

Effectiveness of Self-Care Practices Education Program on Enhancing Chemotherapy Adverse Effects and Quality of Life for Patients with Gastric Cancer

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Abstract

Gastric cancer (GC) is a serious worldwide health burden as well as its treatments especially chemotherapy result in many bothersome physical adverse effects and psychosocial problems, which negatively impact patients' quality of life (QoL). Effective self-care education about chemotherapy's adverse effects aids patients in better managing them, adapting to chemotherapy, and improving treatment outcomes. Furthermore, boosting cancer patients' confidence about their ability on performing self-care strategies could have a significant impact in enhancing their functioning role and quality of life. **Study aim:** evaluate the effectiveness of self-care practices education program on enhancing chemotherapy adverse effects and quality of life for patients with gastric cancer. **Study Design:** a quasi-experimental design. **Setting:** Oncology and chemotherapy outpatient clinic at Zagazig University Hospitals, Al Sharkia governorate, Egypt. **Subject:** A Purposive sample of 50 adult patients with GC receiving chemotherapy. **Tools:** Interview questionnaire, Self-reported chemotherapy adverse effects questionnaire, Self-care practices questionnaire, and EORTC QLQ-C30 questionnaire to measure patients' QoL. **Results:** the highest percentage of studied patients (54%, 56%, 56%, 36.0%, and 52%) were <50 years old, males, from urban, had mid qualification and smokers respectively. There was a statistically significant difference and improvement in patients' total knowledge, chemotherapy adverse effects, self-care practices toward these adverse effects, and quality of life at the post-intervention phase of the program as compared to the pre-intervention phase ($p=0.0001$). Patients' knowledge and self-care practices improvement correlated positively with QoL and negatively with chemotherapy adverse effects that correlated negatively with QoL. **Conclusions:** Self-care practices education program had an effective role in improving knowledge and self-care practices of patients with GC toward chemotherapy adverse-effects, which resulted in decreasing these adverse-effects and enhancing their quality of life. **Recommendations:** Availability of Self-care practices education programs and guidebooks in all Egyptian Oncology Centers for patients with GC is recommended to inform them about chemotherapy adverse effects and self-care strategies to handle it in a specific and comprehensive manner.

Keywords: Self-care practices, Education program, Chemotherapy adverse effects, Quality of life, Gastric cancer.

Introduction:

Gastric or stomach cancer (GC) is a deadly disease that affects people all over the world. It is the fifth most common malignancy to be diagnosed (Bray et al., 2018; Raeisi et al., 2019). Due to the late stage of disease at the time of diagnosis and the lack of viable therapies, patients diagnosed with GC have abysmal five-year survival rates (Venerito et al., 2018). Gastric cancer is commonly caused by untreated gastric ulcers caused by infections such as *Helicobacter pylori* (*H. pylori*), which infects the mucosa of the gastric padding and accounts for one-third of all occurrences of

gastric cancer (Graham, 2015; Mustafa et al., 2017). Meals that raise the quantity of nitrate in the stomach, such as smoked, dried, salty, and peppery foods (which are culturally part of the Middle Eastern diet), are another risk factor (Chun & Ford, 2015). Because gastric cancer is one of the most behaviorally influenced cancers, it can be prevented (World Cancer Research Fund, 2018) by encouraging the consumption of foods high in fruitiness, greens, or items that can be properly stored and refrigerated (Benusiglio et al., 2013).

Surgery, chemotherapy, radiation treatment, hormone therapy, and immunotherapy are all

used to treat patients with stomach cancer, and they can all be used at the same time or at various times (**Hardy et al., 2018**). Despite great awareness of the cancer-related biology supporting this malignancy and widespread exploitation for therapeutic options, chemotherapy medications remain the cornerstone therapy with reasonable success (**Grabenbauer & Holger, 2016**). Chemotherapy is a word that refers to the treatment of cancer with chemicals or medicines (**American Cancer Society, 2016**). It can be used on its own or in conjunction with other therapies like surgery, radiation, or biologic therapy (**National Cancer Institute, 2017**).

Chemotherapy has been shown to enhance life expectancy and improve quality of life (QoL) by preventing cancer from recurring (**Liu et al., 2019; Han et al., 2017**). Chemotherapy, on the other hand, may have a wide range of harmful adverse effects on individuals while also being beneficial (**Zhang et al., 2019; Nakagawa et al., 2019**). Chemotherapy adverse effects include exhaustion, nausea, vomiting, sleep issues, bowel problems (diarrhea or constipation), and a taste abnormality (**Afrasiabifar et al., 2018**). These adverse effects are usually temporary and can be avoided or greatly reduced with proper care and suitable treatment. Inadequate and poor control of adverse effects leads to patients discontinuing treatment, lowering the treatment dose, or terminating the treatment, and persistent bodily symptoms lead to psychosocial troubles in patients (**Afrasiabifar et al., 2018; Bender et al., 2002; Valeberg et al., 2008**). Chemotherapy adverse effects management practices are critical for reducing complications, improving life quality, and rising cancer patients' survival time (**Effendy et al., 2015**).

In this regard, cancer patients' health care services should increasingly include self-care programs, which can improve both patients' QoL and lifespan by improving their knowledge of cancer, treatments, treatment-related adverse effects, complications, allowing them to better play an active role in decision-making, and ultimately improve their QoL (**Salehi et al., 2016**). Self-care is a broad term that refers to all measures people take to look after themselves in order to maintain their health and well-being (Rosenberg et al., 2016). Patients with GC need to be able to perform self-care practices as

part of their recovery. Furthermore, informing patients with cancer about self-care strategies or activities can help them cope with the negative effects of chemotherapy as well as cancer symptoms, thus can greatly improve their QoL (Moorhead et al., 2018).

Previously, recovery and/or death were used to decide whether or not therapy was beneficial. However, nowadays, patients' survival is no longer the primary goal of treatment; they also want a good QoL (**Sharifi et al., 2013; Salehi et al., 2016**). As a result, QoL has become a critical measure for assessing cancer patient treatment outcomes and long-term survival. The goal of cancer therapy, given the limitations of current medical science, is to control symptoms and slow disease development rather than to cure cancer. Furthermore, because QoL is a key part of symptom management and meeting the needs of cancer patients, health-care providers are concentrating their efforts on ensuring that those patients have a better QoL (**Rusten et al., 2010; Lehto, 2010**). Patients with GC who can adjust and cope with the adverse effects of chemotherapy on their own may have a higher QoL throughout treatment (**Daniels & Nosek, 2012**).

Patients' lack of understanding about chemotherapy, its adverse effects, possible toxicity, and self-care tasks, on the other hand, is producing a host of physical and psychological problems (**Pearce et al., 2017**). Patient-centered training programs help reduce the unpleasant effects of cancer medicines like chemotherapy and patients can take charge of their own care and participate in the decision-making process (**Song et al., 2016**). As a result, people with GC need to learn about chemotherapy-related adverse effects and how to manage them as soon as possible. Giving sufficient pre-chemotherapy information about adverse effects and self-care practices has been shown to reduce treatment-related anxiety as well as physical and psychological outcomes (**Aranda et al., 2012; Haryani et al., 2017**).

Oncology nurses play an important role in helping cancer patients improve their self-care skills. Patients' ability to maintain and improve self-care activities can aid them in maintaining a positive quality of life and psychological well-being while also supporting them in adjusting to

the disease's consequences (Yuan et al., 2014; Salehi et al., 2016). Increasing patients' self-confidence in self-care behaviors may also help in the management of cancer-related therapy adverse effects (Johansson et al., 2018). Therefore, the goal of this study was to evaluate the effectiveness of self-care practices education program on enhancing chemotherapy adverse effects and quality of life for patients with GC.

