Effect of Benson's Relaxation Response on Sleep Quality and Anorexia of Cancer Children undergoing Chemotherapy

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Abstract:
Background: Sleep disorders and anorexia are the most commonly reported symptoms of cancer children undergoing chemotherapy. **The present study was aimed** to investigate the effect of Benson's Relaxation Response (BRR) on sleep quality and anorexia of cancer children undergoing chemotherapy. A quasi-experimental research **design** was conducted at the **pediatric oncology unit of** South Egypt Cancer Institute, Assiut University. A total of **80 children** took part in this trial, which was randomly divided into two groups: intervention and control. The data was collected using three tools. **Tool I:** Biosocial demographic characteristics of studied children, **Tool II:** St. Mary's Hospital Sleep Questionnaire (SMHSQ). **Tool III:** It included two parts: **Part (1)** visual analog appetite scale and **Part (2)** is the functional assessment of anorexia-cachexia therapy (FAACT). The **results** of this study showed a significant improvement in the sleep quality and anorexia level in the intervention group with a p-value of 0.001, while there was no statistically significant difference in the control group. The researchers **concluded that Benson's Relaxation Response** had a positive effect on sleep quality and anorexia in cancer children undergoing chemotherapy**.** For children with cancer receiving chemotherapy, hospitals are **recommended** to utilize the BRR in conjunction with other therapies to enhance sleep and reduce anorexia.

Keywords: Anorexia, Benson's Relaxation Response, Cancer Children, Chemotherapy & Sleep quality

Introduction

Cancer is a widespread disease, particularly in developing nations **(Harorani et al., 2020).** Children who are treated for cancer with a variety of therapies, such as chemotherapy, radiotherapy, surgery, biologic therapy and targeted hemodynamic therapy experience a variety of difficulties **(Irmak et al., 2019).** Chemotherapy is a long-term treatment that entails numerous rounds and has a number of adverse effects that harm both healthy and cancerous cells **(Yoon & Park, 2019).** The most frequent adverse effects of chemotherapy include fatigue, anorexia and sleep disturbance **(Hsu et al., 2017).**

There are numerous detrimental impacts of sleep disturbances on a child's social and emotional development. Additionally, failing to appropriately treat them makes many issues worse, including fatigue, anxiety and depression, which eventually accelerate the course of cancer. Because of their decreased food intake and metabolic abnormalities, these children experience anorexia and lose weight **(Heydarirad et al., 2019)**.

These deadly diseases cause severe mental distress in children and their families, as well as higher mortality, lower survival rates and decreased survival rates. Anorexia lowers quality of life and raises the chance of treatment failure, toxicity and other adverse outcomes in over 80% of cancer-affected children. Up to 40% of deaths from cancer, according to estimates, may be attributable to anorexia. Moreover, there aren't many treatments for anorexia, a significant adverse effect of chemotherapy **(Shiomi et al., 2018).** Children still have physical and psychological side effects from cancer therapy, despite the availability of many treatments. Therefore, it is quite important to make an effort to enhance their physical and mental health. Currently, one of the most efficient and risk-free treatments is complementary and alternative medicine (CAM) **(Farahani et al., 2019).** To manage the side effects of chemotherapy, using CAM in addition to other therapies has been suggested. Recent research has demonstrated that CAM is more effective, less invasive and more widely available than other treatments. The price of treatment has also decreased. Additionally, it appears that more people are using different CAM therapies to treat cancer **(Yoon & Park, 2019).**

A complementary, non-pharmacologic technique is Benson's relaxation response (BRR). Additionally, it is a simple and non-intrusive intervention technique. Anxiety, pain, despair and mood are only a few of the physical and psychological symptoms that Benson's relaxation consists of **(Biabani et al., 2019).** Herbert Benson first invented BRR, claiming that it can cause a relaxation response by lowering autonomic nervous system activity **(Poorolajal et al., 2017).**

Increasing children comfort during chemotherapy is one of the goals for which the pediatric nurses work and CAM is a facilitator to achieve this goal **(Harorani et al., 2020).**

Significance of the study

Throughout a scientific investigation of children at the pediatric oncology unit in the South Egypt Cancer Institute at Assiut University. It was noted that the number of cancer children undergoing chemotherapy was increasing. Researchers have found that sleep disturbance and anorexia are common among children treated with chemotherapy. Unfortunately, one of the objectives that pediatric nurses strive for is to make chemotherapy more comfortable for children and CAM helps them to accomplish this **(Zhang et al., 2017).** In order to find out how the Benson's relaxation response affects sleep quality and anorexia in children treated with chemotherapy, this study was carried out.

