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Body Image and Psychosocial Adjustment in Adolescent Cancer Survivors[1]

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Examined body image and social adjustment in 21 adolescents who had completed cancer treatment and a healthy comparison group. Subjects completed questionnaires assessing body image and social adjustment and were videotaped during an interview. Raters blind to health status independently rated subjects' attractiveness. Cancer survivors reported less than half as many social activities as the healthy controls. No group differences were found on social anxiety, loneliness, or composite body image scores. However, within the cancer group, adolescents who had been off treatment longer reported lower self-worth, more social anxiety, and more negative body image perceptions, but were not rated as less attractive by observers. Findings suggest body image concerns and social anxiety may not develop until several years after treatment termination.

KEY WORDS: adolescence; cancer; body image; psychosocial adjustment; late effects.

Adolescence marks a period during which children are at increased risk for psychosocial difficulties and psychiatric disorders (Rutter, Graham, Chadwick, & Yule, 1976). Changes in school environments occurring in middle and high school can result in different peer groups and increased responsibility and autonomy. These changes are often accompanied by increased social comparisons and

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decreased self-esteem, particularly when coupled with increasing sexual interest and pubertal development (Eccles et al., 1993; Simmons & Blythe, 1987). Furthermore, the emerging capacity for abstract thinking enables may lead adolescents to compare themselves to their peers.

The increase in social comparisons occurring in adolescence along with the physical changes associated with puberty results in much attention being placed on appearance and attractiveness and is often followed by a more negative body image (Dorn, Crockett, & Petersen, 1988; Duncan, Ritter, Dornbusch, Gross, & Carlsmith, 1985; Eccles et al., 1993). Research has shown that negative body image perceptions have strong implications for social adjustment. Negative body image is often accompanied by avoidance of situations associated with concern about appearance, such as social activities (Rosen, Srebnik, Saltzberg, & Wendt, 1991). In addition, both self-perceptions of unattractiveness and negative objective ratings of actual appearance have been positively correlated with negative peer relations, decreased activities with peers, lower school grades, and poor self-esteem (Brooks-Gunn & Petersen, 1983; Rauste-von Wright, 1989).

Researchers and clinicians have speculated about the importance of body image issues in adolescents with cancer (e.g., Carr-Gregg & White, 1987; Cull, 1990; Mullis, Mullis, & Kerchoff, 1992). Besides the developmental physical changes occurring in adolescence, teens with cancer also have to adjust to physical changes resulting from treatment and thus may pay even more attention to their physical appearance than healthy peers. Side effects such as hair loss, weight gain or weight loss resulting from treatment, the unpredictability of health status, and corticosteroid therapy place adolescents with cancer at risk for poor body image (Cull, 1990; Fritz & Williams, 1988; Mogtader & Leff, 1986).

Despite the theoretical implications of body image concerns for psychosocial adjustment, few controlled studies have *empirically* examined body image concerns in adolescent cancer populations (Cull, 1990; La Greca, 1990). In a qualitative study, Hodgkin's disease survivors frequently described unpleasant experiences with peers who teased them about their physical appearance (Wasserman, Thompson, Wilimas, & Fairclough, 1987). In addition, oncology patients have reported that their illness affected their body image more than did other illness groups (e.g., cardiology, cystic fibrosis, and healthy peers) (Zeltzer, Kellerman, Ellenberg, Dash, & Rigler, 1980). However, no information was obtained about the patients' current feelings about their physical appearance or about the relationship between current perceptions of physical appearance and other areas of adjustment, such as peer relations.

Furthermore, no study to date has directly compared self-perceptions of physical attractiveness versus objective ratings of actual appearance in adolescent cancer survivor populations. Negative body image attitudes could be either accurate assessments or misperceptions of actual appearances. During treatment, negative body image perceptions may be accurate as the adolescent experiences

weight gain or loss, hair loss, and other treatment side effects. However, once treatment is over, most physical effects disappear. Researchers have not examined whether the adolescent's perceptions of attractiveness also change at this time. Although the actual long-term impact of cancer on an adolescent's physical appearance could be quite mild, the adolescent's perceptions of his/her changes in appearance may be very significant. Distinguishing between accurate assessments versus misperceptions would impact intervention strategies. It is also important to examine the relationship between negative body image perceptions and other psychosocial difficulties occurring after cancer treatment ends.

