▪ *Basic Research*

Effect of Benson's Relaxation Technique on Anorexia in Cancer Patients Undergoing Chemotherapy

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Abstract

Introduction: Cancer patients undergoing chemotherapy experiencing numerous symptoms such as anorexia, which is the most frequently reported symptom that is linked to decreased quality of life and overall survival. Benson's Relaxation Technique (BRT) is an effective complementary and non-pharmacological technique used to reduce anorexia in cancer patients undergoing chemotherapy. **Aim:** The study aimed to evaluate effect of Benson's relaxation technique on anorexia in cancer patients undergoing chemotherapy. **Setting:** the study was conducted in the oncology unit affiliated to Benha University Hospital, Benha, Egypt. **Design** A quasi-experimental research design was utilized to conduct the current study. The following hypothesis was formulated to achieve the study's aim; Anorexia score among cancer patients undergoing chemotherapy will be significantly improved after implementation of Benson's relaxation technique than before implementation. **Subject:** A purposive sample of 100 adult cancer patients undergoing chemotherapy within six months were enrolled in this study to reach to a number of 86 patients at the end of study period. **Tools:** Four tools were used; Structured interviewing questionnaire which consists of socio-demographic data and patients' health history, also the patients' knowledge questionnaire, the patients' practice observational checklist regarding Benson's relaxation technique, and anorexia scale which consists of {(Visual analogue appetite scale (VAS) and Functional assessment of anorexia - cachexia therapy (FAACT)}. **Results:** The study showed that there was highly significant statistical improvement in total knowledge and practice scores of studied patients after three months of implementing the technique as compared to pre implementation, all mean total scores of anorexia scale for cancer patients improved significantly after applying Benson's relaxation technique. Finally, the independent variables contributing to variance in anorexia score were cancer staging, knowledge and practice scores, age, treatment line as well as educational level. **Conclusion:** Benson's relaxation technique had a positive effect in reducing and improves anorexia in cancer patients undergoing chemotherapy. **Recommendations:** Importance of presenting posters to remind patients about BRT and to improve patients' knowledge and practices. Also, hospitals are recommended to use the BRT alongside other treatments to alleviate anorexia and symptoms in cancer patients undergoing chemotherapy.

Keywords: Anorexia, Benson's relaxation technique, cancer patients, chemotherapy.

Introduction

Cancer is mainly a common chronic disease globally [1], Patients with cancer receiving chemotherapy experience many problems which are having a negative impact on a person's life [1, 2] . Chemotherapy as a long-term treatment includes many cycles and causes different side effects through destroying both normal and cancerous cells. [2,3] Given the fact that chemotherapy is systemic treatment, it affects the whole body and therefore leads to more side effects compared to surgical therapy and radiotherapy which are local [3,4]. Chemotherapy is likely to cause toxicity which can affect the nutritional status of patients [1]. In advanced cancer, anorexia considered the fourth most commonly symptoms after pain, fatigue, and weakness with a high prevalence in cancer patients undergoing chemotherapy [2].

   Anorexia is the involuntary loss of appetite or desire to eat that results in reduced caloric intake and often weight loss [1,3] . Inadequate food intake and consequently malnutrition which occurs in about 80 % of cancer patients [3].These life-threatening problem increase mortality reduce survival rates and helps to develop severe psychological distress to the patients and their families [6]. Also anorexia negatively affects the quality of life and increases the risk of treatment failure in these patients [5]. Many studies estimated that anorexia accounts for up to 40 % of cancer-related deaths [4,5]. Anorexia is one of the important side effects of chemotherapy for which there are only a few treatment options, so diet occupies an important role in oncology and any impact on nutritional status is directly related to the disease process and the antitumor treatments [7,10].

Management of anorexia among cancer patients receiving chemotherapy includes pharmacological and non-pharmacological interventions. Given the complications associated with pharmacological treatments, the use of complementary and non-pharmacological methods seems reasonable [1,11]. Common complementary and non-pharmacological interventions include music therapy, yoga, biofeedback, mind distraction techniques, relaxation, lifestyle changes, time control, guided imagery and cognitive restructuring. Relaxation technique is an effective and low risk nursing intervention, which has been introduced as a beneficial complementary and non-pharmacological method [12]. A complementary and non-pharmacological intervention has been recommended to be used to control the side effects of chemotherapy. The results of recent studies showed that complementary and non-pharmacological interventions are more efficient, less invasive, and more accessible than other treatments which reduces stress over its effect on physical and psychological symptoms, such as anxiety, pain, depression, mood, self-steam, and improves the quality of life of cancer patients [1,12,13].

Active tumor causes an inflammatory response and changes in hypothalamic function which has a negative effect on appetite so, a complementary and non-pharmacological intervention

acts by balancing the posterior and anterior hypothalamic regions, dropping the activities of sympathetic nervous system and inducing catecholamine secretion leads to reduced muscle tension, alleviation of adverse physiological effects, reduced blood pressure , regular breathing, pulse rate and muscle spasms induced by stress [14,15] .

