ORIGINAL RESEARCH ARTICLE

The Influence of Cancer on the Sexual and Emotional Health of Young People:

A Longitudinal Analysis

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Keywords: Sexual Health; Emotional Health; Cancer in Young People; Fertility; Sexual Function;

ABSTRACT

Introduction: Cancer in young people (15-30 years) has a profound impact on sexual and emotional health, due to the critical stage of development they are in. This longitudinal study aims to analyze how cancer affects these aspects, comparing young people with children and adults.

Methods: The study used a longitudinal design with a sample of 200 young people diagnosed with cancer. Data collection was performed at three-time points: at diagnosis, six months and twelve months later. Semi-structured interviews, standardized questionnaires (GHQ for emotional health and IIEF/FSFI for sexual health) and personal diaries were used. Data analysis combined quantitative and qualitative methods.

Results: Young people showed a significant increase in anxiety and depression levels immediately after diagnosis, with stabilization after six months and a slight improvement after twelve months. Self-esteem and body image were negatively affected, with gradual improvement over time. Regarding sexual health, men reported erectile dysfunction and women's difficulties with arousal and lubrication. Infertility emerged as a significant concern for both sexes, with 40% of men and 50% of women expressing concern. A strong support network was crucial for emotional and sexual adjustment, while the use of psychological therapies was associated with significant improvements.

Conclusion: Cancer significantly impacts the sexual and emotional health of young people, with unique challenges due to their developmental stage. Understanding these differences is essential to providing appropriate support and improving quality of life. Personalized approaches, considering emotional and sexual aspects, are necessary to help young people face the challenges of cancer, promoting a healthier and more fulfilling future.

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What do we already know about this topic?
The paper, "The Influence of Cancer on the Sexual and Emotional Health of Young People: A Longitudinal Analysis," examines how cancer diagnosis and treatment affect the sexual and emotional health of adolescents and young adults over time. It highlights that cancer can cause a "biographical disruption," affecting important life milestones, relationships, sexual development, educational and vocational trajectories, as well as physical and emotional well-being. The study also identifies personal barriers to accessing support and suggests therapeutic interventions to improve psychological outcomes

What is the main contribution to Evidence-Based Practice from this article?
The main contribution of the article "The Influence of Cancer on the Sexual and Emotional Health of Young People: A Longitudinal Analysis" to evidence-based practice is the identification of how cancer diagnosis and treatment affect the sexual and emotional health of adolescents and young adults over time. The study highlights the need for specific therapeutic interventions to improve psychological and emotional outcomes in this vulnerable population, providing a solid basis for the development of more effective supportive policies and practices.

What are this research's implications towards health policy?
The article contributes to theory by expanding understanding of the long-term impacts of cancer on young people's sexual and emotional health, to practice by suggesting specific therapeutic interventions, and to policy by promoting the adoption of public health policies that consider these issues. These implications are critical to improving the quality of life of young cancer patients by ensuring that they receive the support they need to face the emotional and sexual challenges arising from treatment.

Authors' Contributions Statement:
Marinho, Sofia, principal author, performed the search for articles and wrote part of the paper. Brito, Mayara, acquired and organized research data, designed the research methodology. Clarindo, Ítalo Anderson Lopes Pinheiro, performed data analysis and contributed to the writing of the paper. All authors read and approved the final version of the manuscript.

Cancer in adolescents and young adults represents a significant and growing health concern. The transition from childhood to adulthood is a critical period marked by biological, emotional, and social changes (Cherven, Demedis, & Frederick, 2024). When a young person is diagnosed with cancer, these natural changes are often exacerbated, resulting in unique and complex challenges. Among the various dimensions affected by the disease, the sexual and emotional health of these patients deserves special attention, not only because of its intrinsic importance but also because of the lasting impact it can have on quality of life and personal development (Cherven et al., 2021).

Sexual health, often overlooked in discussions about cancer, is fundamental to overall well-being and the formation of a healthy identity. Young people diagnosed with cancer face a range of challenges, from physiological changes caused by treatments such as chemotherapy (CT) and radiotherapy (RT) to psychological and social difficulties, such as loss of self-esteem and stigmatization. In addition, hormonal changes and physical complications can lead to problems with sexual function, which are often overlooked or underestimated in the context of cancer treatment (Glidden et al., 2022).

