



## **THE IMPACT OF HEALING GARDENS ON IMPROVING PSYCHOLOGICAL RECOVERY OF CHILDREN –APPLICATION ON PEDIATRIC CANCER HOSPITAL IN EGYPT**

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### **ABSTRACT**

There is an increasing interest in using healing gardens in general hospitals and in pediatric hospitals in particular since it has an important psychological impact on children for instance it reduces stress. The paper focuses on the impact of health care on hospitalized children, theories of environmental restoration and design guidelines for healing gardens in children's hospitals.

The paper aims to prove the relation between the design of healing garden and hospitalized children behavior to discover if certain elements of design principles have indeed a positive impact on psychological recovery of children, and if so, what are these elements and how they can be improved.

The paper examined the perceptions of 25 children towards the healing garden in the pediatric cancer hospital in Egypt and the results revealed that, 80% of children showed satisfaction toward the garden. 20% of them gave no negative comments. Additionally, fifth likert scale was conducted to identify the impact of healing garden on psychological recovery of children. The results showed that not only 95.6% of 50 specialized therapists and psychiatrists admitted that the communication with nature has a positive effect on psychological recovery of children. The most important survey was made with 50 volunteers who discussed the effectiveness of 25 elements from 6 design principles for a healing garden in pediatric cancer hospital. These principles was agreed on by the volunteers with different percentage sense of control (74.8%), Social support(74.6%), positive distractions(67.6%), sensorial dimensions(53.2%), movement and exercise(60.4 %) and Natural distractions(89.2%).

Finally, the paper is concluding that healing gardens have an important role in increasing the communication between sick children and nature, improving cognitive performance and promoting psychological recovery

**Keywords:** Healing Garden, Design Principles, Cognitive performances, psychological recovery

### **1. Introduction**

The healing properties of health care environments have been ignored for a long period. Medicine had considered as the self-sufficiency in the treatment of disease. However, the new evidences have revealed the contribution of healing gardens in hospitals for the healing process [1].

In the case of pediatric hospital, the design of hospital has a special importance because the children are a unique case for learning and interaction with the world around them which requires

specific activities for natural development. Therefore, the design of the hospital must provide a healing garden that includes special determinants that differ from the design of other gardens [2].

## **2. The impact of health care on children**

Illness and hospitalization are considered the most stressful issues on human life [3]. Hospitalization often erodes the patient's feeling of constraints because of the aspects of the loss of privacy and loss of control on eating, sleep times and losing information, these aspects cause pressure on the adult patients and then lead to several negative effects including depression, anxiety, disability, low cognitive performance, high blood pressure, and suppression of immune performance [1]. As for sick children, they look to the hospital environment as a strange environment which causes pain and separate them from their families. The vision of the outsiders and complex devices which required for treatment has led the children to be terrified and stimulated their negative behavior [4].

The children, who are suffering from cancer, respond differently to chemical therapy due to their particular path physiology that has a negative effect on their feelings and behavior. Some of these behaviors include excessive nighttime fears, increased clinging and dependence on parents, loss of control of the intestines and bladder. For these reasons, the pediatric cancer hospitals focused on developing children-centered environment, including new spaces such as play areas, different activities places, art regions, etc[5] to provide a conciliatory effect and emotional relief more than the therapeutic environment that causes fatigue [3,5].

### *2.1. Satisfaction and behavioral intentions of sick children*

The satisfaction has a sharp focus in the researches of healing garden as it considered the desired emotional result [6, 7]. The patient satisfaction with the individual judgment suggests that the healing garden has a pleasing level of aesthetic needs [8]. It is found that, the design of healing gardens in an enjoyable manner may raise the positive behaviors between patients then we can understand the relationship between the environment and behavior [9].

Therefore healing gardens should be designed to improve positive behaviors among children through carefully chosen design elements that promote the following [10]:

- Restoring the feel of control
- The social support
- An opportunity to move and practice sports
- Access to natural deviations in addition to the access to privacy as a subset of the sense of control.