Research examining the psychosocial adjustment of cancer survivors has been mixed. Several studies have shown increased risk for psychiatric disorders, adjustment difficulties, and academic problems in child and adolescent cancer survivors (Lansky, List, & Ritter-Steer, 1986; Mulhern, Wasserman, Friedman, & Fairclough, 1989; O'Malley, Koocher, Foster, & Slavin, 1979). However, others have identified few psychosocial difficulties in cancer survivors (Greenberg, Kazak, & Meadows, 1989; Kazak & Meadows, 1989; Noll, Bukowski, Davies, Koontz, & Kulkarni, 1993). It is likely that adjustment problems do not characterize all children and adolescents with chronic illnesses. Rather, these youngsters may be at increased *risk* for developing psychosocial difficulties. Thus, it becomes important to identify factors that predict successful psychosocial adaptation (La Greca, 1990).

The time of diagnosis may be one factor that predicts adaptation (Koocher, O'Malley, Gogan, & Foster, 1980; Lansky et al., 1986). For example, children diagnosed during middle childhood or adolescence have been shown to be more at risk for psychosocial difficulties than children diagnosed in infancy (Koocher et al., 1980). Koocher and colleagues hypothesized that the developmental tasks of infancy are less disrupted by cancer than the developmental tasks of adolescence. The importance of body image during adolescence along with the impact that cancer has on appearance may be one determinant of the increased risk of psychosocial difficulties occurring during adolescence.

The vast majority of studies examining cancer survivors focus on individuals diagnosed in early childhood rather than in adolescence (Lansky et al., 1986). The current study addresses this gap in research and examines psychosocial difficulties and body image concerns in 21 adolescent cancer patients who recently completed chemotherapy treatment and a healthy comparison group. We hypothesized that the cancer survivors would exhibit more psychosocial difficulties than would healthy peers due to the impact that cancer has on key adolescent concerns (for example, the increased emphasis on appearance and the growing importance of physical attractiveness). We expected that cancer survivors would report more negative body perceptions than would healthy peers and that body image perceptions would be strongly related to other social adjustment indices, such as loneliness and social anxiety.

Finally, unlike any prior research, the present study assessed both objective raters' estimates of subjects' physical appearance and self-perceptions of attractiveness to determine whether body image-related difficulties were results of accurate assessments or misperceptions of physical appearance. Because the most dramatic physical effects of cancer treatment (e.g., hair loss and effects from corticosteroid use) were absent at this point in the cancer group, the cancer survivors and the healthy controls were not expected to differ in actual physical appearance, thus allowing for clearer identification of expected self-perceptions of attractiveness.

METHOD

Participants

Nine female and 12 male adolescent cancer survivors, ages 11 to 21, participated in the study approximately 17 months (SD = 8.65) after completing cancer treatment. Children with obvious physical disabilities (e.g., limb amputation, surgical scars) were excluded. The mean age at diagnosis was 12.2 years (SD = 2.69). The average treatment length was 19.49 months (SD = 14.85). Diagnoses included leukemia (n = 8), lymphoma (n = 9), and other solid tumors (n = 4). Families fell into a wide range of socioeconomic status (SES) using Hollingshead's (1975) five-category classification: Category 2, 10%; Category 3, 35%; Category 4, 40%; and Category 5, 15%. Of the sample 67% were Caucasian, 19% African American, 9% Hispanic, and 5% Asian American. This distribution is roughly comparable to the clinic population, with the exception of Hispanic patients, who were underrepresented. A comparison sample of 21 adolescents matched for subject's age, gender, and ethnicity was recruited through advertisements in local newspapers. There were no significant differences in SES, age, gender, or ethnicity between cancer survivors and comparison subjects.

Procedure

Cancer survivors were sent a letter explaining the study and then were called by a trained research assistant. A complete list of 25 adolescents who had been finished with their cancer treatment for 6 months to 2½ years was obtained from the Texas Children's Hospital Cancer Center database. Two subjects were unable to be reached (e.g., moved out of the area, unlisted phones). Ninety-one percent (21 of 23) of cancer survivors approached agreed to participate.