Aim of the Study

The aim of the present of study was to:
Evaluate the effect of Benson's relaxation response on sleep quality and anorexia of cancer children undergoing chemotherapy.

Operational definitions:

Benson's Relaxation Response: Dr. Herbert Benson, a Harvard professor, author, cardiologist, and founder of the Mind/Body Medical Institute, is credited with coining the term "Relaxation Response." The term "response" refers to the individual capacity to induce chemical and brain signal releases from the body, which slow down the muscles and organs and increase blood flow to the brain.

Research hypothesis

1. Children with cancer who undergo Benson's relaxation response are expect to improve sleep quality levels.
2. Children with cancer who receive Benson's relaxation response are exhibit modest levels of anorexia.

Subjects and method

Research design:

A quasi-experimental research design was used for the current study.

Setting:

This experimental study was conducted at the pediatric oncology unit in the South Egypt Cancer Institute at Assiut University. The pediatric oncology unit serves Upper Egypt from Beni-Suef to Aswan, offers treatment and diagnosis to children with cancer. It also offers supportive, social and psychological care to children with cancer through some recreational activities.

Subjects:

This experiment involved 80 chemotherapy-treated cancer children who were enrolled through convenience sampling on the second day of their treatment. By writing the children's names on slips of paper, placing the slips in a bowl and randomly choosing the slips, a straightforward random sampling was used to divide the children equally into two groups. The first slip belongs to the intervention group, whereas the second slip belongs to the control group.

Sample size:

The sample size was determined and calculated using the G-power analysis and using the T. test (effect size 0.75, α error 0.05 and power 0.95). The sample size in each group was 40 children and the total sample size was 80 children.

Inclusion Criteria:

- Cancer children in the age group ranged from 6–12 years, at least six months after their diagnosis and receive at least one chemotherapy cycle.
- Children being able to communicate
- Children with unrestricted movement to relax.

Exclusion Criteria

- Children experiencing hearing loss.
- Children using hypnotic or anxiolytic drugs

Tools for data collection:

For the current study, data were gathered using three different tools:

Tool I: Bio sociodemographic characteristics form:
It was developed by the researcher to collect the required information and included three parts:

Part (1): Personal data of the studied children (age, sex, residence and level of education)

Part (2): Medical data of the studied children (family history of cancer and presence of chronic illness).

Part (3): Disease profile as type of cancer, type of cells in the tumor, duration of cancer & past treatment

Tool II: St. Mary's Hospital Sleep Questionnaire (SMHSQ)
The SMHSQ was developed by **Ellis et al., 1981** to assess how well someone slept the last night. The questionnaire includes 14 questions. The answers to closed ended questions are based on a 4-Likert scale, with 1 being "never" and 4 being "high". Its overall score runs from 11 to 44, with mild (11–21), moderate (22–32), severe sleep disorders (33–44). The open ended questions are evaluated comparatively based on time. The researchers completed this questionnaire three times: before the intervention, 24 and 48 hours later.

Tool III: It was divided into two parts to examine anorexia:

Part (1): Visual analog appetite scale
This scale was adopted from **Flint et al., 2000** for evaluating anorexia in cancer patients. This scale is a

10 cm ruler with the words "good appetite = 0" on one side and the words "anorexia = 10" on the other. Its overall score is 0 to 10, with the three categories of mild (0–3), moderate (4–6) and severe anorexia (7–10). This scale allowed children to self-report their appetite. The researchers completed the anorexia questionnaire using the Visual Analog Scale (VAS) three times: before the intervention, 24 hours and 48 hours after the intervention.

Part (2): Functional Assessment of Anorexia-Cachexia Therapy (FAACT):

Ribaudo et al., 2000 developed the FAACT. This scale was used to evaluate anorexia in cancer patients. There were twelve items in it. It was translated into Arabic and deemed to be accurate and reliable in the manner described below: I have a decent appetite; I eat enough to meet my needs; I worry about my weight; most food tastes bad to me; I worry about how thin I seem; and the moment I try to eat, I lose interest in it. I find it difficult to consume rich or heavy foods; my family or friends are urging me to eat; I've been throwing up; when I eat, I feel satisfied quickly; my stomach hurts; my overall health is getting better and was scored on a five-point Likert scale (0 = not at all, 1 = a little bit, 2 = somewhat, 3 = quite a bit, 4 = very much). A global score (ranging from 0 to 48) was created by adding the component scores; a lower number implies a lack of hunger, while a higher score suggests a good appetite.

