

Changing Cancer's Course

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Executive Summary

Background

In 2019, over 1.75 million people were diagnosed with cancer in the United States with the incidence rate being 439 new cases per 100,000 people (CDC, 2022). About 600,000 of these people died but over the past 20 years, cancer rates have been declining and have declined by 27%. Reasons behind this trend have been shown to come from population changes in cancer risk factors, advances in treatment and diagnostics, and cancer screening test usage (CDC, 2022). Not only does cancer affect the physical being of the individual, but also mental health. Anxiety, depression, and fear are all common emotions and feelings affected by a cancer diagnosis (Cancer and Mental Health, n.d.). By offering screenings and intervention methods, we look to continue declining these rates of cancer and improving physical and mental health during times of treatment.

Solutions

Through recent studies, physical activity, music therapy, and web-based interventions show potential advantages in lowering the significant negative health outcomes that a cancer diagnosis and symptoms have on the population. Physical activity and exercise have been implicated to have positive effects on health. Still, more specifically when it comes to cancer, it may lower cancer risks and improve quality of life (mentally and physically) when undergoing treatment (*Exercise Linked with Lower Risk of 13 Types of Cancer*, 2016). Studies have shown these effects in thirteen types of cancer. Music therapy has shown to have positive effects on individuals experiencing anxiety, depression, trauma, and other emotional and mental issues.

This music acts as a coping and processing mechanism for these emotions so that peace, relaxation, and comfort in their uncomfortable situations (Warren, 2016). Web-based interventions are important to enhancing the delivery of care for patients as internet and technology usage has increased over time. These interventions will be crucial for communication and providing information for symptom management for cancer patients through the internet (Fridriksdottir et al., 2017). They will focus on symptoms and treatments of cancer and mental health effects. Incorporating these interventions and behavior changes into traditional care will help with cancer patients' quality of life, mental health, and health outcomes.

Timeline and Costs

Incorporating this intervention into traditional treatment methods such as chemotherapy would create an average timeline of 3-6 months for one course of treatment (*How Long Is Chemotherapy? What to Expect*, 2021). These courses come in cycles of 2-6 weeks, so applying these interventions throughout each cycle will allow chances for review and evaluation. By including the Social Cognitive Theory (SCT), personal and environmental factors must be considered when implementing the program. This means involving funding for staff, personal trainers, web applications, and licensed therapists to work alongside healthcare professionals in applying the intervention to traditional care of chemotherapy.

Statement of Health Problem

Norfolk, Virginia is one of the biggest cities in the state of Virginia with a population of 238,000 in 2020. 19.6% of the population is under the age of 18 and 11% is over the age of 65 (*U.S. Census Bureau QuickFacts: Norfolk City, Virginia*, n.d.). This 11% is less than the US average of 15.6%. 47% of the population is female with the majority of the population being white alone at 46%. The Black or African American alone population is 40% with the rest of the population being Asian, mixed, or Hispanic. Between 2016 and 2020, of the people ages twenty-five and older, 88% are high school graduates. About 17.8% of the population is in poverty and 12.9% of the population is without health insurance for those under the age of sixty-five. Norfolk is the melting pot of Virginia and is home to the largest naval station in the world which means that there are great differences in the people there and these people have diverse needs and health issues.

In 2019, 41,646 cases of cancer were reported in the state of Virginia, and 15,045 deaths were reported. According to the Virginia Department of Public Health, from 2014-to 2018, the Norfolk incidence count for all cancers was 5,224 (2,231 Black and 2,792 White, 2,631 female, and 2,593 male) (CDC, 2021). The mortality count was 2,085 (959 Black and 1,087 White, 953 female, and 1,132 male) (VDH, 2022). Cancer is a disease that grows and expands through our cells as they uncontrollably grow and spread throughout the body. Cancer is a genetic disease which means that it is caused by changes in genes that control the way our cells function and grow (National Cancer Institute, 2021). Typically, our bodies can handle this on their own, but as we age, the greater we are at risk of cancer. Many cancers are metastatic which means that it moves around the body, and this can only be helped with treatment. Treatment will help control

the growth and symptoms of cancer because these cancers can cause loss of bodily functions and death.

Traditional cancer treatments are often chemotherapy, surgery, and radiation. Other treatments are targeted therapies. All of these include the overarching goal of being cancer free, but also if the cancer is not curable, it is the best way to minimize symptoms and get as close to normal as possible. Treatment options can vary depending on several factors, such as general health, type and stage of cancer, and preference of treatment (Mayo Clinic, 2020). Specific treatments are aimed at killing cancer cells while others are used to relieve symptoms and improve the quality of life and health outcomes. These traditional treatment options are typically done to help after the onset, but there are other contributing factors that come before that contribute to the onset.

