

Effect of Recreational Program on Psychological Status of Children with Cancer at Pre-Therapeutic Procedure

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Abstract

Background: Recreational program is a distinct professional field that focuses on ways to incorporate physical and intellectual activities into a structured program to improve cognitive, emotional functioning and well-being. **Aim of this study:** Was to evaluate effect of recreational program on psychological status of children with cancer at pre therapeutic procedure. **Design:** Quasi-experimental design (pre-test, post-test) was utilized to achieve the aim of this study. **Setting:** This study was conducted at National Cancer Institute in Cairo for pre therapeutic cancer children. **Study sample:** A convenient sample of 60 children attending for pre therapeutic procedure before receiving drug dose. **Data collection tools:** Four tools were used: **Tool (1):** Structured interviewing questionnaire divided in two parts, **I:** Socio demographic data, **II:** Knowledge of children about recreational program, **Tool (2):** The Spence Children's Anxiety Scale (SCAS), **Tool (3):** Hamilton Scale of Depression scale & **Tool (4):** White perceived stress scale. **Results:** The result showed there were highly statistically significant difference between total knowledge of children regarding recreational program post compared to pre-educational program implementation $p < 0.001$. There was highly statistically significant improvement of psychological problems (depression, anxiety, stress) post program compared to preprogram implementation. **Conclusion:** The recreational intervention program had a positive effect on reducing the psychological problems among pre therapeutic procedure cancer children. **Recommendations:** Recreational program should apply to decrease the level of negative emotion in patients (children) with cancer.

Keywords: Children cancer, Psycho- logical Program, Recreational program.

Introduction

Cancer is one of the main and basic dilemmas of health and treatment all over the world. It is considered the third cause of death and the second chronic non-communicable disease. Unfortunately, statistics of the individuals who affected by this disease is increasing in all age groups, especially children and has a significant effect on different dimensions of the patients' life activities, and their caregivers (Batinic Nesvanulica & Stankovic, 2017).

Children hospitalized in pediatric oncology wards may experience negative sign and symptoms such as developmental delay, sleep disorders, eating disorders, aggression, anxiety,

depression, dependency on caregivers, disruption of daily activities, diminished quality of life, and limited participation in social functions. There was different from treatment modalities starting from chemo program, radio program, surgery, etc... As psychological included recreational program. (Lin et al., 2020).

Recreational Program, known as therapeutic recreational application is a means to psychological and physical health, recovery and well-being. The purpose of the RP process is to maintain physical, cognitive, social, emotional and spiritual status, to facilitate full contribution in life. Recreational Program using a variation of techniques that including "art, music, sports

Effect of Recreational Program on Psychological Status of Children with Cancer at Pre-Therapeutic Procedure

games, video games, board games, animal interactions, dance and movement, gardening, storytelling, creative writing, drama, cooking classes, community and cultural outings (Peikert et al., 2018).

As well as Recreational interventional therapists utilize interventions “to improve the physical, cognitive, emotional, social, and leisure needs of their clients”, recreation program interventions include stress management, guided imagery, relaxation techniques, bio feedback, reminiscence and social skills training, caregivers can be described as “the person who most often helps the person with cancer” (Chen & Chippendale, 2018).

Nurses deliver procedures of professional services in the form of meeting the basic needs provided to patients who experience physical, psychological, and social disorder. Nurses are health workers who show a role in caring, maintaining, and protecting person who is sick. Skilled nurses are expected to handle cases and identify any psychological problems during observation and shift assessment, provide health education to patients and families related to medication and its possible side effects that reduce stress and anxiety. The role of nurses is as implementing nursing services, managing nursing services, and educational institutions, as well as care providers, advocates, coordinators, collaborators, consultants, and innovators (Drincic et al., 2017).

Significance of the Study

Although pediatric cancer death rates have declined by nearly 70% over the past four decades, cancer remains the leading cause of death from disease among children, Worldwide, it is estimated that childhood cancer has an incidence of more than 175,000 per year, and a mortality rate of approximately 96,000 per year, according to the World Health Organization (WHO) there is 150 children per million under

20 years diagnosed yearly with cancer (Huang et al., 2021).

Aim of the study

Evaluate the effect of recreational program on psychological problems among pre therapeutic procedure cancer children.

