

Body image and it relationship to academic achievement in a school-aged child with cancer under the influence of (The effectiveness of chemotherapy).

Saci houamdi ^{1*}

¹ Université Echahid Hamma Lakhdar - El Oued; houamdi-saci@univ-eloued.dz

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Abstract: The current study aims to find out the relationship between body image and academic achievement in children with cancer under (effectiveness of chemotherapy).the study used the descriptive correlational method, and to collect data, Body image scale was applied on a sample of (50) boys and girls, and this is based on their achievement rates for the first semester of the academic season (2025/2026).

Keywords: Body image; academic achievement; child with cancer; chemotherapy.

* Saci houamdi

I- Introduction :

Cancer is a disease that threatens human health and well-being. Its impact is not limited to the physical dimension but also extends to psychological and social adjustment, potentially hindering patients from fulfilling their social roles and returning to their normal lives. Most patients with cancer, particularly children, experience difficulties in adapting to the physical changes associated with the disease. These changes may affect their body image and may be accompanied by mixed feelings of sadness, anxiety, depression, and embarrassment in interactions with their peers.

Cancer of various types has become increasingly widespread in many geographical regions of the world. According to a report by the World Health Organization, approximately 18.1 million new cancer cases were recorded in 2018, and this number is expected to reach between 29 and 37 million cases by 2040 (Debban Fallah, 2024, p. 277).

American statistics indicate that approximately one in every 330 children under the age of 18 may develop some type of cancer (McDougall, 1997).

In Algeria, according to the National Cancer Registry Network, a total of 56,329 cases were recorded in 2023, including approximately 1,800 new cases among children. Most of these cases involved blood cancers, particularly leukemia and lymphoma. According to the cancer registry in El Oued Province, between 500 and 600 new cases were recorded in 2024, including between 40 and 60 new cases among children annually.

According to *Malomie de l'infirmier*, cancer is a malignant tumor characterized by rapid and potentially generalized growth. It includes several types, such as liver cancer, colon cancer, bronchial cancer, adenomas, and skin cancer. Treatment may involve radiotherapy, chemotherapy, or surgery. These treatments may negatively affect children's body image and physical appearance, potentially resulting in traumatic psychological reactions such as grief, difficulty accepting the disease, and social withdrawal, thereby affecting their quality of life.

Satisfaction with one's body image is directly associated with feelings of happiness and reassurance, whereas dissatisfaction may contribute to behavioral difficulties. Individuals develop perceptions of themselves that encompass thoughts, attitudes, feelings, and perceptions concerning their bodies. A mental representation of the body gradually develops through awareness of its physical and functional characteristics (Khoja, 2011).

Body image is influenced by both conscious and unconscious emotional processes and constitutes an essential component of an individual's self-concept. Thompson defines body image as the mental representation an individual has of the size, shape, and composition of the body, together with the feelings associated with that representation. This definition is consistent with the view of Rosen and colleagues, who describe body image as a positive or negative mental representation of one's body, expressed through a set of behavioral tendencies associated with that image. A fundamental aspect of body image involves an individual's evaluation of body size, weight, and other physical characteristics that contribute to overall physical appearance (Majdi Muhammad Al-Desouki, 2006, p. 16).

The neurologist Henry Head indicated that body image results from the integration of past experiences with current bodily sensations, which are organized within the sensory areas of the brain (James Breakey, 2010, p. 107). Head further noted that smooth movement and bodily coordination implicitly influence an individual's integrated cognitive awareness of the size, shape, and composition of the body. He also emphasized that body image changes continuously through

learning and examined the effects of brain functioning and bodily damage on this representation (Al-Ashram, 2008, p. 26).

Body image is particularly important during childhood and adolescence. A negative body image may contribute to anxiety, depression, and low self-esteem, as the body constitutes an important source of identity and self-esteem for many children and adolescents. It may also contribute to psychological difficulties and psychosomatic disorders associated with distorted body image. Such difficulties may arise when an individual's physical appearance does not correspond to what is considered ideal according to prevailing social standards. This suggests that a negative self-concept is often associated with dissatisfaction with body image and its disturbances. Body image is an important component of one's sense of self, is closely related to self-esteem, and is influenced by numerous social and cultural factors. It may also affect an individual's desire to belong to society and may contribute to feelings of social rejection.

