



Consequences of Altered Body Image in Adolescents with Cancer: A Narrative Review

Ghada Mohammad Abu Shosha^{1*}

¹Faculty of Nursing, Zarqa University, Jordan.

Author's contribution

The sole author designed, analyzed and interpreted and prepared the manuscript.

Article Information

DOI: 10.9734/JCTI/2016/24144

Editor(s):

(1) William CS Cho, Queen Elizabeth Hospital, Hong Kong.

Reviewers:

(1) Iryna Lobanova, National Medical University, Kiev City, Ukraine.

(2) Pasquale Cianci, University of Foggia, Italy.

Complete Peer review History: <http://sciencedomain.org/review-history/13249>

Review Article

Received 6th January 2016
Accepted 2nd February 2016
Published 10th February 2016

ABSTRACT

Background: The diagnosis of cancer develops many challenges for adolescents. Changes associated with cancer treatment are considered stressful and impact negatively on adolescents' psychosocial status. Adaptation to body image changes is essential to the ultimate coping with cancer.

Aim: This study aimed to present a narrative review of the literature regarding body image changes in adolescents with cancer and coping strategies.

Methods: Searching for keywords was performed in various databases including CINAHL, PubMed Central, and EBESCO.

Results: Altered appearance was appraised by adolescents as a threatening and upsetting issue that negatively influenced their lives. However, adolescents with cancer used many strategies to deal effectively with their changed appearance. These coping mechanisms included strategies for concealing signs, strategies for instilling hope, and strategies for gaining social support.

Conclusion: Altered body image resulting from cancer and its treatment is the most distressing factor among adolescents with cancer. Medical staff should be trained and oriented about the physical and psychosocial impact of cancer on adolescents through continuous training and follow up programs. Nurses should give the opportunity for adolescents to express their own feelings and concerns about the effects of chemotherapy on their physical appearance.

*Corresponding author: Email: ghada_abushosha@yahoo.com;

Keywords: Adolescents; cancer; body image; coping strategies.

1. INTRODUCTION

The diagnosis of cancer is one of the most distressing life events [1]. At present, children with cancer have a better opportunity to survive than before; the use of aggressive multimodal therapies has resulted in increased survival rates [2,3]. A report from the United States indicated that 80% of children diagnosed with various types of cancer are expected to survive using the multimodal treatment approach [4]. This improvement in the treatment strategies calls for increased awareness of changes associated with cancer treatment as well as the emotional and psychosocial wellbeing of cancer survivors [5,6]. Understanding the impact of cancer treatment on adolescents becomes important because in addition to suffering from cancer, adolescents in particular face many challenges as they move from childhood to adulthood [7-9]. Furthermore, adolescence is a period of increased awareness of body features and evaluation of body appearance [10,11]. The development of sexual characteristics and awareness of physical and social changes make adolescents concerned about their appearance [12,13]. Therefore, an extraordinary effort is made to improve one's appearance and presentation since they often determine one's self-esteem [13]. Previous studies found that body image is a central issue during adolescence. Self-concept and self-esteem are linked to body image; in other words, adolescents who perceive their body image differently or abnormally than peers may view themselves negatively [12,14]. Changes associated with cancer treatment can be more intense with adolescents causing deterioration in identity formation [15]. These changes may produce a negative impact on adolescents' self-recognition of their body image and feeling of normality [8,16,17]. This paper discusses the concept of body image and reviews studies concerned with body image among adolescents with cancer. It blends the concepts of body image changes with coping strategies that are usually undertaken by adolescents with cancer.