### *2.2. Theories of environmental restoration*

There are two theories which have the notion of restorative impact on children one of them is stress coping restoration theory [1] and the other is attention restorative theory [4]. Both theories focus largely on physiological stress [11]. In the perspective of child psychology, environmental psychology and treatment of gardening and landscaping, there are three ways to increase patient performance: physical, cognitive and social manners [1, 11, and 12] which can lead to many positive clinical outcomes [12] as the following:

- Low taking medication.
- Low pressure and pain
- Increasing recovery rate

- Increasing mental and physical peace and increasing psychological adjustment.

Whereas, the hospitalized child is suffering from stress and interaction retroactively due to staying on his bed. So, permitting him to play in the garden will encourage him to move and practice various activities which letting him to reveal a lot of significant information about the garden [13]. Moreover, motion allows the patient to bear different body posture, create his own boundaries, have sense of control and explore his abilities [14].

Increasing cognitive performance means a positive shift in improving the sense of affection and behavioral development for the hospitalized children [15, 16]. The other cognitive functions such as increasing self-regulation, memory, attention, information processing and intuition. Participation in outdoor playing areas reduces child stress, decreases anxiety, and improves satisfaction and other positive psychological stimuli [12, 17].

In addition, the increase in social performance means improving social play and the communication of the child with the other children during the activities in the garden, which leads to positive behavioral changes [18, 19].

### **3. The Healing gardens in pediatric hospitals**

Healing garden in pediatric hospital offers a special environment away from the atmosphere of the hospital and insures the communication between the children and the natural environment, where children can be get around and explore the healing benefits of the natural environment [20]. Hence, the ideal relationship between natural and architectural features in the garden promotes the positive emotions of children [21].

#### *3.1. The role of healing garden in the development of cognitive and behavioral abilities of children*

The healing garden affects on children in different stages of treatment because of its characteristics which influence the children's different feelings and emotions [22]. Also, the different elements of the healing garden grant the opportunity to meditate on the nature, which expand the children perception, enrich their culture and deepen their understanding for the meaning of the continuity of life [23].

The importance of the garden has shown through the direct interaction with its components so that the children can reshape his physical environment to fit his personality through [24]:

- The use of the different formation and the wide spaces gives a sense of vitality and activity with taking into account not to use excess shapes that creates the sense of loss of safety and reassurance.
- The size of elements within the garden fits the child's scale leads to increase self-confidence and self-assertion and it can be achieved in design with the size of seats, tables and other garden's furniture with the size and age of the child who used the garden.
- The use of chromatic rhythm with the repetition of elements in the design attracts visual attention and develops the child's cognitive abilities.
- The uses different and differentiated tiles in flooring is motivating the child to practice movement, activity and playing, on the other side, the soft floors make it difficult for the child movement and also, the floors with rough texture give a sense of fatigue and lack of sense of security.

### 3.2. Design of healing gardens in pediatric hospitals

The healing garden is an outdoor green area on the campus of the hospital that has the ability to relieve physical illnesses and low stress levels as the emotional instability of hospitalized children. So the importance of designing a healing garden lies to fit the sensitivity of hospitalized children [25]. The environment is also symbolically related with children by addressing the subconscious of sight, smell and sound [1]. Well-design healing gardens entails promoting sick children well-being related to an aesthetic, comfortable, safe, and pleasant atmosphere; encouraging children to interact with their families and other patients[26].

Table.1. below presents the design guidelines that can improve the well-being of children in pediatric hospitals and the health outcomes, which have been compiled based on four major theoretical and practical researches. Selected studies are Cooper Marcus & Barnes, (1999), McDowell & Clark-McDowell, (1998), Mitrione & Larson, (2007) Naderi & Smith, (2008) [25, 27, 28, 24].

**Table. 1.**

Design principles of healing garden [25, 27, 28, 24].