Significance of the study:

With an estimated 1 million new cases and 783,000 deaths in 2018, gastric cancer is still one of the most popular and deadly cancers throughout the world (Bray et al., 2018; Kinoshita, 2020). Low- and middle-revenue countries were responsible for 51% of all cancer cases in the world (Deka et al., 2016). Patients with GC undergoing chemotherapy experience a variety of adverse effects from both the disease and the treatment (Lin et al., 2020). Chemotherapy adverse effects are frequently distressing and life-threatening, and they usually occur when patients are at home in the absence of professional assistance (Chan & Ismail, 2014; Wochna Loerzel, 2015).

Patients' health outcomes, such as functional performance, psychological state, QoL, and survival rate, might be harmed by untreated adverse effects (Pearce et al., 2017). Cancer patients' capacity to control the negative effects of chemotherapy is hindered due to a lack of education and awareness of basic self-care measures (Lewis et al., 2012). As a consequence, self-care education can assist patients in becoming more self-sufficient, avoiding frequent hospitalization, lowering treatment costs, and improving QoL (Salehi et al., 2016). As a consequence, the goal of this study was to evaluate the effectiveness of self-care practices education program on enhancing chemotherapy adverse effects and quality of life for patients with GC.

Aim of the study:

The current study aimed to evaluate the effectiveness of self-care practices education program on enhancing chemotherapy adverse effects and quality of life for patients with GC through the following objectives:

1. Assess patients' knowledge regarding gastric cancer and chemotherapy.
2. Assess the chemotherapy's adverse effects on patients' body systems.
3. Assess patients' self-care practices toward chemotherapy adverse effects.
4. Evaluate the quality of life of patients with GC who are undergoing chemotherapy.
5. Based on the requirements of the patients, develop and execute a self-care practices education program.
6. Evaluating the effectiveness of self-care practices education program on reducing chemotherapy adverse effects and improving patients' QoL.

Hypotheses of research:

The following research hypotheses were developed to fulfill the study's aim:

- H1:** Self-care practices education program will have an effective role in reducing (improving) chemotherapy adverse effects.
- H2:** Self-care practices education program will have an effective role in improving patients' quality of life.

Subjects and Methods:

Research design:

A quasi-experimental research design (with one group and pre-and post-intervention testing) had been used to attain the study's aim. The quasi-experimental study method examines if the independent and dependent variables have a cause-and-effect relationship. The independent variable is the influencing variable, whereas the dependent variable is the impacted variable (Loewen & Plonsky, 2016).

Setting:

The current study was placed in Oncology and chemotherapy outpatient clinic at Zagazig University Hospitals in Egypt's Al Sharkia governorate. Oncology and chemotherapy outpatient clinics are located on the sixth floor of the outpatient clinics building and consist of two rooms: the first room is for examinations and includes a large hall for receiving patients, and the second room is large for chemotherapy administration and contains 12 beds, with the capacity to receive up to 40 cases per day.

Subjects:

A purposive sample of 50 adult patients with GC who were undergoing solely chemotherapy (especially those receiving parenteral chemotherapy) at the above-mentioned

facility and met the following criteria: Adult patients aged 18 and up were eligible if they had at least one chemotherapy session, lack of metastases, agreed to participate in the study, were able to communicate, and had not participated in any self-care training program in the previous three months. The following were used as exclusion criteria: Patients with chronic conditions that may limit their self-care ability; patients with vision or hearing impairment; and patients with mental and behavioral problems.

Data collecting tools include:

The Tool I: An interview questionnaire: It is divided into two sections:

Section I: Socio-demographic data: utilized to collect the participants' sociodemographic data at the start of the study. It includes eight questions about the patient's age, gender, occupation, marital status, education level, residence, income, and smoking history.

Section II: Patients' knowledge assessment: It is used to assess the patients' knowledge regarding gastric cancer disease and chemotherapy. It contained nine multiple-choice questions that covered the gastric cancer definition, causes, signs and symptoms, risk factors, and treatment methods; as well as chemotherapy definition, purpose, administration methods, and chemotherapy side effects. It was adapted from **Roe & Lennan (2014)** and modified by the researchers after reviewing related literature (**Black & Hawks, 2016; Mustafa et al., 2017**),

Knowledge scoring system: Each right response received a "one" while the erroneous answer received a "zero." The total of the item scores was divided by the number of items to provide a mean score for the area, which was then converted to a percentage score. Knowledge was rated satisfactory if the percent score was 65 percent or more, and unsatisfactory if the percent score was less than 65 percent, based on data input and statistical analysis.

Tool II: Self-reported Chemotherapy adverse-effects questionnaire:

It was used to measure the adverse or negative effects of chemotherapy on several bodily systems in patients. It contained 20 items that covered the adverse effects of chemotherapy

on skin and hair (3 items), digestive system (3 items), respiratory system (3 items), cardiovascular system (3 items), genitourinary system (2 items), musculoskeletal system (3 items), and psychological status (3 items). The researchers adapted it from **Dewit et al., (2016)** and modified it after reviewing previous and recent available literature (**Robison & Smith, 2016; Ignatavicius et al., 2018**)

Chemotherapy adverse-effects scoring system: the questionnaire for evaluating chemotherapy adverse effects utilizing a 3-point Likert scale ranging from "Never to Always", never (take 2 scores), sometimes (take 1 score), always (take zero). The scores of the items in each subgroup were summed together and the total scores were divided by the number of items in each subgroup, providing a mean score for the subgroup. In addition, the overall mean for the Likert-type scale was determined, and the percent score was classified as unaffected if it was equal or less than 50%, and affected if it was more than 50%, based on data input and statistical analysis.

Tool III: Self-care practices questionnaire: It is composed of two sections:

- Section I: General self-care practices assessment:** It was about evaluating patients' general self-care habits in order to address their physical, social, psychological, and spiritual requirements on a daily basis. It was adapted from **Chailse et al., (2012)** and modified by the researchers after reviewing related literature (**Williams et al., 2010; Smyth et al., 2016**). It was made up of 26 items divided into seven parts: general self-care practices toward nutrition and fluid intake (7 items), elimination pattern (4 items), personal appearance and hygiene (3 items), physical daily activities (3 items), social interaction (4 items), sleep and comfort (2 items), and adaptation with medication (3 items).
- Section II: Specific self-care practices assessment:** It was concerned with the assessment of specific self-care practices of patients toward chemotherapy adverse effects. The researchers adapted it from the **American society of clinical oncology, (2015)** and modified it after analyzing related literature (**Wochna Loerzel, 2018; White et al., 2019**). It was composed of 60 items

consisting of 11 parts, each part represented a chemotherapy-related adverse effect or problem, as well as specific self-care practices used by patients to deal with these adverse effects, such as patients' specific self-care practices toward fatigue (5 items), nausea and vomiting (8 items), appetite loss (6 items), hair loss (4 items), mouth or throat sores (7 items), skin changes or problems as dry skin (3 items), diarrhea (6 items), constipation (5 items), infection tendency (7 items), the bleeding tendency (6 items), and sleep problems (3 items).