2. BODY IMAGE CONCEPT

The concept of body image has been studied over the last half century [18]. It has been influenced by many disciplines, scientists and practitioners [19]. However, there is no consensus for the definition of the concepts of

body image [18]. Historically, the perception of "body image" or "body schema" began with clinical attempts to understand neuropathological forms of body experience including phenomena such as "phantom limb", and "autopagnosia" [19]. Several researchers have defined body image to comprise both perceptions and attitudes of person's body. Roid and Fitts (1998) defined body image as "a mental picture of the "physical self" and it includes attitudes and perceptions of one's physical appearance, state of health, skills, and sexuality" (as cited in [20] p. 176). On the other hand, body image was defined as an integral component of an individual's physical self which was considered as a subdimension of self-concept [21]. In addition, body image encompasses an individual's body related self-perception and self-attitude and it is linked to self-esteem, interpersonal confidence, eating and exercise behaviors, sexual experiences, and emotional stability [22]. Similarly, Alipour et al. [23] defined body image as a psychological construct which refers to self-concept including self-image and feelings of an individual's perception of his or her body.

Researchers have agreed that body image is a multi-dimensional construct [18]. Probst et al. [24] divided the concept of body image into three dimensions that can be differed at any time. The first dimension is a cognitive response which indicates how an individual "thinks" he or she looks; the second is an affective response refers to how an individual "feels" he or she looks; and the last is an optative response indicates how an individual "wants" to look. Similarly, Wu & Chin [25] have considered body image as a dynamic concept that is composed of what an individual feels and thinks about his or her body. Cash [19] defined body image as a multidimensional psychological construct that embraces both body-related self-perception and self-attitudes including thoughts, beliefs, feelings, and behaviors.

On the other hand, body image formation falls into a social and cultural context, so the greater dissatisfaction arises as self-perception of personal appearance deviates from the idealized cultural standard [26]. Therefore; body image is developed when individuals internally compare themselves with others and with cultural ideals considering that real and imagined feedback from others is important [20]. In the same way, Martin [27] reported that body image is a

subjective concept of one's physical appearance based on self-observation and the reaction with others. Martin [27] asserted that "ideal" body image is determined by one's cultural group that enhances feeling of beauty or success in achievement of the optimal physical status. Therefore, "ideal" body image varies between cultural groups, ethnic groups, and with any other groups to which one belongs. The term of body image also describes the state of overall wholeness, functionality, and ability to interact with others [28]. As a result, body image can significantly affect the way of how an individual perceives and interacts with the surrounding environment [23]. Therefore, the individual with a distorted body image may suffer from low self-esteem or lack of feelings of self-worth [23]. Consequently, people would seek some modifications in their appearance such as grooming, distraction, or concealment by using makeup, special clothing, and accessories [8].

3. DISTRESSING BODY IMAGE CHANGES IN ADOLESCENTS WITH CANCER

The advancement in medical technology has led to increased survival from cancer.

However, some obstacles inhibit the success of treatment and aggravate the harmful effects of cancer treatment in addition to delay adolescents' coping process. The following distressing domains contribute significantly to the feeling of stress. Physical and psychosocial consequences resulting from cancer treatment may disturb body image, induce the sense of alienation, and impede restoring normal life. However, some studies found positive consequences of cancer and its treatment. Table 1 shows a summary of the major studies that discussed altered body Image in adolescents with cancer.

3.1 Physical-Related Consequences

The diagnosis and treatment of cancer are stressful and threatening experiences that may be emotionally harmful to adolescents [5,29]. The results gained from the therapy may be explicit or hidden for several months or years after completion the treatment [30]. The intensity of later signs of cancer is related to the location and the extent of therapy, the kind of treatment, patient's age, and preexisting factors [30]. Young patients face some difficulties to accept treatment which impair their independency and may negatively affect their body image [31].

Altered appearance due to cancer treatment can be directly or indirectly observed and it can affect long term recovery from both physical and psychological aspects. Previous studies reported that hair loss is considered as one of the most distressing and noticeable effects of cancer treatment [8,16,17,32-34]. Hair loss, thinning of the hair or bald patches produced by cancer treatment create a permanent reminder of cancer, therefore, adolescents have few choices to hide the fact that they have cancer [33]. Similarly, Grinyer [34] stated that hair loss is the main source of distress and it is usually perceived by adolescents as threatening to self-esteem.