Method of data collection:

1. Official permission was obtained from the director of the pediatric oncology unit in the South Egypt Cancer Institute at Assiut University to collect the necessary data for this study.
2. A pilot study was carried out on 10% of cancer children (8) to test the clarity and applicability of the sheet and to estimate the time needed to fulfill each sheet. The necessary modifications were made and the final form was developed. All children who participated in the pilot study were excluded from the total sample of the study.
3. Five experts in the disciplines of pediatric nursing and pediatric oncology evaluated the content validity of tool I, which was created by the researchers. The necessary adjustments were made. Their content validity index was 95%. The reliability of the tool I was checked using the alpha Cronbach test and it was 0.60.
4. The validity and reliability of Tool II were tested by **Atiaa et al., 2021.** The validity was 87%. The reliability was 0.83.
5. Tool III Part (1) was valid and reliable by **Flint et al., 2000** (r=0.50–0.53, P<0.001).
6. Tool III Part (2) was valid and reliable by **Abd El-Salam & Mosaad 2022.** The validity was 95%. The reliability was 0.78.

7. Field of work: This study was carried out over a period of six months, from the beginning of December 2022 to the end of May 2023. The researchers went to the hospital two days per week.

The interviewing and assessment phase:

During this phase, the researchers explained the aim of the study; the components of the tools and collected the needed information using tool I. The researchers assessed sleep quality and anorexia level in both intervention and control groups before intervention using tool II and Tool III. The steps of BRR were explained. The time needed for completing the questionnaire ranged from 30 to 45 minutes for each child.

The intervention phase:

The researchers provided clear words for the intervention group's BRR guidelines. Instruction was kept up until all material had been absorbed. To make sure the children understood and used the relaxation technique properly, the researchers had them do it once in front of them. In order for the children to perform it three times a day (morning, afternoon and night) for 48 hours in a peaceful room without any interruptions. Messages were sent to the participants' parents' phones or their mobile devices to remind them about the intervention and to follow up on it. The intervention group received the instructions via MP3 players and headphones after being recorded. In 20 minutes, in order to eliminate the necessity for a clock while relaxing, the audio file for the instructions was created. The steps of Benson's relaxation technique that were taught to the intervention group were as follows:

1. Take a comfortable supine position and gently lie down.
2. Slowly close your eyes.
3. Start with your feet and move to release the tension in all of your muscles. Keep your muscles loose and reach up to your face.
4. When relaxing, try not to think about anything upsetting.
5. Pick a phrase like "calm" or "easy" and repeat it frequently.
6. Repeat the word while taking long, steady breaths.
7. Maintain the state of relaxation for 20 minutes; all muscles should be set free.
8. Open your eyes carefully and wait several minutes before getting up after 20 minutes.

Control group:

Children in the control group were received routine hospital care.

Evaluation phase:

Quality of sleep and anorexia level was evaluated by the researchers after 24 and 48 hours in both intervention and control groups using tool II and tool III.

Ethical consideration

The Assiut University Faculty of Nursing's Ethics Committee evaluated and accepted the study request and after submitting a formal letter outlining the study's objectives, the director of the pediatric oncology unit at the South Egypt Cancer Institute granted the study's official approval. Then, make sure that each participant understands the purpose of the study, its advantages and how the data will be collected. The participants were made aware that their participation was optional and that they might stop at any time without facing any repercussions. The parents of every child recruited in the study were then asked for their signed approval. The researcher promised that all information gathered would be kept completely private and utilized only to further the goals of the study. The participants wouldn't experience any negative impacts as a result of the study strategy.

Statistical analysis

Data entry and data analysis were done using the statistical package for social science (SPSS) version 26. The data were presented as numbers, percentage, means and standard deviations. One-way anova, Cochrane, Chi-square tests and Pearson correlation were used to show relationships between variables. A P-value is considered statistically significant when $p < 0.05$.

Results

Table (1): Distribution of the studied children according to their personal and medical data (N=80).

Item	Intervention group N=40		Control group N=40		p-value
	No	**%**	**No**	**%**	
Age/ years:					
6-< 9 years	33	82.5	32	80.0	**0.775**
9-≤12 years	7	17.5	8	20.0	
Mean±SD of age	**8.25±1.32**		**8.30±1.56**		**0.603**
Sex:					
Male	24	60.0	22	55.0	**0.651**
Female	16	40.0	18	45.0	
Residence:					
Urban	15	37.5	17	42.5	**0.684**
Rural	25	62.5	23	57.5	
Level of education:					
Primary	39	97.5	37	92.5	**0.305**
Preparatory	1	2.5	3	7.5	
Family history of cancer:					
Yes	13	32.5	14	35.0	**0.813**
No	27	67.5	26	65.0	
Presence of chronic illness:					
Yes	4	10.0	6	15.0	**0.449**
No	36	90.0	34	85.0	
If yes, type of illness:					
Hypertension	2	50.0	4	66.7	**0.696**
Diabetes	2	50.0	2	33.3	

Chi-square test was used

Table (2): Distribution of the studied children according to their current cancer data (N=80).