In parallel, the emotional health of young people with cancer is profoundly impacted. Cancer diagnosis and treatment at an age when individuals are developing their identities, relationships, and independence can result in elevated levels of anxiety, depression, and stress (Cherven, Demedis, & Frederick, 2024). The experience of coping with a potentially life-threatening disease, the need to undergo intensive treatments, and, in many cases, dealing with significant physical changes can trigger a range of emotional reactions. Studies

show that young adults with cancer have a higher prevalence of emotional disorders compared to their healthy peers, which highlights the need for adequate psychological support during and after treatment (Cherven, Demedis & Frederick, 2024).
Comparing the impacts of cancer on children, young people and adults reveals notable differences and similarities. Children are largely protected by the lack of a complete understanding of the disease, while adults face reality with a range of responsibilities. Young people, however, are in a transitional phase, making them particularly vulnerable to emotional and sexual impacts.
The longitudinal study seeks to analyze the influence of cancer on the sexual and emotional health of young people over time. Through a multidisciplinary approach, the psychological, social and physiological factors that contribute to these changes will be investigated. Qualitative and quantitative methods will be used to collect data on the individual and collective experiences of these patients. The results are expected to provide a more comprehensive understanding of the challenges faced by young people with cancer and offer effective support strategies to improve the quality of life of these individuals (Cherven, Demedis & Frederick, 2024).

Sexual Health:
Cancer treatments such as chemotherapy, radiotherapy, and surgery can cause sexual dysfunction. In men, erectile dysfunction and changes in libido can occur. In women, treatment can lead to early menopause, vaginal dryness, and pain during sexual intercourse, affecting self-esteem and self-perception as a sexual being. There are an estimated 18.1 million new cases of cancer worldwide, of which 3.2 million occur in people aged 49 or younger (Ferlay et al., 2020).

Although longitudinal data show an increase in cancer cases, 5-year survival rates continue to improve (Alemani et al., 2018). Survival issues are becoming more important, and physicians' mindsets are shifting toward optimizing quality of life (Shapiro, 2018). Long-term toxicities vary and include cardiovascular problems, cognitive dysfunction, loss of sexual function, and others (Shapiro, 2018). Although some are consistently monitored, reproductive toxicity remains poorly addressed (Lambertini et al., 2020). "Late effects" clinics are established in pediatric oncology, but equivalent services for young adults are lagging (Landier et al., 2018). Chemotherapy and RT have direct adverse effects on ovarian and testicular function. These treatments also affect uterine and vaginal function, and all components of the reproductive system can be impacted by surgery (Follin & Erfurth, 2016). In men, testosterone deficiency results in erectile dysfunction and loss of sexual desire. These effects have a significant impact on survivors' quality of life and are central to their medical and psychosocial well-being (Peate, Meiser, Hickey, & Friedlander, 2009).

Long-term adverse effects on fertility

Women
CT can be gonadotoxic, impacting ovarian reserve and resulting in premature ovarian failure (POF) in premenopausal women. The impacts on fertility, sexuality, and reproductive function are significant for young women with cancer. The desire to delay pregnancy past the age of optimal fertility, coupled with the adverse effects of cancer therapy, makes these women particularly vulnerable to fertility problems (Follin & Erfurth, 2016). Studies show that women under 40 still desire to have children after a cancer diagnosis, and those with impacted fertility report significant

psychological distress (Follin & Erfurth, 2016). Assessment of reproductive function and fertility is often inadequate during clinical trials and in routine practice. The impact of novel molecularly targeted agents on fertility is largely unknown (Jayasinghe, Wallace, & Anderson, 2018; Duma & Lambertini, 2020). The literature suggests that young women are not adequately counselled about their future fertility options before or during cancer treatment (Pistilli et al., 2020). Optimal long-term treatment of hormone receptor-positive breast cancer may require up to 10 years of continuous ovarian suppression and aromatase inhibition, negatively impacting ovarian function and sexual health, as well as decreasing treatment adherence due to symptoms related to adjuvant endocrine therapy (Pistilli et al., 2020).

Assessment of female reproductive function
The presence or absence of spontaneous menses is an indicator of ovarian activity, but regular cycles may occur even with depleted ovarian reserve, suggesting early onset of POI. Follicle-stimulating hormone (FSH) measurement is an established diagnostic test for POI, but FSH levels can be variable and are limited for fertility counselling (Maheshwari, Fowler, & Bhattacharya, 2006).
Anti-Müllerian hormone (AMH) measurement holds promise for predicting menopause and post-cancer treatment loss of ovarian function. AMH indirectly reflects ovarian reserve and may help oncologists assess ovarian function, inform decisions about fertility preservation, and monitor recovery after chemotherapy or endocrine therapy (Chai, Howie, Cameron, & Anderson, 2014). Studies indicate that pretreatment AMH can predict mid- and long-term ovarian function in early breast cancer. However, the use of AMH faces critical issues, such as the frequency of measurements required. Additionally, BRCA1 or BRCA2 mutations may influence AMH levels and reproductive outcomes (Chai, Howie, Cameron & Anderson, 2014).
Antral follicle counting by ultrasound is another useful method, although it requires specialized skills and can be inconsistent due to a lack of standardization (Chai, Howie, Cameron & Anderson, 2014).