Fatigue and tiredness are also debilitating factors that induce a feeling of poor body functioning and have a negative effect on body image [33,35]. Changes in the bone growth can be a serious problem in adolescents because during puberty, some noticeable differences between adolescents who undergoing treatment and healthy peers appear [33]. Additionally, adolescents with cancer may have altered skin integrity. The placement of a central venous device may result in deteriorated body image, and may become a constant reminder of the disease and its treatment. It may also cause an alteration in body appearance and invasion of physical integrity [8,15]. In addition, cancer treatment can cause immuno-suppression and subsequently cause infections, thrombocytopenia, anemia, malnutrition, nausea, vomiting, constipation, oral mucositis, and pain [5,35-37]. Late physical effects may cause damage to kidneys, lungs, heart, and other vital organs, increase a risk of secondary malignancies, chronic obesity, infertility, learning impairments, speech and hearing difficulties, neurocognitive deficits, and mild to severe physical impairment [38,39].

Cancer survivors may also be at risk for unknown changes that result from new therapies [38]. Several studies were conducted to explore distress associated with cancer and its treatment. A study by Hedstrom et al. [40] assessed distress resulting from cancer and its treatment in children and adolescents with cancer. The study revealed that changes in appearance characterized by losing hair, visible nasogastric tubes, weight gain, using a wheel chair, and the visible implanted venous access device under the skin were the most distressing factors in patients older than 13 years of age. In the same way, Hedstrom et al. [41] found that the most

prevalent distressing factors were; losing hair (91%), missing leisure activities (84%), weight loss or gain (80%). In addition, 38% of adolescents reported worry about changed appearance and 45% reported worry from round face. However, the previously discussed two studies have examined a heterogeneous sample in terms of cancer type and treatment duration. This indicates an inconsistency in the characteristics of patients involved in the study because the perspectives of patients might differ over time and conditions which limits the generalizability of the results. Another study by Mattsson et al. [42] explored the impact of cancer on adolescents. Thirty eight patients aged between 13 and 19 years were interviewed via telephone calls to seek their recognition of good and bad things during chemotherapy period. Adolescents reported several physical problems due to changes in their appearance. They stated that their body appearance is not as they desire. Various physical problems limited their activities such as "tiredness", "feeling destroyed", and being in "bad shape".

On the other hand, Hokkanen et al. [43] were interested in studying how adolescents with cancer conceive their current life and how they envision the future. Twenty patients aged between 13 and 18 years were interviewed using focus groups. The findings revealed that adolescents were pleased to be alive. However, they reported negative feelings due to changes in physical appearance, anxiety, and sense of inferiority. Changes in physical appearance included, hair loss, scars, and small teeth. Some adolescents were bullied from school due to the changes in their physical appearance and impaired physical functioning.

Similarly, Cicogna et al. [35] studied the same issue and used semi-structured interviews in ten children and adolescents between 8 and 18 years who were undergoing chemotherapy. The study revealed that chemotherapy is associated with undesirable effects due to the physical changes and its relationship with body integrity. Physical problems include discomfort, nausea and vomiting, malaise, poor appetite, and headache. Weight loss and alopecia were the most distressing factors due to people's comments. A study by Wallace et al. [16] examined appearance-related concerns in adolescents with cancer. Semi-structured interviews were conducted with six females who were undergoing cancer treatment and aged between 14 and 19 years. The results indicated

that the worst side effect of treatment was hair loss which induced anxiety, in addition to scarring, bloating, rapid weight changes, and stretch marks. Altered appearance was significant during treatment and holding up as a constant reminder of "difference" and "marker of illness". However, the previous study conducted by Wallace et al. [16] excluded vulnerable and delicate patients who were thought to have psychological distress while interviewing. It is assumed that those patients with psychological disturbances or who could not sustain longer in the study might generate some essential inferences that reflect an actual psychosocial disturbances resulting from cancer. Williamson et al. [17] also investigated the impact of altered appearance during cancer treatment. Four adolescents and six of their parents were interviewed in addition to eighteen adolescents aged between 13-18 years shared in online survey. The study found that adolescents with cancer experience distress due to the alterations in their appearance. They indicated that their appearance differed from their peers and they viewed themselves unattractive, ugly, aged or ill looking. They were also worried about scarring, stretch marks, weight loss, bruising, spots, and looking ill. Hair loss and weight gain were reported most frequently. However, because of using a small sample, this study becomes less transferable to similar situation.