Research hypothesis:

The recreational program will have a positive effect on psychological problems among pre therapeutic procedure cancer children.

Subject and methods

Research design:

Quasi-experimental design (pre-test, post-test) was utilized to conduct and achieve the aim of this study.

Setting:

This study was conducted in procedure room at National Cancer Institute in Cairo for newly diagnosed patients.

Subjects:

A convenient sample of 60 children attended for pre therapeutic procedure before receiving drug dose was chosen.

Tools of Data Collection:

Four tools were used in this study and classified as the following:

Tool 1: Structured Interview Questionnaire. It was developed by the researcher consisted of two parts.

Part one: Socio-demographic data: It was included all the related socio-demographic data including age, sex, residence, socio economic level and marital status

Part two: Knowledge of children about recreational program, it was consisted of closed questions related to recreational program such as definition, types, uses, benefits, etc. Total question (15).

The total scoring system of patient's knowledge was calculated and classified in two levels as following:

- **Satisfactory knowledge** if total degree from 9 to 15.
- **Unsatisfactory knowledge** if total degree from 0 to 8.

Tool II: - Spence Children's Anxiety Scale (SCAS): that was developed by (Spence, 1998). It used to assess anxiety symptoms in children. It consisted consists of 44 items, 38 of which assess specific anxiety symptoms relating to six sub-scales, namely social phobia, separation anxiety, panic attack/agoraphobia, obsessive-compulsive disorder, generalized anxiety and physical injury fears. based on six items serve as positive "filler items" in an effort to reduce negative response bias.

Scoring system:

The total scores of the statement were 132 degrees which equal 100%, each statement was assigned a score according to children' responses were a lot, sometime, a little and never and were scored 3, 2, 1 and 0 respectively. These scores were summed up and were converted into a degree. It was classified into 3 categories:

- **Mild if total degree** from 1 to 66.
- **Moderate if total degree** from 67- 92.
- **Severe if total degree** from 93 to 132.

Tool III: Hamilton Scale of Depression scale.

This tool was developed by **Hamilton (1986)** to assess depression of child, it consisted of 17 items. There are two types of items according to the method of grading. Those with three grades are scored on the basis of absent (0), doubtful or trivial (1), and present (2). For the items with five levels, the last level is split into three grades of mild (2), moderate (3), and severe (4). It is important for the rater to recognize that "severe" (four points) covers all grades of severity.

Scoring system: The total scores of the statement which equal 100%. These scores were summed up and were converted into a degree. It was classified into 3 categories:

- **Mild if total degree** from 1 to 66.
- **Moderate if total degree** from 17 to 24.
- **Severe if total degree** from 25 to 34.

Tool IV: White perceived stress scale.

This tool was developed by **(White, 2014)** to assess stress among children which consisted of 14 items seven items were negatively worded (1, 2, 3, 8, 11, 13 and 14) and seven positively worded (4, 5, 6, 7, 9, 10, and 12).

Scoring system:

The total scores of the statement which equal 100%. Each item was rated on a 5-point scale. Scores were calculated after reverse-keying positive items and summation of scores. Possible total scores range from 0 to 52 (higher score indicating greater stress, although this effect is nonlinear). These scores were summed up and were converted into a degree. It was classified into 3 categories:

- **Mild if total degree** from 1 to 26.
- **Moderate if total degree** from 27- 36.
- **Severe if total degree** from 37 to 52.

Content validity:

It was ascertained by a group of experts in psychiatric & mental health nursing (5) professor. Their opinions elicited regarding the format, layout, consistency, accuracy and relevancy of the tools.

Content Reliability:

Reliability analysis by measuring of internal consistency of the tool through Cronbach's Alpha test. Internal consistency of structure interview questionnaire was 0.753, spence children's anxiety scale was 0.851, Hamilton Scale of Depression scale was 0.834 and White perceived stress scale was 0.81.

Effect of Recreational Program on Psychological Status of Children with Cancer at Pre-Therapeutic Procedure

Pilot study

A pilot study was carried out after the adaptation of the tools and before starting the data collection. It was conducted on 10 % of the studied 6 children 6 in order to test the applicability of the constructed tools and the clarity of the questions.

Ethical Considerations:

Before conducting the study the participants were assured about confidentiality and anonymity of their obtained information throughout the study. They were informed about their right to refuse to participate in the study and the right to withdraw from the study at any time.

