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Mental Health Interventions for Adolescent Cancer Patients

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MENTAL HEALTH INTERVENTIONS FOR ADOLESCENT CANCER
PATIENTS

by

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A thesis submitted in partial fulfillment of the requirements
for the Honors in the Major Program in Nursing
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and in the Burnett Honors College
at the University of Central Florida
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ABSTRACT

Background: According to the National Cancer Institute (2017) approximately 15,270 individuals' ages 0 to 19 years would be diagnosed with cancer in 2017. Although pediatric cancer survival rates continue to rise, there are high rates of anxiety, fear, and depression amongst this population. The purpose of this literature review was to explore mental health interventions for adolescent cancer patients.

Methodology: A total of 165 articles were found in a literature search. Databases used include: CINAHL Plus with Full Text, Cochrane Center Register of Controlled Trials, Cochrane Clinical Answers, MEDLINE, and PsycINFO. As results were further narrowed based on relevance and set limiters a total of 7 articles were used for the purpose of this review.

Results: Multiple interventions were used in the purpose of this review including therapeutic play, animal-assisted activities, complementary and alternative medicine interventions, and coping and stress reduction interventions. Interventions used significantly decreased anxiety, fear, and depression amongst adolescent cancer patients.

Conclusion: One intervention was not more successful than another. Interventions that included participants in their plan of care, promoted normalcy, and were developmentally appropriate were successful at decreasing anxiety, depression, and fear in adolescent cancer patients.

DEDICATION

To God, thank you for leading me towards the profession of nursing. Your love for me has enabled me to pursue a career where I am able to give to those in need.

To my parents, Linda and William Faherty. Thank you for your continuous support and encouragement. You two have taught me to follow my dreams and have helped me turn those dreams into reality. No amount of words could ever express my love and gratitude for the both of you.

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INTRODUCTION

Background and Significance

In 2017, the National Cancer Institute (2017) predicted that 15,270 individuals ages 0 to 19 would be diagnosed with cancer. Accredited to the advancements made in cancer treatment, the American Cancer Society (2016) states that more than 80% of pediatric cancer patients survive 5 years or more. The National Cancer Institute (2017) states there are approximately 419,000 survivors of childhood and adolescent cancer in the United States. Specific to the adolescent subpopulation, lymphomas, brain and other central nervous system tumors, leukemias, gonadal germ cell tumors, thyroid cancer, and melanomas are among the most common cancers diagnosed (National Cancer Institute, 2017).

Although pediatric oncology survival rates continue to rise, treatments can be invasive or stressful for the child involved (Chiu, Chung, & Li, 2010). Surgery, radiation therapy, and chemotherapy are the main interventions used in cancer treatment (American Cancer Society, 2016). Anorexia, alopecia, fatigue, memory or concentration problems, and pain are among the many physical adverse effects associated with cancer treatment (National Cancer Institute, 2017). Fear of death, physical body changes, and isolation from friends and family contribute to the reports of fear, anxiety, and depression from pediatric cancer patients. The American Cancer Society (2016) states the undesirable physical symptoms of cancer also increase prevalence of emotional distress in pediatric cancer patients.

A qualitative study noted that several pediatric cancer survivors described their diagnosis as a “nightmare” and recounted how their families and peers reacted (Fletcher, 2017). One survivor in particular commented that while her support system remained positive to her face,

she could see the grief and sadness in their eyes when they walked into her hospital room (Fletcher, 2017). For some patients in this study, the often unspoken reality and fear surrounding their diagnosis contributed to the patients' feeling of isolation.

In a cross-sectional study Chiu (2010) showed that older pediatric patients reported higher levels of anxiety than younger pediatric patients. Participants in this study (age range from 7 to 15 years) attributed their feelings of anxiety and depression to the lengthy separation from family, friends, and school. Researchers convey that it is crucial for nurses to implement psychosocial interventions early in treatment to maintain a pediatric patient's normal development and lessen stress levels related to treatment. Recommendations from this study include implementing interventions, such as therapeutic play, that maintain a sense of normalcy for pediatric cancer patients during the time they spend isolated from friends and family. Interventions that allow the patient to participate and communicate with others like they would outside of the hospital setting are essential for the individual's normal growth and development (Chiu, 2010).