3.2 Psychosocial-Related Consequences

Changes in personal appearance often lead to isolation, depressed mood, loss of hopefulness, increased dependence on family, and separation from peers [44].

According to Callaghan [45] increased demands of illness threaten the adolescents' ability to establish the sense of identity and peers relationships. Social isolation is the most harmful effect that might deteriorate a persons' self-confidence [34]. In addition to the physical issues, survivors have to cope with emotional, social, economic, and academic consequences during cancer treatment [30]. Treatment protocols obligate adolescents to stay longer in the hospital, and it may also induce depression, alienation, and physical pain [31,38]. Yeh [46] found that persistent vomiting, nausea, fever, oral and anal ulcers, eating disorders, and weight loss is frequent side effects of cancer treatments that cause distress and hopelessness.

Table 1. Summary of reviewed studies regarding altered body Image in adolescents with cancer

Author/ year	Aim of the study	Major findings
1. Larouche & Chin-Peuckert (2006).	- To understand adolescents' perspectives of the impact of physical changes resulting from cancer and its treatment.	- Adolescents with cancer had negative perceptions of their body image. They perceived their body image as being different from others, being abnormal, and unattractive. This in turns affected their daily lives and makes them feel vulnerable. However, adolescents found distinct ways to handle their body changes and control the daily negative feelings of being noticed. Coping strategies used were: "avoiding," "maintaining normality," "testing the waters," and "peer-shield" themes.
2. Hedstrom et al. (2003)	- To examine distressing factors among children and adolescents with cancer from the perspectives of child, parent, and nurse.	- Patients older than 13 years of age reported that changed appearance is the most distressing factor. Aspect of changed appearance mentioned by adolescents were losing hair, visible nasogastric tubes, weight gain, having to use a wheel chair, and the visible implanted venous access device under the skin.
3. Hedstrom et al. (2004)	- To explore distressing and positive experiences in adolescents with cancer.	- Cancer during adolescence is associated with a range of negative experiences such as fears of altered appearance, fears of dying, and various physical concerns. Positive experiences include positive relations with staff and receiving good care.
4. Hedstrom et al. (2005)	- To investigate perceptions of distress among adolescents recently diagnosed with cancer.	- "Losing hair" and "missing leisure activities" were the most prevalent aspects of distress. While "missing leisure activities" and "fatigue" were ranked as the highest levels of distress. "Worry about not getting well," "mucositis," "nausea," "pain from procedures and treatments," and "worry about missing school" were rated as the worst aspects by most adolescents.
5. Ramini et al. (2008)	- To identify adaptive strategies used by adolescents with cancer.	- Adolescents reported evidences of positive adaptation such as responding to nausea, embracing changes, wanting to feel normal, having support from family, and feeling increased psychosocial maturation.
6. Maggiolini et al. (2000)	- To evaluate the attitude to face life and the impact of childhood leukemia in adolescents who had the disease cured.	- Adolescents in whom leukemia was cured showed a positive and mature self-image.
7. Mattsson et al. (2007)	- To explore the negative and positive consequences of cancer during adolescence two years after diagnosis.	- Adolescents reported several physical and appearance problems and negative consequences of body changes. Various physical problems including tiredness and being in bad shape limit them in their lives. Operations have led to scars and a change appearance. Some adolescents reported an inner change with