Field work:

The study was carried out from the first of March 2021 to August of May 2021.

Development of recreational program: The recreational program was developed by the researcher after a thorough review of the related literatures and after making the pilot study. The recreational program aimed to evaluate the effect of recreational program on psychological problems among pre therapeutic procedure cancer children. This program has a set of general objectives, and specific objectives for each session. The number of program's sessions was 10 sessions. at the beginning of each session, the researcher give feedback about previous session.

The opening session: acquaintance session
Introduction about aim, objectives and content of the sessions. (60min).

The 1st session (theoretical): over view about cancer (60 min).

The 2nd session (theoretical): Pre therapeutic procedure cancer children (60 min).

The 3rd session (theoretical): Psychological problems of cancer children (60 min).

The 4th session (theoretical): over view about recreational program (60 min).

The 5th session (practical): Color my emotions (90 min).

The 6th session (practical): Emotional Masks (90 min).

The 7th session (practical): Mandala painting (90 min).

The 8th session (practical): Magic kingdom drawing (90 min).

The 9th session (practical): Doll making (90min).

The 10th session (practical): Relaxation technique (90 min).

The end session: Summary about the program sessions and post-assessment test (60 min).

Implementation Phase:

This phase was beginning by data collection then implementation of recreational program.

Methods of evaluation:

Feedback through: oral questions, re-demonstration, positive participation, role play.

Evaluation Phase (post-test):

This phase aimed to the effect of recreational program on psychological problems among pre therapeutic procedure cancer children. Fill in post - test.

Statistical analysis:

All data were collected, coded, tabulated and subjected to statistical analysis. Statistical analysis was performed by statistical Package for Social Sciences (SPSS version 24). Descriptive statistics were applied in the form of mean and standard deviation for quantitative variables and frequency and percentages for qualitative variables. Qualitative categorical variables were compared using chi-square test. Statistical significance was considered at p-value $p \leq 0.05$, and considered highly statistically significance at p-value $p \leq 0.001$.

Data collected from the studied sample was revised, coded and entered using Personal Computer (PC). Computerized data entry and statistical analysis were fulfilled using the Statistical Package for Social Sciences (SPSS) version 24. Data were presented using descriptive statistics in the form of frequencies, percentages. Chi-square test (X²) was used for comparisons between qualitative variables. Statistical significance was considered at p-value $p \leq 0.05$, and considered highly statistically significance at p-value $p \leq 0.001$.

Results:

Table (1): Reveals that, less than one third 30.0% of the studied sample children age between 6 and less than 9 years old. Regarding age, 60.0% of the children are male while, 40.0% of them are female. Moreover, 70.0% of them lived in rural residence. Regarding education level, 55.0% of them study in primary school while, 35.0% of them study in preparatory school. More than one third (36.7%) of the studied subjects are the second child in the family and 71.7% of them lived with their father and mother.

Table (2): Demonstrates that there is a highly significance difference regarding children knowledge about recreational program between pre and post program implementation (p value =0.005). Also 78.3% of the studied children had satisfactory knowledge about recreational program post program implementation while only 41.7% of them had satisfactory knowledge about recreational pre program. On the other side, 58.3% of the studied children had unsatisfactory knowledge about recreational pre program while only 21.7% of them had unsatisfactory knowledge about recreational program post program implementation.

Table (3): Shows that there is a highly significance difference regarding children total Spence Children's Anxiety Scale scores

between pre and post program implementation (p value =0.000). As, Mild total Spence Children's Anxiety Scale was (28.3%) in pre program and (75.0%) in post program .and moderate total Spence Children's Anxiety Scale was (55%) pre program and (20.0%) in post program while severe total Spence Children's Anxiety Scale was (16.7%) in pre program and (5.0%) in post program.

Figure (1): Shows that 76.7% of the studied children's total Hamilton rating scale for depression between pre & post program implementation (p-value = 0.000). As mild total Hamilton rating scale for depression was (36.7%) in pre and (76.7%) in post program implementation. And moderate total Hamilton rating scale for depression was (60.0%) in pre and (23.3%) in post program implementation while, severe total Hamilton rating scale for depression was (23.3%) in pre program and (00.0 %) in post program implementation.