These considerations support the view that body image has cognitive and emotional consequences for an individual's interactions within society. Fayed (2010, p. 5) emphasizes that body image has social, psychological, and physiological dimensions. Accordingly, an individual's perception of his or her body may influence psychological well-being and is associated with several psychological and social characteristics, including self-esteem, depression, anxiety, and attitudes. Academic achievement is likewise associated with psychological, social, and physiological dimensions. When a child with cancer experiences the effects of chemotherapy without adequate psychological and family support, the prolonged symptoms and challenges associated with the disease may generate a profound fear of bodily changes and anxiety about death. These concerns may become persistent, particularly following the diagnosis of cancer and in cases where recovery may involve surgical resection or amputation. Chemotherapy and other cancer treatments, particularly in cases of childhood bone cancer that may require the amputation of a limb, can result in feelings of inferiority and negative self-esteem associated with changes in physical appearance. These experiences may consequently reduce children's motivation to learn and achieve academically and may impair their ability to concentrate on their studies.

Accordingly, the present study seeks to investigate the relationship between body image and academic achievement among school-aged children with cancer experiencing the effects of chemotherapy.

1. Problem of the Study

To address the problem of the study, the following main question was formulated:

Is there a relationship between body image and academic achievement among school-aged children with cancer experiencing the effects of chemotherapy?

The following sub-questions arise from this main question:

- What is the level of body image among children with cancer experiencing the effects of chemotherapy?
- What is the level of academic achievement among children with cancer experiencing the effects of chemotherapy?
- Is there a statistically significant relationship between body image and academic achievement among male children with cancer experiencing the effects of chemotherapy?
- Is there a statistically significant relationship between body image and academic achievement among female children with cancer experiencing the effects of chemotherapy?

1.1 Study Hypotheses

- The level of body image among children with cancer experiencing the effects of chemotherapy is average.

- The level of academic achievement among children with cancer experiencing the effects of chemotherapy is average.
- There is a statistically significant correlation at the 0.05 significance level between body image and academic achievement among male children with cancer experiencing the effects of chemotherapy.
- There is a statistically significant correlation at the 0.05 significance level between body image and academic achievement among female children with cancer experiencing the effects of chemotherapy.

1.2 Objectives of the Study

The present study aims to:

- Identify the level of body image among children with cancer experiencing the effects of chemotherapy.
- Identify the level of academic achievement among children with cancer experiencing the effects of chemotherapy.
- Determine whether there is a correlation between body image and academic achievement among male children with cancer experiencing the effects of chemotherapy.
- Determine whether there is a correlation between body image and academic achievement among female children with cancer experiencing the effects of chemotherapy.

1.3 Significance of the Study

Given the increasing incidence of cancer, particularly among children, and the physical and psychological changes associated with chemotherapy, it has become important to examine this population. School-aged children undergoing cancer treatment may experience changes in body image that can affect their academic achievement.

The significance of the present study can be summarized as follows:

- Its findings may be presented to specialists in psychology, psychological counseling, and educational counseling in psychological and educational institutions, as well as to researchers, to assist in developing appropriate counseling and therapeutic programs.
- There is a relative scarcity of previous studies addressing children with cancer as a study population.
- The study may draw the attention of officials to the needs of this group and to the limited resources available to address the challenges they face.

1.4 Operational Definitions of the Study Variables

Body Image: Body image refers to the representation that members of the study sample have of their physical appearance, whether positive or negative and whether realistic or unrealistic. It is influenced by psychological and social factors and is operationally represented by the score obtained by a child with cancer on the body image scale developed by Muhammad Al-Nubi (2013).

Academic Achievement: Academic achievement is represented by the annual average obtained by the student during the 2025/2026 academic year across all subjects. It reflects cognitive and skill-based performance and represents an indicator of the competencies required for progression to the next educational level.

Effects of Chemotherapy in Children with Cancer: These refer to the side effects experienced by children as a result of chemotherapy during the treatment period. The most important effects identified in the present study include hair loss, yellowing of the skin, nausea, and increased susceptibility to infection.

2. Methodological Procedures of the Study

2.1 Study Methodology

The descriptive-correlational approach was adopted, as it was considered appropriate to the nature of the study, in order to examine the relationship between body image and academic achievement among children with cancer who experienced the effects of chemotherapy.