Other studies have focused on the need for support in pediatric populations experiencing distress. A study focusing on adolescents and young adults undergoing treatment showed that out of 1,386 pediatric patients receiving treatment on the oncology unit, 435 of them received psychological support after being referred by doctors, nurses, social workers, teachers, or family. Researchers concluded that the majority of patients had difficulty adapting to their diagnosis and treatment, which ultimately led to them receiving psychological support (Casanova, 2008).

Early recognition and intervention by the oncology nurse is essential to preventing or lessening the severity of depression, anxiety, and fear in adolescent cancer patients. A

longitudinal study that included 223 participants who ranged from 8-17 years of age showed that while the majority of adolescent cancer patients reported feelings of positivity, it is important to complete early screenings to identify those at risk for a mental health illness (Okado, 2016).

Interventions for adolescents at risk include monitoring and early treatment, including Psychiatric referrals or cognitive behavioral therapy.

As many cancers are now considered a chronic illness, health care professionals have become more aware of the importance of pediatric patients' emotional and psychosocial wellbeing throughout treatment (Chiu, 2010). Despite many studies concluding that there is a need for more research on mental health interventions in pediatric oncology units, the results available suggest that interventions should be appropriate for the patient's cognitive development. Examples would include distracting a younger child with a toy while they are undergoing chemotherapy, whereas use of guided imagery or meditation could be helpful in an adolescent undergoing treatment (Kazak, 2015).

Pediatric oncology nursing poses obstacles for nurses in regards to the large span of age groups present on pediatric oncology units. In one study Szalda (2015) states that out of the 109- oncology nurses that participated more than half stated they did not feel comfortable or know how to address mental health with their adolescent cancer patients, however 77% felt it was important to discuss the topic with their patients. Nurses in this study completed a one-hour interactive in-service education program and completed a survey 3-6 months following the in-service. After completing the in-service, 72% of the nurses felt comfortable and knew how to address mental health with their adolescent cancer patients (Szalda, 2015).

A qualitative study conducted by Wu (2009) acknowledges that the models of coping being used for adolescent oncology patients lack input from the patients themselves, further highlighting the gap of knowledge regarding mental health interventions for adolescents undergoing cancer treatment. Researchers suggest that educating nurses and other health care professionals on adolescent coping mechanisms will enable them to implement more effective interventions that will promote a supportive environment (Wu, 2009). Interventions specific to the adolescent age group could promote psychological adjustment, therefore decreasing the prevalence of anxiety, depression, and fear among this population undergoing cancer treatment (Wu, 2009).

Research like this suggests that there are a lack of education and resources provided to pediatric oncology nurses to address these issues. Providing educational information to nurses on adolescent psychosocial development could increase the effectiveness of interventions used on pediatric oncology units. Interventions that target adolescent cancer patients' mental health should be included in their plan of care to decrease the prevalence or severity of symptoms, which is why further research is critical. Recent studies have shown that the models being used to develop interventions for adolescent cancer patients are based off evidence that supports adult coping mechanisms (Wu, 2009).

Purpose

The purpose of this literature review is to explore mental health interventions for adolescent cancer patients. The Food and Drug Administration (2018) considers individuals between the ages of 12-21 years old adolescents. This review will concentrate on interventions that focus on decreasing feelings of depression, anxiety, and fear reported by pediatric oncology

patients (American Cancer Society, 2016). Depression will be defined as feelings of helplessness, loneliness, or hopelessness (Chiu, 2010). Anxiety will be defined as feelings of worry, upset, and nervousness (Chiu, 2010). Fear will be defined as a strong emotion originating from something painful or unknown that is happening (Cambridge University Press, 2018).

Methodology

A comprehensive examination of literature was conducted to review available literature that addressed mental health interventions in adolescent oncology patients. Efficacy of these studies was also evaluated. Databases used include: CINAHL Plus with Full Text, Cochrane Center Register of Controlled Trials, Cochrane Clinical Answers, MEDLINE, and PsycINFO.

The following search terms were used: cancer* or oncology* or neoplasm* NOT survivor* or adult* or parent* AND anxiet* or depress* or fear* AND cognitive behavioral therap* or intervention* or mindful* or mental health. Inclusion factors include research published between 2008-2018, journals and academic journals written in the English language. Exclusion factors include studies focusing solely on younger pediatric oncology patients (under 12 years of age).

