Perception of body image and self-esteem in adolescents with cancer diagnosis: a pilot study

La percezione dell'immagine corporea e dell'autostima in adolescenti con diagnosi oncologica: uno studio pilota

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Abstract

Body image (BI) and self-esteem (SE) are crucial for adolescents' well-being, especially when affected by cancer, yet research on this topic remains limited. The study aimed at investigating BI, SE, and their association in 14 adolescents (aged 12–19) within a year of cancer treatment, at four time points: diagnosis (T0), 3 months (T1), 6 months (T2), and 1 year post-diagnosis (T3). BI and SE were significantly correlated at T2 and T3, with a few gender differences. Findings highlight the need for multidisciplinary teams to assess BI and SE concerns, promoting targeted prevention and intervention during treatment and follow-up stage.

Riassunto

L'immagine corporea (BI) e l'autostima (SE) sono cruciali per il benessere degli adolescenti, soprattutto quando colpiti da cancro, tuttavia la ricerca su questo argomento è ancora limitata. Lo studio mira a indagare l'immagine corporea, l'autostima e la loro associazione in 14 adolescenti (di età compresa tra 12 e 19 anni) entro un anno dal trattamento oncologico, in quattro momenti: diagnosi (T0), 3 mesi (T1), 6 mesi (T2) e 1 anno dopo la diagnosi (T3). L'immagine corporea e l'autostima sono significativamente correlate a T2 e T3, con alcune differenze di genere. I risultati evidenziano la necessità di team multidisciplinari per valutare i problemi di immagine corporea e autostima, promuovendo prevenzione e intervento mirati durante il trattamento e la fase di follow-up.

Introduction

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Body image (BI) is a multidimensional construct involving affective, cognitive, behavioral, and relational processes, reflecting an individual's perception of their body and appearance. It is shaped by historical, cultural, and social influences, impacting self-perception and appearance management. Self-esteem (SE) relates to an individual's recognition and appreciation of their character, qualities, and achievements. BI and SE are closely interconnected, significantly influencing overall well-being.

Individuals may experience concerns related to physical appearance, due to life events affecting the body through alteration of physical aspect in a manner that can draw others' attention: that represents what Rumsey and Harcourt (2004) call a visible difference. Adaptation to such differences varies but often leads to identity shifts and a reduced quality of life. These effects highlight the psychological and social challenges associated with living with visible differences.

Cancer is one of those conditions that can lead to a visible difference, associated with significant body changes, due to treatments (surgery, chemotherapy, radiotherapy, hormone therapy) or illness itself.

The main body modifications can include hair loss, compromised linear growth and changes in body weight. A visible difference derived from cancer can have significant psychological implications during puberty and adolescence, already marked by significant physical and psychological changes affecting the body.

While some adolescents are able to adapt, others report difficulties that include a negative impact on BI and concerns in SE, higher levels of anxiety, depression, behavioral problems, issues in social interactions with peers and a worse quality of life.

Previous studies investigated different aspects linked to BI and SE, showing that they had a significant impact on the overall well-being and that they are influenced by gender and age.

In literature, only a few studies have explored body image (BI) and self-esteem (SE) in adolescents with cancer, focusing primarily on AYA survivors. This study aimed to evaluate BI and SE in a small sample of adolescents undergoing cancer treatment over one year, examining changes in scores over time. Given the literature linking gender with BI, the study also investigated gender differences and potential variations in BI and SE during treatment.

Matherial and methods

Participants

This prospective observational study enrolled 14 adolescents (aged 12–19, mean age 14.60±0.20) with cancer at Meyer Children's Hospital in Italy, between November 2017 and December 2019. Data collection was disrupted by the COVID-19 pandemic, preventing the intended sample size from being reached. The following inclusion criteria were applied: undergoing cancer treatment, first cancer diagnosis, Italian language proficiency, and providing informed consent. Exclusion criteria included disease relapse, cognitive impairment, prior diagnoses of anxiety, depression, or eating disorders, and lack of consent.

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Data collection and procedure

Data collection was conducted at four time points: within five days of diagnosis (T0), three months post-diagnosis (T1), six months after the initiation of treatment (T2), and one year following diagnosis (T3). At T0, researchers approached eligible patients and their families to introduce the study and obtain informed consent. Socio-demographic data were subsequently gathered, and self-report instruments assessing self-esteem (SE) and body image (BI) were administered. These instruments were delivered at T1, T2, and T3.