2.2 Basic Study Sample

The basic study sample was selected using a cross-sectional method. The sample consisted of 50 children with cancer, including 22 males and 28 females, who experienced the effects of chemotherapy and were receiving care at either the Cancer Control Center or the Mother and Child Hospital, as shown in the following table.

Table 1. Classification of the Basic Study Sample According to Gender

Study Setting	Gender	Number (n)	Percentage	Total
Mother and Child	Females	15	60%	25 (100%)
	Males	10	40%	
Cancer Control	Females	13	52%	25 (100%)
	Males	12	48%	
Overall Total	Females	28	56%	50 (100%)
	Males	22	44%	

2.3 Study Limitations

Time Limit:

The study was conducted from the beginning of May to the end of June of the 2025/2026 academic year.

Spatial Limit:

The study was conducted at the Cancer Control Center and the Mother and Child Hospital in El Oued.

2.4 Data Collection Tool

The present study relied on the Body Image Scale developed by Muhammad Al-Nubi (2010). Its psychometric properties were assessed by calculating discriminant validity using the *t*-test, which yielded a value of **11.09**, indicating statistical significance.

Reliability was also assessed using Cronbach's alpha coefficient, which yielded a value of **0.94**.

2.5 Statistical Methods

The Statistical Package for the Social Sciences (SPSS), Version 25, was used to analyze the study data.

Presentation, Analysis, Discussion, and Interpretation of the Results

2.6 Results Related to the First Research Question

The first research question of the present study asks:

What is the level of body image among children with cancer who have experienced the effects of chemotherapy?

The following section presents the detailed results obtained by the male participants on the Body Image Scale.

Table 2. Detailed Results of Male Participants on the Body Image Scale

Body image	The number		Body image	The number
34	1		86	12
37	2		88	13
39	3		96	14
41	4		93	15
54	5		102	16
63	6		94	17
66	7		95	18
77	8		103	19
79	9		98	20
81	10		113	21
83	11		108	22
			Total	1730
			Arithmetic mean	78,63636

Table 2 shows that the **highest score** obtained by the male participants on the Body Image Scale was **113**, recorded by participant No. **21**, whereas the **lowest score** was **34**, recorded by participant No. **1**. This indicates a wide range of scores among the male participants, with a range of **79 points**.

The following section presents the detailed results obtained by the female participants on the Body Image Scale.

Table 3. Detailed Results of Female Participants on the Body Image Scale

Body image	The number		Body image	The number
65	1		111	15
42	2		102	16
41	3		94	17
39	4		95	18
57	5		103	19
77	6		98	20
67	7		113	21
71	8		108	22
75	9		112	23
97	10		109	24
92	11		108	25
88	12		99	26
92	13		113	27

98	14		107	28
			Total	2455
			Arithmetic mean	87,67857

Table 3 shows that the **highest score** obtained by the female participants on the Body Image Scale was **113**, recorded by girls No. **21 and 27**, whereas the **lowest score** was **39**, recorded by girl No. **4**. This also indicates a wide range of scores among the female participants, with a range of **74 points**.

The study participants can be classified collectively according to their scores on the Body Image Scale into three levels: **low, medium, and high**, as presented in the following table:

Table 4. Classification of Male and Female Participants According to the Levels of the Body Image Scale

Body Image		Females		Males		T-R	T-P
Level	Range	Repetition	Percentage %	Repetition	Percentage %		
Low	From (30) to (59)	4	14.29%	5	22.73%	9	18.00%
Average	From (60) to (89)	7	25.00%	8	36.36%	15	30.00%
High	From (90) to (120)	17	60.71%	9	40.91%	26	52.00%
Total	From (30) to (120)	28	100%	22	100%	50	100%

Table 4 shows some differences between the male and female participants in terms of the number of individuals who obtained low scores on the Body Image Scale.

This difference is evident in the percentage of male participants who obtained low scores, which was **22.73%**, compared with **14.29%** among female participants. A more noticeable difference can also be observed in the percentages of participants whose scores fell within the average level of the Body Image Scale, with a difference of more than **11 percentage points** between the two groups. At the high level of the scale, the difference between the two groups was approximately **20 percentage points**.

The lowest score recorded on the Body Image Scale was **34**, whereas the highest score was **113**. Thus, the range between the scores was considerable, indicating differences in the participants' responses to the scale.

The overall results of the study participants are presented below, classified according to the levels of the Body Image Scale.