The comparison sample was recruited through advertisements in neighborhood newspapers sent to 40 local communities of varied SES. Advertisements

described the study as a questionnaire survey examining the social adjustment of adolescents. Over 200 families responded to the advertisement. Potential participants were screened by phone for age, ethnicity, and other chronic illnesses or reading disabilities. Appointments were then scheduled for those who were the appropriate age (within 6 months), gender, and ethnic match for each cancer survivor and who did not have other chronic illnesses or reading disabilities.

A trained research assistant explained the research study. Cancer survivors and matched controls received the same description of the study. Informed consent and assent were obtained from the parent and child, respectively. Subjects received $25. Completion of questionnaires took an average of 1½ hours. In addition, after subjects completed the questionnaires, a 10-minute interview was conducted by a senior research assistant. Both the completion of questionnaires and the interview were conducted without parents in the room. Interviews were videotaped so that undergraduate research assistants could later view the videotapes and provide objective ratings of attractiveness. Raters were blind to the condition (cancer survivor vs. control) of each subject. The interview consisted of a few, general, open-ended questions concerning body image. Examples of questions include, "Do you feel that your cancer influences your physical appearance? If so, how?" and "Describe how you feel that your cancer affects the way you feel about your body" for cancer survivors and "How important do you think physical appearance is to adolescents your age?" for controls. These questions were designed to provide a standard format for interviewing and videotaping the subjects. Questions were not scored. Raters turned off the sound when viewing the videotapes so that they would remain blind to each subject's condition.

Measures

Demographics

Parents completed a brief questionnaire identifying marital status, parents' education and occupation, and ethnicity.

Body Image Assessment Measures

To ensure a comprehensive and multidimensional assessment of body image, several body image measures were used in the current study. Raw scores on each measure were converted to *z* scores and then summed to calculate a composite body image measure. Means and standard deviations of each measure can be found in Table I.

Self-Image Questionnaire for Young Adolescents (SIQYA; Petersen, Schulenberg, Abramowitz, Offer, & Jarcho, 1984). The 11-item Body Image subscale

Table I. Descriptive Statistics of Demographic, Body Image, and Social Adjustment Variables[a]

Variable	Controls (n = 21)		Survivors (n = 21)		F value
	M	*SD*	*M*	*SD*	
Body image					
Self-image quest.	48.24	8.90	46.52	7.37	
Body Cathexis Scale	169.81	24.87	161.00	31.85	
Likert ratings					
Overall	3.95	0.74	3.48	1.40	
Face	3.76	0.94	3.52	1.29	
Body	3.76	0.70	3.10	1.41	
Movement	3.85	0.81	3.38	1.02	
Impact of illness	NA		2.67	1.32	
SPPA physical appearance	13.19	2.56	14.29	3.57	
Body image avoidance	25.90	12.33	22.48	10.18	
Situational inventory	47.05	27.01	34.29	26.34	
Body image composite[b]	−0.01	0.49	0.01	0.82	−0.11
Objective ratings of physical appearance					
Overall	3.31	0.56	3.20	0.50	0.45
Face	3.22	0.60	3.26	0.49	0.06
Body	3.38	0.61	3.23	0.66	0.63
Movement	3.20	0.32	3.11	0.40	0.59
Peer adjustment					
Peer Interaction Record					
No. of activities	78.67	60.49	35.86	22.20	7.27[c]
Peer network	9.52	7.29	9.00	6.86	0.22
Loneliness	27.33	8.94	26.57	9.06	0.17
SASC-R					
SAD-G	7.05	2.58	6.95	3.53	0.02
SAD-N	15.00	4.27	13.14	4.90	1.65
FNE	19.19	7.51	16.14	7.86	3.03
SPPA global self-worth	16.05	2.60	16.95	3.17	1.14
School absenteeism (mother)	0.32	0.67	1.10	1.71	2.94
School absenteeism (child)	1.24	1.67	1.85	2.85	0.96

[a]To reduce the number of analyses, group differences were not conducted on all body image variables; only on the objective ratings and on the body image composite. Separate MANOVAS were conducted for the set of objective ratings of attractiveness and for the set of peer adjustment variables. Group difference in composite body image variable was examined using independent t tests.

