

Effect of Oral Care and Relaxation Technique on Gastrointestinal Tract Problems of Patients Undergoing Chemotherapy

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Abstract

Chemotherapy is a type of cancer treatment that use one or more anti-cancer drugs as part of a standardized chemotherapy regimen. **The study aimed to** evaluate effect of oral care and relaxation technique on gastrointestinal tract problems of patients undergoing chemotherapy. **Research design:** A quasi-experimental design was utilized to conduct this study. **Setting:** The study was conducted at the Chemotherapy Unit, Benha University Hospital in Benha City. **Sample:** Systematic random sample was used, it included (100) patients undergoing chemotherapy. **Three tools were used:** I: A structured interviewing questionnaire to assess; a) Socio-demographic characteristics of studied patients, b) Medical history of studied patients, c) Knowledge of studied patients regarding chemotherapy. II: Observational checklist which consists of two parts to observe a) Oral care protocol, b) Progressive relaxation technique. III: Scale to measure gastrointestinal tract problems of patients undergoing chemotherapy. **Results:** 53.0% of the studied patients had good knowledge while, 63.0% of the studied patients had satisfactory practices and 53.0% of the studied patients had mild gastrointestinal tract problems post implementation of intervention. There was positive statistically significant correlation between the studied patients' total knowledge, total practices and total severity of gastrointestinal tract problems post implementation of intervention **Conclusion:** The nursing intervention succeeded to improve knowledge, practices and severity of gastrointestinal tract problems of the studied patients undergoing chemotherapy. **Recommendations:** Continuous application of nursing intervention for patients undergoing chemotherapy to enhance patients' knowledge, practices and severity of gastrointestinal tract problems.

Key words: Chemotherapy, Oral care, Progressive relaxation technique.

Introduction

Chemotherapy is the therapeutic use of chemical agents to treat disease especially, the administration of one or more cytotoxic drugs to destroy or inhibit the growth and division of malignant cells in the treatment of cancer. Chemotherapy may be used alone as a primary treatment or may be used before, after, or in conjunction with surgery or radiation. The goals of chemotherapy depend on the type of

cancer and spread. Sometimes, the goal of treatment is to get rid of all the cancer and prevent coming back, delay or slow cancer growth and help managing symptoms caused by the cancer (**American Society of Clinical Oncology (ASCO), 2022**).

Chemotherapy drugs can affect any body system, but the following are most susceptible: anemia, thrombocytopenia-cardiomyopathy,

arrhythmia, nausea and vomiting, appetite changes, constipation, diarrhea, hair loss, pain, weakness, numbness, changes in libido and sexual function, fertility problems, urine and bladder changes and kidney problems, lose some bone mass. Cancer patients experience negative changes in their quality of life, and some of them can have physical side effects and mental health problems moreover, lifestyle changes related to exercise, oral care and nutrition improve the health of cancer patients not only physically but also mentally (**Hwang & Nho, 2019**).

Oral complications arising from cancer or chemotherapy treatment, such as mucositis and dry mouth, are common. In the general cancer setting, oral complications can be expected in at least 50% of patients undergoing chemotherapy or targeted therapy to treat a solid tumor. In patients with head and neck cancers and in those undergoing hematopoietic stem cell transplantation, the incidence is much higher. Oral complications can cause distress, malnutrition and/or dehydration, inability to sleep, delays to treatment, long-term complications and increased morbidity. However, oral complications are not inevitable and a planned, proactive team approach to oral care can assist in preventing or in reducing complications incidence and severity (**Quinn et al., 2020**).

Researchers and practitioners changed their attention from pharmacological treatment to non-pharmacological intervention. As the most common non-pharmacological option, Progressive Muscle Relaxation (PMR) exercise has been widely applied to prevent and alleviate the toxic resulted from chemotherapy especially nausea and vomiting. PMR is found effective, safe, non- pharmacological,

non- invasive, cost effective method in conditions like anxiety, depression, stress and pain (**Li et al., 2019**).

Community Health Nurse (CHN) has a serious role in educating nurses as well as patients delivering appropriate oral care. The primary goal of oral care is to promote oral hygiene, decrease microbial colonization in the oropharynx and dental plaque, and reduce aspiration of contaminated saliva. Which lead to nausea and vomiting occurrence. CHN should assess oral mucosa daily before, during and after chemotherapy treatment for early detection of oral complication and applying appropriate nursing care (**Setianingsih et al., 2017**).

Significance of the study:

Chemotherapy treatment is the most commonly used treatment in Egypt. The number of oncology patients attending the Ministry of Health centers according to frequency statistics in 2017 reached 557, 736 oncology patients on outpatient clinics. There were about 134,632 new cancer cases and 89,042 cancer-related deaths in 2018 in Egypt(**Egyptian Ministry of Health, 2019**).