Table 5. Classification of the Study Participants According to the Levels of the Body Image Scale

Body image		Repetition	Percentage
level	range		
low	From (30) to (59)	09	18 %
average	From (60) to (89)	15	30 %

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High	From (90) to (120)	26	52 %
total	From (30) to (120)	50	100 %

Table 5 shows that more than half of the study participants obtained scores at the **high level** of the Body Image Scale, which confirms the presence of negative feelings among children with cancer as a result of the effects of chemotherapy.

The results also indicate that the number of participants who obtained average scores on the scale was nearly twice the number of those who obtained low scores. This finding suggests that most of the children experienced negative feelings as a result of being exposed to cancer and the effects of chemotherapy.

This is understandable, as physical appearance receives considerable attention from individuals. In this regard, Khoja (2011) indicates that we do not perceive ourselves in exactly the same way that others perceive us. Body image is part of an individual's internal perception of the self, and our feelings are reflected in the image we hold of our bodies. The physical changes resulting from chemotherapy and its side effects may place children in a continuous process of comparison with their healthy peers, which may generate negative feelings toward themselves.

During childhood, males and females may be similar in their perceptions of self-image. According to Rogers, body image is one of the basic aspects of self-esteem and has a strong influence on psychological adjustment. However, functional impairment affecting certain parts of the body as a result of physical deformities or loss, such as limb amputation, may negatively influence an individual's thoughts and perceptions regarding body image.

2.7 Results Related to the Second Research Question

The second research question of the present study asks:

What is the level of academic achievement among children with cancer who have experienced the effects of chemotherapy?

The following section presents the detailed results obtained by the male participants on the academic achievement scale.

Table 6. Detailed Results of Male Participants on Academic Achievement

Academic achievement	The number		Academic achievement	The number
5,98	1		6,08	12
6,77	2		5,77	13
7,67	3		5,96	14
7,93	4		8,89	15
6,49	5		6,85	16
6,17	6		6,89	17
6,84	7		5,24	18
5,76	8		5,09	19
5,53	9		4,56	20
8,22	10		3,78	21
6,71	11		3,34	22

	Total	136,52
	Arithmetic mean	6,20

Table 6 shows that the **highest score** obtained by the male participants on the Academic Achievement Scale was **8.89**, recorded by participant No. **15**, whereas the **lowest score** was **3.34**, recorded by participant No. **22**. This indicates a considerable range of scores among the male participants, amounting to **5.55 points**.

The following section presents the detailed results obtained by the female participants on the Academic Achievement Scale.

Table 7. Detailed Results of Female Participants on the Academic Achievement Scale

Academic achievement	The number		Academic achievement	The number
5,98	1		8,89	15
6,77	2		6,85	16
7,67	3		6,89	17
7,93	4		5,24	18
8,67	5		5,09	19
6,17	6		4,56	20
6,84	7		7,09	21
5,76	8		7,12	22
5,53	9		3,78	23
8,22	10		3,34	24
6,71	11		5,67	25
6,08	12		4,87	26
5,77	13		5,09	27
			Total	207,03
			mean Arithmetic	7,39

Table 7 shows that the **highest score** obtained by the female participants on the Academic Achievement Scale was **8.89**, recorded by girl No. **15**, whereas the **lowest score** was **3.34**, recorded by girl No. **25**. This also indicates a considerable range of scores among the female participants, amounting to **5.55 points**.

The study participants can be classified collectively according to their scores on the Academic Achievement Scale into three levels: **low, medium, and high**, as presented in the following table:

Table 8. Classification of Male and Female Participants According to the Levels of the Academic Achievement Scale

Academic achievement		Females		Males	
Level	Range	Repetition	Percentage %	Repetition	Percentage %
Low	From(00)to(4,99)	04	(14,29 %)	03	(13,64%)
medium	From(05)to(6,99)	17	(60.71 %)	15	(68,18%)
High	From(07)to(10)	07	(25 %)	04	(18,18%)
Total	From (30) to (120)	28	100%	22	100%
Sum total	/			50	100%

Table 8 shows a high degree of similarity between the male and female participants in terms of the number of individuals who obtained low scores on the Academic Achievement Scale. This is evident in the percentage of male participants who obtained low scores, which was **13.64%**, compared with **14.29%** among female participants.