Benson's Relaxation Technique (BRT) is one of the best muscular relaxation techniques which are better tolerated by cancer patients undergoing chemotherapy. This technique was introduced by Herbert Benson (1975), who has mentioned that this method can induce a relaxation response by reducing autonomic nervous system activity [16]. It is the most effective and easy nursing intervention method to use. It includes mindfulness techniques that are affected on wide range of physical and psychological symptoms in cancer patients undergoing chemotherapy through its effect of complete relaxation of all the muscles. Increasing patients' comfort during chemotherapy is one of the aims for which the nurses work, complementary and non-pharmacological intervention is a facilitator to achieve this aim. Since many cancer patients undergoing chemotherapy suffer from anorexia, consequently, the necessity of application of Benson's relaxation technique according to the condition cancer patients seems to be necessary to reduce anorexia and overall sense of wellbeing [1, 12, 14, 15].

Significance of the study

Cancer is a global issue majorly and it is considered the most important cause of morbidity and mortality [19]. Cancer patients receiving chemotherapy have a high risk of anorexia secondary to the disease and treatment; chemotherapy-related symptoms may greatly affect the nutritional status of the patient and reduces the quality of life [18, 19]. Anorexia is the involuntary loss of appetite that has been reported to be as high as 80% in patients with various types of late-stage cancers [1, 17]. Anorexia is the most common cause of decreased nutrient intake that triggers malnutrition and muscle wasting [10]. The prevalence of anorexia in individuals with cancer is highly variable but has been reported to be 40% at diagnosis and 70% in advanced disease [1, 19]. 40-80 % of cancer patients suffer from different degrees of anorexia and malnutrition, depending on tumor subtype, location, staging and treatment strategy [17, 18]. Anorexia in cancer patients affects the patient's overall condition, and it increases the number of complications, the adverse effects of chemotherapy and reduces the quality of life [1, 10]. BRT can be used to increasing patients' comfort during chemotherapy and it is important to prevent and treat chemotherapy-induced side-effects such as anorexia to maintain patients' quality of life and to continue chemotherapy safely [1, 18]. According to recent research evidence and best nursing practice complementary and non-pharmacological intervention is more efficient, less invasive, and more accessible than other treatments. Moreover, it reduces treatment costs [1].

Aim of the study

This study was done to evaluate effect of Benson's relaxation technique on anorexia in cancer patients undergoing chemotherapy.

Research hypothesis:

Anorexia score among cancer patients undergoing chemotherapy will be significantly improved after implementation of Benson's relaxation technique than before implementation.

Subjects and Methods

Research design:

A quasi-experimental (pre/posttest) research design was utilized to achieve the study's aim.

Study setting:

The current study was conducted in the oncology unit affiliated to Benha University Hospital, Benha, Egypt.

Subjects:

A purposive sample of 100 cancer patients undergoing chemotherapy participated and they were enrolled in the study in their second day of chemotherapy through a period of six months, according to the following criteria:

Patients between the ages of 30–60 years, of both sexes.

Patients who accept to participate in the study and able to communicate effectively.

At least 6 months passing from cancer diagnosis.

Patients who receive at least one chemotherapy cycle.

Conscious and having no hearing impairment.

Having no limits on movements to relax.

Patients not planned to receive chemotherapy were excluded.

Patients with physical or mental handicapped were also excluded.

Sampling technique:

The sample size was determined and calculated using EPI info program and it was estimated to be 89   patients coefficient interval 95%. The researchers increased the sample size to 100 patients.

The flow of study participants during data collection was as follow, 14 of them were excluded from data analysis because six of the patients withdrew from the study without giving any reasons, five patients lost to follow up (unable to reach at follow- up period) and three of them were died. Eventually a total of **86 patients** allocated to the study.

Data Collection Tools:

Four tools were used to collect data of the current study:

Tool I- A structured interviewing questionnaire, developed by the researcher after reviewing recent relevant literatures and   scientific references [1, 2, 6]. It included two parts to cover the following data:

Part (1): Socio- demographic data sheet: It was consisted of characteristics of studied patients to collect baseline data which included seven items regarding age, sex, marital status, educational level, occupation, residence, and nature of work.

 Part (2): Patients' health history: It was devoted to assess; past medical and surgical history, present health history, and family history, which included: staging of the disease, duration of cancer, presence of chronic diseases, past treatments, timing, number and duration of chemotherapy cycles and sessions (treatment line).

Tool II: Patients' knowledge questionnaire: developed by the researcher after reviewing recent relevant literatures and scientific references [1, 11, 16, 25] . It aimed to assess patients' knowledge regarding the Benson's relaxation technique, and included a set of questions consisted of 28 question 15 multiple choice questions and 13 true or false questions as regard definition of Benson's relaxation technique, benefits and its effect on anorexia, moreover its performance instructions.

   Knowledge scoring system: The scores obtained for each set of questions was summed up to get the total score for patient's knowledge. The total score was computed out of 28, for each question the score was graded as (1) mark for correct answer and (zero) mark for wrong answer**.**

Tool III: Observational checklist: It aimed to assess patients' practice regarding Benson's relaxation technique, this tool was adapted from **Benson and Klipper, (1975)**, the checklist included (5) steps related to Benson's relaxation technique instructions.

Practice scoring system: One grade was given for each step that done correctly, zero for the step that done incorrectly or not done. The total patients' practice score was computed out of (5) marks.