- **Practice scoring system** a three-point Likert scale ranging from "Never done to Always done", with Never done receiving a score of "zero", Sometimes done receiving a score of "one", and Always done receiving a score of "two". The total scores for each subgroup were put together, and the total scores were divided by the number of items in each subgroup, providing the subgroup's mean score. Additionally, the total mean for the Likert-type scale was calculated and categorized as proper self-care practices if the percent score was 65% or more and improper self-care practices if the percent score was less than 65%, based on data input and statistical analysis.

Tool IV: EORTC QLQ-C30 questionnaire:

The EORTC QLQ-C30 (European Organization for Research and Treatment of Cancer QoL Questionnaire-C30) is a 30-item multidimensional questionnaire that was adapted from Aaronson et al., (1993) and Cella et al., (1993) and then amended by researchers after examining related literature (Afrasiabifar et al., 2018). It was used to evaluate patients' QoL based on five functional scales (physical, role, cognitive, emotional, and social functioning well-being) and nine disease-specific issues (physical symptoms) or symptom scales (fatigue, swallowing difficulty, stomach discomfort or pain, reflux or heartburn, stomach fullness or indigestion, nausea/vomiting, appetite loss, flatulence, and diarrhea), with a higher score of functional scales indicating better quality of life while a higher score of symptom scales indicating poorer QoL.

- **Quality of life scoring system:** On a four-point Likert scale, the first 28 items were completed and scored as follows: not at all (take 1), a little bit (take 2), a quit bit (take 3), and very much (take 4). The rest of the items are rated from 1 (very poor) to 7 (very good). All of the scales and single-item measures have a 0 to 100 score range. A high scale score represents a higher response level. As a consequence, a high functional scale score suggests a high/healthy level of functioning and a higher QoL, whereas a high symptom scale/item score indicates a high degree of symptomatology/problems and a lower QoL.

Tools validity and reliability:

After the data collecting tools were finalized, they were given to a panel of five experts from various nursing and medical disciplines to assess their content validity. Three professors of medical-surgical nursing and two professors of oncology made up the panel. The tools were examined by these professionals for relevance, comprehensiveness, clarity, and simplicity of administration, and small changes were made based on their recommendations. A Chronbach's Alpha test was used to assess the internal consistency reliability of all items in the tools; it was 0.58 for knowledge (tool I), 0.75 for chemotherapy adverse-effects questionnaire (the tool II), 0.64 and 0.81 for general and specific self-care practices questionnaire (tool III), and 0.80 for the quality-of-life questionnaire (EORTC QLQ-C30) (tool IV).

Ethical considerations:

Before beginning the study, the Dean of the Faculty of Nursing and the directors of the previously stated setting gave their official approval. The oral agreement was acquired from participating patients before data was collected, and they were informed of the study's nature, goal, and methodology to ensure maximal participation and make arrangements for the participants' attendance. The participants were also advised of their ability to withdraw from the research at any time. Throughout the study, strict confidentiality was maintained, and all patients were assured that their information would only be used for research reasons.

Pilot study:

On 10% (5 patients) of the primary study population, the tool's clarity, relevance, comprehensiveness, understanding, applicability, and simplicity of execution were examined. It also helped in estimating how long it would take to complete the paperwork (tools). Because the tools had not been changed, patients who took part in the pilot study were included in the real study sample.

Fieldwork:

The study was carried out in four stages (Assessment phase, planning phase, implementation phase, and evaluation phase).

(1) Assessment phase:

- The data of the current study had collected from the beginning of August 2019 to February 2020. The implementation of the Self-care practices education program had done over seven months, as one month for the assessment phase, two months for the theoretical part, and three months for education the self-care practices or activities toward chemotherapy adverse-effects and gastric cancer symptoms, then collecting the post-program data that took one month. The researchers obtained the essential clearances from the Director of Zagazig University Hospital and the study setting directors through the assessment phase. The researchers went to the study locations, met with the directors, and described the study's goal as well as the data collecting method to keep their cooperation during data collection and to set its schedule to make data gathering easier.
- Data was gathered four days a week; initially, the researchers met the patients, introduced themselves, described the study's goal and data gathering process, and offered them to participate after being informed about their rights. After each patient agreed to participate, the researchers began the data gathering procedure by conducting an individual interview with them using the data collection tools. The interview questionnaire took an average of 25-30 minutes to complete. The researchers obtained the patient or his family caregiver's phone number at the outpatient clinic's

initial contact to decide the next appointment and continue the data collecting procedure.

(2) The planning phase:

- Following the completion of the assessment phase, all data were analyzed to determine the knowledge and self-care practices needs of patients with gastric cancer, then a self-care practices education program and related educational booklet were developed based on the previously assessed needs of patients and designed in Arabic by the researchers based on related literature and expert opinions.

(3) The implementation phase:

- The implementation of self-care practices education program and related educational booklet were took place to equipped patients with knowledge and self-care practices toward adverse effects associated with chemotherapy and GC symptoms. The researchers explained the self-care practices booklet to every studied patient, and then each participant patient obtained a copy of it. The researchers scheduled with patients the teaching sessions. The patients had divided into five small groups; each group contained ten patients because it was difficult to gather all the patients at one time. The research team was accessible during the morning and afternoon shifts four days a week. Researchers ran a self-care practices education program through "9" educational sessions as the following:

- A- **The first three sessions:** through it, the patients were given information on a variety of issues, such as the gastric cancer disease (definition, underlying causes, risk factors, signs and symptoms, warning signs, diagnosis, and therapeutic methods, preventive measures of GC), the chemotherapy as (definition, purpose, types, the possible adverse effects of it on body systems), and the general self-care practices or activities that maintain QoL of patients with GC as nutritional, elimination, personal appearance and hygiene, physical daily activities, sleep and comfort, and psychosocial self-care practices. The training sessions were also

attended by a family member who was in charge of main patient care. This session lasted from 30 to 40 minutes. During the session, patients and family members were invited to ask questions, which were addressed, also, they were given an overview of the program's aims and outlines at the start of the first session and a booklet comprising educational themes with a focus on self-care practices that patient may require to managing or controlling chemotherapy adverse effects.

- B- **The next six sessions:** In these sessions, the focus was on safe specific self-care practices that patients can use to alleviate or manage chemotherapy adverse effects such as fatigue, nausea, vomiting, appetite loss, hair loss, mouth sores, skin problems or changes as dryness, diarrhea, constipation, bleeding tendency, infection tendency, and sleep problems. It also highlighted particular self-care practices for symptoms including swallowing difficulty, stomach discomfort or pain, reflux or heartburn, stomach fullness or indigestion, and flatulence, which are all common GC symptoms. Each session lasts 45-60 minutes and generally begins with a recap of what was covered in previous sessions as well as the goals for the new one. During program implementation, giving praise and/or acknowledgment to the interested patient was employed to keep the patient motivated. A presentation, lecture, and discussion were used to implement a self-care practices education program. Suitable teaching aids were cited including colored handouts; posters, videos, and educational booklet were given to every patient. In addition, the researchers used telephone calls to connect with patients for teaching and reinforcement.

(4) The evaluation phase:

- The focus of the evaluation was on determining the effect of the Self-care practices education program on improving chemotherapy-related adverse effects and quality of life for patients with GC by comparing the results before and after the program's implementation using the same

data collection tools during the patient's subsequent chemotherapy session. The program's effectiveness was determined by the presence or absence of changes or differences between the pre-intervention (baseline evaluation) and post-intervention stage of the program.

