning (B= 3.95, p =0.011, f2 =0.017, d =0.15). **DV2:** Significant effect on decreasing depression (B=_0.63, p =0.007, f2 =0.019, d = 0.21). Not significant at decreasing anxiety (B=_0.60, p = 0.017, f2 =0.014, d =0.27). **DV3:** Significant effect on decreasing fatigue (B=_4.36, p= 0.020, f2 =0.013, d =0.21).	**Level of Evidence** 2-RCT **Strengths** Participants from 21 different hospitals **Weakness** Women who survived breast cancer were over represented, higher mean age of participants, self-administered questionnaires **Feasibility** Most likely generalizable to adults with various forms of cancer. Study is a reminder that cancer survivors cared for at DNP project site still have need for a mental health intervention.

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Appendix B

Table 2

Synthesis Table

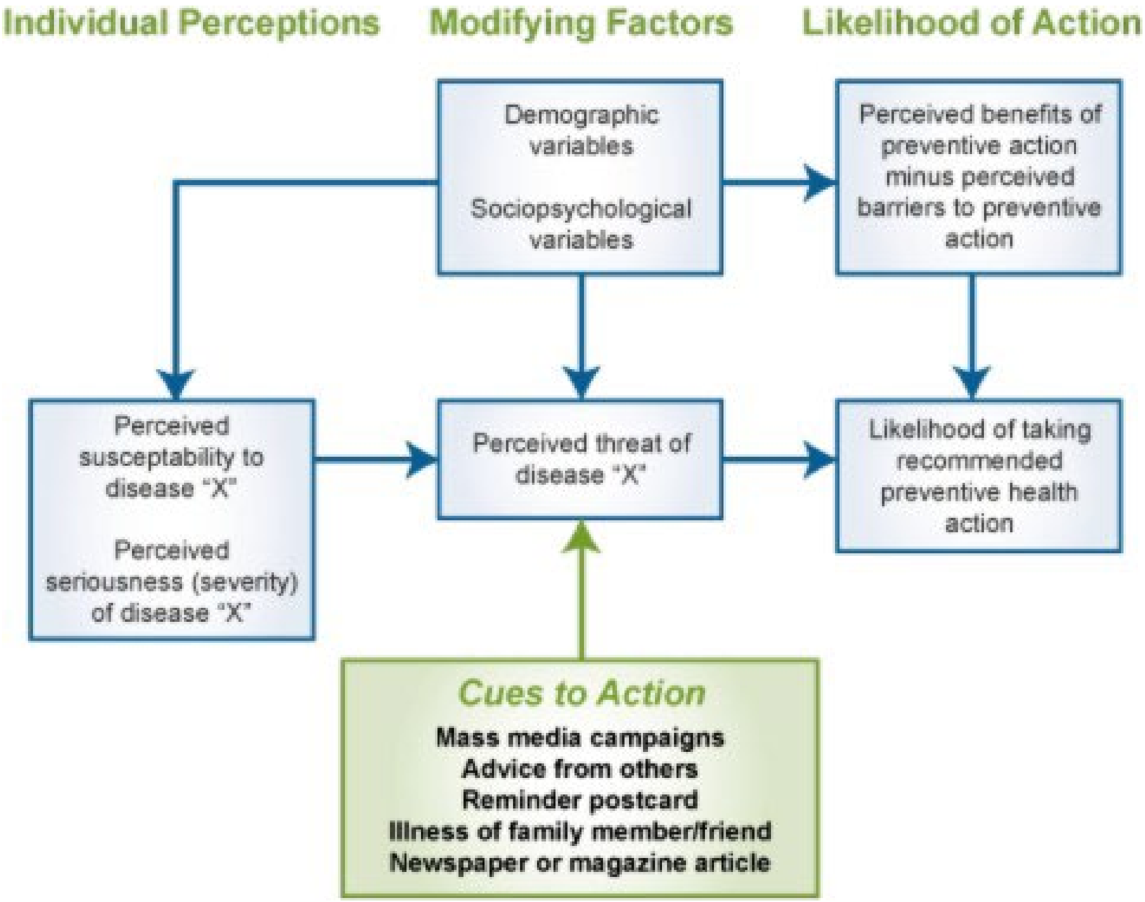
Author	**Abernethy**	**Agboola**	**Barrera**	**Dau**	**Fann**	**Nelson**	**O’Hea**	**O’Hea**	**Singer**	**Willems**
Year	2010	2015	2020	2020	2016	2018	2020	2014	2017	2016
LOE	4-Cohort	1-SR	2-RCT	4-Cohort	2-RCT	2-RCT	2-RCT	2-RCT	2-RCT	2-RCT
<<< Interventions >>>										
Platform										
Web-based		X	X	X	X		X	X		X
Telehealth		X				X				
In-person	X		X						X	
Methods										
Counseling/emotional support	X	X			X	X			X	X
Patient education	X	X			X	X	X	X		X
Patient surveys	X		X	X			X	X	X	X
Provider training/education			X				X	X	X	
Self-paced learning modules	X	X								X
Symptom monitoring		X			X	X				X
<<< Outcomes >>>										
Variables										
QOL	⇑	⇑								⇑
General MH Variables				NS	⇑		NS		NS	
Depression		⇑	NS		⇑	⇑				⇑
Anxiety			NS			⇑				NS
Healthcare Utilization							⇓	⇑	⇑	
Measurement Tools for Outcomes										
BHS							X	X		
CES-D		X								
EORTCCQ					X				X	X
HADS		X	X			X			X	X
PAL-C		X								
PHQ-9					X				X	
PI-ED			X							
Surveys	X	X		X						X