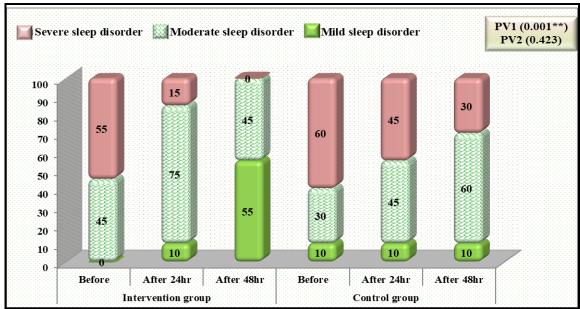| Current cancer data	Intervention group N=40		Control group N=40		p-value
	No	%	No	%	
Type of cancer:					
Leukemia	4	10.0	8	20.0	
Brain & spinal cord tumors	7	17.5	6	15.0	
Neuroblastoma	13	32.5	8	20.0	**0.450**
Wilms tumor	8	20.0	6	15.0	
Lymphoma	8	20.0	12	30.0	
Types of cells in the tumor:					
Benign	19	47.5	18	45.0	
Premalignant or precancerous	11	27.5	14	35.0	**0.737**
Malignant	10	25.0	8	20.0	
Duration of cancer/years:					
<1	3	7.5	3	7.5	
1-<2	8	20.0	15	37.5	**0.074**
2-3	27	67.5	16	40.0	
>3	2	5.0	6	15.0	
Past treatment					
Radiotherapy					
• Yes	20	50.0	16	40.0	**0.369**
• No	20	50.0	24	60.0	
Chemotherapy					
• Yes	40	100.0	38	95.0	**0.152**
• No	0	0.0	2	5.0	
Hormonal therapy					
• Yes	30	75.0	34	85.0	**0.264**
• No	10	25.0	6	15.0	
Treatment line (chemotherapy cycles and session):					
1st line	0	0.0	4	10.0	
2nd line	21	52.5	16	40.0	**0.095**
Higher than 2nd line	19	47.5	20	50.0	

Chi-square test was used

Figure (1): Distribution of the studied children according to their sleep quality before, after 24 and 48 hours (N=80).

Cochrane test
Pv1 (between before, after 24 and 48 hours in the intervention group)
Pv2 (between before, after 24 and 48 hours in the control group)
*Statistically significant difference

Table (3): Distribution of the studied children according to their mean and SD of last night's sleep rate (time/minute) before, after 24 and 48 hours (N=80).

Items	Intervention group N=40			Pv1	Control group N=40			Pv2
	Before	After 24hr	After 48hrs		Before	After 24hr	After 48hrs	
	Mean± SD	Mean± SD	Mean± SD		Mean± SD	Mean± SD	Mean± SD	
What time did you settle done for the night?	184.5±38.76	249.0±48.13	291.0±48.13	**0.002**[**]	188.5±53.42	193.0±49.31	203.0±57.92	**0.467**
What time did you fall a sleep last night?	267.25±42.95	348.0±89.31	391.5±59.59	**0.001**[**]	242.75±50.47	242.75±50.47	251.5±66.66	**0.725**
What time did you wake this morning?	51.0±21.69	66.0±18.23	69.0±21.69	**0.002**[**]	33.0±30.23	36.0±29.77	41.0±25.69	**0.125**
What time did you get up this morning?	51.0±21.69	60.0±0.0	60.0±0.0	**0.003**[**]	36.0±29.77	39.0±28.98	43.0±24.69	**0.145**
How much sleep did you have last night?	244.5±62.47	313.5±44.52	336.0±37.95	**0.001**[**]	236.0±42.29	236.0±45.45	236.5±61.12	**0.998**
How much sleep did you have during the day /yesterday?	54.0±26.49	90.0±30.38	108.0±24.31	**0.001**[**]	25.5±29.26	31.5±29.57	37.5±28.62	**0.188**
How long did it take you to fall asleep last night?	93.0±9.34	28.25±5.38	14.0±3.79	**0.001**[**]	95.0±10.56	85.75±10.29	71.7±11.17	**0.872**