Besides genetics, different sets of behavioral and substance factors have added to the development of cancers. Studies cannot necessarily prove direct causation in singular studies, but multiple studies have pointed out similar associations between potential risk factors and increased cancer risks (National Cancer Institute, 2015). Alcohol is one risk factor that can be avoided and increases cancer risk with consumption increase. Cancer-causing substances are called carcinogens. Some of these substances are chemicals in tobacco smoke or radiation which can be avoided to an extent. Others are not so easily avoided like the air we breathe, our work environment, substances in the water we drink, or even our food (*Cancer-Causing Substances*, 2018). Our diet can lead to obesity or a certain impact of unknown nutrients that can add to the risk of cancer. While some of these may not even play a role because of genetics or just unforeseen contributing factors, cancer can still take a toll on a person's physical and mental health.

Cancer has physical side effects that vary based on stages and types of cancer. Some specific physical effects include anemia, bleeding and bruising, constipation and diarrhea, diabetes, fatigue, hair and hearing loss, heart and brain issues, etc. (*Physical Side Effects of Cancer* | Knight Cancer Institute | OHSU, 2019). Anemia can leave you fatigued and short of breath as your red blood cells have been depleted. Medications and treatment can lead to constipation, which is often helped with lots of liquids, but on the other hand, this can cause diarrhea which causes a loss of a lot of liquids. For fatigue and hormonal change, exercise and physical activity have been shown to improve energy and feeling. Hair loss can lower an individual's self-esteem and decline in mental health. All of these physical effects can lead to negative health outcomes and make the quality of life worse.

Emotional wellness is often disregarded, yet it influences the manner in which individuals think, act, respond to upsetting circumstances, and their general wellbeing. This can cause anxiety, depression, and stress which all can add to declines in wellbeing and health outcomes since there can be an absence of inspiration when treatment is still a choice. Feelings of discomfort can create barriers to care and worsen health outcomes. Treatment for mental health has shown promise to improve survival rates and improve overall health outcomes and quality of life (*Cancer and Mental Health*, n.d.). A few studies have shown the improvement in anxiety and depression and have seen improvement in medical conditions because people are more likely to pursue medical care and have a better quality of life.

Program Description

Creating a program to introduce different techniques that will improve the health outcomes and quality of life of those diagnosed with cancer can be life-changing for not only the individual but also families. Physical activity can be used as a way to reduce cancer risk before diagnosis and integrated into treatments to decrease possible side effects and symptoms. Physical activity can include anything that requires muscle usage and uses more energy than resting does, so this could be walking, running, working out, household chores, etc. Evidence has been linked to higher rates of physical activity and lower possible implications and risks of cancer, but this has only been observed (National Cancer Institute, 2020). Different studies and observations have shown to lower risks of bladder, breast, colon, esophageal, kidney, and stomach cancer. American Cancer Society Researchers and the National Cancer Institute (NCI) have done research to associate physical activity with lower risks of thirteen different types of cancer.

Exercise is important and linked to specific biological effects that associate it with specific cancers. For example, improving immune system function, reducing the risk of obesity, lowering hormone levels which are important in breast and colon cancer, and keeping insulin levels in check. Researchers from the American Cancer Society stated: “At least 18% of all cancers and about 16% of cancer deaths in the US are related to excess body weight, physical inactivity, alcohol consumption, and/or poor nutrition” and this can be affected by changes in the level of physical activity (American Cancer Society, 2020). A systematic review was performed

by Anne McTiernan and co-studies to discover the relationship between cancer risk factors and mortality for physical activity and people diagnosed with cancer. 145 studies were reviewed and show strong associations that can link physical activity to reducing the risk of most cancers (breast, stomach, esophagus, and kidney) and moderate evidence for lung cancer risk (McTiernan, 2019). There has been little to no evidence of association from any other cancers and more studies and trials are needed to confirm relationships. A few of the associations show dose-response relationships, but that relies on the population, type of cancer, and program trials.

Other studies have looked at integrating physical activity as well as dieting into traditional treatment as supportive care. These have been shown to have effects on anxiety and depression, sleep, and overall quality of life. Providing patients with the opportunity to reject their motivation to get better and a chance to improve their health status is better than just the use of draining traditional care methods. By getting trainers and families to help support patients in their health, the trajectory of negative health outcomes from cancer can be changed.