Figure (2): Presents that mild total Perceived Stress Scale scores (8.3%) in pre program and (65.0%) in post program implementation and moderate total Perceived Stress Scale scores (68.4%) in pre program and (30.0%) in post program implementation while severe total Perceived Stress Scale scores was (23.3%) in pre program and (5.0%) in post program implementation.

Table (4): Shows positive correlation between studied variables among studied children There is a positive correlation between total knowledge and total stress level & total anxiety level & total depression level (p=0.001 & p=0.000 & p=0.002). Also, there is a positive correlation between total stress level and total anxiety level & total depression level (p=0.001 & p=0.000). Moreover, there is a positive correlation between total anxiety level and total depression level (p=0.000).

Effect of Recreational Program on Psychological Status of Children with Cancer at Pre-Therapeutic Procedure

Table (1): Frequency &percentage of studied socio-demographic characteristics (N=60).

Demographic characteristics	(n=60)	
	N	Percent
Age group: /year		
6 < 9	18	30.0
9 < 12	15	25.0
12 < 15	21	35.0
15 : 18	6	10.0
Mean ± SD 11.23 ± 2.78		
Sex		
Male	36	60.0
Female	24	40.0
Residence		
Rural	42	70.0
Urban	18	30.0
Level of education		
Primary	33	55.0
Preparatory	21	35.0
Secondary	6	10.0
Order of the child in the family		
The first	17	28.3
Second	22	36.7
Third	13	21.7
Fourth	8	13.3
The child lived with		
Father and mother	43	71.7
Father only	3	5.0
Only mother	14	23.3

Table (2): Comparison between the studied children at pre and post program implementation regarding to their total knowledge about recreational program (n=60).

Total knowledge	Pre (n=60)		Post (n=60)		χ^2	(p-value)
	No	%	No	%		
Satisfactory Knowledge	25	41.7	47	78.3	31.25	.005**
Unsatisfactory Knowledge	35	58.3	13	21.7		

Table (3): Comparison between the studied children at pre and post program implementation regarding their total Spence Children’s Anxiety Scale (n=60).

Total Anxiety Scale	Pre (n=60)		Post (n=60)		t-test	(p-value)
	N	%	N	%		
Mild	17	28.3	45	75.0	27.83	.000**
Moderate	33	55.0	12	20.0		
severe	10	16.7	3	5.0		
Total	60	100	60	100		

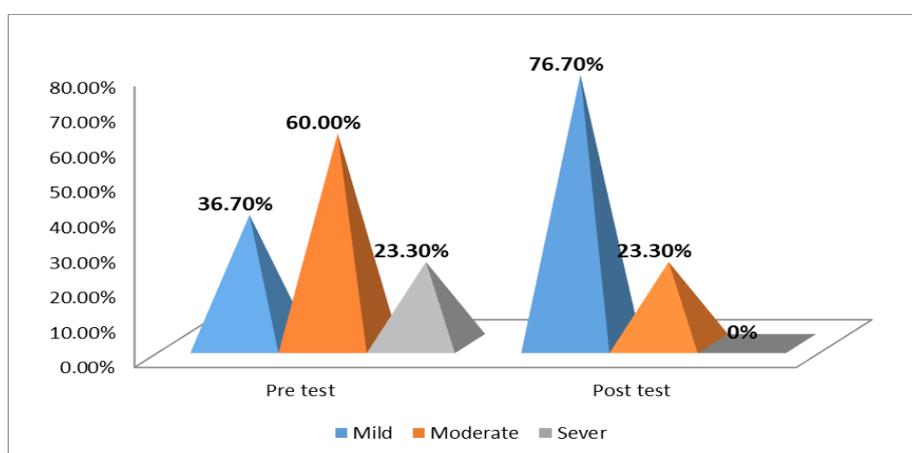


Figure (1): Comparison between the studied children at pre and post program implementation regarding their total Hamilton rating scale for depression (n=60).