The proportion of cancer patients having chemotherapy is strongly influenced by stage at diagnosis. Other factors are also important, such as whether the patient is generally well enough to tolerate the treatment, the patient's age, and patients own treatment preference (**Khaled& Soliman, 2021**).

Aim of the study:

The study aimed to evaluate effect of oral care and relaxation technique on gastrointestinal tract problems of patients undergoing chemotherapy.

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Research Hypothesis: Oral care and relaxation technique will decrease gastrointestinal tract problems of patients undergoing chemotherapy.

Subject and method

Research design:

A quasi- experimental design was used in carrying out this study.

Setting:

The study was conducted at the chemotherapy unit, Benha University Hospital in Benha City.

Sampling:

Systematic random sample was used in this study. The total number of patients with cancer attended to chemotherapy unit in 2019 were about 200 cases the sample included 50% (100 cases).

Tools of data collection: Three tools were used to collect the data.

Tool I: A structured interviewing questionnaire: It was developed by researcher and revised by supervisor staff, consisted of three parts to assess the following:

First part: It was designed to assess socio-demographic characteristics of the studied patients.

Second part: It was designed to assess medical history of studied patients undergoing chemotherapy.

Third part: To assess knowledge of patients about chemotherapy and measures to be taken to overcome chemotherapy side effects on gastrointestinal tract guided by **Saad et al (2019)** which was adopted and modified by the researcher and revised by supervisor staff to assess patients knowledge regarding: **A- Knowledge of patients about chemotherapy** which included 6 questions. **B- Measures to be taken to overcome chemotherapy side effects**

on gastrointestinal tract which included 7 questions.

Scoring system

Knowledge score for each answer was given as follows (2) for correct complete answer, while (1) for correct & incomplete answer and (0) for incorrect answer. The score of the items was summed- up and the total divided by the number of the items, giving a mean score. The total knowledge score was considered good if the score of the total knowledge was >75% (> 19 score), while considered average if the total score was 50-75% (13-19 score) and considered poor if it was < 50% (<13 score).

Tool II: Observational checklist was developed by researcher and revised by supervisor staff which covered the following two parts: **First part: Oral care protocol** designed for observing patients practices regarding oral care through mentioning steps of oral care which included (9) items **Second part : Progressive relaxation technique:** designed for observing patients practices through demonstrating steps of progressive relaxation technique which included (14) items.

Scoring system:

The scoring system for patients' practices was calculated as following: (1) score for done and (0) for not done practicing. The score of the items was summed-up and the total divided by the number of the items, giving a mean score. These scores were converted into a percent score. The total practices score was considered satisfactory if the score of the total practices $\geq 80\%$ (≥ 18 score), while considered unsatisfactory if it is $< 80\%$ (< 18 score).

Tool III: Gastrointestinal tract problems scale guided by American Society of Clinical Oncology (2014). The scale was measured on a Likert type of (always, sometimes and never) which was adopted and modified by the researcher and revised by supervisor staff to assess gastrointestinal tract problems of patients undergoing chemotherapy. It was translated into Arabic by the researcher and divided into five domains: Nausea which included (5) points. Vomiting which included (5) points. Oral inflammation which included (5) points. Constipation which included (9) points. Diarrhea which included (5) points.

Scoring system:

Gastrointestinal tract problems scale was calculated as (2) scores for always, (1) scores for sometimes and (0) for never. The score of the items was summed- up and the total divided by the number of the items, giving a mean score. These scores were converted into a percent score. The total gastrointestinal tract problems score was considered mild if the score > 75% (> 43 score), while considered average if its 50- 75% (29 – 43score) point and considered poor if it < 50 (<29 score).

Content validity of the tools:

The tools validity was assessed by five members of Faculties Staff Nursing Experts from the Community Health Nursing Specialists Faculty of Nursing Benha University who reviewed the tool for clarity, relevance, comprehensiveness, applicability, and easiness for implementation and according to their opinion minor modification were carried out.

Reliability of the tools:

Reliability of the tool was applied by the researcher for testing the internal consistency of the tool, by administration of the same tool to

the same subjects under similar condition on one or more occasion. Answers from repeated testing were compared (test-re-test reliability). The reliability was done by Cronbachs Alpha coefficient test which revealed that each of the three tools consisted of relatively homogenous items as indicated by the moderate to high reliability of each tool. The internal consistency of the knowledge was 0.88 , while practices were 0.91 , and gastrointestinal tract problems were 0.86.