Statistical analysis of the data:

All of the data was gathered, tabulated, and statistically analyzed using SPSS 20.0 for Windows (SPSS Inc., Chicago, IL, USA 2011). Quantitative data were expressed using the mean, SD, and range, whereas qualitative data were expressed using absolute and relative frequencies (percentage). The Chi-square test or Fisher's exact test were used to compare percentages of categorical variables where applicable. The Wilcoxon sign rank test was used for two non-normally distributed dependent variables. The Spearman correlation coefficient was generated to analyze the link between various research variables. The (+) symbol denotes direct connection, whereas the (-) sign denotes inverse connection; also, numbers around 1 denote high correlation, while values near 0 denote weak correlation. All of the tests were done in groups of two. P-values less than or equal to 0.05 were classified as statistically significant (S), p-values less than 0.001 as highly statistically significant (HS), and p-values more than 0.05 as statistically insignificant (NS). The equation was used to measure a percent of improvement (pre-intervention score – post-intervention score) | pre-intervention score multiplied by 100%.

Results:

Table 1 demonstrates that 54% of studied patients were <50 years old with a mean of age equal 48.4 ± 8.5 years, 56% were males, 38% were employers, and 68% of them were married. Furthermore, 36.0% of studied patients had a mid qualification, and 56% residing in urban as well as 62.0% and 52% of them had insufficient income and were smokers respectively.

Table 2 reveals that in the pre-intervention phase of the self-care practices education program, only 10% of the patients had satisfactory knowledge about GC and chemotherapy treatment, whereas 52 percent of them had satisfactory knowledge in the post-intervention phase of the program. In general, there was a highly statistically significant

difference and improvement in total patient knowledge post-intervention of the program as compared to pre-intervention ($p=0.0001$), with an improvement rate of 86.3 percent.

Table 3 indicates that there was a statistically significant difference and decrease of chemotherapy adverse effects mean score on patients' skin and hair ($p=.001$), digestive system ($p=.041$), respiratory system ($p=.049$), urogenital system ($p=.004$), and musculoskeletal system ($p=.020$) post-intervention of self-care practices education program compared with pre-intervention of a program with a percent of the decrease in chemotherapy adverse effects range from -10.4 to -34.9 post-program intervention. There was also a decrease in chemotherapy-related adverse effects on the cardiovascular and psychological status of patients after the program's intervention, although the difference was not statistically significant. In general, there was a highly statistically significant difference and decrease (improvement) ($p=0.0001$) in overall chemotherapy adverse effects of studied patients at the post-intervention phase of the program compared to the pre-intervention phase, ranging from 12.2 ± 3 to 8.78 ± 2.9 , with a percent of improvement (decrease) equal to -28.2 percent post-intervention of the program.

Table 4 demonstrates that the most general self-care practices dimensions of studied patients were improved post-intervention of self-care practices education program compared with pre-intervention of a program with a percent of improvement post-intervention of the program range from 16.3 to 54.5, the only exception for general self-care practices of physical daily activities, that improved after program's intervention, although the difference was not statistically significant. In general, there was a statistically significant difference and improvement in overall general self-care practices mean ($p=0.0001$) in the post-intervention phase of the program compared to the pre-intervention phase, with a percent of improvement equal to 35.6 percent post-intervention of the program.

Table 5 shows that all specific self-care practices dimensions of studied patients toward chemotherapy adverse effects were improved at a post-intervention phase of self-care practices education program compared with the pre-intervention phase of the program with a percent of improvement post-intervention ranging from

33.0% for infection tendency specific self-care practices to 146.1% for sleep problems specific self-care practices. In general, there was a statistically significant difference and improvement in overall specific self-care practices mean score ($p=0.0001$) at the post-intervention phase of the program compared to the pre-intervention phase, ranging from 38.9 ± 22.8 to 73.8 ± 29.6 , with an improvement rate of 89.8%.

Figure 1 clarifies that only 10% of studied patients had satisfactory total knowledge about GC and chemotherapy, 54% of patients unaffected by chemotherapy adverse effects, 14% and 12% of studied patients had proper general and specific self-care practices toward chemotherapy adverse effects respectively at a pre-intervention phase of self-care practices education program, while at the post-intervention phase of program 52% of studied patients became had satisfactory total knowledge, 90% of patients unaffected by chemotherapy adverse effects, 56% and 70% of patients became had proper general and specific self-care practices respectively toward chemotherapy adverse effects.

Table 6 reveals that the post-intervention phase of the program had a high mean score for all functional scales (physical, role, cognitive, emotional, and social functioning) and a low mean score for all symptoms scales (fatigue, swallowing difficulty, stomach discomfort or pain, reflux or heartburn, the fullness of stomach or indigestion, nausea/vomiting, appetite loss, flatulence, diarrhea) when compared to the pre-intervention phase of the program. There was a statistically significant difference and improvement in patients' overall quality of life mean score ($p=0.0001$) from 24 ± 23.9 to 72.5 ± 22.2 in the post-intervention phase of the self-care practices education program.

Table 7 shows that knowledge had a statistically significant *positive* correlation with self-care practice and QoL in both the pre-and post-intervention phases of the program (knowledge with general self-care pre/post program $p=0.003$ & $p=0.0001$ respectively; knowledge with specific self-care post-program $p=0.0001$) (knowledge with QoL pre/post program $p=0.009$ & $p=0.003$ respectively), but had a statistically significant *negative* correlation with chemotherapy adverse effects ($p=0.0001$) at a post-intervention phase of the program. Furthermore, at both the pre-intervention and

post-intervention phases of the program, there was a statistically significant *positive* correlation between patients' self-care practices and QoL (specific self-care with QoL pre | post-program $p=0.021$ & $p=0.002$ respectively) (general self-care with QoL post program was $p=0.0001$), as well as between general and specific self-care practices ($p=0.0001$) at pre and post-intervention phase of the program, while there was a

statistically significant *negative* correlation of self-care practice (general and specific) and chemotherapy adverse-effects ($p=0.0001$) at a post-intervention phase of the program. Furthermore, there was a statistically significant *negative* correlation between chemotherapy adverse effects and QoL ($p=0.014$ and $p=0.005$) at the pre and post-intervention phase of the program.

Table (1): Socio-Demographic Characteristics of Studied Patients (n=50):

Socio- demographic characteristics	n.	%
Age:		
- < 50 year	27	54.0
- \geq 50 year	23	46.0
Mean \pm SD	48.4 \pm 8.5	
Range	(32 - 65)	
Gender:		
- Male	28	56.0
- Female	22	44.0
Occupation:		
- Employer	19	38.0
- Hand worker	15	30.0
- House wife	16	32.0
Marital status:		
- Married	34	68.0
- Others	16	32.0
Education level:		
- Illiterate	9	18.0
- Read and write	7	14.0
- Mid qualification	18	36.0
- High qualification	16	32.0
Residence:		
- Urban	28	56.0
- Rural	22	44.0
Income:		
- Sufficient	19	38.0
- Insufficient	31	62.0
Smoking history:		
- Smokers	26	52.0
- No smokers	24	48.0

Table (2): Patient's Total Knowledge Regarding Chemotherapy throughout Self-Care Practices Education Program Phases (n=50):

Items	Self-Care Practices Education Program Phases				w p- value
	Pre Intervention		Post Intervention		
	No.	%	No.	%	
Patient's' total Knowledge about gastric cancer and chemotherapy:					0.0001*
- Satisfactory	5	10.0	26	52.0	
- Un satisfactory	45	90.0	24	48.0	
Mean\pm SD	2.34 \pm 1.8		4.36 \pm 1.8		
Percent of Improvement	86.3%				