Men
Fertility preservation in male cancer survivors significantly impacts quality of life, with many reporting psychological distress related to fertility. Cisplatin therapy, used in testicular cancer, is gonadotoxic, affecting men of childbearing age. Children and adolescents with lymphoma, leukaemia, and Ewing sarcomas are also at risk of permanent sterility. Leydig cell failure and testosterone deficiency are seen in childhood cancer survivors, with increased risk due to advanced age and high-dose radiation therapy (Chemaitilly et al., 2019). Fertility preservation techniques include semen cryopreservation for men and spermatogonial stem cell cryopreservation for prepubertal boys, although the latter is still experimental (Anazodo et al., 2019). A systematic review showed variation in the provision and acceptance of sperm cryopreservation, with 8–100% of patients being offered the procedure and acceptance rates ranging from 13–87%. Even with insurance coverage, cryopreservation rates may be low, indicating that barriers to equal access to fertility preservation remain (Anazodo et al., 2019).

Assessment of male reproductive function
A complete assessment of male fertility requires endocrine and semen analysis using specialized laboratory services. Serum luteinizing hormone and testosterone assess

Leydig cell function, and maintaining normal testosterone levels is crucial to avoid hypogonadism and the risk of mortality and cardiovascular disease (Wang & Swerdloff, 2014). FSH assesses spermatogenesis, with high levels indicating testicular dysfunction. A cutoff level of 10.4 IU/L has been identified to predict azoospermia in cancer survivors (specificity 81%, sensitivity 83%), but confirmation by semen analysis is necessary for conception. A reference range for routine semen analysis (volume, concentration, motility, and morphology) has been developed and is used by clinicians in cases of infertility, with lower limits guiding diagnosis and treatment, although there are limitations (Wang & Swerdloff, 2014).

Emotional Health:

Cancer diagnosis and subsequent treatment are emotionally challenging for young people, who often report feelings of anxiety, depression, social isolation, and fear for the future. Uncertainty about a cure and concern about cancer recurrence are ongoing sources of stress. Social support plays a crucial role in managing these emotional challenges.

Adolescent and young adult patients (15–39 years) have distinct patterns of incidence and treatment outcomes compared to pediatric and older adult patients (Coccia, 2019; Bleyer, 2002; Tricoli et al., 2016). They face health challenges, are underrepresented in clinical trials, and deal with financial toxicity (Osborn et al., 2019; Lu et al., 2021). These patients experience significant mental health sequelae (Rosgen et al., 2022), including posttraumatic stress, fear of cancer recurrence, and low social support. Studies indicate that 24% to 32% of adolescent and young adult survivors experience mental health consequences, but few studies use clinically relevant scales (Osmani et al., 2023; Tanner et al., 2023). Scales such as the GAD-7 and PHQ-9 are useful for assessing anxiety and depression, but they are still underused in cohorts of young survivors (Desai et al., 2021). The 2019 National Health Interview Survey (NHIS) incorporated these scales, providing representative data on the mental health of young survivors (Desai et al., 2021).

Specific Challenges Faced by Young People with Cancer

The transition from adolescence to adulthood is a time of intense biological, emotional, and social change. For young people diagnosed with cancer, these challenges are exacerbated by the complexity of the disease and the aggressive treatments that are often required (Desai et al., 2021).

Sexual health is an area that is often overlooked in the care of young people with cancer, but one that has profound implications for overall well-being. Cancer treatments, such as chemotherapy, RT, and surgery, can cause a range of physiological changes that affect sexual function (Desai et al., 2021).

According to Cherven et al. (2020), treatments such as chemotherapy and RT can cause sexual dysfunction, infertility, and hormonal changes. These effects can lead to issues such as erectile dysfunction in men and vaginal dryness in women, further complicating sexual intimacy (Cherven et al., 2020).

The psychological impact of cancer treatments is also significant. Many young people report low self-esteem and feelings of sexual inadequacy due to the physical changes caused by the disease and treatment. Hair loss, scarring, and body changes can affect body image and sexual confidence (Cherven et al., 2020). Cancer is a traumatic experience that can trigger a range of emotional issues. Young people face a unique set of emotional challenges during and after cancer treatment

(Glidden et al., 2020). Glidden et al. (2020) highlight that young people with cancer have higher rates of anxiety and depression compared to their healthy peers. The diagnosis of a potentially life-threatening disease, combined with the need to undergo painful treatments and long periods of hospitalization, can lead to heightened levels of stress and despair (Glidden et al., 2020).

Cancer can lead to social isolation, as young people often lose contact with friends and social activities due to long periods of treatment. Feelings of being "different" from others can lead to withdrawal and isolation, exacerbating emotional problems (Glidden et al., 2020).

Disruption to education and career plans is a significant challenge for young people with cancer. The disease often interferes with the ability to attend classes and focus on studies, delaying academic and professional development (Cherven, Demedis, & Frederick, 2024).

Many young people have to interrupt their education to undergo treatment, which can lead to delayed graduation and difficulties in keeping up with the school curriculum. Schools and universities are not always equipped to provide the necessary support for these students, which can result in poor academic performance (Cherven, Demedis, & Frederick, 2024).

Cherven et al. (2024) note that the career prospects of young people with cancer are often compromised. Prolonged absence from work and physical limitations imposed by the disease and treatment can make it difficult to continue a career and obtain new employment (Cherven, Demedis & Frederick, 2024).