Author/ year	Aim of the study	Major findings
8. McCaffrey (2006)	- To explore the major stressors of children with cancer and the effect of these stressors on the physical and psychological wellbeing of these patients.	regard to maturity and development into a responsible person with good self-esteem. - Compromised body image and hair loss issues are major stressors that compromise children's self-esteem overtime. Compromised body image increases children's embarrassment in which they view themselves as a burden to others and wish to change their physical appearance. Coping mechanisms used to cope with physical changes include wearing a hat to cover up a bald head and wearing a baseball cap.
9. Pendley et al. (1997)	- To examine body image and social adjustment in adolescents who had completed cancer treatment and a healthy comparison group.	- There was a significant difference between objective versus self-perception of attractiveness. Body image correlated negatively with social anxiety and loneliness, and positively with global self-worth. Therefore, adolescents who had higher ratings of how cancer affected their appearance also reported feeling lonelier and more socially anxious. Within the cancer group, more negative body image perceptions were associated with a longer time since treatment termination.
10. Carlsson et al. (2008)	- To illuminate fear in adolescents with cancer.	- Adolescents experienced fear related to the physical body included fear of an altered appearance which described in terms of losing hair, having weight gain or loss, looking different, being pale, having a feeding tube fixed to the chin, loss of energy and having a part of the body removed. The experience of putting on weight because of medication caused lowered self-esteem as well as problems with clothing. Altered appearance was a fearful aspect which caused feelings of alienation.
11. Freeman et al. (2003)	- To identify commonly reported problems and helpful resources important to patients with brain tumors and their siblings during phases of illness.	- 40% of children were concerned about changes in their physical abilities and appearance. After diagnosis, changes in personality or moods, appearance, and activity levels were reported as important problems. Support from family and friends were reported as helpful and important by both groups.
12. Woodgate (2005)	- To explore the impact of cancer and its symptoms on adolescents' sense of self.	- Adolescents expressed that they faced many challenges because of cancer. Most significant to them were the distress and suffering that originated from the symptoms that resulted in experiencing new physical and mental body changes. The changing sense of self in adolescents was tied closely to their changing body. Physical and mental bodily changes affected

Author/ year	Aim of the study	Major findings
13. Wu et al. (2003)	-To explore factors related to satisfaction with body image in patients undergoing chemotherapy.	adolescent's self-perception. It was vital that family and friends accepted patients despite the changes in their bodies. Additionally, it was important that friends treated adolescents with cancer as the same persons. - Satisfaction with body image was significantly related to gender, age, education level, and the frequency of changes in appearance caused by chemotherapy. Girls felt more dissatisfied than boys. Satisfaction with body image was lower in older children, in children with a high level of education or in those with more frequently changes in appearance.
14. Wallace et al. (2007)	- To explore appearance-related concerns and determine their psychosocial impact.	- Concerns around an altered appearance were significant during treatment, serving as a constant reminder of "difference" and a marker of illness. The worst part of treatment was hair loss. Other changes included scarring, bloating, rapid weight changes, and resulting stretch marks. Participants negotiated their altered appearance by using practical strategies including wearing caps and scarves, wigs and hair extension and would not go out in public without covering their head.
15. Juvakka & Kylma (2009)	- To describe hope from the perspective of an adolescent with cancer.	-Altered body image was one factor that repressing hope in adolescents with cancer. Loosing hair changed one's appearance to be strange to oneself. Using wig not always helps, some participants found it unnatural and difficult.
16. Hokkanen et al. (2004)	- To determine the way that adolescents with cancer experience their current situation and how they see the future.	- Adolescents were pleased to be alive. However, they reported negative feelings caused by the disease including various health problems, changes in one's physical appearance, anxiety, and sense of inferiority. Changes in physical appearance included loss of hair, scars, small teeth, and effect on growth. Some adolescents had been bullied at school due to the changes that the illness had caused in their physical appearance and their lacking physical skills. Parents, relatives, and teachers were good sources of support. Friends emerged most prominently as significant supporters with whom the adolescents could share their experiences.
17. Wu et al.(2009)	- To investigate the coping experiences of adolescents with cancer.	- Two major theme categories of the coping experience were derived; losing confidence and rebuilding hope. Loss of confidence was generated by difficult clinical situations that exceeded