Another type of therapy more specifically aimed at the mental health of a cancer diagnosis and treatment symptoms is music therapy. Music is a way to express emotions, reflect on memories, and reach a relaxing state. Music is a medium for people to get away from all stressors in the current moment. Music therapy intercessions have been pursued for 10+ years to contrast the effects of music therapy with standard care versus standard care and other interventions. Review authors examined previous randomized control trials using music therapy to determine effectiveness and the beginning results of thirty trials indicated a positive effect on anxiety and mood, but no support for depression (Bradt, 2011). There was a moderate pain reducing effect found along with lower blood pressure and heart and respiratory rate, but there was no compelling evidence for enhancement of fatigue or physical status. The second trial set

was a group of twenty-two new trials that indicated moderate to strong beneficial impacts on anxiety and depression, but the significance of the found evidence still needs to be assessed. The new trials additionally showed an impact on alleviating pain levels and reducing blood pressure and heart rate (Bradt, 2016). In the last set of trials, twenty-nine additional studies were added, and they exhibited similar effects on mental health, specifically anxiety and depression, but at the second look, there was no shown effect on mood. Music has likewise shown to have a pain-reducing effect. Looking at the whole, this study shows that there may be advantages and improvements in Mood, hope, depression, anxiety, and pain from music interventions versus standard care (Bradt, 2021). Utilizing music treatment can be a restorative strategy for getting patients to have an inspirational perspective and experience so treatment is bound to make a difference.

The internet is one of the most prevalent and widespread sources of information. It is a primary source of how to obtain health information that educates and supports consumers in their physical and mental health (Powell et al., 2003). Anywhere you go in today's society, someone is on their smartphone, tablet, or laptop. Today's society and daily living revolve around the use of the internet and the information that we get from it from things as simple as tying a tie to symptoms and treatments of health conditions. Two unique reviews indicate promise in positively lessening the symptoms of mental health, more so anxiety and depression. Ying Wang and co-studies researched different databases to see different mediums such as email counseling, website programs, and single-session psycho-educational interventions and how they work with conveying information. The psycho-educational instruction reduced fatigue and depression while the health conditions need longer-term follow-up. These still have potential due to the widespread use of the internet for daily living (Wang et al, 2020). Fridriksdottir and his co-

studies looked at similar databases with the majority of concept tools of the intervention being self-management support, self-monitoring, feedback/tailored information, and communication with patients and healthcare professionals. This review shows promise and additionally positive outcomes with anxiety and depression (Fridriksdottir, 2017).

Including physical activity, music, and the internet in treatments have the potential to aid in mental and physical well-being. Incorporating these into the cancer patients' norms helps instead of hurting them. These can be combined or independently assessed, but anything that can help improve the overall health and health outcome is a benefit to health information and the individual's health.

Goals and Objectives

Creating a program aimed at changing behaviors contains an education component that increases the knowledge necessary to incite a behavior change. Individuals must have the motivation and knowledge to act and behave in a certain manner that creates a better health outcome. Program goals are general explanations of what the program expects to achieve. These goals are wide explanations of the sorts of discoveries that we trust that research and interventions will accomplish. They depict learning results and ideas in everyday terms. Program goals are explanations of long-range expected results of the program and educational plan.

The goals of this program are:

- Educate patients about risk factors and symptoms of cancer
- Educate patients about prevention and reduction factors for cancer.
- Reduce the mental health impacts of cancer diagnosis and treatment.
- Improve the quality of life of cancer patients.
- Improve the survival rates of those diagnosed with cancer.

Acknowledging a patient's condition and making sure that they know the risk factors that contribute to their risk of cancer is important in determining what next steps and measures they can look for that could help them in early diagnosis. Different cancers have different symptoms and depending on when addressed these symptoms can be more aggressive as cancer progresses.

Therefore, this will make treatment even more important because this will determine how to address questions and plot the next steps in dealing with the symptoms and how it may be possible to look at different routes for cancer progression and which one is in the best interest of the patient based on what we know about their risk factors. By educating a patient about the risk factors of cancer, we can not only determine what behaviors may have contributed to their current health situation but may be able to see trends when there are no behaviors or risk factors that the patient may have. Once these have been acknowledged, these behaviors can be changed and even new factors can possibly be added, and then the best course of action can be followed. This will then lead to the education of different behaviors and features that can reduce the symptoms caused by cancer and treatments.

Each goal comes with an underlying goal of itself. Educating patients about the risk factors and symptoms associated with cancer, would allow patients to possibly detect early their chances for occurrence and that can be the difference in treatment. These patients will learn about prevention and reduction factors of cancer because this will allow for the effort to control cancer in the reduction of cases and deaths. With cancer being the second leading cause of death, prevention and reduction become especially important. Reducing the mental health impacts of cancer diagnosis and treatment is important because patients and families experience a significant amount of stress, anxiety, physical pain, and uncertainty that surrounds several types of cancer. Improving quality of life and survival rates are targets because this intervention could lead to the possible saving of lives and even reduction of health care expenses by offering actions that could tie into mental health impact. Through collaborations and partnerships of both public and private organizations and the spread of data on cancer registries.