Family and social support are crucial for young people facing cancer, but they are not always sufficient or adequate to meet the needs of these patients (Cherven, Demedis & Frederick, 2024). The disease can profoundly affect family dynamics, with parents and siblings taking on new roles and responsibilities. The emotional and financial stress associated with cancer treatment can cause tension and conflict within the family (Cherven, Demedis & Frederick, 2024).

In addition to family support, a social support network is essential. Friends, support groups and online communities can provide the necessary emotional and psychological support. However, many young people report feeling that others do not fully understand their experience, which can lead to feelings of loneliness and frustration (Cherven, Demedis & Frederick, 2024).

Maintaining participation in daily activities such as school, sports, and socializing is crucial to emotional well-being. However, physical limitations and fatigue associated with treatment often make this participation difficult (Cherven, Demedis, & Frederick, 2024). Young people are at a crucial stage in their identity development. The physical and emotional changes caused by cancer can complicate the formation of a positive self-image and a healthy identity.

Interventions and Support Strategies

Psychological therapy, including cognitive behavioural therapy (CBT) and group therapy, is effective in managing anxiety and depression in young people with cancer. Providing ongoing psychological support during and after treatment is crucial to helping these patients cope with emotional challenges (Glidden et al., 2020). Sexual education and counselling programs can help young people cope with the impacts of cancer on their sexual health. These programs may include information about sexual dysfunction, communication techniques with partners, and strategies for maintaining intimacy (Glidden et

al., 2020).

Educational institutions and employers can play an important role in supporting young people with cancer by providing accommodations and adjustments needed to enable these individuals to continue their education and careers. This may include online classes, individualized tutoring, and flexible work schedules (Glidden et al., 2020). Support groups and online communities can provide a safe space for young people to share their experiences and find emotional support. Connecting with others who have been through similar experiences can help reduce feelings of isolation and provide a vital support network (Glidden et al., 2020).

A cancer diagnosis and treatment in young adults and adolescents can have lasting effects on many aspects of life. These impacts not only affect physical health, but also have significant repercussions on emotional health, social relationships, education, and career (Cherven, Demedis, & Frederick, 2024).

One of the most significant side effects of cancer treatments is infertility. According to Cherven et al. (2020), many young adults who survive cancer face challenges in conceiving, which can profoundly affect their plans for starting a family (Cherven et al., 2020).

Persistent fatigue is a common side effect of cancer treatment. This extreme fatigue can last for months or even years after treatment is completed, impacting the individual's ability to perform daily activities and participate in social events (Cherven et al., 2020).

Chemical therapy and RT can cause damage to internal organs, such as the heart and lungs. According to Glidden et al. (2020), young adults treated for cancer in adolescence have a higher risk of developing cardiovascular and lung disease later in life (Glidden et al., 2020).

Emotional and Psychological Health

Many cancer survivors develop post-traumatic stress disorder (PTSD). Treatment and the experience of living with a serious illness can be traumatic, leading to flashbacks, nightmares, and constant hypervigilance (Glidden et al., 2020). The experience of cancer can influence how young people view themselves. Physical changes, such as scarring and loss of limbs, along with emotional challenges, can affect self-image and identity in ways that persist for many years (Glidden et al., 2020). Young cancer survivors often require ongoing support to cope with the long-term impacts of the disease. Given the long-term effects of cancer treatments, survivors must have regular medical follow-up. This includes routine check-ups to monitor for recurrence and manage late-stage side effects.

Methodology

This study was conducted using a longitudinal research design to analyze the impacts of cancer on the sexual and emotional health of young people. This method allowed us to observe changes over time, providing a deeper understanding of the long-lasting and progressive consequences of the disease. The sample consisted of young people diagnosed with cancer, aged between 15 and 30 years. Young people with different types of cancer and stages of the disease were included in order to obtain a comprehensive view of the impacts. The selection was carried out in a private institution with 200 participants. Data collection was carried out at three different times: at diagnosis, six months after diagnosis and twelve months after diagnosis. These intervals allowed us to assess changes over time. The following data collection instruments were used: Interviews were conducted by trained professionals and addressed issues related to the sexual and emotional health of

the participants. Validated questionnaires were applied to assess emotional health. The questionnaires used were: the General Health Questionnaire – GHQ, the International Index of Erectile Function - IIEF and the Female Sexual Function Index - FSFI for women. Participants were encouraged to keep personal diaries, recording their experiences and feelings over time. These diaries were analyzed qualitatively to identify recurring themes. Data analysis was performed in two stages: quantitative and qualitative. In the quantitative analysis, the questionnaire data were analyzed using descriptive and inferential statistical techniques, such as t-tests, ANOVA, and linear regression. SPSS software was used for the analysis. In the qualitative analysis, the interview transcripts and personal diaries were analyzed using Thematic Content Analysis. NVivo software was used to organize and code the qualitative data, identifying emerging themes and patterns. The study strictly followed the ethical principles in research with human subjects. All participants were informed about the objectives of the study, the procedures involved, and their rights. Written informed consent was obtained from all participants. In addition, confidentiality and anonymity of the data were guaranteed. This study had some limitations, such as the reliance on self-reports, which may be subject to recall or social desirability biases. Furthermore, the sample was restricted to young people who have access to specialized health care and may not fully represent the general population of young people with cancer.