Ethical considerations

Ethical permission was granted by the Pediatric Ethical Committee of Tuscany Region (No. 120/17).

Measures

Following measures were administered at T0, T1, T2 and T3.

- *Italian Body Image Concern Inventory*: is a short self-report measure of dysmorphic concern. Higher scores indicate higher frequency of dysmorphic symptoms and greater symptoms interference. The Italian version of the scale showed high internal consistency, both in a non-clinical sample and in a sample of women diagnosed with breast cancer, and good convergent validity with the Italian version of Eating Disorder Inventory-215.
- *Italian version of the Multidimensional Self-esteem Test*: is a self-report measure of SE, It includes six scales: (1) interpersonal relationships, (2) competence in environmental control, (3) emotionality, (4) school achievements, (5) family life, (6) bodily experience. The TMA shows consistency and stability coefficient >.90 over a four-week interval.
- *Body Uneasiness Test* is a 71-item questionnaire that assesses discomfort with physical appearance. It has two sections: BUT-A (34 items): Evaluates overall body image (BI) uneasiness across five dimensions—body image concerns (BIC), weight phobia (WP), depersonalization (D), avoidance (A), and compulsive self-monitoring (CSM). Scores include the average for each dimension and the Global Severity Index (GSI), reflecting overall uneasiness. Higher scores indicate greater BI uneasiness. BUT-B (37 items): Measures discomfort with specific body parts. Scores include the Positive Symptom Total (PST), indicating the number of body parts with discomfort, and the Positive Symptom Distress Index (PSDI), showing the average uneasiness score for these parts. The test demonstrates good internal consistency (α = 0.69–0.90) and test-retest reliability (r = 0.68–0.94) in both healthy and clinical groups.

Analysis

Descriptive statistics summarized participants' demographics and clinical characteristics. Non-parametric repeated-measures ANOVA (Friedman test) evaluated changes in body image (BI) and self-esteem (SE) scores over time. Spearman's correlation assessed the relationship between BI and SE across study

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time points, while the Mann-Whitney U test examined gender differences in BI and SE scores.

Results

Of 25 patients screened for the study, 5 declined to participate, and 4 did not meet inclusion criteria. The final sample consisted of 14 participants. All completed the baseline (T0) and first follow-up (T1) assessments, 11 completed the second follow-up (T2), and 8 completed the third follow-up (T3). Demographics and clinical characteristics are detailed in Table 1.

The Friedman repeated measure ANOVA showed no significant differences in body image (BI) measures across the four study time points, including I-BICI, both BUT-A subscales (weight phobia, compulsive self-monitoring, avoidance, depersonalization, body image concerns, global severity index), and BUT-B indices (positive symptom total, positive symptom distress index), as well as the TMA SE total score. Correlation analyses revealed varying patterns of association between BI dimensions and SE at each time point. At baseline (T0), a significant negative correlation was found between compulsive self-monitoring (BUT-A) and TMA SE total score ($\rho=-0.64$, $p<.05$). At the first follow-up (T1), no significant correlations were observed.

At the second follow-up assessment (T2), most body image (BI) dimensions showed significant correlations with self-esteem (SE). Specifically, the I-BICI total score, along with weight phobia, body image concerns, avoidance, depersonalization (BUT-A), and the positive symptom distress index (BUT-B), all exhibited significant negative correlations with the TMA total score.

[look at table 2]

At the third follow-up assessment (T3), most body image (BI) measures showed significant correlations with self-esteem (SE), similar to T2. The I-BICI total score and BUT-A measures, including weight phobia, body image concerns, compulsive self-monitoring, depersonalization, and the global severity index, all displayed significant negative correlations with the TMA total score.

[look at table 3]

There were no significant gender differences at T0 and T2. However, at T1, males reported a significantly higher number of body parts associated with discomfort (positive symptom total, PST) compared to females (males: 16.86 vs females: 7.14, $p<.05$). At T3, a trend toward significance was observed, with males showing higher scores in avoidance and positive symptom total, though these differences were not statistically significant (avoidance: $p=0.072$, PST: $p=0.071$).