Ethical consideration:

Approval from Ethical Committee at Faculty of Nursing, Benha University was done. All ethical issues were assured; oral consent has been obtained from patients undergoing chemotherapy before conducting the interview and given them a brief orientation to the purpose of the study. They were also reassured that all information gathered would be treated confidentially and used only for the purpose of the study. Patients had the right to withdraw from the study at any time without giving any reasons.

Pilot study:

The pilot study was carried out on 10% of the total sample (10) patients undergoing chemotherapy. The pilot study was aimed to test the content clarity, applicability and simplicity of the tool using the interviewing questionnaire and the observational checklist as a pre-test sheet.

Field work:

The actual field work was carried out over a period of 6 months from the beginning of March 2020 to the end of August 2021. Patient's consent was obtained before collection of data. The researcher visited the chemotherapy unit at Benha University Hospital from 9 am to 1.00 pm, four days /

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week (Saturday, Sunday, Tuesday, Wednesday) to collect the data from patients. The researcher chose these days because increase the frequency of patients in these days and these days appropriate for researcher. The needed time for each sheet was around 30 minute, the average number interviewed at the Chemotherapy Unit were 3-5 patients / day depending on understanding and responses of the patients. Handout about chemotherapy, oral care, relaxation technique and management of gastrointestinal tract problems was given to studied patients.

Nursing intervention included four phases:

Based on the results obtained from the interviewing questionnaire and observational checklists, as well as literature review, the nursing intervention developed by researcher. It was implemented immediately after pre-test. The researcher implemented the nursing intervention through 4 phases as the following:

(I)Assessment phase: In this phase of the intervention assessed knowledge, practices and gastrointestinal tract problems related to chemotherapy, through collection and analysis of baseline data from the filled tools. In this phase the researcher did the pre- test.

(II)Planning phase: The researcher identified the important needs for target group, set priorities of needs, goals and objectives were developed.

(III)Implementation phase: In this phase the researcher implemented the nursing intervention for patients undergoing chemotherapy at the suitable time for them. To insure that they were exposed to the same learning experience. The researcher implemented the nursing intervention through six sessions of 5 hours (4 theoretical sessions

and 2 practical sessions; 3 hours theoretical and 2 hours practical), each session lasted 45- 60 minutes including periods of discussion, and the average number interviewed at the Chemotherapy Unit were 3-5 patients/ day, and immediately did the post-test.

Teaching methods:

All patients received the same intervention content using the same teaching methods, there were:

Lectures, illustration discussion, demonstration and re-demonstration, presentation, role play and brain storming.

Teaching aids: suitable teaching aids were specially prepared for intervention, as: colored pictures, handout, real objects (equipment) and videos.

(IV)Evaluation phase:

After implementation the nursing intervention the researcher applied the post-test immediately to evaluate the knowledge acquired. Evaluation of the intervention was done by using the post-test questionnaire which was the same formats of pre-test in order to compare the change in the patients' knowledge, practices and management of gastrointestinal tract problems related to chemotherapy immediately after implementation of the nursing intervention.

Statistical analysis:

All data collected were organized, tabulated and analyzed using appropriate statistical test. The data were analyzed by using the statistical package for social science (SPSS) version 21 which was applied to calculate frequencies and percentage, mean and standard deviation, as well as test statistical significance and associations by using Chi-square test (χ^2) and linear correlation coefficient (r), and matrix

correlation to detect the relation between the variables (p value).

Significance level were considered as follows:

Highly statistically significant $p < 0.001^{**}$

Statistically significant $p < 0.05^*$

No significant $p > 0.05$

Results:

Table (1): Shows that, 34.0% of studied patients aged more than 60 years old, 33.0% of them aged from 50 to <60 with the mean 54.21 ± 5.81 , 63.0% of them were females, 52.0% of them were married, 37.0% of them didn't read and write, 52.0% of them were living in urban areas and 51.0% of them hadn't enough income.

Table (2):- Shows that, 57.7% of studied patients had diabetes mellitus, 66.0% had digestive system diseases, 77.0% of them had previous surgery related to cancer and 47.1% of studied patients had first degree family history for cancer.

Table (3):- Shows that, 62.0% of studied patients complained vomiting, 74.0% complained nausea, 50.0% complained constipation and 20.0% complained diarrhea. 78.0% had fatigue & severe body pain and 59.0% had hair loss due to chemotherapy.

Figure (1):- Illustrates that, pre intervention 71.0% of studied patients had poor knowledge score, 24.0% had average knowledge score and 5.0% had good score. While, post intervention 22.0% of them had poor knowledge score, 25.0% had average score and 53.0% had good knowledge score.