At the end of the day, the big overarching goal of creating an intervention is to improve health outcomes. These interventions can stretch from medications to reduce risks, looking at lifestyle choices to avoid, treatments that are known to increase risk, a screening test that allows for the diagnosis and removal of cancer, vaccines to protect, and surgery to remove at-risk tissue. Some forms of cancer grow faster than others and affect the physical and mental health of those diagnosed along with family members. Cancer diagnosis and treatments can affect the mental and physical well-being of a patient, or family, and on top of that, the entire quality of life can be declined. There is no guarantee that a patient diagnosed with cancer will survive, but the program is designed with survival being the best outcome, so this is our biggest goal. For survival to be our best outcome the need for goals that will reduce the impact of mental health issues that can mimic the symptoms of cancer. And studies show that if you can treat and minimize depression, anxiety, and stress that survival rates are longer. And also improving the quality of life will empower patients to have a sense of control over their illness and treatment.

Program objectives establish specific criteria and a set of standards that help evaluate the performance of a program. Objectives are specific statements that describe the results that we want to achieve in the project and how they will be met. These objectives follow the SMART criteria to make sure the objectives are clearly defined. The SMART attributes are Specific, Measurable, Achievable, Relevant, and Time-bound (HHS et al., 2014). These objectives can be focused on the process or outcome and are typically made for short-, medium-, and long-term results. The objectives of this program are:

- In the first introduction of the program, all patients are given information about their specific type of cancer and the risk factors. They will also receive information to decide on the interventions so that they can make an informed decision on partaking in the program.

- $\frac{1}{2}$ of the participants will give risk factors and symptoms they must be able to target behaviors and feelings throughout the first week of the program.
- During the next 6 months, five hundred patients diagnosed with cancer will participate in at least one of the programs aimed at reducing the mental health impact on survival.
- After completing the program, self-reported quality of life will be improved in at least $\frac{1}{4}$ of the participants.
- 3 months removed from the program, behaviors from the intervention have continued and been integrated into daily activities.

These objectives are specific and include “who”, “what”, or “where”. These only have one action so that there are no issues with measurement. These objectives are measurable and have a clear focus on “how much” change is to occur. These objectives are achievable and realistic based on the funding and resources allocated to the program. Relevant means that the objectives relate to the program and overarching goals while being completed in a specific timeline. The primary timeline for completing these objectives depends on how many courses of chemotherapy someone needs. One course can range from 3 to 6 months in cycles of 2 to 6 weeks, so the timeline for achieving these objectives must be strictly stuck to.

Implementation Plan

To determine who is eligible for the program, we will visit all oncology centers in Norfolk, VA (primarily the major centers of Sentara, Bon Secours, and CHKD). These are the institutions that we will partner with to implement our program and gain the permission of patients. The reason for choosing these sites is that patients will feel more comfortable with the program being involved at their primary care sites creating a safe atmosphere to get the desired results. These hospitals will be partners, so our funding will come in together along with government agencies such as the National Cancer Institute, the National Institute of Health, the Center for Disease Control and Prevention, and the Agency for Healthcare Research and Quality. These agencies have focused on cancer research and studies, so collaborating with them will allow for advancements in health outcomes at all levels. We will also partner with personal trainers, yoga instructors, families, and web application designers. These will allow us to give the proper and best interventions to the patients while having their best interests at the forefront.

Once our partners are established, then we will select those interested in the program based on a certain criterion. The criteria will include those who have expressed interest after being informed of the project and the features it entails. After expressing interest to doctors, we will review the medical history and survey questions about symptoms, risk factors, and mental well-being. We will also try to determine which patients will have the best family/friend support. From that point, we will look at the stages of cancer and how far along that cancer has progressed in the patients. We do not want to put anyone who is at the ending stage of cancer so that we can see if the program produces results in a course of treatment.

After selecting as many participants as possible, we will then educate the patient and his or her family/support system, if the patient allows, with information about the specific type of cancer, its symptoms, its risk factors, and his/her mental well-being after being diagnosed. This is when we will brief the patient about the program and intentions of including physical activity, music therapy, and web-based interventions. Patients will be informed of the involvement of instructors for each individual component and will be given the week before they begin treatment. This will allow patients to make an informed decision about the program and determine if they would like to proceed and begin when they begin their next course of treatment.