Principles of Healing Garden		Theoretical studies			
		Cooper M. & Barnes	McDowell & Clark	Mitrione & Larson	Naderi & Smith
Sense of control	design of clear pathways	•	•	•	
	private activities	•	•	•	•
	specific landmarks	•	•		
	avoiding the sensation of confusion	•	•	•	•
	There are both sunny and shaded areas in the garden.				
	There are choices of walking routes in the garden.	•			
	There is a bathroom close to the garden.	•			
Social support	The seating in the garden is comfortable.		•		•
	There is a central space for people to gather.				
Beach at the beach	Different areas in garden for conversations in small groups.	•		•	
	The garden has some table arrangements.	•		•	
	The design of different play areas with games and toys	•	•	•	•
Sensory dimensions Age Appropriate Environments	The garden has various types (shapes, widths, and routes)	•	•	•	•
	Art areas in garden	•	•	•	•
	Utilizing different Color	•	•	•	•
	Eliminate noise sources	•	•	•	•
Movement and exercise	Different activities	•	•	•	•
	Different spaces	•	•	•	•
	Provide meandering pathways	•	•		
Natural distractions	The garden provides areas that encourage exercise through walking.	•		•	•
	The garden has plants with a variety of colors.	•			•
	There are spots of bright colors in the plants.	•	•	•	
	Plant life (trees, shrubs, and flowers) is the major portion of the garden.		•	•	•
	Some plants in the garden attract butterflies.	•		•	
This garden has a relaxing view of the surrounding nature.	•				

### 4. Case study of pediatric cancer hospital in Egypt

The research was carried out on the Children's Cancer Hospital in Cairo, Egypt, and is specialized in the treatment of childhood cancer. The hospital was built on an area of 20.000 cubic meters and it had opened on 2007, the hospital now has approximately 245 beds and an outpatient unit capable of accommodating 300 children per day. The hospital

employs more than 150 specialists in all fields, as well as more than 2,000 support staff including nurses, pharmacists, technicians and operators.



**Fig. 1.** Pediatric cancer hospital in Cairo [29]

#### *4.1. Garden analysis*

The hospital has an outdoor garden with an area of 10,046 square meters. It has suitable green spaces for the activities and a variety of plants that attract butterflies and birds to the place, as well as uses of plants as an optical barrier to achieve privacy and separation of activities, as shown in [Figure-2].



**Fig. 2.** The garden of pediatric cancer hospital (source: researcher)

The garden has comfortable seating and a variety of seating areas, which allows for communication with others. Shaded areas are also provided to cover the seating areas. The garden also has suitable lighting elements in all areas with a suitable light for night vision. The garden design provides signs and guideposts for easy access to the places of various activities. In the design of the garden, children's play areas were observed near the seating areas, and the area has safety requirements also it is suitable for the nature of the place and the health condition of the sick children. About the used floors used in the garden they are varied between grass, sand and tiles of geometric shapes and the design included the stairs and slopes which are suitable for children with special needs.

#### *4.2. The analysis of results*

A semi-regular interview was held with 25 children in order to recognize the cognitive and social abilities of the children and their interaction with the garden features and to deal with their peers in the garden. The words of the patients were called upon by asking patients about their cognitive judgments about the garden conditions. That includes positive cognitive judgments about the garden's preference, satisfaction, belonging, affection, relaxation, calm and forgetting fears. Before the interview, the researcher had developed his relationship with the patients, and then the participated the patients in playing. The interview was conducted in playing areas after integration with the patient.