Discussion

This study aimed to assess how body image (BI) and self-esteem (SE) change over a year of cancer treatment in Italian adolescents. Cancer can significantly affect adolescents' well-being, particularly when visible physical changes impact BI and SE, which are crucial for identity development. While few

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studies have examined BI concerns during cancer treatment, some have focused on adolescent and young adult (AYA) cancer survivors, reporting persistent BI concerns with negative consequences like loss of control, insecurity in relationships, and social avoidance. Unlike survivorship studies, this research focuses on adolescents during cancer treatment, examining a period before survival.

The study found no significant differences in body image (BI) and self-esteem (SE) across the four assessments, likely due to the small sample size and diverse diagnoses. Half of the participants had bone tumors with visible body changes, while others with different cancers diagnosis experienced varying changes based on treatment type and duration. Previous research suggests that during active treatment, patients focus more on survival than appearance, with BI concerns emerging later. Consistent with previous studies, BI subscales were negatively correlated with SE, especially at T2 and T3, after significant body changes. At T0, only compulsive self-monitoring was linked to lower SE, and no significant correlation was found at T1.

Consistent with Fan et al. (2009), it can be hypothesized that immediately after diagnosis and in the early stages of treatment, patients are primarily focused on coping with the illness and the psychosocial adjustments required by treatment and hospitalization. This may explain why only compulsive self-monitoring was correlated with self-esteem (SE) at T0, while no significant association was found at T1, when patients were dealing with the initial body changes from intensive treatment. However, by T2, after significant appearance changes have occurred and stabilized, patients become more focused on their body image (BI), which can impact SE. This process is particularly challenging in adolescence due to the central role of physical appearance in identity development.

At T3 patients still have concerns regarding their BI and SE in line with some results of studies on AYA cancer survivors'. Moore et al. (2021) highlighted that cancer-related physical changes evolve over time, both during treatment and throughout the survivorship phase.

Literature reports that female adolescents with cancer and female AYA cancer survivors are usually more at risk for BI concerns and disturbances, while males not only seem to better adjust to physical appearance changes during cancer treatments[6], but also show a higher SE compared to females in studies involving AYA cancer survivors. These differences between males and females in dealing with bodily changes occurring during therapies may be related to the typical different timing of physical and emotional development during adolescence.

Results of the present study show a different direction: no significant association was found at T0 and T2, but a significant difference emerged at T1, showing greater uneasiness in males who reported a higher number of body parts connected to discomfort. At T3, a trend toward significance was found for the number of male body parts associated with discomfort and avoidance behaviors. It is hypothesized that the cancer experience during adolescence might reduce gender differences in body image (BI) dimensions at certain stages of treatment, or lead to alternative patterns, with males becoming more focused on specific

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body parts and showing increased avoidance, especially towards the end of treatment. The main gender difference in body uneasiness appeared when significant body changes occurred and at the end of treatment, when adolescents may be more aware of their physical changes. While some physical features, like hair growth, begin to return to normal, others, such as muscle mass recovery, take more time. This is particularly relevant for males, as studies have shown that they tend to idealize a higher body mass index (BMI) and larger upper body, both of which are impacted by treatment-related weight and muscle mass loss.

Limitations and future studies

The study has several limitations, including a small sample size due to challenges posed by the COVID-19 pandemic, patient availability, lengthy assessment process, variations in treatment pathways and the absence of effect size estimation. In particular, the restrictions related to COVID-19 remained in place even after the end of the emergency, preventing the resumption of the study. Additionally, the sample was unbalanced, with most patients having bone sarcoma, which involves significant body changes, while other conditions like lymphoma and neuroblastoma have different, less comparable outcomes. These factors limit the generalizability of the results.

Future research should explore body image (BI) and self-esteem (SE) in adolescents with cancer through a longitudinal design, including both in-treatment patients and survivors. It would also be valuable to consider factors such as pre-diagnosis body concerns, tumor type, treatment duration and intensity, social support, coping strategies, family adjustment, and internal factors like gender, age, pubertal development, and BMI, all of which can significantly influence body perception and self-esteem.

Future studies should not only focus on the distress and challenges faced by adolescents undergoing cancer treatment but also explore the positive experiences of patients, rather than just maladjustment.

Conclusions

Despite the limitations, the study suggests that systematic screening for BI concerns and SE vulnerabilities could be beneficial in identifying adolescents at higher psychological risk during cancer treatment. Early identification would allow the implementation of preventive strategies, including targeted psychological support during and after treatment.