[b]The body image composite equals the mean of the z-score transformations of: SIQYA, BCS, Self-report Likert ratings, SPPA physical appearance scale, BIAQ, and SIBID

[c]$p < .01$

of SIQYA was designed to assess an adolescent's positive and negative feelings toward general aspects of his/her body. Items are rated on a 6-point scale with responses ranging from *describes me very well* to *does not describe me at all.* The Body Image subscale has adequate internal consistency (alphas range from .77 to .81) and is moderately correlated with other measures of self-esteem (Petersen et al., 1984).

Body Cathexis Scale (BCS; Secord & Jourard, 1953). On this scale, subjects rated their degree of satisfaction with different body parts and functions. Ratings were made on a 5-point Likert scale with responses ranging from *I don't like it at all and I wish it could be changed* to *I am completely satisfied and I would not change it if I could.* This measure has been used extensively with diverse populations, including both male and female adolescents (Clifford, 1971). Split-half reliabilities are high, ranging from .88 to .92, and scores on the test have been significantly correlated with other measures of self-concept (Secord & Jourard, 1953).

Self-Report Likert Ratings of Body Image. Likert ratings were used to obtain global assessments of subjects' feelings about their overall appearance, facial appearance, body appearance, and mobility. Ratings were made on a 5-point scale similar to the BCS with responses ranging from *I don't like it at all and I wish it could be changed* to *I am completely satisfied and I would not change it if I could.* Cancer survivors also rated how much they felt cancer affected their physical appearance.

Self-Perception Profile for Adolescents (SPPA; Harter, 1988). The SPPA was designed to assess an adolescent's personal sense of competence across several domains. This 45-item scale includes nine subscales: global self-worth, scholastic competence, social acceptance, athletic competence, physical appearance, behavioral conduct, romantic appeal, close friendships, and job competence. Adolescents choose one of two statements that best describe them and then rate whether the statement is "sort of true for me" or "really true for me." Harter (1988) reported that the internal consistencies ranged from .55 to .93 for the subscales and that the factor pattern of the eight subscales replicated across six samples. The physical appearance subscale was included in the body image composite.

Body Image Avoidant Questionnaire (BIAQ; Rosen et al., 1991). The BIAQ is a 19-item self-report measure of behaviors that often occur with body image disturbances (e.g., avoiding looking in mirrors, being inactive, and not going out socially). Subjects reported on a 6-point scale ranging from *always* to *never* how often they engaged in specific avoidant behaviors. The BIAQ has adequate internal consistency ($\alpha = .89$) and test–retest reliability ($r = .87$) and significantly correlates with negative attitudes about shape and distortion of body size (Rosen et al., 1991).

Situational Inventory of Body Image Distress (SIBID; Cash, 1991). The SIBID is a 49-item self-report questionnaire that has primarily been used descriptively as a clinical tool. Subjects are asked to rate on a 0–4 scale how often they experienced negative thoughts or feelings about their physical appearance in 49 different situations. The SIBID was included in the current study an additional body image measure assessing the pervasiveness of negative body image feelings across different situations.

Objective Ratings of Attractiveness. Undergraduate research assistants unfamiliar with the project viewed the videotaped interviews and rated each subject's overall appearance, facial appearance, body appearance, and mobility using Likert scales parallel to the subjects' self-report scales. Twelve different research assistants coded all videotapes. Scores were averaged for the analyses to gain a representative assessment of subject's attractiveness.

Measures of Psychosocial Adjustment

Peer Activities. To assess the number of the adolescents' social interactions with peers, a modification of the Health and Daily Living Form (Moos, Cronkite, Billings, & Finney, 1984) entitled the Peer Interaction Record (PIR; Thompson, 1994) was administered. The PIR asks the adolescent to estimate how often they engaged in each of 12 typical peer activities during the past month. Peer activities were appropriate for the full age range of subjects (e.g., going to a friend's house, going out to eat with friends, and playing sports). The number of different peers mentioned across the 12 activities was calculated to estimate the child's peer network.