A total of 165 articles were found (refer to Appendix A for diagram of literature exclusion process). To narrow results, duplicate articles were removed resulting in 140 articles. To further narrow results, article titles that did not focus on mental health interventions for adolescent cancer patients were removed. This process resulted in 31 remaining articles. Abstracts and articles were read in detail, discarding studies that did not focus on mental health interventions for adolescent cancer patients. A total of 7 articles were used for this literature review and met inclusion criteria.

RESULTS

A total of seven articles are included in this review of literature focusing on mental health interventions for adolescent cancer patients. Five studies included did not focus on adolescents specifically, but included their age range in their study. Therefore, those studies were deemed applicable and included in the review. Interventions were organized into the following categories: therapeutic play interventions, animal-assisted interventions, complementary and alternative medicine interventions, and coping & stress reduction interventions.

Therapeutic Play Interventions

Therapeutic play was used as an intervention in three studies included in this review. Interventions were adapted to match the participants' psychosocial developmental stage. LeVieux-Anglin & Sawyer (1993) define therapeutic play as "a set of structured activities designed according to psychosocial and cognitive development of children and health-related issues to prepare children psychologically for hospitalization." Therapeutic play enables pediatric oncology patients to socialize with patients their own age, therefore aiding in healthy growth and psychosocial development.

Tsai (2013) examined the impact of therapeutic play on anxiety and fear during radiotherapy (RT) treatment in pediatric brain tumor oncology patients. Nineteen patients, between the ages of 3-15 years old, were included in this non-randomized study. The intervention group (9 participants) participated in 15-20 minutes of therapeutic play daily for one week prior to RT. During this time they had the opportunity to paint, play video games, and watch TV. Anxiety was measured during RT using Faces Anxiety Scale (FAS), Beck Youth Anxiety Inventory (BAI-Y), heart rate variability (HRV) and salivary cortisol concentration.

Results showed that 9 out of 10 patients in the control group completed RT without sedation; 8 out of 9 patients in the study group completed RT without sedation and signs of anxiety were less noticeable to health care professionals. The difference in FAS scores between the control and study group were statistically significant ($p=0.05$). The difference in BAI-Y scores was also significant ($p=0.01$) between two groups. There was a statistically significant difference in HRV ratio ($p=0.05$) between the control and study groups. There was also a statistical significant difference in salivary cortisol concentration between the control and study group ($p=0.02$). Tsai (2013) concluded that therapeutic play does decrease anxiety levels, and increase cooperation in pediatric oncology patients.

A quasi-experimental study examined the effectiveness of therapeutic play in decreasing anxiety and depression in Chinese pediatric oncology patients (Li, Chung, & Ho, 2011). One hundred and twenty-two pediatric oncology patients (ages 8-16 years old) were included in this study. For one week the experimental group (52 participants) engaged in 30-minutes of therapeutic play each day using a virtual reality game where they were able to play games such as volleyball, football, or billiards. Participants' anxiety and depression levels were measured using the Chinese Version of the State Anxiety Scale for Children (CSAS-C) and Center for Epidemiologic Studies Depression Scale for Children (CES-DC). Results show that depression scores ($p=0.02$) decreased significantly in the experimental group following the intervention, however there was no significant difference in anxiety scores ($P=0.07$) between the experimental and control group.

Gårdling (2017) examined age appropriate therapeutic play interventions to decrease anxiety and the use of general anesthesia (GA) in pediatric oncology patients undergoing

radiotherapy (RT). Thirty-three participants (ages 3-18 years old) were included in this quasi-experimental clinical trial. The seventeen participants included in the experimental group were provided with a booklet explaining procedures (one for 3-10 years old, one for 11-18 years old), a storybook about two children undergoing RT, and two “doll-size” models used for play and demonstration of procedures. Participants also had the choice to listen to music, a story, or watch a movie through audiovisual (AV) goggles. Because patients are often required to be alone in radiotherapy rooms, “safety string” was also used to connect patients to their parents during RT.

Anxiety, pain, and the child’s emotional response was measured using the following: Faces Pain Scale-Revised (FPS-R), Visual Analog Scale (VAS), heart rate (HR), and Children’s Emotional Manifestation Scale (CEMS). Results showed that six children in the control group were able to complete RT without sedation, while 10 received GA. Eight of the children in the intervention group remained awake, while nine received GA. However, all eleven participants (ages 10-18 years old) in both the control and intervention groups remained awake during RT. There was no statistically significant difference in anxiety scores reported between the control and intervention groups. Participants in the intervention group had significantly higher HR prior to RT ($p=0.04$), however there was not a significant difference in HR between the intervention and control groups after completing RT.