Author/ year	Aim of the study	Major findings
18. Stegenga and Ward-Smith (2009)	- To explore the lived experience of being diagnosed with cancer from the perspectives of the adolescents.	<p>participants' thresholds of tolerance and affected their efforts to rebuild hope. The loss of confidence was experienced in proportion to their physical and psychological suffering. Participants kept moving forward in their cancer situation by efforts to rebuild hope; they focused on their belief that they could overcome their disease and regain a normal life by thought restructuring, revaluing what they had, and envisioning hopeful images in order to rebuild hope.</p>
19. Enskar & Von-Essen (2007)	- To examine prevalence of aspects of distress, coping, support and care among adolescents and young adults with cancer.	<p>- Fatigue, eating problems, hair loss, and problem of taking medications were the most common factors that cause physical distress among patients. The scheduled medical plan for everything was the source of psychosocial distress in hospital.</p>
20. Abu Shosha et al. (2013)	- To explore the perceptions of body image changes and coping strategies in adolescents receiving chemotherapy.	<p>- Four major themes were emerged: "awareness of deteriorating physical changes", "psychosocial impact and effects", "coping strategies", and "developing supportive structures". Adolescents showed their awareness of altered appearance and its adverse consequences on their daily living activities. They established distinct strategies to cope effectively with physical and psychosocial changes resulting from chemotherapy such as using measures to conceal signs, accessing hospital facilities, and obtaining social support.</p>

McCaffrey [47] explored the major stressors experienced by patients diagnosed with cancer aged between 5 and 15 years and the effect of these stressors on their physical and psychological wellbeing. An in-depth series of focus group discussions were conducted with patients, parents, and hospital professional. The study revealed that several stressors were articulated by participants. Compromised body image was the major stressor reported by professionals and patients. It has affected patients' self-esteem negatively overtime and increased patients' embarrassment. They recognized themselves as a burden on others and they hope to change their physical appearance. However, patients' age of five years old in this study can be criticized as an incapable age for expressing in-depth emotions in a logical context.

Similarly, Hedstrom et al. [48] explored distressing factors and the experience of adolescents with cancer. A cross-sectional descriptive design was used and semi-structured interviews were conducted with 23 adolescents aged between 13 and 19 years, and 21 nurses. Eleven of adolescent patients were undertaking treatment while twelve of them had completed the treatment. The findings indicated that cancer in adolescence is associated with a range of negative experiences such as fear of alienation, fear of altered appearance, fear of dying, and various physical concerns. Adolescents who were informed of the diagnosis of cancer developed feelings of fear relating to losing hair or having a leg amputated.

Consistent with the findings of the previous study; Carlsson et al. [49] reported that adolescents with cancer experienced fear related to the physical body, existential fear, and fear related to the social life. Adolescents who experienced fear related to the physical body were terrified from altered appearance such as losing hair, having weight gain or loss, looking different, being pale, having a feeding tube fixed to the chin, loss of energy and having a part of the body removed. The experience of weight changes caused lower self-esteem and problems in clothing. Therefore, altered appearance was a fearful aspect and caused feelings of alienation.

Williamson et al. [17] found that changes in appearance may result in low self-esteem and fewer social interactions. Also, the periods of isolation, losing contact, or rejecting friends caused feelings of loneliness. Hence, changes in

appearance impacted negatively on behaviors by restricting social activity [16]. Hokkanen et al. [43] also revealed that altered appearance due to cancer treatment may induce isolation from family and friends and lead to sporadic school attendance.