Loneliness Questionnaire (Asher, Hymel, & Renshaw, 1984). This questionnaire is made up of 16 items assessing children's feelings of loneliness and 8 filler items. In a study of 506 children, Asher et al. (1984) found that the 16 loneliness items loaded on a single factor and that Cronbach's alpha was .90. In a second study with the instrument, Hymel et al. (1983) found that loneliness scores were fairly stable over a 1-year period, $r = .55$. Data from both the Asher et al. (1984) study and Asher and Wheeler (1985) showed that unpopular children (based upon peer sociometrics) scored higher on the loneliness scale than popular children.

Social Anxiety Scale for Children-Revised (SASC-R; La Greca, 1992). The SASC-R was used to assess the child's self-reported anxiety regarding social interactions with peers. The SASC-R consists of 22 items and yields scores on three factors: Fear of Negative Evaluation from Peers (FNE), Social Avoidance and Distress Specific to New Situations (SAD-N), and Generalized Social Avoidance and Distress (SAD-G). Confirmatory factor analysis support the validity of the factor structure, and factors have good internal consistency (La Greca & Stone, 1993). When SASC-R scores were compared cross children in four sociometric subgroups (popular, average, rejected, and neglected), both neglected and rejected children scored significantly higher than average children on the FNE subscale. Neglected children also reported higher levels of social avoidance and distress with peers than did children in all other categories (La Greca & Stone, 1993).

Self-Perception Profile for Adolescents (SPPA; Harter, 1988). As described

above, the SPPA was designed to assess an adolescent's personal sense of competence across several domains. The global self-worth subscale was used as a psychosocial adjustment measure.

School Attendance. Mothers and adolescents were asked how many days of school the adolescent missed during the past month.

RESULTS

Age and gender were not significantly correlated with body image and peer adjustment indices and thus were not included as covariates in the analyses.

To minimize the number of individual *t* tests, the composite body image score was used for analyses. The internal consistency for the composite was .74. To assess objective attractiveness, means were calculated across the 12 coders. Cronbach's alpha coefficients were used to assess whether the means were reliable estimates of attractiveness. The alpha coefficients were .86 for overall, .86 for face, .92 for body, and .70 for movement. To protect against Type I error, MANOVAs, rather than individual *t* tests, were conducted for the objective ratings of attractiveness (i.e., the four Likert ratings of attractiveness made by objective raters) and for the psychosocial adjustment measures (i.e., peer activities, peer network, loneliness, social anxiety-new, social anxiety-general, fear of negative evaluation, and global self-worth).

Group Differences

Body Image. Group differences on hypothesized variables were tested using independent *t* tests or MANOVAs as described above. No significant differences were found between cancer survivors and healthy peers on the four objective ratings of attractiveness (overall, face, body, and mobility) (see Table I). The survivors were not viewed as less attractive than healthy peers. Furthermore, a significant group difference was not found on the composite body image variable. In addition, the hypothesis that adolescents with cancer would perceive their bodies more negatively than would objective raters was not confirmed. There were so significant differences between objective versus self-perceptions of attractiveness in either the cancer or healthy peer group.

Social Adjustment. Results showed that adolescents with cancer participated in significantly fewer peer activities as assessed by the PIR than controls. Contrary to hypothesis, no significant difference were seen using either child or parent report of school absenteeism. In addition, no significant differences between cancer survivors and controls were observed on measures of loneliness and social anxiety.

Correlational Analyses

The relationship between body image and PIR peer activities, PIR peer network, social anxiety, loneliness, SPPA global self-worth, and school absenteeism were examined by two-tailed bivariate correlations for all subjects. As shown in Table II, body image was negatively correlated with social anxiety, loneliness, and SPPS global self-worth. In contrast, body image was not significantly correlated with peer activities, peer network, or school absenteeism. Strong correlations were also observed between the Likert rating of how cancer survivors felt their illness affected their physical appearance and most social adjustment indices. Self-report and observer report on the Likert ratings of overall attractiveness were used to compare the relationships of psychosocial adjustment variables and subjective versus objective ratings of attractiveness for all subjects. Although significant correlations were found between psychosocial adjustment indices and adolescents' Likert ratings of their overall appearance, no significant correlations were found between psychosocial adjustment indices and the corresponding objective rating of overall attractiveness.