Tool IV: Anorexia scale: It aimed to examine anorexia and included two parts

as the following:

   Part (1): Visual analogue appetite scale (VAS): This scale was adopted from **Van et al. (2017)** to assess anorexia in cancer patients. This scale is made up of a 10 cm ruler on which one side shows "good appetite = 0" and other side shows "anorexia = 10". Patients can self-report their appetite using this scale. Visual Analog Scale (VAS) was completed two times by the participants (before and after patients' practice the technique).

Scoring system: The total scores of visual analogue appetite scale ranges from (0-10); a higher score indicates severe anorexia, it was categorized into four groups as the following:

0 was considered "no anorexia & good appetite ."

1-3 was considered "mild anorexia".

4-6 was considered "moderate anorexia".

7-10 was considered "severe anorexia ".

   Part (2): Functional assessment of anorexia - cachexia therapy (FAACT): the FAACT (4th version, Dutch) was developed by **Ribaudo et al. (2000)**. This scale was used to assess anorexia in cancer patients. It consisted of 12 items. It was translated into Arabic language and approved to be valid and reliable as follows, (1- I have a good appetite, 2-the amount I eat is sufficient for my needs, 3- I am worried about my weight, 4- most food tastes unpleasant to me, 5- I am concerned about how thin I look, 6- my interest in food drops as soon as I try to eat, 7- I have difficulty eating rich or 'heavy' foods, 8- my family or friends are pressuring me to eat, 9- I have been vomiting, 10- when I eat, I seem to get full quickly, 11- I have pain in my stomach area, 12- my general health is improving) 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). The component scores are summed to produce a global score (range from 0 to 48), whereby a lower score indicates less appetite while higher scores denote good appetite**.**

Final Anorexia assessment which was validated by (Blauwhoff-Buskermolen et al., 2016) through two external criteria: in order to determine the optimal cut-off values of the FAACT–A/CS and the VAS. **The first external criterion** was the anorexia symptom scale, which consists of one item that assesses appetite: "Have you lacked appetite?" The responses are scaled on a four-point Likert scale (1 = not at all, 2 = a little, 3 = quite a bit, and 4 = very much). A cut-off value of ≥ 2 on the anorexia symptom scale was used to assess anorexia, because the response option "a little" indicates that patients experience their appetite to be different from normal (in contrast to the response option "not at all"). **The second external criterion** which was used in order to assess anorexia is a frequently asked question in clinical practice: "Did you have a decreased appetite during the last month?" The response option for this question was dichotomous: yes/no.

Method

Ethical considerations:

 An official approval to conduct the study was obtained from the director responsible for the oncology unit and the head nurses at Benha University Hospital after submission of a formal letter from the Faculty of Nursing, Benha University after explanation of its purpose. Then, explaining the study's aim and benefits, as well as the procedure of data collection to all participants clearly. The participants were informed that their participation is optionally, and that they have the right to withdraw at any time without any consequences. Then, Verbal consent was obtained from each patient enrolled into the study. The researcher assured that all collected data would be absolutely confidential and only will be used for the study' aim and the study maneuver will not cause any harmful effects to the participants.

Tools validity: All study tools were tested for its content validity by five experts in the medical surgical nursing and oncology medical staff specialty for face and content validity. The required modifications were carried out consequently.

Reliability of tools: all tools of the study were tested for reliability using alpha Cronbach test which is used to measure the internal consistency .The reliability scores of the tools were 0.81 for tool I, 0.78 for tool II, 0.83 for tool III and 0.74 for tool IV, which denotes the high internal consistency of the used tools.

Pilot study: A pilot study was conducted on ten patients (10%) of all patients at oncology unit Benha University Hospital recruited to test the clarity and applicability of the study tools and the necessary modification was done prior to data collection. patients who participated in the pilot study were excluded from the main study sample.

Data collection:

Sampling and data collection were started and completed during the period from the beginning of December 2020 to the beginning of Sept 2021 (six months for enrollment of eligible subjects and three months for evaluating the effect of Benson's relaxation technique after implementation).

The researchers interviewed each patient before applying the technique to collect baseline data on socio- demographic data, health history and knowledge assessment using **(Tool I & II).** Besides, patients' practice using **(Tool III).** Then, all patients were assessed for anorexia using **(Tool IV).** This interview took about 30 to 35 minutes.

The researchers divided the studied patients into groups.

The technique implementation was carried out for each group through the conduction of three sessions during their hospital stay, and each session lasted about 45 minutes.

Different teaching and learning methods were used during the sessions which included; videos, group discussions, demonstration and redemonstration, to learn patients about Benson relaxation technique.

The instructional colored booklet was given to each patient under the study as well as caregivers were involved in order to help for reviewing and support teaching at home, it was written in a simple Arabic language and supplemented by photos and illustrations to help the patient understanding of the content.

Each group attended the sessions as the following:

The first session covered the definition, benefits of Benson's technique, its effect on anorexia, and performance instructions.

The second session focused on application of Benson's relaxation technique by the researchers and asked care giver to observe and guide patients to practice correctly.

The third session included performing of Benson's relaxation technique by the patient and in front of the researchers to ensure that the patient done it correctly.

The researchers carried revision and reinforcement according to participants' needs. Also the researchers corrected the wrong performance of technique and answered questions.

The researchers instruct the patients to practice the relaxation technique correctly twice a day in morning and evening for 20 min, for three months in their homes.