Figure (2): Shows that, there was 79.0% of studied patients had unsatisfactory practical score and 21.0% of them had satisfactory practical score before implementation of intervention. While, after implementation of

intervention 63.0% of studied patients had satisfactory practical score and 37.0% had unsatisfactory practical score.

Figure (3): Shows that; there were improving in the studied patients' severity of gastrointestinal tract problems. 79.0% of the studied patients had severe gastrointestinal tract problems before implementation of intervention. This percentage improved to 21.0% after implementation of intervention. While, 16.0% of studied patients had moderate gastrointestinal tract problems compared to 26.0% after intervention, and 5.0% of studied patients had mild gastrointestinal tract problems before intervention compared to 53.0% after intervention.

Table (4): Reveals that; there was highly statistically significant improving in studied patient's practices in all items about oral care technique post implementation of intervention ($p=0.000$).

Table (5): Reveals that; there was highly statistically significant improving in studied patient's practices in all items about relaxation techniques post implementation of intervention ($p=0.000$).

Table (6): Reveals that; there were positive statistically significant correlation between the studied patients' total knowledge, total practices and total severity of GIT problems pre and post implementation of intervention ($p < 0.001$).

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Table (1): Percentage distribution of studied patients regarding socio- demographic characteristics (n= 100).

Socio-demographic characteristics	%
Age	
<30	8.0
30 -	13.0
40 -	12.0
50-	33.0
60 +	34.0
Mean \bar{x}SD	54.21\pm 5.81
Sex	
Male	37.0
Female	63.0
Marital status	
Single	9.0
Married	52.0
Widow	28.0
Divorced	11.0
Educational level	
Don't read and write	37.0
Primary education	20.0
Intermediate education	35.0
University education and more	8.0
Residence	
Rural	48.0
Urban	52.0
Income	
Enough and saves	7.0
Enough	42.0
Not enough	51.0

Table (2): Frequency distribution of studied patients regarding past medical history (n=100).

Past medical history	No.	%
*Previous chronic diseases		
Hypertension	38	39.2
Diabetes mellitus	56	57.7
Respiratory system diseases	17	17.5
Orthopedic diseases	35	36.1
Digestive system diseases	64	66.0
Vision disorders	30	30.9
Urinary incontinence	33	34.0
Bleeding disorders	31	32.0
No previous chronic diseases	3	3.0
*Previous surgery		
Surgery unrelated to cancer disease	14	23.0
Surgery related to cancer disease	47	77.0
No previous surgery	39	39.0
*Previous hospitalization		
Once	5	6.4
Twice	27	34.6
Three times and more	46	59.0
No previous hospitalization	22	22.0
*Family history		
First degree	32	47.1
Second degree	26	38.2
Third degree	10	14.7
No family history	32	32.0

***The results were not mutually exclusive.**

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Table (3): Percentage distribution of studied patients regarding current chemotherapy side effects (n=100).

Current chemotherapy side effects	%
* Chemotherapy side effect on gastrointestinal tract	
Vomiting	62.0
Nausea	74.0
Mouth dryness	37.0
Mouth inflammation	46.0
Difficult swallowing	30.0
Loss taste sense	18.0
Loss of appetite	69.0
Diarrhea	24.0
Constipation	50.0
Loss of weight	63.0
* Chemotherapy side effect on circulatory and nervous system	
Drowsiness	65.0
Fatigue	78.0
Hyperthermia	40.0
Bleeding	33.0
Sever pain in the body	78.0
* Chemotherapy side effect on skin	
Hair loss	59.0
Redness of skin	60.0
Itching of skin	11.0
Change skin color	53.0

***The results were not mutually exclusive.**

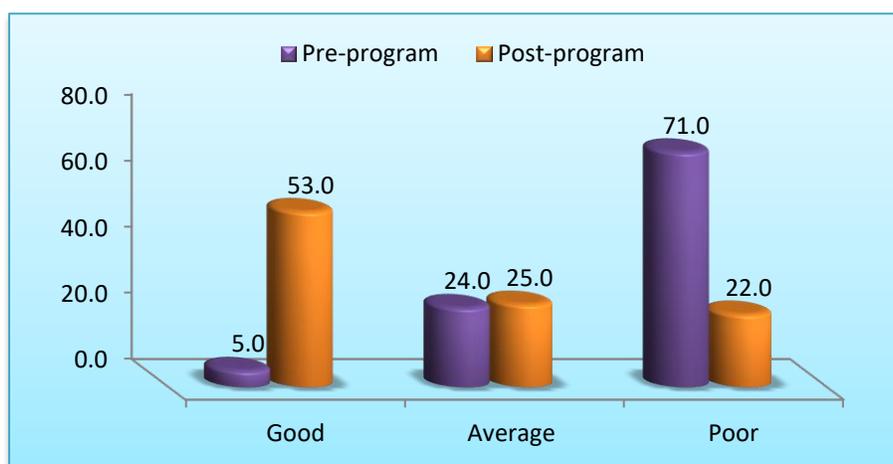


Figure (1): Percentage distribution of studied patient regarding their total knowledge score pre and post Intervention (n=100).

