

# Review of Physical and Psychological Impacts of Cancer on Children and Strategies to Improve it

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## Abstract

**Purpose:** Children with cancer experience physical and emotional health consequences which influence their body image and self-confidence, and decrease their physical, mental and social functions. The current study will highlight precise evaluation of physical and psychological impacts of cancer among children that is necessary to guarantee excellent care and efficient therapy and to find the best ways to decrease these impacts.

**Methods:** The literature search revealed 1200 topics for initial investigation. After reviewing the topics for their overall topics related to physical and psychological impacts of cancer on children and Adolescents and Strategies to decrease these effects, due to exclusion criteria 20 studies remained for literature review.

**Results:** The results showed that childhood cancer leads to physical and psychological negative impacts on children such as pain, fatigue, social isolation, deterioration of self-concept, body image disturbance, nausea, discomfort, anxiety and stress and to reduce these effects some strategies suggested and tested such as hospital clowns, play, encourage kids' participation in healthcare, social therapy, massage therapy, animal-assisted intervention, mandala drawing, the home-based multimodal symptom-management program cognitive-behavioral therapy and problem-solving skills training.

**Conclusion:** Healthcare professionals and their families must provide psychological therapies and physical support to children diagnosed with cancer in order to improve their quality of life and lessen the negative consequences of the disease and treatment. Therefore, need to further studies to establish these strategies in line with progress and development in health care services.

**Key words:** physical and psychological effects, cancer, children

## Introduction

Childhood cancer is a major cause of morbidity and mortality. Globally, cancer is one of the most severe health illnesses among children and adolescents. Every year approximately 151,435 cases with cancer are diagnosed that lead to physical and psychological impacts on children and adolescents (Cancer Statistics Center, 2020 & Schüz, J.; Roman, E, 2021). Furthermore, previous data from the World Health Organization showed approximately 400,000 children and adolescents aged 0–19 are diagnosed with cancer annually (WHO, 2021). A young population with longer life expectancies and a recognized rising cancer burden both locally and globally, pose challenges to providing the finest healthcare.

Locally, the Kingdom of Saudi Arabia has seen an increase in the incidence of cancer over time (Chaudhri, E., Fathi, W., Hussain, F., & Hashmi, S. K., 2020). This may be due to improvements in diagnostic techniques, medical technology, and an effective system for referring patients to reputable tertiary hospitals and oncology-specific treatment facilities located in the country's major cities for further testing and treatment (Chaudhri, E., Fathi, W., Hussain, F., & Hashmi, S. K., 2020). Within this demographic, globally, acute lymphoblastic leukemia is the most common type of childhood cancer. It accounts for approximately 19 percent of all pediatric cancers (WHO, 2021), constituting 34.6 percent of all cases in Saudi Arabia (Ministry of Health, 2020). Children with cancer face many challenges regarding diagnosis and treatment that can affect their lives. Children experience physical and emotional health consequences which influence body image and self-confidence, and decrease their physical, mental and social functions. Moreover, the parents and siblings are profoundly affected psychologically, physiologically, socially, and financially (Lewandowska, A at et al., 2021).

Some studies have been conducted to assess physical and psychological impacts of cancer on children and their parents. A study was done by Lewandowska, A at et al., (2021) to evaluate issues that faced children and parents during treatment and hospitalization and recognized the requirements from their experience. As a result of this study, the authors showed that 82% of children report having unpleasant feelings with the illness overall; the most common ones are anger (33%), depression (58%) and fear (61%). Furthermore, patients most frequently cited isolation as a factor that negatively impacted their wellbeing (76%).

Additionally, the shock of the child and families from identifying the medical diagnosis, the process of diagnostic tests, the course of therapy, recurrence of admission to the hospital, and the health care organization environment are factors that interfere with mental and physical functions, low self-esteem and negatively impact on body image (H.J. Hsiao et al., 2019 & M. Oud et al., 2019). According to Miller et al. (2011), physical side effects such as