The instruction of the Benson's relaxation technique included the following steps:

-Sit in a comfortable position.

-Close the eyes.

-Relax all muscles beginning from the soles for the feet to the top of the head moving forward up, and relax all parts of the body.

-Take a breath from the nose. Exhale from the mouth whenever exhaling, repeat one word or number (as Allah or one) inhale, and exhale with comfort and confidence.

-Do this for 20 minutes. Try to keep the body and muscles relaxed and repeat the desired word in their mind. Then open the eyes slowly and do not move or stand up for a few minutes.

The evaluation of technique was done after three months by using the same study tools of the pretest, by comparing the results pre and post technique implementation to determine the effect of the Benson relaxation technique on anorexia in cancer patients undergoing chemotherapy.

Data Analysis

Data was analyzed using Statistical Package for Social Sciences (SPSS) program version 20. A variety of statistical methods were used to analyze the data in current study as Qualitative variables were presented as number and percent. Quantitative variables were tested for normality distribution by Shapiro test. Wilcoxon sign test were used for paired comparison and nonparametric variables were presented as median (minimum -maximum). Paired t-test was used for pre-post comparison and normally distributed variables were presented as mean and standard deviation. A p-value ≤ 0.05 was considered significant, and <0.001 was considered highly significant.

Results

Table (1) shows the distribution of the studied patients regarding to their socio-demographic characteristics. It was observed from the table that 74.4% of studied patients aged between 51-60 years with mean age of 56.255± 6.78 years, females were more prevalent and constituted 68.6 % of the patients, while 31.4% of them were males. The majority 86% of the studied patients were married. Regarding their educational level 66.3% were secondary education, while 12.8% of them were illiterate, 11.6% of them were university degree, only 9.3 of them were had primary education and there are no postgraduate studies in the studied sample. As well, It was observed that 79.1% were workers, 61.6% of studied patients

reported had manual work and slightly less than two third of them 64% resided in rural areas.

Table (2) shows the distribution of the studied patients related to their medical history. It was found that 70.9 % of patients were not suffering from chronic diseases, 16.3 % of them were suffering from diabetes mellitus. Moreover, 73.2 % of the patients had family history of cancer. Regarding cancer type and staging it noticed that, prostate (stage IV), breast (stage II–IV), Colon/rectal (stage IV) were more prevalent and constituted 25.6 %, 24.4 %, 23.3% respectively, While pancreas (stage III–IV), liver (stage IV), kidney (stage II–IV) was recorded the lowest percentage of the studied sample and constituted 2.3 %, 1.2 %, 1.2 % respectively, and 16.3 % of the patients suffer from cancer since less than 1 year, 47.7 % of them since 1to less than 2 years, 31.4 % of them since 2- 3years and only 4.6 % of the patients reported the duration of cancer more than 3 years. As regard their past treatments 48.8 %, 33.7 % respectively, were taking radiotherapy and hormonal therapy, 9.3 % of them were taking targeted therapy and 8.1 % of them had a previous surgery. In relation to chemotherapy cycles and sessions more than half of the patients 59.3 % were taking 1st line treatment, and 24.4 % ,16.3 % of them taking 2nd line and higher than 2nd line treatment.

Table (3) shows the effect of acquiring knowledge and application of Benson's relaxation technique on mean score of anorexia of the studied patients**.** It appears from the table that the total mean score of knowledge and practice increased, and the total mean scores for anorexia patients were decreased (improved) significantly after applying Benson's relaxation technique at (P $\leq$ 0.01**).

Table (4) shows the effect of the Benson's relaxation technique on mean score of FAACT and VAS subscales. The table demonstrated a high significant difference was found before and after application of the technique concerning the mean score of the FAACT and its standard criteria subscales and the total mean scores of VAS for anorexia patients were decreased (improved) significantly after applying Benson's relaxation technique at (P $\leq$ 0.01).

Table (5) Multivariate linear regression model in this table presents that anorexia among the studied subjects which assessed by cutoff values of the (Functional assessment of anorexia and the Visual analogue of appetite) was best predicted by cancer staging, knowledge and practice scores, age, treatment line as well as educational level accounting for 77.9 % of the variance of Functional assessment of anorexia and 64.8% of the variance of Visual analogue of appetite.

Table (1): Number and percentage distribution of patients regarding their socio-demographic characteristics (n=86).

Socio-demographic data	Study group (n=86)	
	Number (N)	Percent (%)
Age (years) 30- ≤ 40 41- ≤ 50 51- ≤ 60	8 14 64	9.3 16.3 74.4
Range Mean ± SD	33.0-60.0 years, 56.255± 6.78 years	
Sex Males Females	27 59	31.4 68.6
Marital status Single Married Widow	7 74 5	8.1 86.0 5.8
Education level Illiterate Primary Secondary education University education Postgraduate education	11 8 57 10 0	12.8 9.3 66.3 11.6 0.0
Occupation Working Not working	68 18	79.1 20.9
If yes, what is the nature of work? (n=68) Office work Manual work	15 53	22.1 77.9
Place of residence Rural Urban	55 31	64.0 36.0

Table (2): Distribution of patients regarding their medical history (n=86)