In addition to that, 100 questionnaires' copies were distributed equally to specialized physicians (therapists and psychiatrists) and volunteers, who had previous experience with cancer, in the hospital by formulating a set of questions that determining the effectiveness of the garden for psychological state and supporting the social relations of the children. Also, there were other questions that evaluating beautiful scenery, cheerful environment,

different activities and how it provides freedom for children's play. The questionnaire was prepared in accordance with the following principles:

- Limit the question of one idea
- The lack of questions that accept multiple complex answers
- Avoid leading questions
- Simple language
- Avoid conditional answers
- Ask only necessary questions

These questionnaires were distributed through personal interviews. The responses demonstrated their opinions, perceptions as well as their knowledge of patient experiences. Most efforts are based on aesthetic assessment of garden to children. The descriptive statistical measures of the research variables were used and were based mainly on fifth Likert scale which is the sum of responses in several elements, its range was from strongly agree to strongly disagree as shown in [Table -2][30].

**Table 2.**  
Weighted mean according to fifth Likert scale [30]

fifth Likert scale	
score	Responding Remarks
1.00-1.79	Strongly disagree
1.8-2.59	Disagree
2.6-3.39	Somewhat Agree
3.4-4.19	Agree
4.2-5.00	Strongly Agree

#### 4.2.1. The perceptions of hospitalized children towards the garden

All the children in the hospital had positive feeling towards the garden and didn't want to leave it. The children described their feelings towards the garden as the best, happy, beautiful and not bored. Hence, 80 % (n=20) of children mentioned positive words indicating their satisfaction toward the garden. 20% (n=5) of them gave no negative comments. From the 20 respondents, 15 of them mentioned the word 'best' towards the garden. 60% (n=15) preferred to play and stay in shaded areas, 20% (n=5) preferred shaded and sunny areas equally and 20% (n=5) preferred to play in sunny areas. On the other side, 60% (n=15) were not Participating in activities with other children and preferred to play with volunteers and their moms. 40% (n=10) of children were participating in activities with other children and volunteers.

Based on the results, the garden has a significant effect on children's feeling, their perceptual preferences and predilection to participate in the garden activities which indicated to the great importance of the garden in the pediatric hospital.

#### 4.2.2. The evaluation of specialized physicians on children's behavior after participating in the garden

Healing garden is considered as breathing area for children in the hospital to participate in various activities and away from confinement in their rooms.

**Table 3.**

Responses of specialized physicians on children's behavior after participating in the garden [Source – Researcher]

Types of Behavior	Strongly Agree	Agree	Somewhat Agree	Disagree	Strongly Disagree	Mean
Cooperative	19	25	6	0	0	4.22
Happier	28	22	0	0	0	4.56
Less Crying	21	17	12	0	0	4.18
Physically Active	13	22	15	0	0	3.85
Independent	13	23	14	0	0	3.98
Obedient	19	25	6	0	0	4.26
Total	113	134	53	0	0	4.2

In the analytical study that has conducted, positive psychological responses are shown in [Table-3], including the following:

- More cooperative and obedient towards medication
- Less crying because they are able to play outside their rooms
- Physical activity as shown in the playing activities

Based on the analytical study, the participating in the garden activities would encourage the children to feel involved with the natural environment which lead to positive behaviors and a better psychological well being of the children. Hence, these results are a significant sign on the potential of garden for restorative process.

#### 4. 2. 3. Responses of specialized physicians and volunteers about the impact of the healing garden

These results are determined by specialized physicians and volunteers, who observed the behavior of pediatric patients during their residence in the hospital. Table 4 shows the evaluation of medical staff and former volunteer patients on the responses of patients after their participation in the gardens.

**Table 4.**

The impact of the healing garden on the psychological state, support social and cognitive performance of children

The Importance of healing garden	Strongly Agree	Agree	Somewhat at Agree	Disagree	Strongly disagree	Mean
The treatment in Hospital has a negative impact on children's behavior	88	12	0	0	0	4.88
Communication with nature reduces the size of the physiological response to stress and tension	78	22	0	0	0	4.78
The natural environment expands the child's perception	66	34	0	0	0	4.66
Shadow and light enhance the movement	14	84	4	0	0	4.10
Lack of a healing garden affects negatively on children's psychological status	88	12	0	0	0	4.88
The shadow and the light stimulate the perception of time through the movement of sun	18	77	5	0	0	4.13
The healing garden helps to accelerate healing	51	46	3	0	0	4.48
Participation in activities at the garden stimulates participation with other children	14	36	50	0	0	3.64
Garden design methods contribute to support treatment process	21	46	33	0	0	3.88
Total	438	369	95	0	0	4.38