3.3 Positive-Related Consequences

Despite the fact that cancer treatments produce many negative physical, psychological, and social consequences, some studies found that cancer experience can contribute positively to some aspects such as enhancing maturity and developing personality. For example, Maggiolini et al. [50] evaluated the impact of leukemia on adolescents' lives. A quantitative cross sectional design was conducted in two groups; seventy adolescents aged between 12 and 20 years who had survived leukemia and seventy participants for the control group selected based on specific criteria for age, sex, and socio-economic status. The findings revealed that adolescents who experienced leukemia showed more emotional stability and positive body image than the another group. They felt more confidence to face difficulties and to make decisions. They also reflected their ability to adapt and accommodate with the external challenges.

Hedstrom et al. [48] also asserted that some positive experiences were noted during cancer treatment such as positive relations with staff and having appropriate information about cancer and its treatment from competent professionals. In a study by Wallace et al. [16], adolescents showed some positive changes due to cancer treatment such as valuing the importance of life and enjoying their time. They felt stronger, confident, and able to deal with other stressful situations effectively. In addition, adolescents showed a desire to remain normal as previous and therefore, they refused being described as "ill persons", and they denied their "sick role". Mattsson et al. [42] also found that some patients with cancer reported a positive change in maturity and development which enhanced better self-esteem compared with other normal persons.

In conclusion, cancer and its treatment have many negative physical and psychosocial consequences, considering that physical changes may induce social isolation and poor interpersonal interaction. However, some studies revealed that adolescents with cancer may be motivated by that distressing illness to develop

their self-identity, positive relationship with others and attaining self-confidence toward the disease and its treatment.

4. COPING STRATEGIES WITH BODY IMAGE CHANGES

The previously discussed studies described the potential physical and psychosocial consequences resulting from cancer treatment as experienced by adolescents.

Adolescents cancer patients reported that their lives are stressful compared with healthy peers, they have more restrictions and limitations in their daily living activities and they need extraordinary efforts to cope [43]. However, adolescents with cancer have to cope effectively with the physical changes [51]. Effective coping has been linked with the sense of control, positive emotions, and available resources [52].

Tseng et al. [53] asserted that adolescents have many kinds of pressures imposed on them such as changes in their appearance and alterations in puberty. These changes may be appraised by adolescents as threats [33,13].

However, when adolescents are able to adapt with these normal developmental changes, they can produce positive outcomes that enhance their development. Depending on the effectiveness of the adolescent's ability to cope, the diagnosis of cancer can yield either irreparable damage or successful maturation [11]. The following coping strategies were acknowledged by adolescents with cancer as effective techniques that helped them to deal with the surrounding stressors caused by cancer treatment.

4.1 Strategies for Concealing Signs

Several techniques might be used to hide the visible signs of cancer such as hair loss, weight loss or gain, and skin discolorations. Wallace et al. [16] found that patients with cancer dealt with losing their hair by getting it cut into very short length and then shaving it completely [5]. Adolescents also managed hair loss by using practical strategies including wearing caps and scarves, and using wigs and hair extensions that enabled them to engage in the community without embarrassment [8,16,11]. Williamson et al. [17] confirmed that the need to feel normal was a main motivator for adolescents to cope

with their altered body image; they used strategies to improve their appearance such as using camouflage techniques, fashionable accessories, jewelry, and makeup like eyeliner and colorful powder. Wigs were acknowledged as a helpful device, but criticized as uncomfortable, itchy, and a source of stigma. Juvakka and Kylma [54] also found that using wig is not helpful in all situations as some participants found wig unpleasant and difficult to be used.