When incorporating physical activity into treatment, patients will be allowed to choose whichever type of physical activity they want to incorporate on that specific day. Whether it be walking, dancing, yoga, exercise, etc., if it is greater than 1.5 metabolic equivalent of task (MET), a measure of the intensity of physical activity. Physical activity has been linked with helping control weight, reducing sex hormones, and strengthening immune systems. It has also been linked with improving the quality of life in cancer patients and recent studies have shown to lower risks of cancer. Some have shown as much as a 20% risk decline and effects in thirteen types of cancer. Collaborating with a trainer will allow for activity to be done with precaution and at a slow effective pace so that patients are not overwhelmed. This will be done every other day for each cycle in the course of treatment. The trainers will conduct progress evaluations after each cycle and then from there each week's progression will be edited based on patient ability.

For music therapy, the goal is to alleviate the mental health impact that a cancer diagnosis can have on patients. Music can bring comfort and relaxation that can ease the pain and psychological battles that come with cancer. This can also help patients rest and sleep better

which can decrease symptoms of depression (Brennan, 2020). Music can also lift moods and reduce stress as it lowers cortisol levels, decreases blood pressure, and lowers heart rates. Music is encouraging, so creating a mood playlist to boost morale and express yourself during times of discomfort is important. Research has shown it helps mental health conditions such as anxiety and depression, so performing activities such as lyrical analysis and listening sessions will help with social connection and mood management (*Music Therapy and Mental Health*, 2019). Physically, music helps to ease and manage pain while also possibly increasing workout endurance which goes alongside the physical activity component of the intervention (NorthShore University HealthSystem, 2020). Music therapy can assist in pain management. With music reducing stress levels, it also provides a strong stimulus to the pain signals that enter the brain. Music can reduce the perception of pain. Listening to the mood boosting playlist can also boost physical performance and increase endurance when physical activity gets tough.

Another option of treatment for the intervention is a web-based program. Two separate studies show promise at reducing the symptoms of anxiety and depression. Ying Wang and co-studies searched research databases to discover intervention tools such as email counseling, website programs, and single-session psycho-educational interventions. These educational interventions can reduce fatigue and depression while the other health outcomes and feelings need to be pursued for time after it ends, but still have the opportunity to be effective because of the widespread use of the internet for daily living (Wang et al, 2020). Fridriksdottir and his co-studies looked at similar databases with the majority of intervention tools being self-management support, self-monitoring, feedback/tailored information, and communication with patients and healthcare professionals (Fridriksdottir, 2017). Implementing a web-based program will offer another option to get patients the educational and mental health care to improve the effects of

cancer. An application will be created and used similarly to the studies above as it will give daily health messages, ask questions about symptoms and feelings, educate patients about their current health status, and host counseling sessions. Counseling sessions will be held twice a week for 6 weeks then depending on the progress it will either remain the same throughout the rest of the course of treatment. While this can contradict the music therapy and physical activity treatment because it is more sedentary, but it has the same goals.

Both options will be implemented by cycle and course. After each individual cycle, a change will be made to either increase the intensity of the treatment, remain the same, or decrease. Therapists and trainers will be used to guide the music therapy and mental treatment and the web-based applications will be self-guided. Families and support systems have the opportunity to go through the intervention alongside the patients so that patients know they are not alone. The physical activity and music therapy treatments will be used side by side and the web application will be used independently.

Evaluation Design, with Logic Model

Evaluation is the cycle when we decide how important a program is or how its components are based on specific criteria or set of standards. These standards are created and acknowledged by stakeholders invested in the program and the conceivable results produced. There are five different types of evaluation: Formative, Process, Summative, Impact, and Outcome. The purpose of evaluation is to decide whether this intervention meets goals and objectives related to improved wellbeing or more positive health outcomes. The evaluation additionally gives responsibility to stakeholders and the community, increases social support, and adds to scientific research. Finally, evaluation serves as a tool to further develop the program itself. Using evaluation as a cycle permits us to accomplish these while accounting for all possible circumstances.

Formative evaluation is completed to examine the quality of the program in its beginning stages. This is so that changes and enhancements can be made while the program is in progress and before it concludes as headway is made (CDC, 2020). For this intervention, looking at the way that cancer patients receive their treatments (chemotherapy, music treatment, physical activity, web-based intervention) before and at the initial start date. Questions, for example, “how often”, “what if”, and “then what” will be asked to fully comprehend how functions will be done and how issues will be managed in the event that they emerge. Process evaluation checks to ensure that activities are implemented and conducted as planned. The entire implementation process is measured and followed to see what functions well and what does not. This process will be connected to Who, What, When, and Where questions. This will be directed at all of the progress checkpoints throughout the implementation of the program. These two types of evaluation go hand in hand and are very much alike.