nausea, discomfort, and fatigue are frequently linked to chemotherapy and can affect patient compliance with treatment and recovery. However, children with cancer may experience less pain, anxiety, and depression with cognitive-behavioral therapy. It has the potential to lessen behavioral discomfort as well. More research is required on these components of functioning, as there has been insufficient study on them despite the large effects on stress, anger, and self-efficacy. Because the results are based on a variety of participants and interventions, it is important to carry out carefully planned intervention studies that involve cancer survivors (Melesse, T. G., Chau, J. P. C., & Nan, M. A., 2022). In addition, Arriaga, P., Melo, A.S. & Caires, S. (2020) conducted a study to investigate the impact of Hospital Clowns (HCs) on the physical and emotional responses of pediatric patients during ambulatory chemotherapy. HCs are professional artists who work to foster positive relationships through play and humor with patients, caregivers, and medical staff in order to promote a happy environment at the hospital (Spitzer 2006). HCs are one of the numerous complementary non-pharmacological approaches such as play, that appear to encourage kids' participation in healthcare (Stenman et al. 2019). Diversion, visualization, and music therapy are also suggested to be helpful coping mechanisms for kids facing more invasive and painful cancer treatments (Landier and Tse 2010; Thrane 2013). Hospital Clowns (HCs) employ a number of these strategies in concert with one another with the primary objective of improving the wellbeing of everyone they come into contact with while visiting patients. The results of this study demonstrated the value of HCs as supportive care agents for children, as their short-term effects during ambulatory chemotherapy appear to improve the health of young patients (Arriaga, P., Melo, A.S. & Caires, S., 2020). An evidence-based clinical practice guideline (CPG) done by Christen et al. 2020 showed increase in the proportion of children, adolescents and young adult cancer survivors, suffering from cancer related fatigue, even years after the end of treatment.

A local study by Al Thibani & Moud, (2024), aimed to assess the anxiety levels of children with cancer and their parents following admission to the Military Hospital in Riyadh City. According to this study, parents of cancer patients as well as their children are suffering from moderate to severe anxiety. It is crucial to give careful thought to the psychological health of cancer patients and their families; it is not a subject to be disregarded (Al Thibani & Moud, 2024).

One study showed children and adolescents with cancer may experience pain, anxiety, or depression, which presents a significant problem for health care providers (Rodriguez, 2020). In recent years, a number of studies have been published that highlight the benefits of technology for the management of symptoms (Rodriguez, 2020). It is crucial to take this research into account in order to lessen the detrimental effects on this population's quality of life (Rodriguez, 2020). In order to better understand the advantages of emerging technologies

for treating pain, anxiety, and depression in children and adolescents with cancer, this study examined the evidence that was currently available (Rodriguez, 2020). Six electronic databases were used in a systematic search to find studies that focused on pain, anxiety, and depression and included technological interventions (Rodriguez, 2020). The studies were published between 2008 and 2018 and included cancer patients aged 0 to 18. Only five of the 1261 identified studies satisfied the inclusion requirements for this systematic review (Rodriguez, 2020). Furthermore, only two studies that used robots to provide entertainment and social therapy saw notable gains. In three studies, the usage of virtual reality, a smartphone application, and a videogame produced positive effects on pain and anxiety (Rodriguez, 2020).

However, all previous studies had limited attempts made to evaluate the issues in the biopsychosocial domain of stresses and needs among children and adolescents receiving cancer treatment. Furthermore, a small amount of research discussed the methods and strategies to decrease the consequences of childhood cancer. (Lewandowska, et al., 2021).

Therefore, this literature review will highlight precise evaluation of physical and psychological impacts of cancer among children and their parents that are necessary to guarantee excellent care and efficient therapy and to find the best ways to decrease the negative impacts.

## Method

The literature review method was conducted in this research. Numerous articles were defined through searches of four electronic databases: CINAHL, Google Scholar, PubMed, and Web of Science. Key words during the search process included physical impact of cancer, psychological effects of cancer, cancer-related fatigue, childhood cancer, quality of life with cancer, cancer-related psychosocial challenges.

The most used key words in the health care literature was childhood cancer, therefore, these terms were used during the search in databases as the key terms.

Due to the presence of inclusion and exclusion criteria such as eligible research, the majority of earlier studies were included. These studies: 1) were original, 2) were published in English, 3) included children diagnosed with cancer between birth and age 21, 5) described individuals who had survived cancer at any age who were at least three years post-diagnosis and/or one year post-therapy completion, and 6) included a sample size greater than twenty to improve generability. Research with a broad range of ages and/or times between diagnosis and treatment were only kept if the mean age and/or time interval satisfied the previously described requirements, organizations, or included some specific diseases.

The literature search revealed 1200 topics for initial investigating. After reviewing the topics related to our research and discarding unrelated topics and repeated titles, 60 topics remained for literature review. Furthermore, 40 studies were excluded from research because they did not align with inclusion criteria in our research. Also due to exclusion criteria, two more studies were excluded during full-text reading, yielding 20 studies for integrative review.

The strength of each study was assessed based on the validity and reliability of a tool that was used to assess patient safety culture (Cummings et al., 2010; Lee & Scott, 2016).