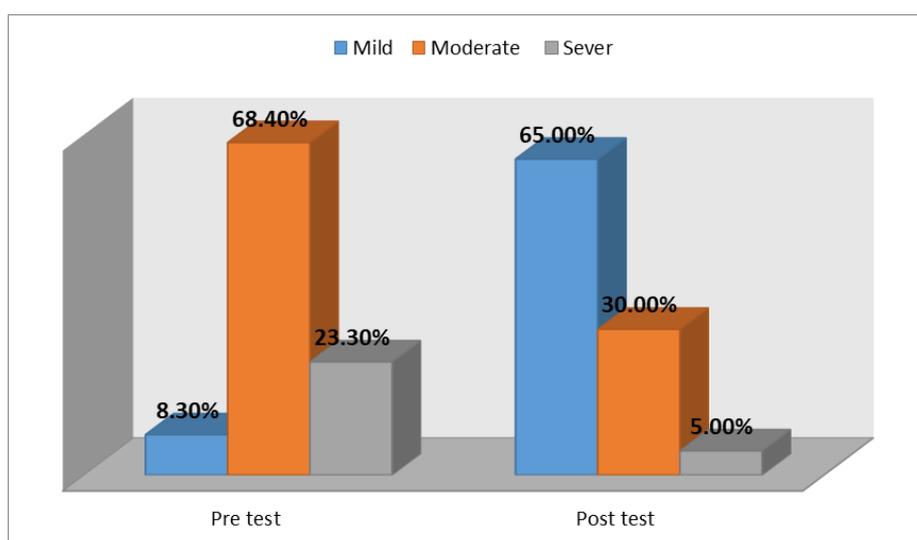


Figure (2): Comparison between the studied children at pre and post program implementation regarding their total perceived stress scale (n=60).

Effect of Recreational Program on Psychological Status of Children with Cancer at Pre-Therapeutic Procedure

Table (4): Correlation matrix of children knowledge, stress level, anxiety level and depression level (n=60).

Items	Spearman's rank correlation coefficient			
	Total knowledge	Total stress level	Total anxiety level	Total depression level
Total knowledge				
Total stress level	r. .759 p. value .001**			
Total anxiety level	r. .872 p. value.000**	r. .680 p. value .001**		
Total depression level	r. .510 p. value.002**	r. .864 p. value .000**	r. .830 p. value .000**	

Discussion

Concerning age, the current study showed that less than one third of the studied children aged between 6 and less than 9 years old, while, only 10.0 % of them aged between 15 and less than 18 years old, this result disagreed with **Tan et al., (2021)** who conducted study about "Psychological Distress in Parents of Children with Cancer" and reported that less than two fifths of the studied children aged between 15 and less than 18 years old.

Regarding sex, the present study revealed that less than two thirds of the studied children were male and rest of them were female. On other hand, these result disagreement with **Borrescio-Higa, & Valdés, (2022)** who conducted study about "The Psychosocial Burden of Families with Childhood Blood Cancer" and revealed that more than half of the studied children were females. Concerning on residence, the current study revealed that less than three quarters of the studied child living at rural areas.

As regard to Child's educational level, the current study displayed that more than half of them had primary education, this finding in same line with **Zhang et al., (2019)** who conducted study about "Effects of cognitive behavioral program on psychological adjustment in Chinese pediatric cancer patients receiving chemo program" and showed that more than two thirds of the studied children had primary education.

Regarding Order of the child in the family, the current study displayed that more one third of them second child in the family, this result contrast with **Alburaiki et al., (2021)** who conducted study about "Association of Parental, Child, and Environmental Factors with the Occurrence of Childhood Leukemia in Upper Egypt" and showed that half of the studied child third and more child in the family.

Comparison between the studied children at pre and post intervention regarding to their total knowledge about entertainment program the current study demonstrated that more than half of the studied children had unsatisfactory knowledge about recreational program pre

program implementation while less than one quarter of them had unsatisfactory knowledge about recreational program post program implementation. From the researcher point of view, this is may be because these patients suffering from pain, and which make them focus on treatment and not focus recreational program. Also, that there is a highly significance difference regarding children s` knowledge about recreational program between pre and post program implementation.

This results were in same line with **Huang, & Kang (2021)** who conducted study about " Participation in Play and Leisure Activities of Young Children with Autism Spectrum Disorder and Typically Developing Children in Taiwan: A Preliminary Study" and represented that most of the studied children had poor knowledge about recreation program and recommended that perform educational program for child to improve their knowledge.

Comparison between the studied children at pre and post intervention regarding to their **Spence Children's Anxiety Scale** Regarding the current study revealed that there was a highly significance difference regarding children s`opinion when having a problem, they feel shaky, feeling happy and being scared of insects or spiders between pre and post program implementation. From researcher point of view, this may be because the program they received improved their coping with anxiety.