Anova test was used

Pv1 (between before, after 24 and 48 hours in the intervention group)

Pv2 (between before, after 24 and 48 hours in the control group)

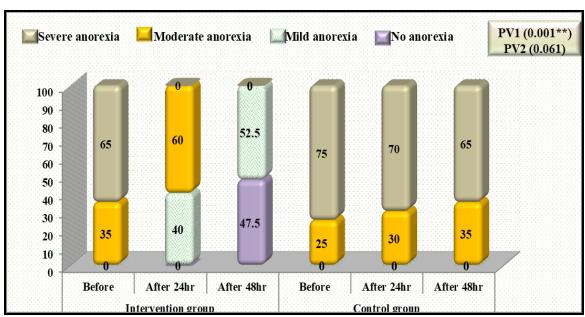**Statistically significant difference*

Figure (2): Distribution of the studied children according to their anorexia level before, after 24 and 48 hours (N=80).

Cochrane test

Pv1 (between before, after 24 and 48 hours in the intervention group)

Pv2 (between before, after 24 and 48 hours in the control group)

*Statistically significant difference

Table (4): Distribution of the studied children according to their mean and SD of their FAACT before, after 24 and 48 hours (N=80).

Items	Intervention group N=40			Pv1	Control group N=40			Pv2
	Before	After 24hr	After 48hrs		Before	After 24hr	After 48hrs	
	Mean± SD	Mean± SD	Mean± SD		Mean± SD	Mean± SD	Mean± SD	
I have a decent appetite.	1.35±.83	2.46±1.22	2.73±1.33	0.001**	1.15±.58	1.35±.48	1.45±.51	0.063
I eat enough to meet my needs.	1.21±.79	2.05±1.05	2.50±1.25	0.001**	1.00±.64	1.15±.66	1.35±.61	0.213
I worry about my weight.	.81±.79	1.89±1.15	2.30±1.28	0.002**	.65±.66	.95±.59	1.25±.71	0.051
Most food tastes bad to me.	.78±.66	1.91±1.36	2.24±1.46	0.001**	.65±.66	.70±.46	.90±.63	0.123
I worry about how thin I seem.	.88±.82	1.88±1.36	2.21±1.33	0.002**	.90±.71	.75±.78	1.05±.68	0.174
The moment I try to eat, I lost interest in it.	.86±.69	1.88±1.28	2.29±1.47	0.002**	.75±.71	.80±.76	.95±.59	0.141
I find it difficult to consume rich or heavy foods.	.86±87	1.85±1.30	2.29±1.38	0.002**	.90±.78	.80±.69	1.05±.68	0.210
My family or friends are urging me to eat.	1.04±.68	1.90±1.43	2.16±1.46	0.003**	.85±.48	.65±.66	.90±.78	0.067
I have been throwing up.	.81±.87	2.09±1.29	2.25±1.54	0.001**	.65±.66	1.00±.72	.85±.66	0.174
When I eat, I feel satisfied quickly.	.91±.78	2.00±1.38	2.21±1.59	0.001**	.75±.71	.85±.66	.75±.71	0.221
My stomach hurts.	.99±.76	2.19±1.37	2.44±1.18	0.001**	.90±.55	1.10±.78	1.40±.59	0.091
My overall health is getting better.	1.08±.73	2.24±1.21	2.58±1.39	0.003**	.95±.68	1.20±.52	1.30±.65	0.084
Total	13.05±6.19	37.35±3.95	43.17±2.69	0.001**	10.10±3.71	11.30±2.74	13.20±3.27	0.174

Anova test was used

Pv1 (between before, after 24 and 48 hours in the intervention group)

Pv2 (between before, after 24 and 48 hours in the control group)

*Statistically significant difference

(FAACT) Functional Assessment of Anorexia-Cachexia Therapy

Table (5): Correlation between the studied children's sleep quality, anorexia level and their FAACT before, after 24 and 48 hours (N=80).