Medical history	N	%
Presence of chronic diseases		
Yes	25	29.1
No	61	70.9
If yes, types of chronic diseases? (n=25)		
Diabetes mellitus	14	16.3
Hypertension	8	9.3
Heart disease	2	2.3
Liver disease	1	1.2
Family history of cancer		
Yes	63	73.2
No	23	26.7
Cancer type & staging		
Breast (stage II–IV)	21	24.4
Prostate (stage IV)	22	25.6
Colon/rectal (stage IV)	20	23.3
Lungs (stage II–IV)	9	10.5
Leukemia (stage II–IV)	7	8.1
Pancreas(stage III–IV)	2	2.3
Liver (stage IV)	1	1.2
Kidney (stage II–IV)	1	1.2
Brain (stage I–II)	3	3.5
Time since diagnosis (Year)		
< 1	14	16.3
1- < 2	41	47.7
2- 3	27	31.4
> 3	4	4.6
Past treatments		
Radiotherapy	42	48.8
Surgery	7	8.1
Targeted therapy	8	9.3
Hormonal therapy	29	33.7
Treatment line (chemotherapy cycles and sessions)		
1st line	51	59.3
2nd line	21	24.4
Higher than 2nd line	14	16.3

Table (3): Effect of acquiring knowledge and application of Benson's relaxation technique on mean score of anorexia for the studied patients (n=86).

Variables	Before implementation Mean ± SD	After implementation Mean ± SD	Significance test
Median Knowledge (min -max)	0 (0-7)	28 (20-28)	z=8.2 P= 0.001**
Median Practice (min -max)	0 (0-2)	5 (1-4)	z=7.2 P= 0.001**
Mean score of functional assessment of anorexia (FAACT)	18.395±1.374	12.267±1.676	t=26.036 P= 0.001**
Mean score of visual analogue appetite scale (VAS)	18.430±3.230	6.627±2.029	t=27.799 P= 0.001**

(**) Highly statistical significance

Z of Mann-Whitney test

(FAACT) Functional assessment of anorexia/cachexia therapy

(VAS) Visual analogue appetite scale

Table (4): The effect of the Benson's relaxation technique on mean score of FAACT and VAS subscales (n=86).

Standard criteria subscale	FAACT (0-48)			VAS (0-10)		
	Before implementation Mean ± SD	After implementation Mean ± SD	Paired t-test & P-value	Before implementation Mean ± SD	After implementation Mean ± SD	Paired t-test & P-value
Have you lacked appetite Not at all	2.965±0.184	1.907±0.475	t= 19.880 P= 0.001**	2.200±0.136	1.900±0.474	t=13.015 P=0.001**
A little bit	2.613±0.489	1.093±0.292	t= 22.517 P= 0.001**	1.382±0.603	0.968±0.192	t=19.861 P=0.001**
Somewhat	2.883±0.322	1.965±0.416	t= 15.277 P= 0.001**	2.688±0.786	1.355±0.035	t=13.229 P=0.001**
Quite a bit	1.255±0.799	0.988±0.711	t= 5.267 P= 0.001**	1.125±0.271	1.208±0.284	t=20.321 P=0.001**
Very much	2.613±0.489	1.093±0.292	t= 22.517 P= 0.001**	2.965±0.184	1.907±0.475	t= 19.880 P= 0.001**
Did you have a decrease appetite during the last month? Yes	1.255±0.799	0.988±0.711	t= 5.267 P= 0.001**	1.700±0.560	1.900±0.969	t=5.538 P=0.001**
No	3.346±1.382	2.730±0.358	t=4.559 P=0.001**	3.000±0.000	2.825±0.439	t= 3.684 P= 0.001**

(**) Highly statistical significance (FAACT) Functional assessment of anorexia/cachexia therapy (VAS) Visual analogue appetite scale

Table (5) Multiple linear regression analyses for predictor variables of anorexia among the studied subjects after implementation of Benson's relaxation technique (n=86)

Predictor variables	Functional assessment of anorexia					Visual analogue of appetite				
	Standardized Coefficients		Un Standardized Coefficients	T	P value	Standardized Coefficients		Un standardized Coefficients	T	P value
	B	SEB	β			SEB	B	β		
Age	.775	.201	1.100	3.852	.031*	2.551	-9.076	-.504	3.558	0. 016*
Educational level	0.824	0.259	-.499	-3.606	.001**	4.027	-18.245	-1.080	-4.531	0.011*
Presence of chronic illness	-4.574	12.946	-271	-0.353	0.758	-1.233	2.856	0.073	-0.432	0.695
Cancer type & staging	-8.989	2.493	-0.499	-3.606	0.011*	2.199	6.171	2.081	27.402	0.001**
Treatment line	-15.922	3.642	-0.942	-4.371	0.007*	3.226	-17.251	-1.021	-5.347	0.002*
Knowledge score	6.900	1.979	2.199	5.989	0.001**	2.319	6.018	1.766	13.428	0.001**
Practice score	-9.076	2.551	-0.504	-3.558	0.016*	0.303	33.059	0.352	4.299	0.084*
Constant	-11.726	-73.815	-0.146	-2.076	0.001**	-64.176	-7.394	0.254	-2.076	0.020*
Adjusted R² = 0.779 , P = 0.001**						Adjusted R² = 0.648 , P = 0.001**				