There was also little difference between the male and female participants in terms of the percentages of those whose scores fell within the average level of the Academic Achievement Scale, with the difference not exceeding **8 percentage points**. At the high level of the scale, the difference between the two groups was approximately **6 percentage points**.

The highest score obtained on the Academic Achievement Scale was **8.89**, whereas the lowest score was **3.34**. Thus, the range between the scores was considerable, indicating differences in the participants' responses to the scale.

The following section presents the overall results of the study participants, classified according to the levels of the Academic Achievement Scale.

Table(09) classification of sample members , results according to levels of academic achievement

Academic achievement		Repetition	Percentage
level	range		
low	From (00) to(4 99)	07	(14 %)
average	From (05) to (6,99)	32	(64%)
High	From (07) to (10)	11	(22 %)
total	From (30) to (120)	50	100 %

Table 9 shows that more than half of the study participants obtained scores within the **average level** of the Academic Achievement Scale. This finding supports the validity of the achievement tests administered to students in general and to children with cancer in particular. The results also indicate that the number of participants who obtained high scores on the scale was nearly twice the number of those who obtained low scores.

This may be attributed to the assessment process used in primary schools, which does not place excessive emphasis on students' performance and responses while taking into consideration their health conditions and the human dimension of the teachers' assessment practices.

Consequently, most of the study participants were classified within the intermediate or average level of academic achievement.

2.8 Results Related to the Third Research Hypothesis

The hypothesis states:

There is a statistically significant correlation between body image and academic achievement among male children with cancer who have experienced the effects of chemotherapy.

To determine whether a relationship exists between the two variables among the male participants, the **Pearson correlation coefficient** was calculated. The results are presented below.

Table 10. Results of the Pearson Correlation Coefficient Between Body Image and Academic Achievement Among Male Children with Cancer Who Have Experienced the Effects of Chemotherapy

Males	Sample size	Arithmetic mean	Standar deviation	The value of "R"	Significance level of "R"	The decision
Body image	22	78,636	24,3615	0,479	0,024	Significant 0,05
Academic achievement	22	6,2055	1,35004	/	/	/

Table 10 shows that the arithmetic mean of body image among the male participants with cancer who experienced the effects of chemotherapy was **78.36**, which falls within the average level defined by the range of **60–89**. This indicates the distribution of the participants' scores on the scale, with most of their scores clustered around the arithmetic mean.

Regarding academic achievement, the arithmetic mean of the male participants was **6.2055**, which also falls within the average level of academic achievement, defined by the range of **5–6.99**. This classification was adopted because a score below **5 out of 10** does not enable the student to pass and progress to the next academic stage. Accordingly, the remaining range from **5 to 10** was divided into average and high levels of academic achievement.

After calculating the **Pearson correlation coefficient** between body image and academic achievement among the male participants with cancer who experienced the effects of chemotherapy, the coefficient was found to be **0.479**. Since the significance level was **0.024**, which is lower than **0.05**, the correlation coefficient is statistically significant at the **0.05 significance level**.

Therefore, there is a statistically significant correlation between body image and academic achievement among the male participants with cancer who experienced the effects of chemotherapy. Thus, the hypothesis was supported.

2.9 Results Related to the Fourth Research Hypothesis

The hypothesis states:

There is a statistically significant correlation between body image and academic achievement among female children with cancer who have experienced the effects of chemotherapy.

To determine whether a relationship exists between the two variables among the female participants, the **Pearson correlation coefficient** was calculated. The results are presented below.

Table 11. Results of the Pearson Correlation Coefficient Between Body Image and Academic Achievement Among Female Children with Cancer Who Have Experienced the Effects of Chemotherapy

females	Sample size	Arithmetic mean	Standar deviation	The value "R"	Significance level of "R"	The decision
Body image	22	87,679	22,8766	0,452	0,016	Significant 0,05
Academic achievement	22	6,2132	1,35811	/	/	/

2.10 Interpretation and Discussion of the Results Related to the Fourth Research Hypothesis

Table 11 shows that the arithmetic mean of body image among the female participants with cancer who experienced the effects of chemotherapy was **87.679**, which falls within the average level defined by the range of **60–89** and is very close to the high level of the Body Image Scale. This may indicate that female participants are more affected by the physical changes caused by chemotherapy, particularly given the importance generally attached to appearance and beauty among females.