Key: **BHS-** Behavioral Health Status Scale; **CES-D-** Center for Epidemiological Studies - Depression Scale; **EORTCCQ-** European Organization for Research and Treatment of Cancer Core Questionnaire; **HADS**- Hospital Anxiety and Depression Scale; **LOE-** level of evidence; **MH-** mental health; **NS-** not significant; **PAL-C-** Profile of Adaptation to Life Clinical Scale; **PHQ-9-** Patient Health Questionnaire-9; **PI-ED-** Pediatric Index of Emotional Distress; **QOL-** quality of life; **RCT-** randomized control trial; **SR-** systematic review; ⇑- improvement; ⇓- reduction

Appendix C

Figure 1

Health Belief Model

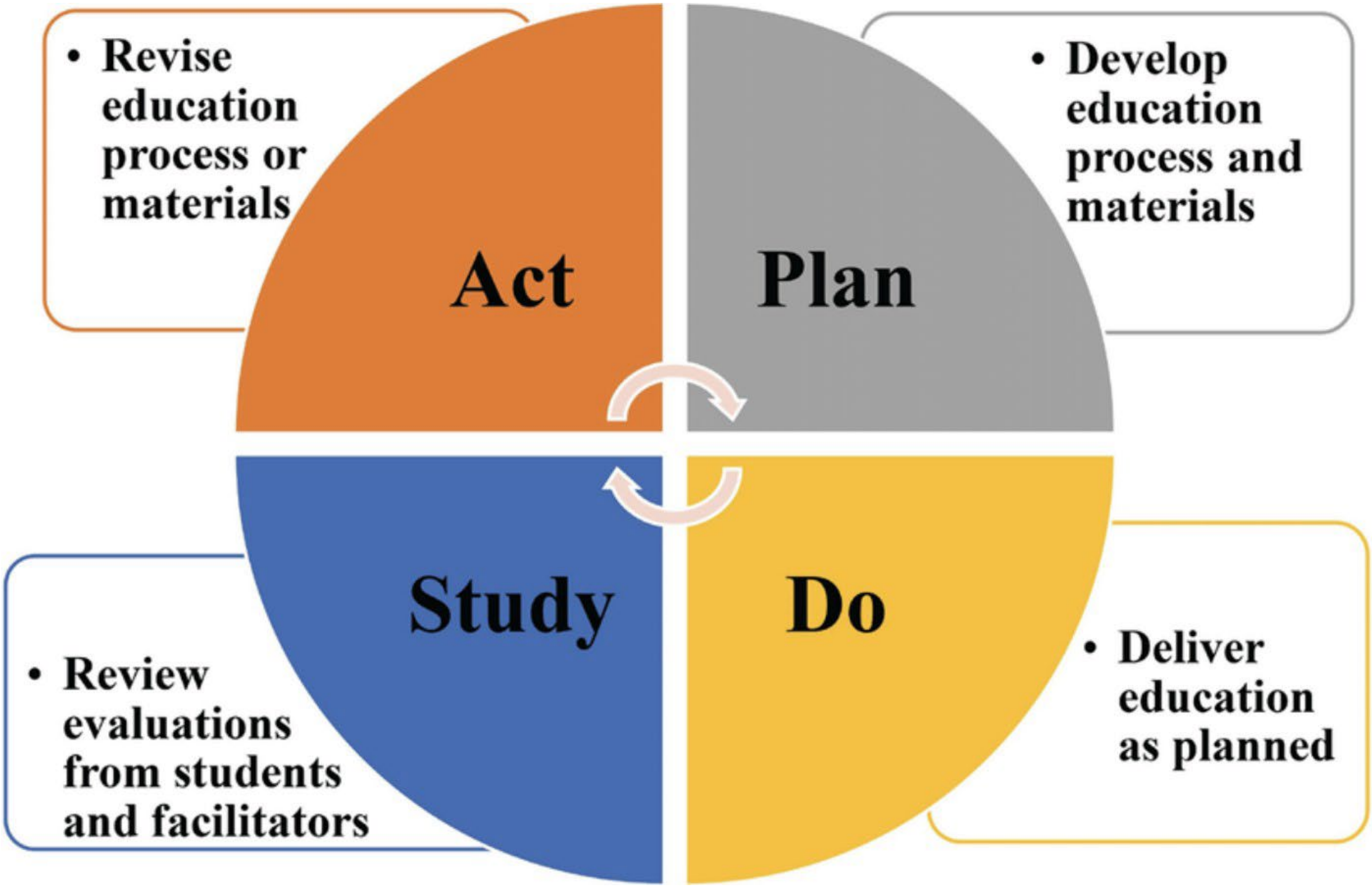


Becker & Maiman (1975)

Appendix D

Figure 2

Plan-Do-Study-Act (PDSA) Model



Brown et al., (2018)