(**) Highly significant statistically   (*) Significant statistically   (B): Beta Co-Efficient   (SEB): Standard Error

Discussion

Cancer patients receiving chemotherapy have a high risk of malnutrition secondary to the disease and treatment. Anorexia is the most commonly reported symptoms in cancer patients undergoing chemotherapy, and 40-80 % of cancer patients suffer from different degrees of malnutrition, depending on tumor subtype, location, staging and treatment strategy. Malnutrition in cancer patients affects the patient's overall condition, and it increases the number of complications Kamarajah et al. [21]. Current literature and best nursing practice recommended to apply Benson's relaxation technique (BRT) have likely to reduce anorexia and improve the healing process [22, 32]. So, the current study aimed to evaluate effect of Benson's relaxation technique on anorexia in cancer patients undergoing chemotherapy. The study hypothesized that cancer patients undergoing chemotherapy who apply Benson's relaxation technique will have a significant improvement in anorexia.

The results of the present study reported that more than two third of the studied patients aged between 51-60 years with mean age of 56.255± 6.78 years. From the researcher point of view, this may be due to the fact that cancer occurs with old age. The same results were

reported by Castillo-Martínez et al. (2018) who stated in his study entitled "Nutritional assessment tools for the identification of malnutrition and nutritional risk associated with cancer treatment" that cancer usually occurs in persons aged 50-69 years. Also, this result agreed with Green et al. (2020) who studied "Epidemiological study in cancer patients in Denmark" showed that, the highest incidence of cancer was in patients aged 40 to 60 years. This result was incongruent with Villain et al. (2019) who mentioned in their study entitled " Incidence, Risk Factors, and Impact of Age on oncology after Surgery" that the average age of patients was 79 years.

As for sex, the results of the present study revealed that more than two thirds of the studied patients were females. This result is congruent with the literature and the same result was reported by other studies that cancer patients are predominantly females [1, 36]. Other studies conducted by Yoon and Park, (2019) who made a study about "The effect of auricular acupressure on sleep in breast cancer patients undergoing chemotherapy" and supported this result which concluded that the rate of progression of cancer is more rapid in women than in men . The impact of gender on oncologic outcomes, disease recurrence and progression may reflect both genetically determined differences between both sexes in body structure and function as well as receptor-mediated effects of sex hormones [1, 37, 38]. On the other hand, this finding disagreed with Harorani et al. (2020) who report in his study entitled " The effect of Benson's relaxation technique on sleep quality and anorexia in cancer patients undergoing chemotherapy" that half of the participants were female and the other half were male. Also, Winn et al. (2019) who studied "Gender Differences in Case Volume among Oncology Residents" mentioned that the majority of participants were males.

Concerning their marital status, the results of the current study revealed that the majority of the studied patients were married. This result was in agreement with Wong et al. (2017) who conducted a study entitled "Marital status and its relationship with the risk and pattern of cancer in a multi-ethnic Asian population", mentioned that more than three quarters of the studied patients were married. Regarding educational level, the results of the current study showed that two third of patients received secondary school education and there are no postgraduate studies in the studied sample. From the researcher point of view, this may be due to that the study was conducted in the governmental hospital which accommodates many numbers of patients' with low socioeconomic levels with low educational level. This result was congruent with Wei et al. (2020) who stated in their study entitled " effectiveness of an educational intervention on levels of pain, anxiety and self-efficacy for patients with cancer" that more than half of patients with cancer received secondary school education. Similarly, this result was in agreement with Harorani et al. (2020) who found that the majority of the patients in the experimental and the control group were high school graduates. But this result was incongruent with Yoon and Park (2019) who found that more than half of patients' had an education level of junior high school or lower.

The results of the present study found that nearly four fifths of them were workers; nearly two thirds of studied patients reported had manual work slightly less than two thirds of them resided in rural areas. This result was supported by Aredes et al. (2018) whose study was about "Influence of chemoradiotherapy on nutritional status, functional capacity, quality of life and toxicity of treatment for patients with cervical cancer" illustrated that the entire study group and the majority of control group were workers and were live in rural. While this finding in contrast with Harorani et al. (2020) who reported that about one thirds of the study subjects were house wife and live in the urban areas.

As regards the distribution of the studied patients according to their medical history; the current study revealed that more than two thirds of patients were not suffering from chronic diseases, had family history of cancer and prostate (stage IV), breast (stage II–IV), Colon/rectal (stage IV) were more prevalent, while pancreas (stage III–IV), liver (stage IV), kidney (stage II–IV) was recorded the lowest percentage of the studied sample. In addition, less than half of the patients suffer from cancer since 1to less than 2 years and nearly less than one thirds of them reported the duration of cancer since 2- 3years. In relation to chemotherapy cycles and sessions more than half of the patients were taking 1st line treatment. This finding was in consistent with Abraham et al. (2019) who studied "Early recognition of anorexia through patient generated assessment predicts survival in patients with esophagogastric cancer" and found that more than half of patients didn't have chronic diseases and the majority of them didn't made previous surgeries, the majority of the studied sample had family history of cancer and most of patients were taking 1st line treatment, 2nd line and higher than 2nd line of chemotherapy. Also, around two thirds of their subjects had been reported the duration of cancer since 3years.On opposite side a study conducted in Turkey by Irmak et al. (2019) reported that the majority of their subjects had been cancer for more than 5 years [44].