As shown in table-4, the average total mean of the respondents is 4.38 representing 87.6% who agreed that there is a great importance of healing gardens in the hospital. About 97.6% of the specialized physicians and volunteers (4.88) believed that the treatment in Hospital and the lack of healing gardens have a negative impact on children's behavior and their psychological state.

Furthermore, the communication with nature has a positive effect on the treatment outcomes of the patient by (4.78) representing 95.6% which approaching to consensus, the effect of the natural environment on the expansion of the child's perception by (4.66) representing 93.2%, and the garden helps to accelerate healing by (4.83) representing 89.6%. On the other side, participation of children in social activities in the garden represented the lowest percentage 72.8%.

#### *4.2.4. Responses of volunteer about the design elements of the garden*

Based on the results as shown in [Table-5], the average total mean of the respondents is 3.74, representing 74.8% who agreed that the importance of sense of control principle in the hospital's garden, which included design of clear pathways by (4.2) representing 84%, private activities by (3.64) representing 72.8%, avoiding the sensation of confusion by (3.64) representing 72.8%, There are both sunny and shaded areas in the garden by (3.54) representing 70.8%, There are choices of walking routes in the garden by (3.00) representing 60% and The seating in the garden is comfortable by (4.00) representing 80%.

The average of total mean of the respondents is 3.73, representing 74.6% who agreed that the importance of the social support principle in the hospital's garden, that included, a central space for people to gather by(3.5) representing 70%, areas in the garden for conversations in small groups by (3.9) representing 78%, and the garden has some table arrangements by (3.88) representing 77.6%.

The respondents agreed that the importance of Positive distractions principle by (3.38) representing 67.6% that included, the design of different play areas with games and toys by (3.68) representing 73.6%, the garden has various types by (3.26) representing 65.2%, and Art areas in garden by (3.2) representing 64%.

On the other hand, the sensorial dimensions represented 53.2% of the design principles , the average of total mean of the respondents is 2.66, which included, utilizing different color by (3.66) representing 73.2%, eliminate noise sources by (3.12) representing 62.4%, different activities by(1.82) representing 36.4 % and different spaces by (2.04) representing 40.8%.

The movement and exercise represented 60.4% of the design principles, the average of total mean of the respondents is 3.02, that included Provide meandering pathways by (1.4) representing 28 %, and The garden provides areas that encourage exercise through walking. by (4.64) representing 92.8%.



**Table 5.**  
Availability of design principles in hospital's garden

Principles of Healing Garden		former volunteer patients' responses about the effectiveness of the healing garden design						Mean of each principle
		Strongly Agree	Agree	Somewhat Agree	Disagree	Disagree Strongly	Mean	
Sense of control	Design of clear pathways	15	30	5			4.2	3.74
	Private activities	13	25	12			4.02	
	Specific landmarks	5	22	23			3.64	
	Avoiding the sensation of confusion	10	24	16			3.64	
	There are both sunny and shaded areas in the garden.		27	23			3.88	
	There are choices of walking routes in the garden.			50			3.54	
	There is a bathroom close to the garden.		50				3	
Social support	The seating in the garden is comfortable.		25	25			4	3.73
	There is a central space for people to gather.		20	30			3.5	
	There are areas in the garden for conversations in small groups.	10	25	15			3.9	
Positive distractions	The garden has some table arrangements.	8	28	14			3.88	3.38
	the design of different play areas with games and toys	7	20	23			3.68	
	The garden has various types (shapes, widths, and routes)		13	37			3.26	
Sensorial dimensions	Art areas in garden		10	40			3.2	2.66
	Utilizing different Color	8	17	25			3.66	
	eliminate noise sources		6	44			3.12	
	different activities		3	10	12	25	1.82	
Movement and exercise	different spaces		2	13	20	15	2.04	3.02
	Provide meandering pathways				20	30	1.4	
Natural distractions	The garden provides areas that encourage exercise through walking.	32	18				4.64	4.46
	The garden has plants with a variety of colors.	25	18	7			4.36	
	There are spots of bright colors in the plants.	25	18	7			4.36	
	Plant life (trees, shrubs, and flowers) is the major portion of the garden.	45	5				4.9	
	Some plants in the garden attract butterflies.	30	17	3			4.54	
This garden has a relaxing view of the surrounding nature.		16	26	8			4.16	
Total		249	449	430	52	70		3.6