Animal-Assisted Activity Interventions

Animal-assisted activities (AAA) on pediatric oncology units were used as an intervention in one study included in this review. Pet Partners (2016) defines animal-assisted activities as “opportunities for motivational, educational, and/or recreational benefits to enhance quality of life... delivered by a specially trained professional, paraprofessional, and/or volunteer,

in partnership with an animal that meets specific criteria for suitability.” Chubak (2017) examined the potential of animal-assisted activities in pediatric oncology units. Researchers of this pilot study wanted to see if AAA could decrease anxiety, fear, and depression in pediatric cancer patients. Nineteen pediatric cancer patients (ages 7-25 years old) were included in the study. A therapy dog visited participants’ private rooms with a trained handler for a maximum of 20 minutes. Effectiveness of AAA interventions were measured using self-report surveys that looked at distress, anxiety, and sadness by participants and staff prior to/post therapy dog visit, direct observation, EMR and case review (Chubak et al., 2017). These subjective results showed that 94% of participants said they enjoyed the therapy dog visit and 86% of staff said they saw positive benefits such as decreased anxiety and sadness from patients following the therapy dog visit. Chubak (2017) stated that findings supported the idea that AAA decreases anxiety, fear, and depression in pediatric oncology patients. The difference in anxiety, depression, and fear reports prior to/post AAA intervention were statistically significant ($p=0.002$).

Complementary and Alternative Medicine Interventions

The National Cancer Institute (n.d.) defines complementary and alternative medicine (CAM) as “forms of treatment that are used in addition to or instead of standard treatments.” Çelebioglu (2015) stated that 31-84% of pediatric cancer patients use some type of CAM during treatment. Complementary and alternative medicine interventions including belly breathing, massage therapy, and biofeedback were examined in two studies included in this review.

A quasi-experimental study examined the ability of massage therapy to decrease anxiety and pain from intrathecal therapy (IT) and bone marrow aspiration (BMA) in pediatric cancer patients (Çelebioglu, Gürol, Yildirim, & Büyükavci, 2015). Twenty-five participants (ages 4-15

years old) were included in this study. Twelve patients included in the experimental group received one massage for 10-15 minutes from a licensed massage therapist prior to treatment, while the control group received treatment without any intervention. Anxiety and pain of pediatric cancer patients included in this study was measured using visual analogue scale (VAS) prior to the massage and after IT/BMA. Celebioglu (2015) found that the difference in the experimental group's anxiety and pain scores pre and post intervention were significant ($p < 0.05$). However, the control group's anxiety and pain scores pre and post intervention were not statistically significant ($p > 0.05$).

Shockey et al. (2013) evaluated the use of belly breathing and biofeedback techniques to decrease preprocedural anxiety and fear in pediatric cancer patients. Twelve pediatric cancer patients (ages 8-14 years old) were included in this feasibility study. Researchers set up four 60-minute sessions where a study investigator introduced belly breathing during the 1st session, biofeedback techniques in the 2nd session, and combined the two in the remaining 3rd and 4th sessions. Anxiety and fear were measured using the following: FACES scale, State/Trait Anxiety Scale for Children (STAIC), baseline heart rate and heart rate variability (HRV), and a satisfaction survey (Shockey et al., 2013).

Results suggest no statistical significance regarding pre/post intervention fear scores, however anxiety scores significantly decreased throughout the four sessions. Improvement in participants HRV was also noted. Shockey et al. (2013) found that 63% of participants said belly breathing alone helped ease distress and 45% of participants said biofeedback techniques alone helped decrease distress. However, 81% of participants said the combination of belly breathing and biofeedback techniques significantly decreased anxiety and fear. There was a statistical

significant difference in anxiety and fear between the control and experimental group ($p < 0.05$) following the 3rd and 4th sessions where biofeedback & belly breathing were used together.

Coping and Stress Reduction Interventions

One study attempted to decrease depression, anxiety, and fear in adolescent cancer patients by using coping and stress reduction interventions.