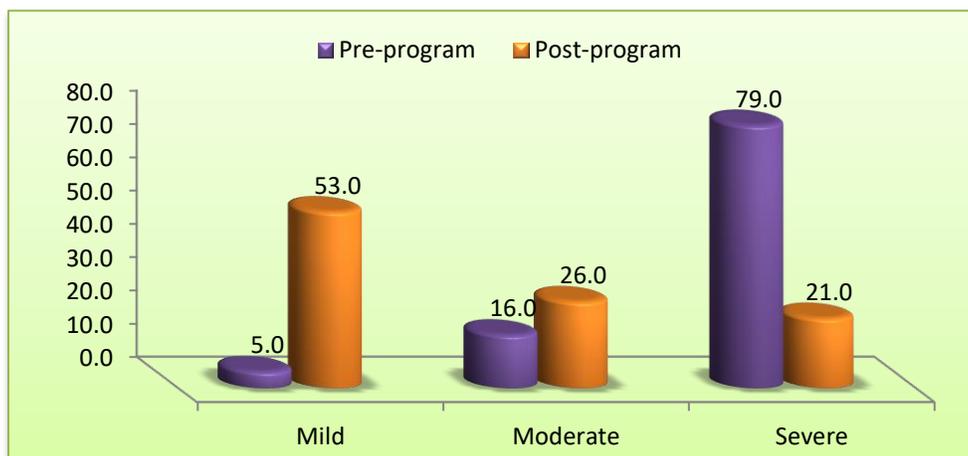


Figure (2): Percentage distribution of studied patients regarding their severity of gastrointestinal tract problems pre and post intervention (n=100).

Table (4): Percentage distribution of studied patients regarding their practices about oral care technique pre and post intervention (n=100).

Oral care technique	Pre intervention		Post intervention		X ²	p-value
	Done	Not done	Done	Not done		
	%	%	%	%		
Clean all dental surfaces	30.0	70.0	63.0	37.0	21.88	** .000
Avoid using mouthwashes that may contain alcohol	27.0	73.0	75.0	25.0	46.09	** .000
Use of fluoride-containing toothpaste	19.0	81.0	59.0	41.0	33.62	** .000
Use the brush gently on the gums and tongue to remove any residue	31.0	69.0	61.0	39.0	18.11	** .000
Rinse the mucosa of the mouth	25.0	75.0	68.0	32.0	37.16	** .000
Wash mouth and teeth by brush after meal and before bedtime	21.0	79.0	49.0	51.0	17.23	** .000
Soften lips with 65% glycerin	31.0	69.0	59.0	41.0	15.83	** .000
Increase fluids in body	21.0	79.0	68.0	32.0	44.72	** .000
Chewing gums free from sugar	37.0	63.0	62.0	38.0	12.50	** .000

**** A highly statistically significant (p<0.001)**

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Table (5): Percentage distribution of studied patients regarding their practices about relaxation technique pre and post intervention (n=100).

Relaxation technique	Pre intervention		Post intervention		X ²	p-value
	Done	Not done	Done	Not done		
	%	%	%	%		
Sleep on back or sit on chair	33.0	67.0	72.0	28.0	30.49	** .000
Think on positive things	24.0	76.0	68.0	32.0	38.96	** .000
Try relaxation and relax all muscles	14.0	86.0	65.0	35.0	54.42	** .000
Raise eye brows then return them	3.0	97.0	61.0	39.0	77.29	** .000
Pressure eye muscles then relax	8.0	92.0	51.0	49.0	44.45	** .000
Apply the back teeth together and then gradually keep them apart	12.0	88.0	60.0	40.0	50.00	** .000
Pull the chin forward then relax	12.0	88.0	64.0	36.0	57.38	** .000
Pull the chin back to the back until it's tightened and then relaxed.	19.0	81.0	64.0	36.0	41.70	** .000
Join the fists and tighten the arms then relax	18.0	82.0	64.0	36.0	43.73	** .000
Breathe slowly and regularly	25.0	75.0	57.0	43.0	21.16	** .000
Catch the abdominal muscles then relax	28.0	72.0	60.0	40.0	20.77	** .000
Tighten the thighs then relax	19.0	81.0	66.0	34.0	45.19	** .000
Move the toes up then relax them	19.0	81.0	68.0	32.0	48.84	** .000
Relax all the muscles of the body	16.0	84.0	62.0	38.0	44.47	** .000

**** A highly statistically significant (p<0.001)**

Table (6): Correlation matrix between studied patients' total knowledge, practices and severity of gastrointestinal tract problems pre and post intervention (n=100).