The natural distractions principle represented 89.2% of the garden design principles, the average of total mean of the respondents is 4.46, which included the garden has plants with a variety of colors by (4.36) representing 87.2 %, there are spots of bright colors in the plants by (4.36) representing 87.2 %, plant life (trees, shrubs, and flowers) is the major portion of the garden by (4.9) representing 98%, some plants in the garden attract butterflies by (4.54) representing 90.8% and the garden has a relaxing view of the surrounding nature by (4.16) representing 83.2 %.

Total mean of availability of design principles in hospital's garden is 3.6 representing 72 %.

## 5. Results and recommendations

The paper managed, through conducting a profound theoretical and practical analysis, to assert the effectiveness of healing gardens to promote psychological recovery of hospitalized children through proper designing, which was shown in two stages:

The first stage, theoretical review shaded the light on the well-designed garden at hospitals not only to provide a restorative and pleasant view of nature, but also, to create a strong interplay between children's emotions and garden which due to promote the restorative process of children in hospitals by increasing the cognitive performance and

positive behaviors. Moreover, the gardens can be seen as a place where children can maintain a balance between familiarity and change, Hence, reducing the stress and improving the psychological state of children as well as contributing in the improvement of clinical outcomes through various mechanisms such as increasing social support, the sense of control over the environment, and natural elements.

The second stage, the paper conducted a more detailed analysis of evaluation the reaction of the hospitalized children and the opinions of specialized physicians and volunteers about the effectiveness of the healing garden at the children's cancer hospital 57357 in Egypt in order to get a sharp insight on the psychological impacts and the existing behaviors of hospitalized children towards the healing garden.

Hence, the case study depended on fifth Likert scale to define impact of the healing garden on the psychological state of children, support social and cognitive performance according to respond of specialized physicians and volunteers. Based on the results, as shown in [Tables -3-4], the importance of healing gardens in the hospital was represented 87.6%. About 98 % of the specialized physicians and volunteers admitted that participating in the garden activities would encourage the children to feel free in the natural environment which lead to positive behaviors and a better psychological well being of the hospitalized children.

Finally, the paper analyzed volunteer's responses about the design elements of the garden, that was important to understand the views of former patients, especially, they encountered the same experience of hospitalization from cancer disease and its impact on the psychological situation. In addition, their ability to express about the impact of design principles in hospital's garden on the psychological states of children. Based on the results, as shown in [Table -5], Total mean of availability of design principles in hospital's garden was 3.6, representing 72 %. So, all the responders expressed their views for the design development of hospital's garden, such as providing footpaths, resting areas, social spaces, personal spaces and a wide range of colors in landscaping that support specifications of healing garden. Moreover, all of them believed that variety of playing areas, whether natural or industrial, could contribute in the healing role.