4.2 Strategies for Instilling Hope

Patients may rely on some strategies to help them in instilling hope and returning to the normal life. Kyngas et al. [55] found that belief in recovery, belief in God, getting back to normal life, a positive attitude toward life, hope to recover, and willingness to fight the disease were effective resources to cope with cancer and its treatment. Wu et al. [56] studied coping experiences in adolescents with cancer. Ten adolescents aged between 12 and 18 years who received chemotherapy were interviewed. Two major themes of the coping experience emerged; "losing confidence" and "rebuilding hope". Loss of confidence was developed when difficult clinical situations exceeded patients' level of tolerance and affected their efforts to retrieve hope. Losing confidence resulted in physical and psychological disturbances and therefore, there was a tension between losing confidence and rebuilding hope while receiving treatment. Participants kept moving toward rebuilding hope; they focused on the belief that they could restore their normal lives by restructuring, revaluing, and envisioning hopeful images. On the contrary, Juvakka and Kylma [54] found that altered body image is a factor that represses hope in adolescents with cancer. Participants reported that losing hair changed their appearance and induced feeling of alienation.

4.3 Strategies for Gaining Social Support

Obtaining support from health care providers, family, parents and friends was one of the major coping strategies used by adolescents to bridge the gap between the illness and health, and to minimize the state of isolation. In a study by Kyngas et al. [55] fourteen adolescents and young adults with cancer revealed that social support was a major coping strategy. Other studies also claimed that adolescents seek support from parents, relatives, and teachers [43,11,57-59].

Williamson et al. [17] also found that adolescents managed their reactions with people by choosing the most appropriate time to interact with others. Humor was a useful strategy to reduce discomfort and tension. Peers and family support were highly valued and adolescents appreciated the reassurance and acceptance of their appearance by parents and friends. By this, adolescents learned the benefits of being confident and informative when faced negative reactions. Similar to the previous findings Larouche and Chin-Peuckert [8] reported that adolescents with cancer found distinct ways to deal with their body changes and control their feelings towards their body image. The following coping strategies were created by adolescents to manage their physical and social deterioration; (1) avoiding social situations, (2) trying to maintain normality by using different measures to conceal physical changes associated with cancer treatment, (3) peer-shield, which means that adolescents rely strongly on their friends to act with them away from other people's mocks and comments, (4) testing the water used when adolescents choose the most appropriate time to react with others.

In addition to gaining support from others, some studies found that time distraction is one of the effective techniques to cope with the disease. For instance, McCaffrey [47] and Enskar et al. [57] found that many children and adolescents watch television or movies as a coping technique to pass the time faster. McCaffrey [47] reported that some adolescents used painting as another source of enjoyment and expressing self. Listening to their favorite music and popular stories for entertainment and distraction were also helpful.

5. CONCLUSION

In conclusion, these are some coping strategies undertaken by adolescents with cancer to accommodate with the distressing factors associated with cancer and its treatment. Social support, concealing signs, distraction, and hope are the most common methods used to cope successfully with cancer treatment as suggested by adolescents.

6. SUMMARY

Cancer is a disease associated with destructive side effects that influence both physical and psychosocial performance. It is considered as a distressing diagnosis to adolescents' body

image, autonomy, and independency. Body image is a complex and multidimensional construct that involves body-related self-perception and self-attitudes, including thoughts, beliefs, feelings and behaviors. It is influenced by a variety of historical, cultural, social, and individual factors. Previous studies revealed that hair loss, presence of a central line, and weight changes are the most distressing physical changes that can impair adolescents' body integrity. As a result, adolescents might become socially isolated instead of maintaining normal socialization. Body image is associated with patients' self-esteem, and there is a relationship between body image and psychosocial adjustment. In general, patients with cancer use different coping strategies to gain confidence and to rebuild hope. The following strategies helped adolescents to recover from the state of infirmity; wearing wigs, scarves, and hair extensions to hide alopecia, using cosmetic makeup and accessories, hope to recover, and willingness to fight the disease. Adolescents need to garner support from their family, society, and health care providers to be able to cope successfully with the stress of cancer and its treatment. In addition, time distraction and self-convincing strategies were appreciated as important factors for alleviating distressing factors. All studies agreed that body image changes are a major concern for adolescents who are facing a complex developmental milestone. In fact, qualitative research elicits rich data and deeper understanding using patients' perspectives. It provides the freedom to express and release participants' own views and feelings toward the effects of cancer and its treatment on their psychosocial life [16,60,61].

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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