These result was in accordance with study done by **Mehrara et al., (2018)** who conducted study about " The Effectiveness of Cognitive-Behavioral Play Program on Pain Tolerance and Trait-State Anxiety Among Children with leukemia cancer in Isfahan City" and represented that cognitive-behavioral program games increased pain tolerance and reduced trait anxiety in children with cancer, also that there is a significance difference regarding children's when having a problem, they feel shaky, feeling

happy and being scared of insects or spiders between pre and post program implementation.

The current results the demonstrated that three of quarter of the studied children had mild level total Spence Children's Anxiety post program implementation while less than third of them had mild level of total Spence Children's Anxiety preprogram implementation, Also, there was a highly significance difference regarding children's total Spence Children's Anxiety between pre and post program implementation. From researcher point of view, this may be because the program made them distraction from the anxiety and focus on recreation. This results were in same line with **Gerçeker et al., (2021)** who conducted study about " The effect of virtual reality on pain, fear, and anxiety during access of a port with huber needle in pediatric hematology-oncology patients: Randomized controlled trial" and showed that more of the studied child had moderate of anxiety pre program implementation become one quarter reported of them had moderate of anxiety, Also, the study was a highly significance difference regarding children's total Anxiety level between pre and post program implementation. This finding was consistent with **Gazestan et al., (2021)** who conducted study about "The Effect of Group Play Program on Anxiety in Children Diagnosed with Leukemia" and showed that that there is a highly significance difference regarding children's total level Spence Children's Anxiety between pre and post implementation program. On other hand, this result was disagreement with **Faherty, K. A. (2018)** who conducted study about " Age-appropriate preparations for children with cancer undergoing radio program: A feasibility study" and showed that there were no significant differences between anxiety pre and post recreational program implementation.

Regarding total depression, the current study Comparison between the studied children at pre and post intervention regarding to their

Effect of Recreational Program on Psychological Status of Children with Cancer at Pre-Therapeutic Procedure

total Hamilton rating scale for depression demonstrates that less than two thirds of the studied children had moderate level of depression pre program implementation, while, post program implementation become about one third of them had moderate depression Also, there was a highly significance difference regarding children's total Hamilton level for depression between pre and post program implementation. From researcher point of view, this may be because the program made them focus on recreational activities which improve adjustment pattern with the disease and its complications.

These findings matched with study of **Ozturk, & Toruner, (2022)** entitled "Effectiveness of technology based psychosocial interventions for child, adolescents and young adults undergoing cancer treatment: A meta-analysis of randomized controlled trials" and showed that more than half of the studied children had moderate level depression pre program implementation, while, post program implementation became about one of them had moderate level of depression Also, there was a highly significance difference regarding children's total level of depression between pre and program implementation. Also, this result supported with study by **Hamedi et al., (2020)** who conducted study about "Effectiveness of Conventional Cognitive-Behavioral Program and Its Computerized Version on Reduction in Pain Intensity, Depression, Anger, and Anxiety in Children with Cancer: A Randomized, Controlled Trial." and proved that recreational intervention was effectiveness on reducing depression among children had cancer

Regarding to their **Total Perceived Stress Scale** As well as the current study revealed that about two thirds of the studied children had mild level of Perceived Stress post program implementation while only less than tenth of them had mild level of Perceived Stress level pre

program implementation. Also that there was a highly significance difference regarding children's level of Perceived Stress between pre and post program implementation. From researcher point of view, this may be because the recreational activities improve their coping with the disease.

This result matched with **Shojaei et al., (2019)** who conducted study about "The effect of cognitive-behavioral art-play program and cognitive-behavioral story program on pain perception and hope in children with cancer" and revealed that perceived stress decreased after recreational program among the studied children with cancer with significance difference regarding children's total level Perceived Stress between pre and post program.

Finally the current study correlation matrix of children knowledge, stress level, anxiety level and depression level showed that there was a highly positive correlation between total knowledge and total stress level & total anxiety level & total depression level. This may be because the positive effect of recreational program implementation on the psychological health and coping mechanism with the disease and its complications in the children.