W=Wilcoxon sign rank test

* $p \leq 0.05$ statistically significant

Table (3): Mean of Chemotherapy Adverse Effects as Reported by Studied Patients throughout Self-Care Practices Education Program Phases (n=50):

Items	Self-Care Practices Education Program Phases		% of improvement	W p- value
	Pre Intervention	Post Intervention		
	Mean± SD	Mean± SD		
Chemotherapy adverse-effects on body systems:				
On skin and hair	2.16 ± 0.8	1.62±0.88	-25	.001*
On digestive system	1.9 ± 0.9	1.48±1	-22.1	.041*
On respiratory system	1.46 ± 1	1.08±1	-26	.049*
On cardiovascular system	1.54 ± 0.6	1.38±0.72	-10.4	.249
On urogenital system	1.66 ± 0.9	1.08±0.94	-34.9	.004*
On musculoskeletal system	1.8 ± 0.8	1.3±0.93	-27.8	.020*
On psychological status	1.18 ± 0.8	1.02±0.71	-13.6	.102
Overall chemotherapy adverse-effects	12.2 ± 3	8.78± 2.9	-28.2	.0001*

W=Wilcoxon sign rank test *p≤0.05 statistically significant

% of improvement= percent of improvement score post intervention

Table (4): Mean of Patients' General Self-Care Practices Regarding Chemotherapy throughout Self-Care Practices Education Program Phases (n=50):

Items	Self-Care Practices Education Program Phases		% of improvement	W p- value
	Pre Intervention	Post Intervention		
	Mean± SD	Mean± SD		
Patients' General Self-Care Practices toward:				
Nutrition & Fluids intake	7.22±2.5	9.7±3	34.3	0.0001*
Elimination pattern	4.36±1.5	5.82±1.8	33.5	0.0001*
Personal appearance & hygiene	2.02±1.4	3.12±1.5	54.5	.001*
Physical daily activities	2.7±1.3	3.14±1.6	16.3	.130
Social interaction	2.62±1.3	3.74±1.6	42.7	.001*
Sleep and comfort	1.8±1.2	2.5±1.2	38.9	.008*
Adaptation with disease	2.34±1.7	3.36±1.6	43.6	.004*
Overall general self-care practices	23.06±6.8	31.3±8.2	35.6	0.0001*

W=Wilcoxon sign rank test *p≤0.05 statistically significant

% of improvement= percent of improvement score post intervention

Table (5): Mean of Patients' Specific Self-Care Practices toward Chemotherapy Adverse Effects throughout Self-Care Practices Education Program Phases (n=50):

Items	Self-Care Practices Education Program Phases		% of improvement	W p- value
	Pre Intervention	Post Intervention		
	Mean± SD	Mean± SD		
Patients' Specific Self-Care Practices toward:				
Dealing with fatigue	2.66±2.5	6.3±3.3	137.6	0.0001*
Dealing with nausea and vomiting	3.64±3.5	8.04±4.2	120.9	0.0001*
Dealing with appetite loss	3.08±3.6	6.7±3.9	118.2	0.0001*
Dealing with hair loss	1.86±2	4.56±2.5	145.2	0.0001*
Dealing with mouth or throat sores	3.36±3.3	8.1±4.2	140.5	0.0001*
Dealing with skin changes as dryness	1.42±1.6	3.3±2.1	132.4	0.0001*
Dealing with diarrhea	4.8±2.4	6.8±2.4	41.1	0.0001*
Dealing with constipation	5.24±2.4	7.02±2.3	34.0	.001*
Dealing with bleeding tendency	2.86±3.4	7±4	145.5	0.0001*
Dealing with infection tendency	9.16±2.8	12.2±3.2	33.0	0.0001*
Dealing with sleep problems	1.52±1.8	3.74±2.1	146.1	0.0001*
Overall specific self-care practices	38.9±22.8	73.8±29.6	89.8	0.0001*

W=Wilcoxon sign rank test

*p≤0.05 statistically significant

% of improvement= percent of improvement score post intervention

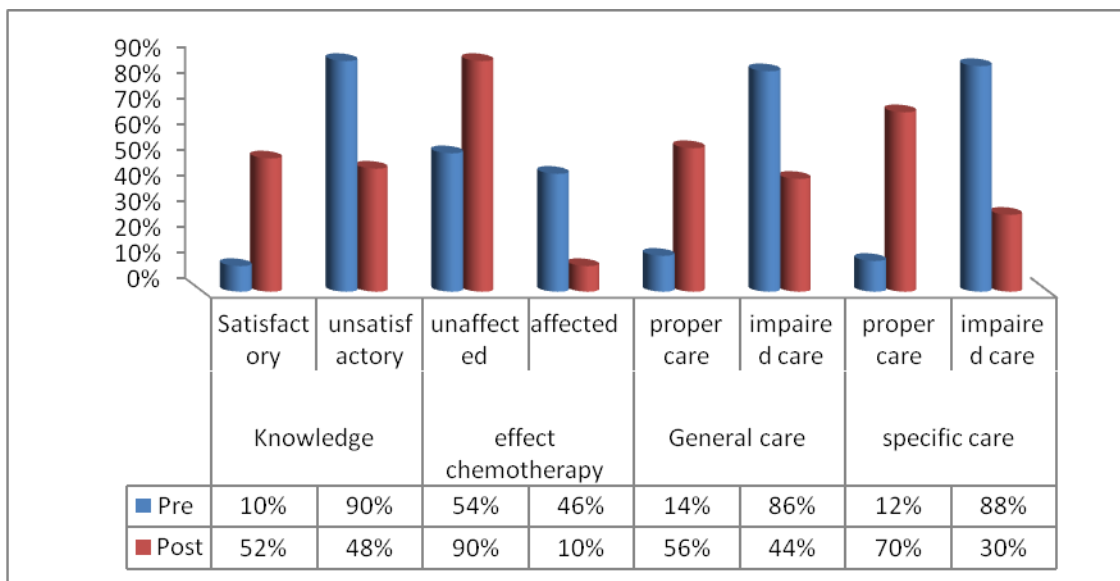


Figure (1): Percent of Patients' Total Knowledge, Chemotherapy Adverse Effects, General and Specific Self Care Practices Pre and Post Program Intervention

Table (6): Mean of Studied Patients' Quality of Life regarding Chemotherapy throughout Self-Care Practices Education Program Phases (n=50):

Patients' Quality of Life (QoL)	Self-Care Practices Education Program Phases		% of improvement	w p- value
	Pre Intervention	Post Intervention		
	Mean± SD	Mean± SD		
Functional scales:				
Physical functioning	27.2±24.5	56.9±29.0	109.3	0.0001*
Role functioning	24.0±29.0	58.0±33.3	141.6	0.0001*
Cognitive functioning	23.0±22.6	59.0±34.8	156.5	0.0001*
Emotional functioning	26.3±27.0	59.0±32.5	124.1	0.0001*
Social functioning	25.0±30.0	57.0±35.5	128.0	0.0001*
Symptoms scales:				
Fatigue	75.3±24	39.8±32.3	-47.2	0.0001*
Swallowing difficulty	74.7±31.3	41.3±38.4	-44.6	0.0001*
Stomach discomfort or Pain	75.0±30.3	38.7±35.8	-48.4	0.0001*
Reflux or Heartburn	74.0±35.8	34.7±38.7	-53.2	0.0001*
Fullness of stomach or indigestion	82.7±29.5	48.3±40.4	-41.5	0.0001*
Nausea/Vomiting	75.3±30.0	42.0±39.0	-44.2	0.0001*
Appetite Loss	80.0±30.8	43.3±42.2	-45.8	0.0001*
Flatulence	74.7±31.3	40.7±38.8	-45.5	0.0001*
Diarrhea	66.0±35.3	38.7±37.0	-41.4	0.0001*
Overall patients' quality of life	24±23.9	72.5±22.2	202.3	0.0001*

W=Wilcoxon sign rank test

*p≤0.05 statistically significant

% of improvement= percent of improvement score post intervention

Table 7: Correlation Matrix between Patients' Knowledge Score, General and Specific Self Care Practices Score, Chemotherapy Adverse Effects Score, and Quality of Life Score among Studied Patients Pre and Post Self-Care Practices Education Program: (n=50).