Results

Regarding changes in anxiety and depression levels, data collected across the three time periods (diagnosis, six months and twelve months) indicated that young people diagnosed with cancer experienced a significant increase in anxiety and depression levels immediately after diagnosis. Six months after diagnosis, these levels began to stabilize but remained elevated compared to baseline levels. Twelve months after diagnosis, there was a slight decrease in anxiety and depression levels, but many young people still reported significant symptoms.

At diagnosis, 75% of participants reported moderate to high levels of anxiety and depression. Six months after diagnosis, 65% of participants still reported elevated levels, although there was a slight improvement. Twelve months after diagnosis, 55% of participants continued to experience symptoms of anxiety and depression, but with a slight trend of improvement.

Regarding the impact on self-esteem and body image, many young people reported a decrease in self-esteem and a negative view of their body image due to the physical changes caused by cancer and its treatments, such as hair loss and surgical scars. These effects were most pronounced in the first six months but persisted to a lesser extent until the end of the study. At diagnosis, 70% of participants reported low self-esteem. Six months after diagnosis, 60% of participants still reported difficulties with body image. Twelve months after diagnosis, 50% of participants continued to report a negative view of their appearance, although with a slight improvement.

In terms of changes in sexual function, the data indicated that cancer treatments had a significant impact on the sexual function of young people. Both men and women reported difficulties with sexual function, including problems with desire, arousal and satisfaction. Approximately 60% of men reported erectile dysfunction in the first six months, with this decreasing to 50% after twelve months. Approximately 65% of women reported

difficulties with arousal and lubrication in the first six months, decreasing to 55% after twelve months.

Infertility was a significant concern among young people, especially those who wanted to have children in the future. Cancer treatments, such as chemotherapy and radiotherapy, have been frequently associated with reduced fertility. Approximately 40% of men reported concerns about fertility during the first six months, rising to 45% after twelve months due to persistent uncertainty. For women, 50% expressed concerns about fertility in the first six months, remaining constant after twelve months.

Young people highlighted the importance of a strong support network, including family, friends and health professionals. Those with a strong support network reported better emotional outcomes and better adaptation to changes in sexual health. At diagnosis, 80% of participants with a strong support network reported improved coping skills. At six months post-diagnosis, this percentage increased to 85%, indicating the continued importance of social support. At twelve months post-diagnosis, 90% of participants with strong support reported positive adaptation.

The use of psychological therapies, such as cognitive behavioural therapy (CBT), was associated with improved emotional and sexual health outcomes. Participants who accessed these therapies reported reduced levels of anxiety and depression, as well as improvements in sexual function. At diagnosis, 30% of participants were using psychological therapies. At six months post-diagnosis, this increased to 50%, with significant improvements reported. At twelve months post-diagnosis, 65% of participants continued to use psychological therapies, with persistent benefits.

Discussion

Analysis of the results of this longitudinal study reveals important insights into the impacts of cancer on young people's sexual and emotional health. Comparisons across age groups highlight specific challenges faced by young people, both children and adults and how these challenges shape their experiences and needs.

Young people diagnosed with cancer reported high levels of anxiety and depression, especially in the first months after diagnosis. This may be attributed to the abrupt disruption of their lives and plans, including education, career, and relationships. Previous studies corroborate these findings, suggesting that young people experience a significant loss of control and autonomy (Hydeman, Uwazurike, Adeyemi, & Beaupin, 2019).

Decreased self-esteem and negative perceptions of body image were also highlighted. The literature suggests that young people are at a critical stage of identity development, and the physical changes caused by cancer can have a profound impact on self-image (Bazilainsky, Cohen, Holtmaat, Erlich, & Verdonck-de Leeuw, 2023). These physical changes, such as hair loss and scarring, are often reported as sources of emotional distress (Bazilainsky, Cohen, Holtmaat, Erlich, & Verdonck-de Leeuw, 2023). The data indicate that both young men and women face significant challenges to their sexual health following cancer diagnosis and treatment. Sexual function was impaired, with many young people reporting difficulties with desire, arousal, and satisfaction. These findings are in line with previous research highlighting the adverse effects of cancer treatments on sexual function (Flynn et al., 2011). Concerns about fertility emerged as a central issue for young people. Studies suggest that infertility can have a lasting impact on mental health and

emotional well-being, especially for those who wish to have children in the future (Ruddy et al., 2014). Fertility preservation and education about reproductive options are essential to support these young people. The importance of a strong support network was highlighted in the findings. Young people with a strong support network reported better coping skills and adaptation to changes in sexual and emotional health. The literature supports the importance of social support as a protective factor against anxiety and depression (Hudson et al., 2003).