One of the most common effects of chemotherapy among cancer patients is hair loss, which affects both males and females. However, the significance attached to hair and physical appearance may differ between the two groups.

The arithmetic mean of academic achievement among the female participants was **6.2132**, which also falls within the average level of academic achievement, defined by the range of **5–6.99**. This value is very close to the arithmetic mean of academic achievement among the male participants and is, in fact, almost identical to it. The study interprets this similarity as suggesting that female participants may be more affected by the physical changes associated with chemotherapy than males. In primary schools, the academic achievement of healthy female students is observed to be higher than that of healthy male students. Therefore, the convergence in academic achievement between male and female children with cancer may indicate that the disease and its physical effects have affected female participants to a greater extent.

After calculating the **Pearson correlation coefficient** between body image and academic achievement among the female participants with cancer who experienced the effects of chemotherapy, the coefficient was found to be **0.452**. Since the significance level was **0.016**, which is lower than **0.05**, the correlation coefficient is statistically significant at the **0.05 significance level**. Therefore, there is a statistically significant correlation between body image and academic

achievement among the female participants with cancer who experienced the effects of chemotherapy. Thus, the hypothesis was supported.

G. Bambault argues that children may attach a negative meaning to being afflicted with a disease, which may be associated with destructive or hostile feelings and feelings of guilt or self-reproach (Mozot & Mouzel, 1994, p. 406).

Such experiences may place children under continuous psychological pressure and preoccupation with their illness, which can negatively affect their academic performance.

Studies by **Deschamps (1988)** and **Marcelle (1999)** also indicate that children may develop four responses to cancer: **regressive, isolated, dismissive, and aggressive behaviors**. These responses have been attributed to factors such as age, maturity, and the defensive mechanisms available to the child. Such psychological experiences associated with cancer may affect school-aged children's schooling and their acquisition of educational competencies.

The levels of anxiety and depression associated with cancer, together with the deterioration of body image resulting from chemotherapy, provide further support for the study's hypotheses. These findings are consistent with the study by **Zaatout and Rouibah (2018)**, which found an association between levels of anxiety and depression and the increased presence of disease symptoms among cancer patients. They are also consistent with the findings of **Fawqia (2008)**, which indicated that physically disabled individuals may have a negative perception of their body image, reflected in dissatisfaction with physical appearance, attempts to conceal physical defects from others, difficulties in interpersonal relationships related to perceived physical attractiveness, excessive concern about others' perceptions of their appearance, and a desire to change various aspects of physical appearance. The study also emphasized the perceived importance of physical attractiveness in social relationships, particularly among females.

The findings also reveal some differences between males and females in their negative perceptions of body image. Hair loss among females, for example, may contribute to a more negative perception of body image. However, the present study suggests that female participants may compensate for this negative perception through academic achievement, as the mean academic achievement score among females was higher than that among males.

Conclusion

The present study examined two important variables, namely **body image and academic achievement among children with cancer who experienced the effects of chemotherapy**.

The study reached the following conclusions:

- The level of body image among children with cancer who experienced the effects of chemotherapy was **high**, which, according to the interpretation adopted in the study, confirms the presence of negative feelings regarding their body image.
- The level of academic achievement among male and female children with cancer who experienced the effects of chemotherapy was **average**.
- There was a **statistically significant correlation at the 0.05 significance level** between body image and academic achievement among male children with cancer who experienced the effects of chemotherapy.
- There was a **statistically significant correlation at the 0.05 significance level** between body image and academic achievement among female children with cancer who experienced the effects of chemotherapy.

Recommendations

Based on the findings of the present study, the following recommendations are proposed:

1. Conduct further studies on variables associated with cancer, particularly among children, including psychological, personal, and social adjustment, resistance to stress, and physical changes resulting from chemotherapy and other treatments.
2. Give greater attention to preventive psychological and social support, as well as to the educational needs of children with cancer, from the time of diagnosis.
3. Provide health, psychological, and social support to children with cancer by strengthening the role of specialists in treatment centers and supporting their families through counseling sessions that help them increase their acceptance of the disease and develop appropriate strategies for coping with it.
4. Strengthen cooperation among health, media, and university institutions to promote health awareness and community education about cancer in its various types and classifications, as well as about its prevalence among individuals, particularly children. Such efforts may contribute to reducing the lack of awareness that can negatively affect the lives of individuals and society.

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