Parameters	Pre - Intervention Phase							
	Knowledge score		General self care practices score		Specific self care practices score		Chemotherapy Adverse Effects score	
	r	p	r	p	r	p	r	p
General self care practice score	.41*	0.003	1	.				
Specific self care practice score	0.21	0.15	0.51*	0.0001	1	.		
Chemotherapy adverse effects score	-0.19	0.19	-0.15	0.28	-0.06	0.65	1	.
Quality of life score (QoL)	0.37*	0.009	0.21	0.15	0.33*	0.021	-0.34*	0.014
Post- Intervention Phase								
General self care score	0.59*	0.0001	1					
Specific self care score	0.57*	0.0001	0.68*	0.0001	1	.		
Chemotherapy adverse effects score	-0.51*	0.0001	-0.64*	0.0001	-0.61*	0.0001	1	.
Quality of life score (QoL)	0.41*	0.003	0.62*	0.0001	0.43*	0.002	-0.39*	0.005

(r) Correlation coefficient (+) direct correlation (-) inverse correlation * $p \leq 0.05$ statistically significant

Discussion:

Chemotherapy adverse effects have a physical, psychological, social, and spiritual impact on GC patients (Pearce et al., 2017). To assess patients with GC or stomach cancer's QoL, define issue areas, create standards of care, and plan, implement, and improve relevant nursing activities, it is critical to analyze chemotherapy-associated adverse effects (Valeberg, 2008; Bender, 2002). Patients who get self-care education are more capable of making decisions, controlling or managing their illness and treatment adverse effects, and dealing with cancer (Meyerowitz et al., 2008). As a consequence, their QoL and therapeutic adherence will both increase (Song et al., 2016). As a result, the purpose of this study was to evaluate the effectiveness of self-care practices education program on enhancing chemotherapy adverse effects and quality of life for patients with GC.

Socio-demographic characteristics of studied patients:

In terms of the patients' socio-demographic features, the current study revealed that more than half of the studied patients were less than fifty years old with a mean of age equal 48.4 ± 8.5 years old, with more than two-thirds of the patients being married. This result is corroborative with Gaballah et al., (2018), who found that most of the study participants were married in Egypt's study regarding

"Implementation of self-care symptom management guidelines for patients with cancer receiving chemotherapy to enhance their quality of life". This result is also consistent with Salehi et al., (2017), who found that the average age at the time of diagnosis was 48.8 ± 12.01 years in their study "No change in the mean age of diagnosis of breast cancer". In a work titled "Molecular alterations in gastric cancer with special reference to the early-onset subtype", Skierucha et al., (2016) defined early-onset GC (EOGC) as gastric cancer that develops before the age of 45 years and accounts for roughly 10% of all GCs. Furthermore, the present finding is consistent with Elsayed (2015), who showed that in research titled "Supportive Care Needs in relation to Psychological Distress Level among Women under Treatment for Breast Cancer", the mean age of patients included in the study was 46.91 ± 8.83 .

The existing study revealed that more than half of the patients were men, with the highest percentage having a mid-level qualification. According to the study, estrogen's anti-cancer properties may help women avoid GC, especially when more than half of the patients evaluated were under the age of 50. Additionally, occupational exposure and smoking may lead to an elevated GC incidence in males. Wang et al., (2016) backed up this theory by stating that delayed menopause and

increasing fertility reduce the incidence of stomach cancer. This finding is in line with **Hekmatpou et al., (2019)**, who revealed that 50 patients participated in a study in Iran titled "Investigating the Effect of Self-Care Training on Life Expectancy and QoL in Patients with Gastrointestinal Cancer under Radiotherapy", of which 60% were men and 40% were women, as well as 52 and 60 percent of the participants in the control and intervention groups, respectively, were literate.

Furthermore, **Willén et al., (2019)** found that only 10 percent of study patients with cancer were illiterate and most were literate in their study in Sweden titled "Educational level and management and outcomes in non-small cell lung cancer". In addition, **Bray et al., (2018)** found that females have a lower risk of stomach cancer than men in research titled "GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries". Meanwhile, the current finding is consistent with **Davoodi et al., (2015)**, who found that the majority of patients with GC after gastrectomy were men, with an average age of 55 years, in a study titled "Effects of a self-care education program on quality of life of patients with gastric cancer after gastrectomy".

In terms of occupation and income, the existing study revealed that the highest percentage of studied patients was employers and nearly two-thirds of them had insufficient income. Exposure to dust, high-temperature particles, and metals in the workplace and environment, according to the researchers, may be connected to GC. This finding is consistent with **Soliman et al., (2018)**, who found that nearly half of the research group had administrative work in an Egyptian study titled "Effect of a planned educational program regarding post-mastectomy exercises on living activities among breast cancer patients". This finding is also consistent with **Gaballah et al., (2018)**, who found that the majority of cancer patients (86%) do not have adequate income. Furthermore, **Chan & Ismail (2014)** discovered that the majority of patients recruited were from poor socioeconomic backgrounds with little income.

The existing study found that more than half of the studied patients were smokers and from urban or metropolitan regions in terms of smoking history and residence. According to the researchers' point of view, tobacco smoke is the most important recognized carcinogen since it has been related to the development of cancer in several studies. Tobacco usage has been related to a recent increase in GC in industrialized nations, the smoking is considered to be responsible for 11% of global stomach cancer cases and 17% of cases in Europe according to World Cancer Research (2018). This result agrees with **Kodama et al., (2018)** who reported in a study in Brasil titled "Risk factors associated with the development of gastric cancer — case-control study" that most of the cases were current or former smokers, and that smoking was linked to an increased risk of GC in both previous and current smokers. In addition, **Gaballah et al., (2018)** showed that most of the participants were married and all of them lived in urban areas.

Patient's total knowledge throughout self-care practices education program phases:

The current study discovered a highly statistically significant difference and improvement in total patients' knowledge post-intervention of the program as compared to pre-intervention, with less than one-fifth of studied patients having satisfactory total knowledge in the pre-intervention phase of the program while more than half of them had satisfactory knowledge in the post-intervention phase of the program. According to the researchers, the study patients' inadequate knowledge before program intervention could be attributed to a lack of training programs, a lack of continuous education, and the fact that most health care providers did not routinely counsel cancer patients or provide them with written information about chemotherapy and related self-care practices. Thus, after implementing the program, the studied patients had a statistically significant improvement in knowledge with a percent of improvement equal 86.3% especially the highest percentages of studied patients were either had mid or high qualifications.