Length of Time Since Treatment Termination

To examine the relationships between length of time since treatment termination and adjustment, cancer survivors were divided into two groups: those who had finished treatment within the past year (n = 13) and those whose treatment

Table II. Correlations Between Social Adjustment Indices and Body Image Measures and Objective Ratings of Attractiveness

Peer adjustment index	Body image composite (N = 42)	Illness impact rating (N = 21)	Subjective attractiveness (N = 42)	Objective attractiveness (N = 42)
PIR				
No. of activities	.02	−.55[b]	.31[a]	.24
Peer network	−.03	−.26	.11	.22
Asher-loneliness	−.49[c]	.52[a]	−.57[c]	−.05
SASC-R				
SAD-G	−.33[a]	.63[b]	−.52[c]	−.03
SAD-N	−.44[b]	.50[b]	−.50[c]	−.05
FNE	−.43[b]	.61[b]	.43[a]	−.00
SPPA Global self-worth	.41[b]	−.42	.35[a]	−.16
School absenteeism (mother)	.06	−.19	.08	−.05
School absenteeism (child)	.04	.04	−.04	−.03

[a] $p < .05$, two-tailed.
[b] $p < .01$, two-tailed.
[c] $p < .001$, two-tailed.

had been terminated for at least 1 year prior to the study (n = 8). A 1-year period was chosen because cancer survivors should have had opportunities to start a new year in school and rejoin extracurricular activities within a 12-month period.

Independent t tests and MANOVAS were conducted to examine group differences in body image and social adjustment indices. Results showed that cancer survivors who were further from treatment termination had significantly *lower* body image perceptions as assessed by the body image composite than patients who had terminated treatment more recently. However, no significant time effect was found for actual appearance as assessed by objective ratings of attractiveness. Significant group differences also were found on the social anxiety scales but not on number of PIR peer activities or PIR peer network (Table III).

DISCUSSION

The most striking differences between cancer survivors and healthy peers was in peer activities. Cancer survivors reported participating in less than half the peer activities than controls did. However, there were no significant group differences in loneliness and social anxiety. Although cancer survivors were far less

Table III. Comparisons of Short Versus Long Time Since Treatment Termination[a]

	Less than 1 year (n = 13)		At least 1 year (n = 8)		
Dependent variable	*M*	*SD*	*M*	*SD*	*F* value
Body image composite	0.40	0.37	−.23	0.94	2.16[b]
Objective ratings of physical attractiveness					
Overall	3.26	0.59	3.23	0.46	0.08
Face	3.26	0.61	3.26	0.43	0.00
Body	3.20	0.76	3.24	0.62	0.02
Movement	3.15	0.47	3.09	0.37	0.12
PIR					
No. of activities	44.50	26.80	30.54	17.96	2.06
Peer network	10.87	9.37	7.85	4.83	0.96
Asher-Loneliness	22.38	4.72	29.15	10.25	3.05
SASC-R					
SAD-G	6.13	1.73	7.46	4.27	0.70
SAD-N	10.25	3.24	14.92	4.99	5.52[b]
FNE	11.50	5.07	19.00	8.04	5.54[b]
SPPA Global self-worth	18.75	1.28	15.85	3.51	4.98[b]

[a]Separate MANOVAS were conducted for the set of objective ratings of attractiveness and for the set of peer adjustment variables. Group difference in composite body image variable was examined using independent t test.

[b]$p \leq .05$.

active in peer activities, in general they did not report feeling badly about their lack of activity. These results corroborate Noll et al.'s (1993) findings that although cancer patients had a social reputation of being more isolated than their peers, they did not report feeling more lonely or depressed. Similarly, Spirito et al. (1990) found that cancer survivors reported feeling more isolated than peers, but did not report feeling less competent as assessed by the Harter Self-Perception Profile. It is possible that cancer patients may be making external attributions for their isolation (e.g., medical necessity) rather than internal attributions (e.g., self-competence) and thus, the social isolation may not have an immediate impact on emotional well-being.