Items	Pre intervention			Post intervention			
		Total knowledge	Total practices	Total severity of GIT problems	Total knowledge	Total practices	Total severity of GIT problems
Total knowledge	r	1	.283	-.449	1	.580	-.133
	p-value		.004*	.000**		.000**	.187
	n	100	100	100	100	100	100
Total practices	r	.283	1	-.169	.580	1	-.315
	p-value	.004*		.094	.000**		.001**
	n	100	100	100	100	100	100
Total severity of GIT problems	r	-.449	-.169	1	-.133	-.315	1
	p-value	.000**	.094		.187	.001**	
	n	100	100	100	100	100	100

**** A highly statistically significant (p<0.001)**

*** Statistically significant (p<0.05)**

Discussion

Chemotherapy is the main treatment for many cancers. Although chemotherapeutic drugs have greatly improved the survival rates of cancer patients, there are many side-effects associated with their use. The gastrointestinal side-effects of chemotherapy often lead to dose reduction or even discontinuation of treatment, which in turn affects the clinical outcome. Gastrointestinal side-effects, such as chemotherapy-induced nausea, vomiting, oral mucositis, diarrhea and constipation, may persist many years after treatment, greatly reducing quality of life (**Escalante et al., 2017**).

Regarding socio-demographic characteristics of studied patients, the present study findings revealed that, about two thirds of studied patients aged 60 years old and more with mean age 54.21 ± 5.81 . This finding was supported by **Subramaniam et al. (2019)**, who performed study on "Quality of Life among Cancer Patients Undergoing Chemotherapy in Government Hospitals in Peninsular Malaysia, (n=1333)"; reported that 34.0% (one third) of patients aged more than 60 years old. This might be due to that cancer is a silent disease that can't discovered easily, this age is more liable for chronic diseases and low of immunity in this age.

As regard sex of studied patients, more than three fifths of studied patients were females. This finding was in an accordance with **Daniela. (2021)**, who studied "Quality of life of patients with cancer undergoing chemotherapy in hospitals in Belo Horizonte, Minas Gerais State, Brazil, (n=230)"; found that 67.8% (two thirds) of patients were females. This might be due to that most chemotherapeutic drugs founded in chemotherapy unit in Benha University

Hospital were for breast, ovarian and uterine cancer treatment.

Considering marital status of studied patients, more than half of studied patients were married . This finding was in agreement with **Ching et al. (2019)**, who studied "The impact of marital status on survival in patients with surgically treated colon cancer in Taiwan, (n=925)"; found that 80.9% (four fifths) of patients were married. This finding was also in agreement with **Ding et al. (2021)**, who studied "Effects of marital status on overall and cancer-specific survival in laryngeal cancer patients in China, (n=8834)"; found that 54.4% (more than half) of patients were married.

Regarding educational level of studied patients, the result of the current study showed that more than one third of studied patients didn't read and write, and about one third of studied patients had intermediate education, while minority of studied patients had completed university degree. This finding was in agreement with **Heydarzadeh et al. (2020)**, who studied "The effect of peer education on knowledge, comprehension, and knowledge application of patients regarding chemotherapy complications in Iran, (n=80)"; found that 37.5% (one third) of patients had university education.

As regards residence, the present study revealed that more than half of studied patients lived in rural areas. This finding was in agreement with **Sparling et al. (2016)** , who performed a study on "Is distance to chemotherapy an obstacle to adjuvant care among the North Carolina Medicaid-enrolled colon cancer patients in USA, (n=1184); found that 54.0% (more than half) of patients lived in rural areas. This might be due to lack of health

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care centers in rural areas, less access to early cancer detection programs.

Considering studied patient's income, the result of this study revealed that about half of studied patients hadn't enough income. This finding was in agreement with **Anwar et al. (2020)**, who performed a study on "Health-Related Quality of Life of Cancer Patients Receiving Chemotherapy in Egypt, (n=200)"; found that 78.0% (two thirds) of patients hadn't enough monthly income.

Regarding previous medical history of studied patients undergoing chemotherapy, majority of them had previous chronic disease, about three fifths of them had digestive system problems, while more than half of them had diabetes mellitus and about two fifth had hypertension. This finding was in accordance with **Alison et al. (2017)**, who performed a study on "Incidence and severity of self-reported chemotherapy side effects in routine care in Australia, (n=449)"; reported that 74% (three quarters) of studied patients had digestive system problems.