This finding is in line with **Soliman et al., (2018)**, who reported a statistically significant difference in the mean knowledge score at three separate periods before, after, and follow-up the intervention. Furthermore, **Gaballah et al., (2018)** discovered that during the post-test compared to the pretest, the total knowledge scores of the studied sample improved significantly ($p < 0.001$) in terms of cancer (meaning, reasons, and curative ways) and chemotherapy (meaning, objective, mode of administration, and self-care activities to settle chemotherapy side effects). Moreover, **Mahdy & Mohammed, (2017)** in the study in Helwan University titled "Effect of educational guidelines intervention on symptoms burden and information regarding chemotherapy among patients with lung cancer" reported that educational guidelines intervention had a positive effect on patients' information regarding chemotherapy and the chemotherapy-induced symptoms burden among patients with cancer. Similar findings were observed by **Van Dijk-Lokkart et al., (2015)**, who underlines the significance of enhancing patients' awareness of cancer and its treatment, as well as paying attention to long-term detrimental consequences.

Chemotherapy related adverse-effects as reported by studied patients throughout self-care practices education program phases:

The current study discovered a highly statistically significant difference and decrease in overall chemotherapy adverse effects on studied patients' body systems at a post-intervention phase of the program as compared to the pre-intervention phase, ranging from 12.2 to 8.78 with a percent of decrease (improvement) equal to -28.2%. This result indicates the important role of self-care practices education program in improving chemotherapy-related adverse effects that patients experienced, this improvement may be attributed to the tips and strategies that patients received about effective management of these adverse effects especially the results revealed that at a pre-intervention phase of the program more than half of the patients still were unaffected by chemotherapy adverse-effects. This finding is consistent with **Gaballah et al., (2018)**, who discovered that the issues

associated with cancer were visible and chemotherapy treatment affected all body systems of patients before implementation of self-care guidelines, while their study demonstrated a significantly lower level of symptom severity and a significantly improved level of chemotherapy side effects after using self-care educational guidelines by patients, particularly in using suggested medication.

This result is consistent with that of **Karimi et al., (2017)**, who found that self-care instruction can help patients manage adverse effects while undergoing chemotherapy. Meanwhile, in a study in Turkey titled "Effect on Symptom Management Education Receiving Patients of Chemotherapy" **Sahin & Erguney (2016)** discovered that chemotherapy adverse effects, such as nausea, vomiting, feeling distressed/anxious, feeling gloomy and dissatisfied, unusual exhaustion, and difficulties of sleeping, were shown to be statistically significantly reduced, as well as the severity or discomfort level of 11 adverse effects also statistically significantly decreased, suggesting that focused education provided by healthcare practitioners had a positive impact on adverse effects control in chemotherapy patients.

Additionally, **El-Nemer and colleagues (2015)** were investigated the impact of instructional guidelines in reducing chemotherapy side-effects on women with ovarian cancer, and it was observed that when the instructional guideline was implemented, chemotherapy side-effects decreased. This finding is also in line with **Phongnopakoon et al., (2015)** study's findings of "cancer therapy-related symptoms and self-care in Thailand", which found that study populations have a variety of ways to take care of themselves, and researchers support patients' self-care when they experience unfavorable symptoms associated with chemotherapy because it results in symptom relief or reduction.

Similar successes of educational programs interventions for cancer patients have been reported in Sweden (**Ringner et al., 2014**), Iran (**Hashemi & Sokrpour, 2010**), and Malaysia (**Othman et al., 2010**). This might be because patient education is advantageous and crucial in reducing chemotherapy's adverse

effects and improving QoL. Furthermore, in a study titled "Inadequate symptom control in advanced cancer patients" **Laugsand et al., (2014)** discovered that chemotherapy-related symptoms are classed as preventable symptoms. While the current findings differ from those of **Rustoen et al., (2014)**, who found that self-care measures had no statistically significant effect on cancer patients' pain and symptom scales.

Patients' self-care practices throughout program phases:

In terms of total general and specific self-care practices of studied patients, the existing study discovered that only less than one-fifth of patients had proper general and specific self-care practices toward chemotherapy adverse effects at the pre-intervention phase of the program, while more than half of the patients had proper general self-care practices and more than two-thirds of them had proper specific self-care practices toward it at the post-program phase. In general, there was a statistically significant difference and improvement in overall general and specific self-care practices mean scores, with 35.6 percent and 89.8 percent improvement, respectively. This demonstrates how a self-care education program may improve self-care practices in the face of chemotherapy adverse effects.

According to the researchers, this improvement can be attributed to cancer patients' desire to live a quality life free of complaints or suffering as much as possible by dealing with their disease-related problems and controlling the adverse effects of their treatments, as well as once the patients noticed some improvement in their symptoms as a result of following self-care activities learned through the program, they take special care to follow these practices, especially that the highest percentage of studied patients were literate, and this makes them aware of the importance of learning self-care practices in controlling the chemotherapy adverse effects and the importance of being independent people.

The current findings are supported by **Akin and Kas Guner (2019)**, who found that cancer patients' self-care is poor and that patients with

low self-efficacy in self-care may be unable to adequately manage their symptoms in a study in Turkey titled "Investigation of the relationship among fatigue, self-efficacy, and QoL during chemotherapy in patients with breast, lung, or gastrointestinal cancer". As a result, cancer patients who are getting chemotherapy require supportive assistance in order to manage treatment-related adverse effects. Also, **Wochna Loerzel's (2018)** discovery that self-management strategies had a favorable influence on symptoms management and patient outcomes in American research titled "Symptom self-management strategies used by older adults receiving treatment for cancer".

The current findings are in line with those of **Haryani et al., (2017)**, who discovered that teaching the self-care skills needed to manage adverse effects (e.g., better oral care and the use of warm applications), as well as providing information to eat petite meals or intake warm ginger drinks when nauseous, improved the QoL of cancer patients undergoing chemotherapy and their family caregivers, in an Indonesian study titled "Implementation of self-care symptom management program to enhance the QoL of cancer patients undergoing chemotherapy and their family caregivers". Moreover, **Hanai et al., (2016)** discovered in the study looked into the "Effects of a self-management program on antiemetic induced constipation during chemotherapy among breast cancer patients" that after a self-management program intervention, the intervention group had a significant difference in sleep disorder and constipation items compared to the control group, and the occurrence of symptoms in these items decreased.

Meanwhile, **Rashad et al., (2015)** found that patients can engage in self-care practices to save energy and alleviate tiredness and other chemotherapy adverse effects in research titled "Utilization of a self-care educational program for alleviating chemotherapy-induced physical side effects". Similarly, the current findings are consistent with those of **Baghaei et al., (2013)**, who found that giving patients in the study group a booklet with instructions on how to manage chemotherapy adverse effects led to better self-care practices and a reduction in

symptoms in a study about "the effects of educational package on controlling the complications of chemotherapeutic agents on symptom scales of quality of life in patients with breast cancer undergoing chemotherapy".

Patients' quality of life throughout self-care practices education program phases:

At a post-intervention phase of the program, the current study found a high mean score for all functional scales (physical, role, cognitive, emotional, and social functioning) and a low mean score for all symptom scales (fatigue, swallowing difficulty, stomach discomfort or pain, reflux or heartburn, stomach fullness or indigestion, nausea/vomiting, appetite loss, flatulence, diarrhea), which indicates a high level of improvement of symptomatology and studied patients' QoL. In general, there was a statistically significant difference and improvement in overall patients' QoL mean score from 24 ± 23.9 to 72.5 ± 22.2 at a post-intervention phase of the program. From the researchers' point of view, the reason for improved QoL after the program intervention could be attributed to decreased chemotherapy adverse effects as well as improving GC problems after engaging studied patients in performing self-care practices that they taught through their participation in self-care practices education program.