The findings emphasize the need to integrate regular assessments of BI and SE throughout the oncological care pathway, particularly during the intermediate and late stages of treatment, when physical changes become more pronounced and patients may become increasingly aware of their appearance. These phases might be critical windows for psychological intervention.

Given the heterogeneous impact of cancer treatments (related to diagnosis type, treatment duration, and physical consequences) psychological interventions should be individualized. Factors such as gender, pubertal development and pre-existing body image concerns should be considered when designing and

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delivering supportive care.

Furthermore, the results underline the importance of including specialized psychological professionals in paediatric oncology multidisciplinary teams. Their presence ensures continuous emotional support and facilitates early detection of BI and SE-related distress, potentially preventing the development of longer-term psychosocial difficulties, including social avoidance, low self-esteem, and body dissatisfaction.

Finally, it is essential that psychological support continues beyond the conclusion of treatment. As the focus shifts from survival to recovery and identity reconstruction, concerns related to body image may resurface or intensify, particularly as adolescents begin to reintegrate into social contexts and reassess their self-perception.

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APPENDIX

TABLE 1. SAMPLE'S DEMOGRAPHICS AND CLINICAL FEATURES.

Gender	N	%
Males	7	50.0
Females	7	50.0
Mean Age, (sd)		
14.60, (0.20)		
Nationality	N	%
Italian	14	100.0
Other	0	0
Tumor diagnosis	N	%
Bone sarcoma	7	50.0
Lymphoma	4	28.6
Acute lymphoblastic leukemia	1	7.1
Neuroblastoma	2	14.3
Presence of other pathologies	N	%
Yes (allergies, asthma, dermatitis)	3	21.4
No	11	78.8

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	I-BICI	WP	BIC	A	CSM	D	GSI	PST	PSDI	TMA
I-BICI	-									
WP	,806**	-								
BIC	,763**	,952**	-							
A	,788**	,943**	,895**	-						
CSM	,820**	,901**	,899**	,899**	-					
D	,611*	,879**	,829**	,874**	,735**	-				
GSI	,857**	,846**	,800**	,783**	,791**	,701*	-			
PST	-,082	,209	,196	,351	,234	,148	-,152	-		
PSDI	,679*	,755**	,606*	,770**	,529	,683*	,644*	,245	-	
TMA	-,633*	-,727*	-,610*	-,793**	-,598	-,722*	-,543	-,236	-,873**	-
Total				14			100.0			

TABLE 2. SPEARMAN CORRELATION BETWEEN BODY IMAGE (I-BICI TOTAL SCORE, BUT-A AND BUT-B DIMENSIONS) AND SELF-ESTEEM AT SECOND FOLLOW-UP ASSESSMENT (T2).

*significant for p<.05; **significant for p<.01*
BUT-A dimensions: WP= weight phobia; BIC= body image concerns; A= avoidance; CSM= compulsive self-monitoring; D=depersonalization; GSI= global severity index. BUT-B indices: PST= positive symptom total; PSDI=positive symptom distress index.

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TABLE 3. SPEARMAN CORRELATION BETWEEN BODY IMAGE (I-BICI TOTAL SCORE, BUT-A AND BUT-B DIMENSIONS) AND SELF-ESTEEM AT THIRD FOLLOW-UP ASSESSMENT (T3).

	I-BICI	WP	BIC	A	CSM	D	GSI	PST	PSDI	TMA
I-BICI	-									
WP	,952**	-								
BIC	,988**	,982**	-							
A	,681	,813*	,747*	-						
CSM	,958**	,982**	,988**	,813*	-					
D	,636	,822*	,719*	,848**	,752*	-				
GSI	,885**	,921**	,903**	,800*	,897**	,730*	-			
PST	,108	,275	,204	,695	,323	,549	,217	-		
PSDI	,723*	,765*	,783*	,795*	,819*	,707	,733*	,563	-	
TMA	-,778*	-,826*	-,790*	-,659	-,766*	-,741*	-,892**	-,238	-,599	-

*significant for p<.05; **significant for p<.01*

BUT-A dimensions: WP= weight phobia; BIC= body image concerns; A= avoidance; CSM= compulsive self-monitoring; D=depersonalization; GSI= global severity index. BUT-B indices: PST= positive symptom total; PSDI=positive symptom distress index.

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