In relation to the effect of acquiring knowledge and application of Benson's relaxation technique on mean score of anorexia of the studied patients, and the effect of the Benson's relaxation technique on mean score of FAACT and VAS subscales the present study found a high significant positive difference in total median score of knowledge and practice of the studied patients, and the total mean scores for anorexia patients were decreased (improved) after implementation of Benson's relaxation technique (BRT) also, the present study results revealed a high significant improvement regarding the global anorexia, and all anorexia subscales after implementation of the technique, So, these findings support the research hypothesis which stated that Anorexia score among cancer patients undergoing chemotherapy will be significantly improved after implementation of Benson's relaxation technique than before implementation . This improvement may be due to Benson's relaxation technique promotes a relaxation reaction by reducing the activity of the autonomic nervous system thus promoting better perception of anorexia. And also this could

be explained by when the level of anxiety and depression decrease lead to reduced anorexia. In this regard, a study conducted in Iran, by Harorani et al. (2020) found that anorexia in patients undergoing chemotherapy was reduced after the application of Benson's relaxation technique [1]. Moreover, this result was supported by Poorolajal et al. (2017) whose study was about "Effect of Benson relaxation technique on the preoperative anxiety and hemodynamic status" stated that the use of Benson's relaxation technique could lower anorexia in cancer patients. Also a study done in Turkey by Irmak et al., (2019) they noticed that decrease level of anorexia with significantly difference after application of Benson's relaxation technique [44]. Also, this result comes in consistent with the results of many studies [1, 25, 44, 45], whose study results revealed that the Benson's technique is simple, effective, safe technique, in expensive, do not need any equipment or resources and easy to learn by patients. Furthermore, the above findings comes in the same line with the results of many studies [1, 45] whose study results stated that the relaxation exercises improve anorexia in patients by reducing oxygen consumption in the tissues and suppressing the sympathetic nervous system.

Cancer patients undergoing chemotherapy usually experience high levels of psychological stress, anorexia, anxiety, depression, and sleep disorders [1]. The Cortisol is the first hormone secreted by the adrenal glands in response to stress and sleep disorders [49]. Benson's relaxation technique (BRT) decreases anxiety through reducing muscle tension and cortisol secretion. It also affects heart rate, respiratory function and, cardiac workload [1, 48]. This method regulates the hypothalamus and exerts its effects by reducing sympathetic nervous system stimulation and stimulating the parasympathetic nervous system [47]. Decreasing these problems, through nonpharmacological methods like Benson's relaxation technique can be effective for decreasing and controlling patients' problems and provides them with more psychological improvement to help them to cope with their physical condition [50]. BRT include mindfulness techniques that are effect on wide range of physical and psychological signs and sleep quality. Therefore, BRT can play a positive role in reducing anorexia, improving sleep quality in patients through giving a sense of relaxation, reducing stress, and cortisol secretion as well [1,49,50].

On the same line the study done by Kapogiannis et al. (2018) showed that a positive effect of progressive muscle relaxation-guided imagery combination of nausea and vomiting in cancer patients. Relaxation increases parasympathetic activity by reducing stress and anxiety. Activating the parasympathetic nervous system improves the function of the gastrointestinal tract. Therefore, the positive effects of BRT on anorexia can be explained by activating the parasympathetic nervous system [1, 44, 47]. On contrary, a study done in Yogyakarta by Kurniasari et al. (2016) who conducted a study on "The Effect Benson Relaxation Technique with Anxiety in Hemodialysis Patients" reported that Benson's relaxation technique have no effect on anxiety scores of hemodialysis patients [46]. This

contradiction may be explained by this study apply Benson's relaxation for a period of two weeks only and this period was not enough to decrease the level of anxiety while our study conducted for three months Elsayed et al. (2019) [48] and Noruzi zamenjani et al. (2019) [50].

Concerning regression model of predictors for anorexia among the studied subjects the present study revealed that it was best predicted by cancer staging, knowledge & practice scores, age, treatment line as well as educational level, which were significantly correlated with anorexia score. This finding may be attributed to Benson's relaxation technique is simple, easy to be learned by any person regardless of age or marital status, or level of education. These results are the same line with Kim et al. (2018) study about Predictive variables for adverse events including anorexia among cancer patients receiving chemotherapy and found that selected variables in the univariate analysis, which included clinical parameters such as age, sex, cancer type, and chemotherapy-related variables showed a significant association with incidence of adverse events, also congruent with study done in in Brazil by Ozorio et al. (2019) who reported in their study entitled " Appetite assessment of hospitalized cancer patients" that there was a statistical significant correlation between ages of their subjects and level of anorexia, and sleep quality.

This result also is congruent with a study done in Iran by Harorani et al. (2020) who revealed that there were high statistically significant relationships between anorexia, and sleep quality with demographic characters such as age, gender, marital status, economic level, and level of education [1]. This result also come in agree with a study done in Egypt by Talima et al. (2016) who reported that there were significant relationships between anorexia, stress, and depression with demographic characters such as age, sex, economic level, and educational level. The relaxation was found effective in treatment of eating disorders because of its positive impact on anorexia reduction [26]. Moreover, Botero et al. (2019) emphasized the same results in their study entitled "Nutrition risk and mortality in older oncology patients" that there was a statistically significant relationship between socio demographic characteristics, and mean score of anorexia and depression. On the other hand this result was contradicted with many studies conducted by Patrick et al. (2009), Heshmatifar et al. (2015), and Holt et al. (2017), who reported that there was no correlation between patients' characteristics as age, sex, or educational level and their pain levels, anorexia, depression level or economic level, before and after relaxation exercises [53, 54, 55].