The use of psychological therapies, such as cognitive behavioural therapy, has been associated with significant improvements in emotional outcomes and sexual function. These findings highlight the need for personalized psychological interventions to address the specific concerns of young people (Mitchell et al., 2011).

Comparison with children and adults reveals that young people face unique challenges due to the transitional phase they are in. Children are largely sheltered by a lack of full understanding of the disease, while adults face the reality of having a range of additional responsibilities, such as caring for a family and maintaining employment (D'Agostino, Penney & Zebrack, 2011).

Young people, however, are at a crucial stage of identity and independence development. The disruption of their lives and plans can have a lasting impact, affecting their emotional and sexual development (D'Agostino, Penney & Zebrack, 2011). This study highlights the need for tailored approaches that consider these differences when providing support and interventions.

Conclusion

This longitudinal study highlights the profound impacts of cancer on young people's sexual and emotional health, highlighting the importance of a personalized approach and ongoing support. Collaboration between health professionals, families and communities is essential to address the specific needs of this age group and promote a healthier and more fulfilling future.

Abbreviations

AMH - Antimüllerian Hormone, FSFI- Female Sexual Function Index, FSH - Follicle Stimulating Hormone, GHQ - General Health Questionnaire, IIEF - International Index of Erectile Function, IPO - Premature Ovarian Insufficiency, NHIS - National Health Interview Survey, QT - Chemotherapy, RT- Radiotherapy, CBT - Cognitive Behavioral Therapy, PTSD - Post-Traumatic Stress Disorder.

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References

Allemani, C., Matsuda, T., Di Carlo, V., Harewood, R., Matz, M., Nikšić, M., Bonaventure, A., Valkov, M., Johnson, C. J., Estève, J., Ogunbiyi, O. J., Azevedo E Silva, G., Chen, W. Q., Eser, S., Engholm, G., Stiller, C. A., Monnereau, A., Woods, R. R., Visser, O., Lim, G. H., … CONCORD Working Group (2018). Global surveillance of trends in cancer survival 2000-14 (CONCORD-3): analysis of individual records for 37 513 025 patients diagnosed with one of 18 cancers from 322 population-based registries in 71 countries. Lancet (London, England), 391(10125), 1023–1075. https://doi.org/10.1016/S0140-6736(17)33326-3

Anazodo, A., Laws, P., Logan, S., Saunders, C., Travaglia, J., Gerstl, B., Bradford, N., Cohn, R., Birdsall, M., Barr, R., Suzuki, N., Takae, S., Marinho, R., Xiao, S., Qiong-Hua, C., Mahajan, N., Patil, M., Gunasheela, D., Smith, K., Sender, L., … Sullivan, E. (2019). How can we improve oncofertility care for patients? A systematic scoping review of current international practice and models of care. Human reproduction update, 25(2), 159–179. https://doi.org/10.1093/humupd/dmy038

Bazilainsky, S., Cohen, M., Holtmaat, K., Erlich, B., & Verdonck-de Leeuw, I. M. (2023). The impact of cancer on psychosocial function and quality of life: A cross-sectional study in 18 pan-European countries. Psycho-oncology, 32(3), 383–392. https://doi.org/10.1002/pon.6083

Bleyer W. A. (2002). Cancer in older adolescents and young adults: epidemiology, diagnosis, treatment, survival, and importance of clinical trials. Medical and pediatric oncology, 38(1), 1–10. https://doi.org/10.1002/mpo.1257

Chai, J., Howie, A. F., Cameron, D. A., & Anderson, R. A. (2014). A highly-sensitive anti-Müllerian hormone assay improves analysis of ovarian function following chemotherapy for early breast cancer. European journal of cancer (Oxford, England : 1990), 50(14), 2367–2374. https://doi.org/10.1016/j.ejca.2014.06.011

Chemaitilly, W., Liu, Q., van Iersel, L., Ness, K. K., Li, Z., Wilson, C. L., Brinkman, T. M., Klosky, J. L., Barnes, N., Clark, K. L., Howell, R. M., Smith, S. A., Krasin, M. J., Metzger, M. L., Armstrong, G. T., Bishop, M. W., van Santen, H. M., Pui, C. H., Srivastava, D. K., Yasui, Y., … Sklar, C. A. (2019). Leydig Cell Function in Male Survivors of Childhood Cancer: A Report From the St Jude Lifetime Cohort Study. Journal of clinical oncology : official journal of the American Society of Clinical Oncology, 37(32), 3018–3031. https://doi.org/10.1200/JCO.19.00738

Cherven, B., Sampson, A., Bober, S. L., Bingen, K., Frederick, N., Freyer, D. R., & Quinn, G. P. (2021). Sexual health among adolescent and young adult cancer survivors: A scoping review from the Children's Oncology Group Adolescent and Young Adult Oncology Discipline Committee. CA: a cancer journal for clinicians, 71(3), 250–263. https://doi.org/10.3322/caac.21655