Although the adolescent cancer survivors did not *look* more unattractive to objective raters in this study, strong correlations were found between cancer survivors' self-report ratings of how cancer affected their physical appearance and social adjustment indices. Those adolescents who had higher ratings of how cancer affected their appearance also reported feeling more lonely and more socially anxious. In addition, significant correlations also were observed between body image and social adjustment indices, suggesting that body image is an important area to address.

Within the cancer group, more negative body image perceptions as assessed by the body image composite were associated with a longer time since treatment termination. In contrast, observer ratings of attractiveness were not significantly correlated with time since treatment termination. Thus, the more negative body image perceptions in the adolescents further from treatment termination do not appear to be resulting from actual appearance differences.

Loneliness and social anxiety also were significantly correlated with time since treatment termination, suggesting that adolescent cancer survivors become more lonely and socially anxious over time. However, the number of peer activities was not related to time since treatment termination. These findings suggest that while differences in peer activities are evident soon after treatment termination, body image concerns, loneliness, and social anxiety may not develop until several years later. Without extensive longitudinal follow-up, body image related difficulties may be missed.

The obtained relationships between time since treatment termination and social adjustment suggest several hypotheses for future research. Cancer survivors may experience a period of euphoria immediately after treatment ends. They may not be concerned about peer activities or physical appearance. Rather, they may be focused on the fact that they survived the disease and thus report positive feelings about themselves. In addition, positive changes, such as hair growth, are occurring during the first year after treatment ends. Third, cancer survivors may compare themselves to other cancer patients and feel relatively fortunate that they have hair and are not experiencing chemotherapy side effects. After that first year, the rate of positive physical changes inevitably slows or

stops, and they may start comparing themselves to healthy peers rather than other patients and this may result in changed self-perceptions.

Fourth, immediately after treatment ends, survivors still have frequent contact with the medical staff and other families, persons who have been primary sources of social support. However, as shown by Kazak and Meadows (1989), cancer survivors report lower levels of social support as time since treatment termination elapses and thus, may become more lonely. In addition, during treatment, cancer teens are often required to be socially isolated because they are immune-compromised. They may attribute their lack of social activities to medical necessity. However, as physicians remove the social isolation requirement, patients may change their attributions to more internal causes, such as feelings of unattractiveness. As they begin to interact with peers, one would expect increasing social anxiety, particularly if their peers have progressed to more sophisticated social interactions for which the survivors do not feel prepared, for example, dating and romantic relationships.

This study contributes to the literature by comprehensively examining the relationship between body image and psychosocial adjustment of adolescent cancer survivors. It is also the first study to our knowledge to address differences between objective and subjective perceptions of attractiveness in an adolescent cancer population. However, this study is limited by the small sample and the cross-sectional design. Generalization of these findings to the population of adolescent cancer patients cannot be inferred, nor can the causal impact of body image be determined by this project.

Results of the current study indicate that cancer survivors may be at increased risk for psychosocial difficulties, particularly after treatment ends. Future studies should address possible mediating factors, such as age and gender. It is possible that the physical and social changes associated with cancer treatment may have particularly potent effects at certain developmental stages during adolescence. For example, the physical consequences of chemotherapy may have less impact during early adolescence compared with middle adolescence as more pubertal changes occur and romantic relationships become increasingly important. Although the current study included a wide range of adolescents, the sample was too small to examine age as a risk factor.

Physical and social changes associated with chemotherapy also may have a differential impact on boys versus girls. Again, the current study's sample was too small to examine this issue. Future studies could address age and gender as possible risk factors and subsequently identify which cancer patients may be at more risk for psychosocial difficulties and thus, would benefit more from intervention.

The results also have additional clinical implications. Given the increased negative body image concerns and social anxiety as time passed from treatment termination, future studies might examine whether adolescent cancer survivors

demonstrate an increased risk for psychiatric disorders, such as Body Dysmorphic Disorder, Generalized Anxiety Disorder, or Social Phobia. Furthermore, the process by which these disorders develop might have significant intervention implications. For example, if anxiety regarding diagnosis and issues such as mortality result in increased focus on the body and more body image concerns, then anxiety management might be treatment of choice. However, it also is possible that body image concerns result in increased anxiety, thus suggesting that intervention should target improving body image perceptions. These issues are beyond the scope of the current study and can be best addressed with longitudinal research.

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