Lin (2016) evaluated a nurse-led management model that focused on increasing adolescent cancer patients' quality of life. Seventy-three adolescent cancer patients (mean age of 13 years old) were included in this randomized controlled clinical trial. Participants were split into two groups: 36 adolescents were assigned to a nurse-led management program, 37 participants were assigned to a doctor-led program. The nurse-led management program included stress management skills (slow breathing), problem management (listing, selecting, defining a problem, brainstorming, and strategies for choosing an action plan), mood improvement by getting involved in task-oriented activities, strengthening social support with family and friends, and increase overall well-being (Lin, Zhou, Zhang, & Huang, 2016). In addition, the nurse-led model also included optional follow-up appointments that included physical examinations, laboratory tests, and pharmacological interventions with oncologists. The doctor-led management model included the same optional follow-up appointments (physical examination, laboratory tests, and pharmacological interventions) with an oncologist, but did not offer psychological support to patients.

Effectiveness of nurse-led and doctor-led management models were measured using the following: Hospital Anxiety and Depression Scale (HADS), European Organization for Research and Treatment of Cancer (EORTC), and Quality of Life Questionnaire Core 30 (QLQ-C30).

Results show a statistically significant decrease ($p < 0.05$) in depression and anxiety in participants that completed the nurse-led management model. Quality of life reports had increased in the nurse-led management model group ($p < 0.05$) as well, when compared to the doctor-led program.

DISCUSSION

Therapeutic play, animal-assisted activities, belly breathing, biofeedback, a nurse-led management model, and massage therapy were interventions that were successful in decreasing anxiety, fear, and depression in adolescent cancer patients. Multiple articles acknowledged that adolescents are a complex group to treat. Wu (2013) credits this population's complexity to its "critical period of psychological development," including changes in body image, self-identity, and outside relationships. Referring to Erikson's Stages of Psychosocial Development, adolescents face Identity vs. Role Confusion during this time. This population is trying to identify who they are as a person by establishing personal values, goals, and beliefs (Crowe Associates Ltd, n.d.). London (2017) states that interventions that promote independence and control are important to include when caring for an adolescent. Examples of possible interventions include, allowing the adolescent to choose a medication route (intravenous or implant) or providing opportunities for them to socialize with adolescent patients admitted with similar diagnoses.

Interventions in this review that gave participants control, maintained a sense of normalcy, as well as developmentally appropriate were successful at decreasing anxiety, depression, and fear in adolescent cancer patients. Therapeutic play allowed participants to choose an activity based on the patient's personal interests (virtual volleyball, painting, reading, movies, music, etc). Virtual reality intervention not only gave participants control, it also got them physically moving. Interventions like such provided an "escape" for adolescent cancer patients and even provided them with the opportunity to socialize with other patients with similar diagnoses.

London (2017) states the importance of encouraging adolescent patients to express their thoughts and feelings throughout treatment. Interventions like belly breathing, goal-oriented thinking and stress management skills provide adolescent cancer patients with this opportunity. Interventions like such correlate to the stage of psychosocial development adolescents face during this time. While therapeutic play provided an outlet for participants, interventions like ones included in the nurse-led management program promote critical thinking that may be more helpful for an adolescent cancer patient long-term. It helps them maintain a sense of individuality and independence during a time when they fear losing control or independence (London, 2017).

Limitations of this review include small sample sizes, age groups not specific to adolescents, few randomized clinical trials, and a basic lack of research on mental health interventions used for adolescent cancer patients. Five of the studies had 33 or less participants included in their sample size, with the smallest sample size being 12. The largest sample size included in one study was 122 participants, while the other study included 73 participants. None of the studies mentioned using a power analysis to determine sample sizes. Several studies that included small sample sizes acknowledged this as a limitation and suggest future studies include more participants to study an intervention on a larger scale. By using a larger sample group, evidence and statistical data would be stronger.

While all studies included participants in the adolescent age range, none focused specifically on adolescent. There seems to be a gray area on what is considered an adolescent. For the purpose of this review, the FDA's definition was used. Age ranges from all studies included 3-25 years old. The wide variety of age groups included in the studies includes several

psychosocial stages; therefore it is difficult to determine which interventions are more successful for adolescents with cancer.

While different study designs were used in the articles included in this review, only one was a randomized control trial. It is unclear how intervention and control groups were chosen. Because there is a possibility for bias in nonrandomized studies, it is important for more randomized control trials on mental health interventions for adolescent cancer patients to be completed. The lack of research on the topic of this review is also a limitation. It is difficult to determine which interventions are most successful, as well as how to apply the results found. Overall, interventions used were found to be successful. However, more research on adolescents specifically is needed to determine clinical significance of interventions used.