Summative evaluation is utilized to determine how effective the intervention is. With this type of evaluation, the degree of change, awareness, knowledge, behavior, environment, or health status will be checked to see how well the program has functioned and how patients perceive it. In this program, cancer patients' health outcomes, quality of life, and mental health will be measured based on individual responses and measurement of quality of life. Quality of life can be measured via WHOQOL, an assessment created by the World Health Organization (World Health Organization, 2012). We will be able to decide how well the patient comprehends his/her cancer diagnosis and how the behavior change, or intervention activity has helped or upset their health status. Impact evaluation is based on measuring behavior or attitude changes and knowledge and awareness. This comes towards the end of the program and will show the way in which the program accomplished its goals. Outcome evaluation measures the disease more specifically. Impact evaluation and outcome evaluation together make up summative evaluation.

These sorts of evaluations will detail the last report of outcomes that may come. When assessing this program on cancer patients' mental health and health outcomes, the first step is to draw in and connect with stakeholders. The stakeholders in this intervention are hospitals, government agencies, physicians, therapists and fitness professionals, and researchers funding the program. These individuals must have faith and trust in what we are trying to achieve and have a specific vision for the program's outcomes. This program is set to reduce the impacts of cancer diagnosis and treatment on mental health, improve the quality of life of cancer patients, and improve the survival rates and health outcomes of those diagnosed with cancer. During the next 6 months, we aim to see at least five hundred patients diagnosed with cancer taking part in one of the program activities directed at reducing the impact of mental health on survival rates.

After completing the program, we look to see the self-reported quality of life through the WHOQOL, examining if it improved in at least $\frac{1}{4}$ of the participants. 3 months removed from the program, we want behaviors from the intervention to be continued and integrated into daily activities. We must evaluate this program as it progresses. Biweekly check-ins will ask each individual participant about their experience and how their wellbeing is. Each patient will also be asked if they would like to continue participating in the program. These results and feedback will be reviewed and taken into consideration as time passes. For participants who do not complete the intervention, all results for participants not completing a full cycle will not be considered into results to determine effectiveness of the program.

The Social Cognitive Theory (SCT) utilizes reinforcement and a 3-way model to show the collaborations between personal factors, environmental influences, and behavior. Reinforcement can be direct, vicarious (observational), or self. It adds to the general knowledge while additionally working close by the individuals' assumptions for what the result might be to figure out what behavior will be performed. This theory utilizes reciprocal determinism to consider the different ways of changing behaviors as they are overseen by an individual feeling of control (agency). Personal cognitive factors allude to one's capacity to handle data and apply it to their life. This incorporates self-viability, knowledge, and result assumptions. Ecological impacts are physical and social factors that add to an individual's way of behaving and can comprise of observational learning, boundaries and open doors, regulating convictions, and social help. These can straightforwardly influence ways of behaving and can either be health enhancing (gainful) or compromising (detrimental). The SCT permits people to assume a functioning part in their own wellbeing.

The ideas of the SCT fluctuate considering the variables in the three-way model. The personal cognitive factors, develops incorporate self-efficacy, collective efficacy, result assumptions, and knowledge. Self-efficacy is an individual's trust in his/her own capacity to play out a particular way of behaving. Collective efficacy is the conviction of a gathering of people to play out specific activities to get a result. Outcome expectations are the decisions of the outcomes of the moves made. This basically implies that we can either anticipate positive or adverse results from our activities. Knowledge is the comprehension of the wellbeing dangers and advantages of wellbeing practices and ways of behaving.

The constructs for environmental variables incorporate observational learning, normative beliefs, and social support. Observational learning is the point at which somebody learns ways of behaving or data by watching the ways of behaving and results of others. This can be acquired from techniques for peer-driven learning, media, and show scenes. Normative beliefs are the social standards, convictions, and ways of behaving that society considers to be OK. This is when discernments are significant on the grounds that this will show the contrast among convictions and genuine information. Social support is the consolation and support an individual gets from his/her informal community. An extra development of boundaries and valuable open doors additionally comes from natural variables. These environmental factors either make ways of behaving more straightforward or harder to perform.

For behavioral variables, constructs incorporate conduct capabilities, intentions, and support/discipline. Behavioral skills are the capacities expected to effectively play out a way of behaving. Intentions include objectives and thinking behind performing or evolving ways of behaving. These are our objective results behind ways of behaving. Support and disciplines are

the inspirations driving ways of behaving whether it be the evacuation of remunerations or disciplines or help to expand the way of behaving.