Items		Children's sleep quality					
		Intervention group			Control group		
		Before	After 24hrs	After 48hrs	Before	After 24hrs	After 48hrs
		N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Anorexia level before	Pearson Correlation	.008	.049	.054	-219-	-214-	-212-
	Sig. (2-tailed)	.944	.667	.637	.176	.185	.190
Anorexia level after 24 hours	Pearson Correlation	-.006-	.242	.405	-204-	-198-	-196-
	Sig. (2-tailed)	.960	.031*	.000**	.206	.221	.227
Anorexia level after 48 hours	Pearson Correlation	.054	.343	.548	-050-	-036-	-049-
	Sig. (2-tailed)	.635	.002**	.000**	.761	.826	.766
FAACT before	Pearson Correlation	.035	-.069-	-.101-	.293	.287	.282
	Sig. (2-tailed)	.756	.540	.373	.067	.072	.077
FAACT after 24 hours	Pearson Correlation	-.020-	-.327-	-.560-	.058	.078	.087
	Sig. (2-tailed)	.862	.003**	.000**	.722	.632	.593
FAACT after 48 hours	Pearson Correlation	-.013-	-.330-	-.569-	.105	.129	.171
	Sig. (2-tailed)	.910	.003**	.000**	.520	.426	.292

Pearson correlation

**Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

(FAACT) Functional Assessment of Anorexia-Cachexia Therapy

Table (1): Shows the personal and medical data of the studied children. Regarding the child's age, most of them (82.5%, 80%) respectively in both groups were in the age group ranged from 6-< 9 years, more than half of them (60%, 55%) respectively were male in both groups, less than two thirds of them (62.5%, 57.5%) respectively are living in rural areas in both groups, the majority of them(97.5% and 92.5%) were still in the primary level of education in both groups respectively, and less than one third of them (32.5%, 35%) respectively had a family history of cancer in both groups. Only 10% of children in the intervention group and 15% of children in the control group were suffering from chronic illness; in the intervention group, half of them had diabetes and half of them had hypertension; in the control group, (66.7%) of them had diabetes and (33.3%) of them had hypertension. It was noted that there was no statistically significant difference between the two groups.

Table (2): Demonstrates the distribution of the studied children according to their current cancer data in the intervention and control groups, it was found that there was no statistically significant differences between the two groups regarding type of cancer, types of cells in the tumor, duration of cancer, past treatment and treatment line.

Figure (1): Represents distribution of the studied children according to their sleep quality before, after 24 and 48 hours in the intervention and control groups, it was detected that there were a highly statistically significant differences in the intervention group **(p.value 0.001**).**

Table (3): Displays distribution of the studied children according to their mean ± SD of last night's sleep rate (time/minute) before, after 24 and 48 hours in the intervention and control groups, it was detected that there were statistically significant differences in the intervention group.

Figure (2): Clarifies distribution of the studied children according to their anorexia level before, after 24 and 48 hours in the intervention and control groups and it was noted that there were a highly statistically significant differences in the intervention group **(p.value 0.001**).**

Table (4): Indicates distribution of the studied children according to their total mean ± SD of functional assessment of anorexia (FAACT) before, after 24 and 48 hours in the intervention and control groups there were a highly statistically significant differences in the intervention group **(p.value 0.001**).**

Table (5): Shows positive correlation between the studied children's sleep quality, anorexia level and FAACT after 24 and 48 hours, in the intervention group.

Discussion

Sleep disturbance and anorexia are the commonly reported symptoms that are associated with a lower quality of life and a lower overall survival rate in cancer children receiving chemotherapy. When a child with cancer is receiving chemotherapy, Benson's Relaxation Response (BRR) is a powerful complementary and non-pharmacological treatment used to lessen sleep disruption and anorexia **(Harorani et al., 2020)**. So this study aimed to investigate the effect of Benson's relaxation response on sleep quality and anorexia in cancer children undergoing chemotherapy.

Findings of this study demonstrated that Benson relaxation improved the quality of sleep in cancer children and that there were statistically significant differences in the intervention group, which are readily apparent when comparing measurements taken before and after the technique was used.

Cortisol is the first hormone the adrenal glands release in reaction to stress and sleep disturbances. BRR lessens anxiety by lowering cortisol secretion and muscle tension. Heart rate, breathing capacity, and cardiac workload are also impacted. This method modifies the hypothalamus by decreasing activation of the sympathetic nervous system and boosting stimulation of the parasympathetic nervous system **(Byrne et al., 2021).** Therefore, by promoting relaxation, lowering stress levels, and decreasing the release of cortisol, BRR can help youngsters get better quality sleep. This was in line with a study by **Suradi et al., 2022** that examined the impact of Benson relaxation on cancer patients' sleep quality and found a substantial difference between the two groups.

Regarding the impact of BRR on the anorexia severity of the children under study and the impact of the Benson relaxation technique on the mean FAACT score, the current study discovered that anorexia children' total mean scores improved after BRR implementation. Additionally, the present study's findings showed that, after using the technique, the global anorexia scale and all of its subscales showed a highly significant improvement. This improvement may be attributable to BRR, which encourages a relaxation reaction by lowering the activity of the autonomic nervous system, improving how anorexia is perceived. Additionally, this could be explained by the fact that lessening levels of worry and melancholy also results in a decline in anorexia.