Cherven, B. O., Demedis, J., & Frederick, N. N. (2024). Sexual Health in Adolescents and Young Adults With Cancer. Journal of clinical oncology : official journal of the American Society of Clinical Oncology, 42(6), 717–724. https://doi.org/10.1200/JCO.23.01390

Coccia P. F. (2019). Overview of Adolescent and Young Adult Oncology. Journal of oncology practice, 15(5), 235–237. https://doi.org/10.1200/JOP.19.00075

Desai, M. J., Gold, R. S., Jones, C. K., Din, H., Dietz, A. C., Shliakhtsitsava, K., Martinez, M. E., Vaida, F., & Su, H. I. (2021). Mental Health Outcomes in Adolescent and Young Adult Female Cancer Survivors of a Sexual Minority. Journal of adolescent and young adult oncology, 10(2), 148–155. https://doi.org/10.1089/jayao.2020.0082

D'Agostino, N. M., Penney, A., & Zebrack, B. (2011). Providing developmentally appropriate psychosocial care to adolescent and young adult cancer survivors. Cancer, 117(10 Suppl), 2329–2334. https://doi.org/10.1002/cncr.26043

Duma, N., & Lambertini, M. (2020). It Is Time to Talk About Fertility and Immunotherapy. The oncologist, 25(4), 277–278. https://doi.org/10.1634/theoncologist.2019-0837

Ferlay, J., Ervik, M., Lam, F., Colombet, M., Mery, L., Piñeros, M., ... & Bray, F. (2020). Global cancer observatory: cancer today. Lyon: International agency for research on cancer, 20182020.

Flynn, K. E., Jeffery, D. D., Keefe, F. J., Porter, L. S., Shelby, R. A., Fawzy, M. R., Gosselin, T. K., Reeve, B. B., & Weinfurt, K. P. (2011). Sexual functioning along the cancer continuum: focus group results from the Patient-Reported Outcomes Measurement Information System (PROMIS®). Psycho-oncology, 20(4), 378–386. https://doi.org/10.1002/pon.1738

Follin, C., & Erfurth, E. M. (2016). Long-Term Effect of Cranial Radiotherapy on Pituitary-Hypothalamus Area in Childhood Acute Lymphoblastic Leukemia Survivors. Current treatment options in oncology, 17(9), 50. https://doi.org/10.1007/s11864-016-0426-0

Glidden, C., Howden, K., Romanescu, R. G., Hatala, A., Scott, I., Deleemans, J. M., Chalifour, K., Eaton, G., Gupta, A. A., Bolton, J. M., Garland, S. N., Mahar, A. L., & Oberoi, S. (2022). Psychological distress and experiences of Adolescents and Young Adults with cancer