For this review, the most effective way to utilize the SCT is to include numerous constructs to help their interrelatedness and effect on each other. The various interventions utilized in this review to further develop health outcome results and the emotional well-being of patients determined to have cancer are physical activity, music therapy, and web-based interventions. By integrating self-efficacy, outcome assumption, and knowledge into the personal cognitive factors of the study participants, individual capacities for handling data and it are improved to roll out social improvements. With the review, giving the patients information about their condition and how it very well may be improved or overseen is crucial in making the certainty for evolving conduct. Ensuring that patients have the access and capacities to make conduct changes affected by their current circumstance is fundamental. This incorporates the social standards and perception of specific behaviors being performed which can be utilized as hindrances or open doors with regards to further developing these wellbeing results. When these behaviors are determined, expectations and inspirations (support and discipline) are expected to push patients forward.

Permitting these ideas to entwine with each other will augment the effect of these conduct changes. Toward the start of every program, we should provide patients with the information on their condition and get a comprehension of how their condition is affecting them. We should recognize the patient's confidence and the way in which they feel about their capacity to play out the ideal way of behaving. While considering the help they will have simultaneously and their general climate, the standards are fundamental marks of whether a change will happen. These regularizing convictions might require adjusting on the grounds that they are normal confusions,

or they might urge somebody to seek after activity. Conditions are significant for social help and giving the social or actual properties to make ways of behaving more straightforward or harder to perform. From the dynamic course of the intercession to after it closes, supporting elements are fundamental for proceeding with the changed way of behaving. Expectations are self-inspirations and support, and discipline are vital for increment or proceed with a conduct in the long haul.

Program: Improving health outcomes and mental health in cancer patients

Situation: A cancer diagnosis can change the entire dynamic of how a person is feeling physically and mentally, which in turn can create negative health outcomes and negatively impact mental health

Inputs	Outputs (Activities)	Outputs (Participation)	Outcomes
Funding	Deliver cancer education programs	Public	Short - Increased knowledge about cancer diagnosis
Staff	Focus groups and surveys for patients to self-report mental health and feelings (emotional and physical)	Cancer patients	Short - Selected the desired behavior change and increase in commitment to change said behavior
Time	Chemotherapy treatments	Health care professionals	Medium - Increase the action of new behavior
Community partners	Yoga classes	Yoga instructor	Medium - Positive effects of behavior change in mental health and health outcomes
Materials	Web classes and program	Personal Trainers	Long - Increase in positive health outcomes and

			negative mental health issues decrease
		Psychologists/Therapists	Long - Continued behavior change

References

- Bradt, J., Dileo, C., Grocke, D., & Magill, L. (2011). Music interventions for improving psychological and physical outcomes in cancer patients. *The Cochrane database of systematic reviews*, (8), CD006911. <https://doi.org/10.1002/14651858.CD006911.pub2>
- Bradt, J., Dileo, C., Magill, L., & Teague, A. (2016). Music interventions for improving psychological and physical outcomes in cancer patients. *The Cochrane database of systematic reviews*, (8), CD006911. <https://doi.org/10.1002/14651858.CD006911.pub3>
- Bradt, J., Dileo, C., Myers-Coffman, K., & Biondo, J. (2021). Music interventions for improving psychological and physical outcomes in people with cancer. *The Cochrane database of systematic reviews*, 10(10), CD006911. <https://doi.org/10.1002/14651858.CD006911.pub4>
- Brennan, D. (2020). *How Music Affects Mental Health*. WebMD. <https://www.webmd.com/mental-health/how-music-affects-mental-health>
- Carayol, M., Ninot, G., Senesse, P., Bleuse, J. P., Gourgou, S., Sancho-Garnier, H., Sari, C., Romieu, I., Romieu, G., & Jacot, W. (2019). Short- and long-term impact of adapted physical activity and diet counseling during adjuvant breast cancer therapy: the "APAD1" randomized controlled trial. *BMC cancer*, 19(1), 737. <https://doi.org/10.1186/s12885-019-5896-6>
- Cancer and Mental Health*. (n.d.). Mental Health America. <https://www.mhanational.org/cancer-and-mental-health>
- Cancer-Causing Substances*. (2018, December 28). National Cancer Institute; Cancer.gov. <https://www.cancer.gov/about-cancer/causes-prevention/risk/substances>
- CDC. (2020, February 5). *Practical use of program evaluation among sexually transmitted disease (STD) programs*. Centers for Disease Control and Prevention. Retrieved July 25, 2022, from <https://www.cdc.gov/std/program/pupestd.htm>
- CDC. (2021, June). *USCS Data Visualizations*. Gis.cdc.gov. <https://gis.cdc.gov/Cancer/USCS/#/AtAGlance/>
- Cramer, H., Lauche, R., Klose, P., Lange, S., Langhorst, J., & Dobos, G. J. (2017). Yoga for improving health-related quality of life, mental health and cancer-related symptoms in women diagnosed with breast cancer. *The Cochrane database of systematic reviews*, 1(1), CD010802. <https://doi.org/10.1002/14651858.CD010802.pub2>

Exercise Linked With Lower Risk of 13 Types of Cancer. (2016, May 17).