In this line, a study carried out in Iran by **Harorani et al., 2020** discovered that the use of Benson's relaxation technique decreased anorexia in chemotherapy patients. Additionally, **Sami et al., 2022** in their study titled "Functional Assessment of Anorexia/Cachexia Therapy among Egyptian

Children with Cancer Disease after Nutritional Management," supported this finding by stating that the application of Benson's relaxation technique could reduce anorexia in cancer patients.

This finding also was in parallel with **Poorolajal et al., 2017** who conducted a similar study related to "Effect of Benson relaxation technique on preoperative anxiety and hemodynamic status" and found that the use of Benson relaxation technique could lower anorexia in cancer patients.

This study confirmed the hypothesis that practicing Benson's relaxation technique had a positive effect on improving sleep quality and anorexia symptoms. These results are in line with **Abd El-Salam & Mosaad, 2022** who noted that integrating Benson's relaxation technique can promote patient improvement.

Also, the present study results revealed a positive correlation between the studied children's sleep quality after 24 and 48 hours and anorexia level and FAACT in the intervention group and this may be due to a lot of causes. Sleep quality and daytime sleepiness may be influenced by dietary habits and nutrient intake. Anorexia's malnutrition affects brain activity, particularly the synthesis of the neurotransmitters and hormones that regulate sleep and wakefulness. The appropriate generation of hormones that control appetite and hunger is directly impacted by sleep. Sleep disturbances may change hormone levels and eating habits. Sleep is impacted by anorexia and vice versa (**National Eating Disorders Association, 2021).**

Regarding personal characteristics, this study's results showed that the majority of studied children were in the age group from 6-< 9 years more than half of them were male, less than two third of them are living in rural areas; the majority of them were still in the primary level of education; and more than one third of them had a family history of cancer. The same results were reported by **Castillo-Martínez et al., 2018** who stated in their study entitled "Nutritional assessment tools for the identification of malnutrition and nutritional risk associated with cancer treatment" that cancer usually occurs in children.

As regards the distribution of the studied children according to their current cancer data, the current study revealed that were no statistically significant differences between the two groups regarding type of cancer, types of cells in the tumor, duration of cancer, past treatment and treatment line. This result was supported by **Sami et al., 2022** who mentioned that" Functional Assessment of Anorexia/Cachexia Therapy among Egyptian Children with Cancer whose study was about " Functional Assessment of Anorexia/Cachexia Therapy among Egyptian Children with Cancer Disease after Nutritional

Management" and stated that there was no statistically significant difference between the intervention and the control groups regarding type of cancer, types of cells in the tumor, duration of cancer, past treatment and treatment line.

Conclusion
The researchers concluded Benson's Relaxation Response had a positive effect on sleep quality and anorexia of cancer children undergoing chemotherapy. A significant improvement in the sleep quality and anorexia level in the intervention group with a p-value of 0.001, while there was no statistically significant difference in the control group.

Recommendations
1. Posters will serve as a reminder of BRR to youngsters and their parents.
2. Hospitals are advised to utilize the BRR in conjunction with other therapies to lessen anorexia and enhance sleep in cancer children receiving chemotherapy.
3. Further researches should be carried out on a large number of children.

References
▪ **Abd El-Salam, H.** & **Mosaad, M. (2022):** Effect of Benson's Relaxation Technique on Anorexia in Cancer Patients Undergoing Chemotherapy, Egyptian Journal of Nursing & Health Sciences, Vol. (3), No. (1), Pp. 88–110.

▪ **Atiaa, A., Mohamed, M. & Aly, M. (2021):** Association between sleep disturbance and physiological parameters of critically ill patients, Egyptian Journal of Health Care, Vol. (12), No. (3), Pp. 38–47.

▪ **Biabani, F., Moradi-Koosha, F. & Moeini, V. (2019):** The effect of benson's muscle relaxation technique on severity of pregnancy nausea, Electron J Gen Med, Vol. (16), No. (2), Pp.1–6.

▪ **Byrne, N., Yuen, F., Butt, W. & Liu, P. (2021):** Sleep and circadian regulation of cortisol: A short review, Current Opinion in Endocrine and Metabolic Research, Vol. (18), Pp: 178–186.