NURSING IMPLICATIONS

It is important for nurses working with adolescent cancer patients to recognize the presence of coping challenges during treatment. Some evidence show that interventions focusing on promoting independence and maintaining normalcy may be helpful in decreasing anxiety, fear, and depression in this population. Making resources such as virtual games or unit-based chat rooms, available in pediatric oncology units may facilitate the decrease of mental health problems in adolescent cancer patients. The implementation of animal-assisted activities, music or massage therapy on pediatric oncology units may also be helpful. While interventions mentioned above may be expensive, nurses can educate patients on belly breathing and guided imagery to decrease anxiety, fear, and depression. Interventions like these are free and can be used at any time and place.

Educating nurses on the prevalence of anxiety, fear, and depression in this population, as well as the sign and symptoms of a potential problem, is equally important. Nurses should assess their patients' mental health frequently and implement nonpharmacological interventions early. Because chemotherapy and radiation can often be given on an outpatient basis it is important for nurses to be aware of and provide these individuals with information about community resources, such as group therapy, to decrease anxiety, fear, and depression.

APPENDIX A: LITERATURE EXCLUSION PROCESS

APPENDIX A: LITERATURE EXCLUSION PROCESS

DATABASES USED: CINAHL Plus with Full Text, Cochrane Central Register of Controlled Trials, Cochrane Clinical Answers, MEDLINE, PsycINFO

KEY TERMS: (cancer* or oncology* or neoplasm*) NOT (survivor* or adult* or parent*) AND (anxiet* or depress* or fear*) AND (cognitive behavioral therapy* or intervention* or mindful* or mental health*)

LIMITERS: Full Text, Published Date: 2008-2018, English language, Age Group: Adolescent: 13-18 years

Total Articles Found – 165

LIMITERS: Duplicate articles removed

Total Articles Found – 140

LIMITERS: Titles not relevant to mental health interventions for adolescent cancer patients

Total Articles Found – 31

LIMITERS: Abstracts and articles focused on mental health interventions for adolescent cancer patients

Total Articles Found – 7

APPENDIX B: TABLE OF EVIDENCE

APPENDIX B: TABLE OF EVIDENCE

Key Abbreviations

D=depression, A=anxiety, F=fear

Citation	Title	Purpose	Study Design	Intervention	Sample	Results	D	A	F
Gårdling, J., Törnqvist, E., Månsson, M. E., & Hallström, I. K. (2017). Age-appropriate preparations for children with cancer undergoing radiotherapy: A feasibility study. <i>Journal Of Child Health Care, 21</i> (4), 370-380. doi:10.1177/1367493517727070	Age-appropriate preparations for children with cancer undergoing radiotherapy: a feasibility study	Focused on age-appropriate interventions to alleviate anxiety and fear for pediatric oncology patients undergoing radiotherapy; therefore potentially decreasing the number of patients using general anesthesia (GA)	Quasi-experimental controlled clinical trial	2 booklets (<i>one for ages 3-10, one for ages 11-18</i>) with pictures explaining radiotherapy (RT), picture book, "doll-sized" models, children had the choice of listening to music/story or watching movie through AV goggles, "safety string" connecting parents and child	33 children (<i>ages 3-18 years old</i>), 16 individuals in control group, 17 individuals in intervention group	All 11 patients (<i>ages 10-18 years</i>) were able to stay awake during RT; interventions were effective for older pediatric patients		X	X