Concerning previous hospitalization of studied patients related to cancer, about four fifths of studied patients had previous hospitalization related to cancer. This finding was in agreement with **Caitriona et al. (2016)**, who performed a study on "Hospitalizations in Older Adults With Advanced Cancer: The Role of Chemotherapy in New York, (n=18,486)"; reported that 92% (majority) of studied patients had previous hospitalization related to cancer and chemotherapy treatment. This might be due to severity of cancer disease and side effects of chemotherapy on elderly, low immunity and cancer patients with chronic diseases all of them

had role on the severity of chemotherapy side effects.

Considering studied patients family history of cancer, about two thirds of studied patients were positive family history. This finding was in accordance with **Song et al. (2018)**, who performed a study on "Family history of cancer in first-degree relatives and risk of gastric cancer and its precursors in a Western population, (n=307)"; reported that 48.9% (about half) of studied patients were positive family history. This might be due to that most studied patients were females complained uterine and breast cancer in addition to family history considered risk factor for uterine and breast cancer.

Regarding gastrointestinal tract problems due to chemotherapy, most of studied patients had nausea, vomiting, loss of appetite and loss of weight. This finding was in agreement with **Salihah et al. (2016)**, who performed a study on "Chemotherapy-induced nausea and vomiting: exploring patients' subjective experience in Malaysia, (n=15)"; reported that 76.9% (more than three quarters) of studied patients had chemotherapy induced nausea and vomiting. This might be due to the activation of the chemoreceptor trigger zone by the chemotherapy agents circulating in the blood that induce nausea and vomiting.

Considering circulatory and nervous system problems due to chemotherapy, about four fifths of studied patients had fatigue and pain. This finding was in accordance with **Williams et al. (2016)**, who reported that 77.9% (four fifths) of studied patients had fatigue and 86.2% (majority) had pain related to chemotherapy treatment. This might be due to cancer itself or chemotherapy drugs which can cause nausea, vomiting, loss of appetite, anemia, poor nutrition, hormonal

changes and sleep disturbance that lead to fatigue and pain.

As regards skin problems due to chemotherapy, about three fifths of studied patients had hair loss and redness of skin. This finding was in agreement with **Rossi et al. (2017)**, who performed a study on " Chemotherapy-induced alopecia management: clinical experience and practical advice in Italy "; reported that 65.0% (two thirds) of studied patients had hair loss. This might be due to chemotherapy treatment -related aspects such as drug dose, administration regimen and exposure to X-rays.

Concerning to total knowledge of the studied patients, the present study revealed that; minority of the studied patients had good knowledge score pre implementation of intervention, while this percentage improved to more than half of them had good knowledge score after implementation of intervention. This finding was in agreement with **Heydarzadeh et al. (2020)**, who performed a study on " The effect of peer education on knowledge, comprehension, and knowledge application of patients regarding chemotherapy complications in Iran, (n=80)"; reported that only 25.0% (one quarter) of the studied patients had good knowledge score pre intervention this percentage improved after intervention to 75.0% (three quarters) of them had good total knowledge score. This might be due to that the intervention helps the studied patients to acquire knowledge about chemotherapy and it's side effects on gastrointestinal tract.

Concerning to studied patients' practices related to oral care technique, the present study revealed that; more than two thirds of them didn't perform steps regarding oral care technique pre implementation of intervention

including use soft toothbrush, use fluoride-containing toothpaste, rinse the mucosa of the mouth for 1 minute, wash mouth and teeth regularly and take frequent sips of water for dry mouth. While there was improving in this finding after implementation of intervention. This finding was in accordance with **Hagag. (2020)**, who performed a study on " Oral Care And Its Association With Socio-Demographic Characteristics In Leukemic Patients Receiving Chemotherapy in Egypt, (n=150)"; reported that 32,7% (about one third) of the studied patients use soft toothbrush, 42,7% (about two fifths) rinse the mucosa for 1minute, 50.0% (half) wash mouth and teeth regularly and 42.6% (about two fifths) take frequent sips of water for dry mouth. This might be due to lack of awareness and fear of gum bleeding.

Regarding studied patients' practices related to progressive muscle relaxation technique, the present study revealed that; majority of them had unsatisfactory score regarding progressive muscle relaxation techniques pre implementation of intervention. But there was improving in this finding after implementation of intervention. This finding was in accordance with **Sun et al. (2017)**, who performed a study on " The effects of Muscle Relaxation and Therapeutic Walking on Depression, Suicidal Ideation and Quality of Life in Breast Cancer Patients Receiving Chemotherapy in Taiwan, (n=87)"; reported that majority of studied sample had unsatisfactory score regarding relaxation techniques. This might be attributed to insufficient information related to progressive relaxation techniques, also this may be attributed to the lack of continuous education and in-service training programs.