This result was in same line with study by **Toledano-Toledano et al., (2021)** who conducted study about "psychosocial factors predicting resilience in family caregivers of Children with Cancer" and showed that there was a positive correlation between total stress level & total anxiety level & total depression level. This means that the recreational program had apposite effect on reducing the psychological problems of those children

Conclusion

The study revealed only less than one fifth of studied children had severe psychological problems depression perceived because of pre therapeutic procedure cancer children use post-

program implementation compared to nearly that two fifth of them preprogram implementation. Which means that the recreational program had a positive effect on reducing the psychological problems associated with pre therapeutic procedure cancer children.

In other word recreational program has shown benefits in hospitalized children, such as reducing anxiety during the hospitalization process; reducing pain; improving the relationship with health professionals; improving the behavior and attitude of children to the disease and the procedures; and relieving feelings of fear, anxiety, and insecurity.

Recommendations:

Based upon the results of the current study and its conclusion, the following recommendations are addressed to recreational program in the hospitals:

- Recreational programs play a vital role to reduce anxiety, depression and stress. It leads to express negative emotion in non- verbal form. This process is an invaluable tool for children with cancer to convey their feelings and thoughts related to treatment. It is recommended that various types of recreational program should be applied to decrease the level of negative emotion in patients (children and adults) with cancer.

1. Design a regular psychological assessment sheet regarding stress, anxiety and depression assessment among children with cancer and being a routine for nurses to apply.
2. Apply several types of Recreational program to improve psychological status for children during hospitalization.
4. Designing and carrying out Recreational program to support the children with cancer and undergoing chemo program to help them to cope with the cancer more effectively.
5. Pediatric units should train their staff in the use of play program to obtain its positive effects. Additionally, future research should analyze

which recreational program is more effective, comparing different sessions to each other instead of comparing only the recreational program with the usual care.

6. Further studies should be conducted to study the impact of recreational program in every hospital related to Ministry of Health and other hospitals.
7. It is recommended that a study of similar nature should be done in other hospital.

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Effect of Recreational Program on Psychological Status of Children with Cancer at Pre-Therapeutic Procedure

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تأثير برنامج العلاج الترفيهي للحد من المشكلات النفسية لدى الأطفال المصابين بالسرطان قبل الإجراءات العلاجية

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استخدام العلاج الترفيهي لتقليل التوتر والقلق وتوفير الدعم العاطفي والنفسي للأطفال والعائلات أثناء علاج السرطان والبقاء على قيد الحياة، ويقدم المعالجون الترفيهيون مجموعة متنوعة من الخدمات بما في ذلك التنشئة الاجتماعية والتعليم والمتعة البسيطة الخالصة لمنح المرضى "فرصًا للإبداع والتعبير والابتسام وزيادة جودة الحياة أثناء مهاجمة الأعراض العاطفية والجسدية للسرطان"، من خلال توفير فرصًا للمرضى والعائلات ليصبحوا مبدعين ويعبرون عن أنفسهم، واعطاء فرصة للأطفال للتواصل الاجتماعي والمشاركة في أنشطة وقت الفراغ المنظمة. لذا هدفت هذه الدراسة إلى تقييم تأثير برنامج العلاج الترفيهي على المشكلات النفسية لدى اطفال السرطان قبل الاجراءات العلاجية. تم استخدام تصميم شبه تجريبي لتحقيق هدف الدراسة. وقد أجريت هذه الدراسة في المعهد القومي للأورام بالقاهرة لأطفال السرطان التابع لجامعة القاهرة في غرفة العلاج الترفيهي (المكتبة) قبل البدء في أي إجراء علاجي على عينة هادفة من (60) طفل من الاطفال الذين حضروا لعمل الفحوصات التشخيصية. وقد أظهرت النتائج بوجود تحسن كبير إحصائيًا في النتيجة الإجمالية لمعلومات الاطفال حول العلاج الترفيهي بين تنفيذ البرنامج قبل وبعد تنفيذ البرنامج. لخصت الدراسة إلى أن برنامج العلاج الترفيهي له أثر إيجابي في الحد من المشكلات النفسية لدى أطفال السرطان قبل العلاج. كما اوصت الدراسة بضرورة تطبيق أنشطة العلاج الترفيهي لتحسين الحالة النفسية للأطفال أثناء مكوثهم في المستشفى.