<p>Tsai, Y., Tsai, S., Yen, S., Huang, K., Mu, P., Liou, H., & ... Chen, Y. (2013). Efficacy of therapeutic play for pediatric brain tumor patients during external beam radiotherapy. <i>Child's Nervous System: Chns: Official Journal of the International Society for Pediatric Neurosurgery</i>, 29(7), 1123-1129. doi:10.1007/s00381-013-2099-3</p>	<p>Efficacy of therapeutic play for pediatric brain tumor patients during external beam radiotherapy</p>	<p>Examine the effects of therapeutic play on anxiety in pediatric oncology patients</p>	<p>Quasi-experimental</p>	<p>15-20 minutes of therapeutic play every day before RT, 5x a week</p>	<p>19 patients (ages 3-15 years old), 10 in control group and 9 in intervention group</p>	<p>Intervention group reported significantly lower anxiety scores than control group; 8 out of 9 completed RT without sedation & had no behavioral problems</p>		<p>X</p>	<p>X</p>
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<p>Li, W. H., Chung, J. O., & Ho, E. K. (2011). The effectiveness of therapeutic play, using virtual reality computer games, in promoting the psychological well-being of children hospitalised with cancer. <i>Journal of Clinical Nursing</i>, 20(15/16), 2135-2143. doi:10.1111/j.1365-2702.2011.03733.x</p>	<p>The effectiveness of therapeutic play, using virtual reality computer games, in promoting the psychological well-being of children hospitalised with cancer</p>	<p>Examine if therapeutic play has the potential to decrease fear, depression, and anxiety in pediatric oncology patients</p>	<p>Quasi-experimental, pretest-post-test between-subject design</p>	<p>30-minute virtual reality game daily (5x/weeks); small groups maximum of 4 children per play room</p>	<p>122 patients (ages 8-16 years old), 70 patients in control group, 52 in experimental group</p>	<p>Experimental group reported significantly less depressive symptoms post intervention; no significant decrease in anxiety compared to control group</p>	<p>X</p>	<p>X</p>	<p>X</p>
<p>Shockey, D. P., Menzies, V., Glick, D. F., Taylor, A. G., Boitnott, A., & Rovnyak, V. (2013). Preprocedural distress in children with cancer: An intervention using biofeedback and relaxation. <i>Journal Of Pediatric Oncology Nursing</i>, 30(3), 129-138. doi:10.1177/1043454213479035</p>	<p>Preprocedural distress in children with cancer: an intervention using biofeedback and relaxation</p>	<p>Study the effect of relaxation and biofeedback techniques on preprocedural distress</p>	<p>Feasibility study</p>	<p>60-minute sessions (x4) with a study investigator; belly breathing introduced in 1st session, followed by biofeedback techniques in 2nd; repeated both in 3rd/4th sessions</p>	<p>12 participants (ages 8-14 years old)</p>	<p>81% of patients felt less anxiety and fear after utilizing belly breathing and biofeedback techniques</p>	<p></p>	<p>X</p>	<p>X</p>

Lin, H., Zhou, S., Zhang, D., & Huang, L. (2016). Evaluation of a nurse-led management program to complement the treatment of adolescent acute lymphoblastic leukemia patients. <i>Applied Nursing Research: ANR</i> , 32e1-e5. doi:10.1016/j.apnr.2016.08.001	Evaluation of a nurse-led management program to complement the treatment of adolescent acute lymphoblastic leukemia patients	Evaluate nurse-led educational program to improve pediatric cancer patients psychologic health	Randomized controlled clinical trial	Educational program - included stress management skills, problem identifying, encouragement, strengthening relationships	73 adolescents (<i>median age 13 years old</i>); 36 in the nurse-led program, 37 in doctor-led program	Adolescents in nurse-led program reported significantly lower anxiety and depression scores than doctor-led program	X	X	X
Chubak, J., Hawkes, R., Dudzik, C., Foose-Foster, J. M., Eaton, L., Johnson, R. H., & Macpherson, C. F. (2017). Pilot study of therapy dog visits for inpatient youth with cancer. <i>Journal of Pediatric Oncology Nursing</i> , 34(5), 331-341. doi:10.1177/1043454217712983	Pilot study of therapy dog visits for inpatient youth with cancer	Examine potential benefits of animal-assisted activities on pediatric oncology units	Pilot study	One therapy dog visit for 20 minutes in the patient's private room	19 participants (<i>ages 7-25 years</i>); 9 females, 10 males	Patient reported lower levels of anxiety and distress following therapy dog visit	X	X	X

<p>Çelebioglu, A., Gürol, A., Yildirim, Z. K., & Büyükavci, M. (2015). Effects of massage therapy on pain and anxiety arising from intrathecal therapy or bone marrow aspiration in children with cancer. <i>International Journal of Nursing Practice</i>, 21(6), 797-804. doi:10.1111/ijn.12298</p>	<p>Effects of massage therapy on pain and anxiety arising from intrathecal therapy or bone marrow aspiration in children with cancer</p>	<p>Examine the ability of massage therapy to decrease pain, anxiety, and fear in pediatric cancer patients</p>	<p>Quasi experimental study</p>	<p>12 experimental group participants received one 10-15 minute massage before treatment</p>	<p>25 participants (ages 4-15 years old)</p>	<p>Experimental group reported significantly lower pain and anxiety scores</p>		<p>X</p>	<p>X</p>
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