The architects must be considering the importance of specific elements in garden design that immediately impacted on children, such as:

- Multiple playing areas with variety of shapes and colors that allow children to choose freely.
- Shadow patterns of garden structures and plants fascinate children as they change shapes as the sun moves. This phenomenon provides opportunities for children to feel of movement, diversity, orientation and exploration.
- The selection of trees and shrubs should be done carefully, with special attention to the mix of color of foliage and flower.
- The construction of footpaths, rest areas, social and public areas, and water features are suitable for the hospitalized children according to age, the kind of disease and
- The sunny and shaded areas must be arranged in remarkable ways to provide the possibilities of social support and promote sense of control

In addition, the architects must evaluate the healing gardens that were designed and analyze the reflections on the patients and identify the views and opinions of psychiatrists who follow their psychological situation, in order to move forward with possible solutions or avoid mistakes in the future.

Moreover, children should be involved during the design process, through Take children's views seriously and give self-explanatory suggestions to give children the right to express their opinions and concerns, and to allow them to participate effectively in decision-making. The methods used to include children in these processes must be different from adults, for instance, photography, painting, walking tours , daily follow-up of children's activities in the gardens and children's interactions, as they have different forms and methods of expression.

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## تأثير الحدائق العلاجية على تحسين التعافي النفسي للأطفال تطبيق على مستشفى سرطان الأطفال في مصر

### الملخص العربي

هناك اهتمام متزايد بالحدائق العلاجية في المستشفيات عاما وفي مستشفيات الأطفال خاصا , لما لها من تأثير نفسي هام على الأطفال مما يقلل من شعورهم بالتوتر. ولذا تركز الدراسة البحثية على تأثير المستشفيات ومراكز الرعاية الصحية على الأطفال ونظريات استعادة البيئة والمبادئ التصميمية الخاصة بالحدائق العلاجية خصوصا في مستشفيات الأطفال.

تهدف الورقة إلى إثبات العلاقة بين تصميم حديقة العلاجية وسلوك الأطفال في المستشفيات لمعرفة ما إذا كانت بعض العناصر التصميمية لها تأثيرا إيجابيا على التعافي النفسي للأطفال ومن ثم تحديد هذه العناصر لتحسينها .

تناولت الدراسة البحثية تحليل لتصورات 25 طفلا "مريض بالسرطان " نحو حديقة العلاجية في مستشفى سرطان الأطفال في مصر , وكشفت النتائج أن 80% من الأطفال أبدوا رضاهم تجاه الحديقة. 20% منهم لم يعطوا أي تعليقات سلبية. بالإضافة إلى ذلك، تم عمل دراسة تحليلية لأراء الاطباء المتخصصين و المتطوعين (كمرضي سرطان متعافين) باستخدام مقياس ليكرت الخامس لتحديد تأثير حديقة العلاجية على التعافي النفسي للأطفال. وأظهرت النتائج أن 95.6% من اجمالي 50 طبيب متخصص والأطباء النفسيين اكدوا أن تواصل الاطفال المرضى مع الطبيعة له تأثير إيجابي على التعافي النفسي لهم. كما استطلاع للرأي لخمسون متطوعا لمناقشة فعالية التصميمية لحديقة الشفاء والتي تشتمل علي ستة مبادئ منقسمة الي خمسة وعشرون عنصرا تصميميا وذلك لتوصل الي مدي فاعلية حديقة مستشفى سرطان الأطفال و تصوراتهم لتحسينها , فوجد ان مبدأ الشعور بالسيطرة يمثل 74.8% , الدعم الاجتماعي يمثل 74.6% , الأبعاد الحسية 53.2% اما مبدأ الحركة وممارسة الرياضة فيمثل (60.4%) و الملامح الطبيعية تمثل 89.2%.

وأخيرا، تستنتج الدراسة البحثية أن للحدائق الشفاء دورا هاما في زيادة التواصل بين الأطفال المرضى والطبيعة ، مما يؤدي الي تحسين الأداء المعرفي وتعزيز التعافي النفسي.

**الكلمات المفتاحية:** حديقة العلاجية ، المبادئ التصميمية، الأداء المعرفي، التعافي النفسي