Www.cancer.org. <https://www.cancer.org/latest-news/exercise-linked-with-lower-risk-of-13-types-of-cancer.html>

Fridriksdottir, N., Gunnarsdottir, S., Zoëga, S., Ingadottir, B., & G. Hafsteinsdottir, E. J. (2017, September 18). *Effects of web-based interventions on cancer patients' symptoms: review of randomized trials - Supportive Care in Cancer.* SpringerLink; link.springer.com. <https://link.springer.com/article/10.1007/s00520-017-3882-6#citeas>

HHS, CDC, National Center for HIV/AIDS, Hepatitis, V., STD, & and TB Prevention. (2014). *Developing Program Goals and Measurable Objectives.* <https://www.cdc.gov/std/Program/pupestd/Developing%20Program%20Goals%20and%20Objectives.pdf>

How Long is Chemotherapy? What to Expect. (2021, April 13). Healthline.

<https://www.healthline.com/health/cancer/how-long-is-chemotherapy#average-length>

Mayo Clinic. (2020, June 4). *Cancer treatment - Mayo Clinic.* MayoClinic.org.

<https://www.mayoclinic.org/tests-procedures/cancer-treatment/about/pac-20393344>

McKenzie JF, Neiger BL, & Thackeray R. (2017). *Planning, Implementing, & Evaluating Health Promotion Programs: A Primer* (7th ed.). Pearson. ISBN 978-0-13-421992-9.

Music Therapy and Mental Health. (2019, February 5). Discovery Mood & Anxiety Program. <https://discoverymood.com/blog/music-therapy-and-mental-health/>

National Cancer Institute. (2015). *Risk Factors.* National Cancer Institute; Cancer.gov. <https://www.cancer.gov/about-cancer/causes-prevention/risk>

National Cancer Institute. (2020, February 10). *Physical Activity and Cancer.* National Cancer Institute; Cancer.gov. <https://www.cancer.gov/about-cancer/causes-prevention/risk/obesity/physical-activity-fact-sheet>

National Cancer Institute. (2021, May 5). *What Is Cancer?* National Cancer Institute; Cancer.gov. <https://www.cancer.gov/about-cancer/understanding/what-is-cancer>

Norfolk, VA | Data USA. (n.d.). Norfolk, VA | Data USA; datausa.io. Retrieved June 26, 2022, from <https://datausa.io/profile/geo/norfolk-va/#about>

NorthShore University HealthSystem. (2020, December 31). *9 Health Benefits of Music | NorthShore.* Northshore.org. <https://www.northshore.org/healthy-you/9-health-benefits-of-music/>

Physical Side Effects of Cancer | Knight Cancer Institute | OHSU. (2019). Ohsu.edu. <https://www.ohsu.edu/knight-cancer-institute/physical-side-effects-cancer>

Powell, J. A., Darvell, M., & Gray, J. A. M. (2003). The doctor, the patient and the world-wide web: how the internet is changing healthcare. *Journal of the Royal Society of Medicine*, 96(2), 74–76. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC539397/>

Roads, G. H. (2021, December 1). *Greater Hampton Roads :: Indicators :: All Cancer Incidence Rate :: County : Norfolk City, VA*. Greater Hampton Roads :: Indicators :: All Cancer Incidence Rate :: County : Norfolk City, VA; www.ghrconnects.org.
<https://www.ghrconnects.org/indicators/index/view?indicatorId=162&localeId=2991&localeChartIdxs=1%7C2%7C3>

U.S. Census Bureau QuickFacts: Norfolk city, Virginia. (n.d.). [Www.census.gov](http://www.census.gov).
<https://www.census.gov/quickfacts/norfolkcityvirginia>

Wang, Y., Lin, Y., Chen, J., Wang, C., Hu, R., & Wu, Y. (2020, March 16). *Effects of Internet-based psycho-educational interventions on mental health and quality of life among cancer patients: a systematic review and meta-analysis - Supportive Care in Cancer*. SpringerLink; link.springer.com.
<https://link.springer.com/article/10.1007/s00520-020-05383-3>

Warren, M. (2016, December 19). *The Impact of Music Therapy on Mental Health | NAMI: National Alliance on Mental Illness*. Nami.org.
<https://www.nami.org/Blogs/NAMI-Blog/December-2016/The-Impact-of-Music-Therapy-on-Mental-Health>

World Health Organization. (2012, March 1). *WHOQOL - measuring quality of life| the world health organization*. Www.who.int. <https://www.who.int/tools/whoqol>