The present study revealed that; there were highly statistically significant improving in

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gastrointestinal tract problems severity degree in nausea, vomiting, oral inflammation and constipation after implementation of intervention ($p < 0.001$). But, there was no statistically significant improving in diarrhea severity degree after implementation of intervention ($p > 0.05$). This might be due to that educational intervention affect positively on studied patients practices except, diarrhea which need chemotherapy dose reduction or alteration.

Concerning correlation between the studied patients' total knowledge, total practices and total severity of complain, the present study revealed that, there were positive statistically significant correlation between the studied patients' total knowledge, total practices and total severity of gastrointestinal tract problems ($p < 0.001$). These findings were in contrast with **Elsayed et al. (2021)**, who performed a study on "Effect of Self-Care Guidelines on Symptoms Burden for Patients with Lung Cancer Undergoing Chemotherapy in Egypt, (n=50)"; reported that there were highly statistically significant relation between studied patients knowledge, practices and severity of symptoms ($p < 0.001$). This might be due to that the studied patients had poor knowledge and unsatisfactory practices which could effect on their severity of complain and this improved as the effect of implementation of intervention.

Conclusion:

Implementation of the nursing intervention proved to be effective in improving patients' knowledge, practices and severity of gastrointestinal tract problems due to chemotherapy. More than half of the studied patients had good knowledge score post implementation of intervention, more than three fifths of studied patients had satisfactory

practices score post implementation of intervention, and one fifth of the studied patients had severe gastrointestinal tract problems post implementation of intervention. There were positive statistically significant correlation between the studied patients' total knowledge, total practices and total severity of GIT problems pre and post implementation of intervention ($p < 0.001$).

Recommendations:

- Continuous application of nursing intervention for patients undergoing chemotherapy to enhance patients' knowledge, practices and severity of gastrointestinal tract problems.
- Disseminated simplified booklets should be available to patients undergoing chemotherapy in the Oncology center Benha University to raise their knowledge.
- Providing patients undergoing chemotherapy with educational materials as books, pamphlets and videos to increase their awareness about cancer and chemotherapy side effects' management.
- Psychosocial rehabilitation program should be held to meet the needs of patients undergoing chemotherapy.
- Further researches needed to be focusing on improving gastrointestinal tract problems related to chemotherapy.

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تأثير تقنية العناية بالفم والاسترخاء على مشاكل الجهاز الهضمي للمرضى الذين يخضعون للعلاج الكيميائي

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العلاج الكيميائي هو استخدام المواد الكيميائية لمنع الخلايا الخبيثة من النمو أو الانتشار أو التأثير على الخلايا المضيفة. يمكن إعطاء العلاج الكيميائي بهدف علاجي حيث يتضمن استخدام مجموعات من الأدوية، أو قد يهدف إلى إطالة العمر أو تقليل الأعراض (العلاج الملطف). لذا هدفت هذه الدراسة إلى تقييم تأثير تقنية العناية بالفم والاسترخاء على مشاكل الجهاز الهضمي للمرضى الذين يخضعون للعلاج الكيميائي. و تم استخدام تصميم شبه تجريبي لإجراء هذه الدراسة. وقد أجريت هذه الدراسة في وحدة العلاج الكيميائي بمستشفى بنها الجامعي بمدينة بنها على عينة عشوائية حيث شملت عينة الدراسة على 100 مريض. وقد أظهرت النتائج أن بوجود ارتباط إيجابي يعتقد به إحصائياً بين المعلومات الكلية للمرضى الذين تمت دراسته والممارسات الكلية بعد تنفيذ التدخل التمريضي ($p < 0.001$). كما كانت هناك علاقة سلبية ذات دلالة إحصائية بين الممارسات الكلية للمرضى الذين تمت دراستهم وشدة مشاكل الجهاز الهضمي قبل وبعد تنفيذ التدخل التمريضي. في حين كان هناك ارتباط إحصائي سلبي بين إجمالي ممارسات المرضى الذين شملتهم الدراسة وشدة مشاكل الجهاز الهضمي ، وعلاقة سلبية بين المعرفة الكلية وشدة مشاكل الجهاز الهضمي قبل وبعد تنفيذ التدخل التمريضي. وأوصت الدراسة بضرورة تطبيق برنامج التعليم والتدريب الصحي المستمر لتقنية العناية بالفم والاسترخاء للمرضى الذين يخضعون للعلاج الكيميائي لتحسين الحالة الصحية لمشاكل الجهاز الهضمي.