Conclusion

The current study concluded that, applying of Benson's relaxation technique was very effective in reducing anorexia in cancer patients undergoing chemotherapy, which was best predicted by cancer staging, knowledge and practice scores, age, treatment line as well as educational level that supports the research hypothesis.

Recommendations

The present study recommended the importance of conducting in-service training programs periodically and regularly to all health care providers to teach patients about the effects of Benson's relaxation technique for the reduction of anorexia in cancer patients undergoing chemotherapy. In addition, posters to remind patients about BRT and to improve patients' knowledge and practices. Also, hospitals are recommended to use the BRT alongside other treatments to alleviate anorexia and symptoms in cancer patients undergoing chemotherapy. Moreover, further researches should be conducted on the impact of this technique with a large number of patients with different chronic diseases.

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الملخص العربى

تأثير تقنية بنسون للإسترخاء على فقدان الشهية لدى مرضى السرطان الذين يخضعون للعلاج الكيميائي

المقدمة: يعاني مرضى السرطان الذين يخضعون للعلاج الكيميائي من أعراض عديدة مثل فقدان الشهية ، وهو أكثر الأعراض التي يتم الإبلاغ عنها بشكل متكرر والتي ترتبط بانخفاض نوعية الحياة والبقاء بشكل عام. تقنية بنسون للإسترخاء هي تقنية تكميلية وغير دوائية فعالة تستخدم لتقليل فقدان الشهية لدى مرضى السرطان الذين يخضعون للعلاج الكيميائي.

الهدف من الدراسة: هدفت هذه الدراسة إلى تقييم تأثير تقنية بنسون للإسترخاء على فقدان الشهية لدى مرضى السرطان الذين يخضعون للعلاج الكيميائي.

فرضية البحث: سوف تجيب هذه الدراسة على الفرضية الآتية: سوف تتحسن درجة فقدان الشهية لدى مرضى السرطان الذين يخضعون للعلاج الكيميائي بشكل ملحوظ وذو دلالة احصائية بعد تنفيذ تقنية بنسون للإسترخاء مقارنة بما كان عليه قبل التنفيذ.

تصميم البحث: تم إستخدام تصميم بحث شبه تجريبي لإجراء الدراسة الحالية بإستخدام نهج الإختبار القبلى والبعدى.

منهجيه البحث:

المكان: أجرى هذا البحث في وحدة الأورام التابعة لمستشفى جامعة بنها ، بنها ، مصر. **العينة:** تم تضمين عينة غرضية من 100 مريض سرطان بالغ خضعوا للعلاج الكيميائي في غضون ستة أشهر في هذه الدراسة لتصل إلى عدد 86 مريضًا في نهاية فترة الدراسة. **أدوات جمع البيانات :** تم استخدام أربع أدوات لجمع البيانات (الأداة الاولى) استبيان المقابلات المنظم الذي يتكون من البيانات الاجتماعية والديموغرافية والتاريخ الصحي للمرضى ، (الأداة الثانية) استبيان لتقييم معلومات المرضى، (الأداة الثالثة) استمارة ملاحظه لتقييم اداء المرضى فيما يتعلق بتقنية بنسون للاسترخاء ، (الأداة الرابعة) مقياس فقدان الشهية الذي يتكون من (مقياس الشهية و التقييم الوظيفي لفقدان الشهية).

النتائج : لقد أسفرت نتائج البحث عن وجود فروق ذات دلالة إحصائية عالية في مجموع درجات المعلومات والممارسة للمرضى الخاضعين للدراسة بعد ثلاثة أشهر من تنفيذ التقنية مقارنةً بالتنفيذ السابق ، حيث تحسن معدل الدرجات الإجمالية لمقياس فقدان الشهية لمرضى السرطان بشكل ملحوظ بعد تطبيق تقنية بنسون للإسترخاء، أخيرًا أوضحت النتائج أن المتغيرات المستقلة التي ساهمت في التباين في درجة فقدان الشهية هي مراحل السرطان ، ودرجات المعرفة والممارسة ، والعمر ، ووسيلة العلاج ، وكذلك المستوى التعليمي .

الخلاصة: علي ضوء هذه النتائج نستخلص أن تقنية بنسون للاسترخاء لها تأثير إيجابي في الحد من فقدان الشهية وتحسينه لدى مرضى السرطان الذين يخضعون للعلاج الكيميائي.

التوصيات : أفضت نتائج هذه الدراسة الى أهمية تقديم ملصقات لتذكير المرضى بتقنية بنسون للإسترخاء ولتحسين معرفة المرضى وممارساتهم .أيضًا ، يُنصح المستشفيات باستخدام هذه التقنية جنبًا إلى جنب مع العلاجات الأخرى للتخفيف من فقدان الشهية والأعراض لدى مرضى السرطان الذين يخضعون للعلاج الكيميائي.