## Results

Results were synthesized into four domains: (1) the prevalence of childhood cancer (2) physical effects of cancer on children; (3) psychological impact of cancer on children and their families; (4) protective factors against these impacts. Overall, cancer globally is one of the most severe health illnesses among children and adolescents. Every year approximately 151,435 cases with cancer are diagnosed (Cancer Statistics Center, 2020 & Schüz, J.; Roman, E, 2021). Additionally, most of the studies showed that childhood cancer leads to negative impacts physically and psychologically on children and their families, such as pain, fatigue, social isolation, deterioration of self-concept, body image disturbance, nausea, discomfort, anxiety and stress. Regarding reduction of these negative impacts, some strategies were suggested and tested to fight the impacts of childhood cancer such as hospital clowns, play, encouraging kids' participation in healthcare, social therapy, massage therapy, animal-assisted intervention, mandala drawing, the home-based multimodal symptom-management program cognitive-behavioral therapy and problem-solving skills training. Additionally, in three studies, the usage of virtual reality, a smartphone application, and a videogame produced positive effects on pain and anxiety.

## Discussion

The aim of this literature review was to highlight precise evaluation of physical and psychological impacts of cancer among children, adolescents and their parents that are necessary to guarantee excellent care and efficient therapy and to find best ways to decrease these impacts. These effects negatively impacted their activities of daily living, and impaired participants' schooling. The majority of the research showed childhood cancer primary effects on children and adolescents such as pain, sadness, or anxiety in addition to other secondary factors such as nausea, fear, stress, rage, self-efficacy, body image concerns and quality of life. However, patients who received virtual reality or video game therapies reported much less pain (Fazelniya, Najafi, Moafi & Talakoub, 2017 & Atzori et al., 2018). Additionally, the study's findings demonstrated the beneficial effects of computer games both during and four weeks following the intervention. In order to help patients adopt better health-related habits, it is imperative that this effective method of teaching self-care practices be used



in conjunction with patient interaction (Fazelniya, Najafi, Moafi & Talakoub, 2017). The structure and content of this interactive computer game, *The City of Dreams*, was notable for its consideration of the causes of anxiety and worry regarding the side effects of chemotherapy, the application of cognitive and behavioral theories of game design, the use of entertaining games and music in addition to role-playing, and the employment of graphic artists and professional engineers in programming (Fazelniya, Najafi, Moafi & Talakoub, 2017). The game's aforementioned features all helped to achieve the desired outcomes (Fazelniya, Najafi, Moafi & Talakoub, 2017). The researchers might educate and instruct children receiving chemotherapy in a bright and appealing virtual setting by using the computer game *The City of Dreams*. It improved their quality of life and decreased their worry and anxiety related to the negative effects of chemotherapy (Fazelniya, Najafi, Moafi & Talakoub, 2017). Furthermore, the technologies included the creation of smartphone software, computer and tablet gaming, virtual reality gear, and robots built especially to carry out pediatric oncology treatments (Atzori et al., 2018). The reduction of pain during invasive procedures was enabled by employing robots as a helpful diversion. Moreover, both the pain and quality of life improved with the use of a mobile application (Jibb, L. A et al., 2017). Therefore, professionals could be qualified to create this kind of technology for use in the treatment of young cancer patients. These apps should include music and visual components, combining symptom evaluation with practical treatments that encourage self-care and lower stress levels and symptom assessment with direct interventions that promote self-care and reduce stress levels (Do et al, 2018).

The physical and psychological side effects of chemotherapy, which can induce anxiety about beginning chemotherapy and even resistance or rejection of an anti-cancer treatment program, are factors that significantly impact the quality of life for children diagnosed with cancer (Baker, P. D., & Ellett, M. L. (2007). In order to improve patients' quality of life, it is crucial to enrol them in self-care programs and raise their level of awareness and function regarding current treatment regimens, such as chemotherapy (Fazelniya, Najafi, Moafi & Talakoub, 2017).

This study has some limitations which include the dearth of high-quality methodological studies and the lack of a meta-analysis. Most of the studies that have focused on childhood within the context of oncological disease are pilot studies of combined methodology, qualitative, or excessively reduced samples that did not yield relevant results. Some of the more recent studies that have introduced innovative technological interventions include the design of humanoid robots, mobile applications with child interfaces, and studies that are very recent. Despite their original nature, these publications were disqualified since the majority of them sought to reveal the technological development processes of their instruments rather than employing them as an intervention in a patient group to get

outcomes about our relevant variables. Therefore, there is urgent need to develop new studies to cover all factors that effect on children and adolescents with cancer physically and psychologically with enough sample size to enable generalizability of data. Furthermore, we need to do new meta-analysis to accurately measures for variables.

## Conclusion

Healthcare professionals and their families must provide psychological therapies and physical support to children and adolescents diagnosed with cancer in order to improve their quality of life and lessen the negative consequences of the disease and treatment. Therefore, there is need for further studies to establish these strategies in line with progress and development in health care services.

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