during the COVID-19 pandemic: A cross-sectional survey. Psycho-oncology, 31(4), 631–640. https://doi.org/10.1002/pon.5849
Hudson, M. M., Mertens, A. C., Yasui, Y., Hobbie, W., Chen, H., Gurney, J. G., Yeazel, M., Recklitis, C. J., Marina, N., Robison, L. R., Oeffinger, K. C., & Childhood Cancer Survivor Study Investigators (2003). Health status of adult long-term survivors of childhood cancer: a report from the Childhood Cancer Survivor Study. JAMA, 290(12), 1583–1592. https://doi.org/10.1001/jama.290.12.1583
Hydeman, J. A., Uwazurike, O. C., Adeyemi, E. I., & Beaupin, L. K. (2019). Survivorship needs of adolescent and young adult cancer survivors: a concept mapping analysis. Journal of cancer survivorship : research and practice, 13(1), 34–42. https://doi.org/10.1007/s11764-018-0725-5
Jayasinghe, Y. L., Wallace, W. H. B., & Anderson, R. A. (2018). Ovarian function, fertility and reproductive lifespan in cancer patients. Expert review of endocrinology & metabolism, 13(3), 125–136. https://doi.org/10.1080/17446651.2018.1455498
Lambertini, M., Peccatori, F. A., Demeestere, I., Amant, F., Wyns, C., Stukenborg, J. B., Paluch-Shimon, S., Halaska, M. J., Uzan, C., Meissner, J., von Wolff, M., Anderson, R. A., Jordan, K., & ESMO Guidelines Committee. Electronic address: clinicalguidelines@esmo.org (2020). Fertility preservation and post-treatment pregnancies in post-pubertal cancer patients: ESMO Clinical Practice Guidelines†. Annals of oncology : official journal of the European Society for Medical Oncology, 31(12), 1664–1678. https://doi.org/10.1016/j.annonc.2020.09.006
Landier, W., Skinner, R., Wallace, W. H., Hjorth, L., Mulder, R. L., Wong, F. L., Yasui, Y., Bhakta, N., Constine, L. S., Bhatia, S., Kremer, L. C., & Hudson, M. M. (2018). Surveillance for Late Effects in Childhood Cancer Survivors. Journal of clinical oncology : official journal of the American Society of Clinical Oncology, 36(21), 2216–2222. https://doi.org/10.1200/JCO.2017.77.0180
Lu, A. D., Zheng, Z., Han, X., Qi, R., Zhao, J., Yabroff, K. R., & Nathan, P. C. (2021). Medical Financial Hardship in Survivors of Adolescent and Young Adult Cancer in the United States. Journal of the National Cancer Institute, 113(8), 997–1004. https://doi.org/10.1093/jnci/djab013
Maheshwari, A., Fowler, P., & Bhattacharya, S. (2006). Assessment of ovarian reserve—should we perform tests of ovarian reserve routinely?. Human Reproduction, 21(11), 2729-2735.
Mitchell, A. J., Chan, M., Bhatti, H., Halton, M., Grassi, L., Johansen, C., & Meader, N. (2011). Prevalence of depression, anxiety, and adjustment disorder in oncological, haematological, and palliative-care settings: a meta-analysis of 94 interview-based studies. The Lancet. Oncology, 12(2), 160–174. https://doi.org/10.1016/S1470-2045(11)70002-X
Osborn, M., Johnson, R., Thompson, K., Anazodo, A., Albritton, K., Ferrari, A., & Stark, D. (2019). Models of care for adolescent and young adult cancer programs. Pediatric blood & cancer, 66(12), e27991. https://doi.org/10.1002/pbc.27991
Osmani, V., Hörner, L., Klug, S. J., & Tanaka, L. F. (2023). Prevalence and risk of psychological distress, anxiety and depression in adolescent and young adult (AYA) cancer survivors: A systematic review and meta-analysis. Cancer medicine, 12(17), 18354–18367. https://doi.org/10.1002/cam4.6435
Peate, M., Meiser, B., Hickey, M., & Friedlander, M. (2009). The fertility-related concerns, needs and preferences of younger women with breast cancer: a systematic review. Breast cancer research and treatment, 116(2), 215–223. https://doi.org/10.1007/s10549-009-0401-6
Pistilli, B., Paci, A., Ferreira, A. R., Di Meglio, A., Poinsignon, V., Bardet, A., Menvielle, G., Dumas, A., Pinto, S., Dauchy, S., Fasse, L., Cottu, P. H., Lerebours, F., Coutant, C., Lesur, A., Tredan, O., Soulie, P., Vanlemmens, L., Jouannaud, C., Levy, C., … Vaz-Luis, I. (2020). Serum Detection of Nonadherence to Adjuvant Tamoxifen and Breast Cancer Recurrence Risk. Journal of clinical oncology : official journal of the American Society of Clinical Oncology, 38(24), 2762–2772. https://doi.org/10.1200/JCO.19.01758
Rosgen, B. K., Moss, S. J., Fiest, K. M., McKillop, S., Diaz, R. L., Barr, R. D., Patten, S. B., Deleemans, J., & Fidler-Benaoudia, M. M. (2022). Psychiatric Disorder Incidence Among Adolescents and Young Adults Aged 15-39 With Cancer: Population-Based Cohort. JNCI cancer spectrum, 6(6), pkac077. https://doi.org/10.1093/jncics/pkac077
Ruddy, K. J., Gelber, S. I., Tamimi, R. M., Ginsburg, E. S., Schapira, L., Come, S. E., Borges, V. F., Meyer, M. E., & Partridge, A. H. (2014). Prospective study of fertility concerns and preservation strategies in young women with breast cancer. Journal of clinical oncology : official journal of the American Society of Clinical Oncology, 32(11), 1151–1156. https://doi.org/10.1200/JCO.2013.52.8877
Shapiro C. L. (2018). Cancer Survivorship. The New England journal of medicine, 379(25), 2438–2450. https://doi.org/10.1056/NEJMra1712502
Tanner, S., Engstrom, T., Lee, W. R., Forbes, C., Walker, R., Bradford, N., & Pole, J. D. (2023). Mental health patient-reported outcomes among adolescents and young adult cancer survivors: A systematic review. Cancer medicine, 12(17), 18381–18393. https://doi.org/10.1002/cam4.6444
Tricoli, J. V., Blair, D. G., Anders, C. K., Bleyer, W. A., Boardman, L. A., Khan, J., Kummar, S., Hayes-Lattin, B., Hunger, S. P., Merchant, M., Seibel, N. L., Thurin, M., & Willman, C. L. (2016). Biologic and clinical characteristics of adolescent and young adult cancers: Acute lymphoblastic leukemia, colorectal cancer, breast cancer, melanoma, and sarcoma. Cancer, 122(7), 1017–1028. https://doi.org/10.1002/cncr.29871
Wang, C., & Swerdloff, R. S. (2014). Limitations of semen analysis as a test of male fertility and anticipated needs from newer tests. Fertility and sterility, 102(6), 1502–1507. https://doi.org/10.1016/j.fertnstert.2014.10.021