▪ **Castillo-Martínez, L., Castro-Eguiluz, D., Copca-Mendoza, E., Pérez-Camargo, D., Reyes, T., Alejandra-Damasco, E., López-Córdova, G., Fuentes-Hernández, M., Cetina-Pérez, L. & Milke-García, M. (2018):** Nutritional assessment tools for the identification of malnutrition and nutritional risk associated with cancer treatment,

Rev Investig Clin, Vol. (70), No. (3), Pp.121–125.https://doi.org/10.24875/RIC.18002524.

▪ **Ellis, B., Johns, M., Lancaster, R., Raptopoulos, P., Angelopoulos, N. & Priest R. (1981):** The St. Mary's Hospital Sleep Questionnaire: a study of reliability, Sleep, Vol. (4), No. (1), Pp. 93–97.

▪ **Farahani, M., Afsargharehbagh, R. & Marandi F. (2019):** Effect of aromatherapy on cancer complications: A systematic review, Complement Ther Med, Vol. (47).

▪ **Flint, A., Raben, A., Blundell, J. & Astrup, A. (2000):** Reproducibility, power and validity of visual analogue scales in assessment of appetite sensations in single test meal studies, International Journal of Obesity & Related Metabolic Disorders, Vol. (24), No. (1), Pp.38.

▪ **Harorani M., Zamenjani M., Golitaleb M., Davodabady, F., Zahedi, S., Jadidi, A. & Rezaei M. (2020):** Effects of relaxation on self-esteem of patients with cancer: A randomized clinical trial, Support Care Cancer, Vol. (28), No. (1), Pp.405–411.

▪ **Heydarirad, G., Keyhanmehr, A. & Mofid B. (2019**): Efficacy of aromatherapy with Rosa damascena in the improvement of sleep quality of cancer patients: A randomized controlled clinical trial, Complement Ther Clin Pract, Vol. (35), Pp.57–61.

▪ **Hsu, H., Lin, K. & Wu, L. (2017):** Symptom cluster trajectories during chemotherapy in breast Cancer outpatients, J Pain Symptom Manage, Vol. (53), No. (6), Pp.1017–1025.

▪ **Irmak, Z., Tanrıverdi, O. & Odemis, H. (2019):** Use of complementary and alternative medicine and quality of life of cancer patients who received chemotherapy in Turkey, Complement Ther Med, Vol. (44), Pp. 143–150.

▪ **National Eating Disorders Association. (n.d.). (2021):** National eating disorders awareness week. Retrieved from https://www.nationaleatingdisorders.org/getinvolved/nedawareness

▪ **Poorolajal, J., Ashtarani, F. & Alimohammadi, N. (2017):** Effect of Benson relaxation technique on the preoperative anxiety and hemodynamic status: A single blind randomized clinical trial, Artery Research, Vol. (17), Pp.33–38.

▪ **Ribaudo, J., Cella, D., Hahn, E., Lloyd, S., Tchekmedyian, N., Roenn, J. & Leslie, W. (2000**): Re-validation and shortening of the Functional Assessment of Anorexia/Cachexia Therapy (FAACT) questionnaire, Qual Life Res, Vol. (9), No. (10), Pp.1137–1146.

▪ **Sami, H., Almahdi, M. & Mohammed G. (2022):** Functional Assessment of Anorexia/Cachexia Therapy among Egyptian Children with Cancer Disease after Nutritional Management, The Egyptian Journal of Hospital Medicine, Vol. (87), Pp.2422–2429.

▪ **Shiomi, Y., Ohira, Y. & Yoshimura, M. (2018):** Z-505 hydrochloride ameliorates chemotherapy-induced anorexia in rodents via activation of the ghrelin receptor, GHSR1a, Eur J Pharmacol, Vol. (818), Pp.148–157.

▪ **Suradi, E., Al Ihksan, A., Sri, S., Haeril, A., Rizqy, I., Sulkifli, N., Andi, S. & Muhammad, I. (2022):** The Effect of Benson Relaxation on Quality of Sleep of Cancer Patients, Journal of Medical Sciences, Vol. (10), No. (10), Pp.99–104.

▪ **Yoon, H. & Park, H. (2019):** The effect of auricular acupressure on sleep in breast cancer patients undergoing chemotherapy: A single-blind, randomized controlled trial, Appl Nurs Res, Vol. (48), Pp.45–51.

▪ **Zhang, R., Yin, J. & Zhou, Y. (2017):** Effects of mindfulness-based psychological care on mood and sleep of leukemia patients in chemotherapy, Int J Nurs Sci, Vol. (4), No. (4), Pp.357–361.