The current finding is in line with **Xie et al., (2020)**, who discovered that total fatigue and emotional function significantly improved after a 12-week of self-care education in the intervention group when compared to the control group in a study in China titled "The effects of add-on self-care education on quality of life and fatigue in gastrointestinal cancer patients undergoing chemotherapy". Furthermore, self-care intervention seemed to be important for both social and psychological functional wellbeing in gastrointestinal cancer patients receiving chemotherapy.

Moreover, in a study in Iran titled "the Impact of Self-Care Education on the Quality of Life of Women with Breast Cancer Undergoing Chemotherapy: A Quasi-Experimental Study", **Shahraki et al., (2020)** discovered that the mean score of the general quality of life in the experimental group

increased from 52.59 ± 21.08 pre-intervention of Self-Care Education to 78.88 ± 12.38 post-intervention ($P = 0.001$). Furthermore, the mean overall quality of life in the experimental group was 78.88 ± 12.38 , compared to 56.11 ± 17.62 in the control group, demonstrating a statistically significant difference between the two groups ($P = 0.001$), as well as patients with cancer who were having chemotherapy had a low QoL at the assessment phase, but this improved at evaluation phase following the self-care intervention, according to the findings.

This finding was corroborative by **Howell et al., (2017)**, who concluded that nursing programs including psychotherapeutic, psychosocial, and educational interventions had beneficial impacts on QoL in a research review in Canada that looked at "the effectiveness of nurse-delivered interventions". Meanwhile, this finding is consistent with **Yuce & Yurtsever (2017)**, who investigated the "Effect of education about oral mucositis given to the cancer patients having chemotherapy on life quality" and revealed that education had a favorable influence on cancer patient's QoL. Furthermore, the current findings are consistent with those of **Barandeh et al., (2017)**, who found that educating and counseling could alleviate the symptom dimensions of quality of life in women with breast cancer undergoing chemotherapy in a study titled "Effect of self-care on quality of life in women with breast cancer undergoing chemotherapy", implying that addressing and managing one aspect of patients' problems can lead to improved QoL.

Furthermore, **Sahin & Erguney (2016)** discovered a symptom control education that giving to cancer patients receiving chemotherapy lead to lowering the frequency and intensity of symptoms. Furthermore, in a study "Effect on symptom control of structured information given to patients receiving chemotherapy", **Mollaoglu and Erdogan (2014)** found that nausea may be reduced by education. Similarly, **Baghaei et al., (2013)** discovered that applying instructional recommendations resulted in a decrease in symptoms scales and an increase in quality-of-life functioning ratings or scales.

While the current findings contradict with **Davoodi et al., (2015)**, who found that education had no effect on patients' QoL after gastrectomy in a study titled "Effects of a self-care education program on quality of life of patients with gastric cancer after gastrectomy", and the results were not significant. Furthermore, these findings contradicted those of **Ajh (2012)**, who examined "The effect of education in the field of current care and care of breast cancer on the quality of life of patients with breast cancer referring to the oncology clinic of Kowsar hospital" and found that training had no positive impact on overall QoL outcomes.

Correlation between Patients' Knowledge score, General and Specific Self Care Practices score, Chemotherapy adverse Effects score, Quality of Life score among Studied Patients Pre and Post Program:

There was a statistically significant *positive* correlation of knowledge with self-care practices and QoL at both the pre-and post-intervention phases of the program, but a statistically significant *negative* correlation of knowledge with chemotherapy adverse effects at the post-intervention phase of the program. This result is consistent with **Shahraki et al., (2020)**, who found that patients' self-care and quality of life increased as a consequence of their capacity to manage their disease problems and control the adverse effects of their cancer-related therapy after getting the requisite knowledge and training. Similarly, **Tuominen et al., (2019)** reported on the impact of educational nursing interventions on the degree of knowledge, which resulted in a decrease in symptom severity. In a similar vein, a randomized clinical study done in Hong Kong found that information obtained via a health education program was useful in decreasing (improving) chemotherapy adverse effects (**Chung et al., 2015**). Furthermore, **Baghaei et al., (2013)** validated the current findings, stating that utilizing recommendations resulted in a decrease in symptoms and an increase in quality of life functioning scores.

Furthermore, during both the pre-and post-intervention phases of the program, the existing study revealed a statistically significant *positive* correlation between

patients' self-care practices and QoL; however, it was correlated *negatively* with chemotherapy adverse effects at the post-intervention phase. This result is the line with **Hekmatpou et al., (2019)**, who reported in an Iranian study titled "Investigating the effect of self-care training on life expectancy and quality of life in patients with gastrointestinal cancer under radiotherapy" that physical and role functioning scores of QoL increased following the self-care intervention. Meanwhile, the current findings are consistent with those of **Safarzade et al., (2013)**, in a study titled "Effectiveness of stress management and relaxation training in reducing the negative effect and improving the life quality of women with breast cancer", who discovered that self-care has a positive effect on the control of chemotherapy adverse effects such as nausea, vomiting, pain, and appetite loss, and concluded that self-care improvement results in decreased incidence of adverse effects and improve QoL.

Conclusion:

Based on the outcomes of this study, it can be concluded that Self-care practices education program had an effective role in improving the studied patients' knowledge and self-care practices toward chemotherapy adverse-effects, which resulted in decreasing (improving) chemotherapy adverse-effects and enhancing patients' quality of life, this had ascertained by the Correlation matrix that had illustrated the presence of a statistically significant *positive* correlation of patients' knowledge and self-care practices improvement with quality of life as well as the presence of statistically significant *negative* correlation of patient's knowledge and their self-care practice with chemotherapy adverse effects that had a *negative* correlation with patients' quality of life pre and post-intervention of self-care practices education program.

Recommendation:

1. Availability of Self-care practices education programs and guidebooks in all Egyptian Oncology Centers for patients with gastric cancer is recommended to inform them with the latest information on GC,

chemotherapy, chemotherapy-related adverse effects, and self-care practices to handle these adverse effects in a specific and comprehensive manner.

2. Nurses' responsibilities in health-care settings should include self-care education, which will improve the quality of care and patients' QoL during the cancer treatment process.
3. Engage oncology nurses on periodic training to improve their medical information about cancer therapy, its harmful effects on patients, and safe self-care strategies.
4. The study should be replicated on a large sample and different hospital settings to generalize the results.

References:

- Aaronson NK, Ahmedzai S, Bergman B, (1993):** The European Organization for research and treatment of cancer QLQ-C30: A quality-of-life instrument for use in international clinical trials in oncology. *J Natl Cancer Inst*; 85(5): pp.365–376
- Afrasiabifar A, Hamzhiikia SH, Hosseini NA, (2018):** The effect of self-care program using Orem's self-care model on the life quality of women with breast cancer undergoing chemotherapy: A randomized controlled trial. *Armaghane danesh*; 23(1): pp.1–13.
- Akin S, Kas Guner C, (2019):** Investigation of the relationship among fatigue, self-efficacy and quality of life during chemotherapy in patients with breast, lung or gastrointestinal cancer. *Eur J Cancer Care (Engl)*; 28(1): e12898. doi: 10.1111/ecc.12898. Epub 2018 Jul 24. PMID: 30039883.
- American Cancer Society (2016):** Chemotherapy. Available at: www.Chemotherapy.org.
- American society of clinical oncology (2015):** Side effects of chemotherapy. Available at: www.cancer.org > ... > Chemotherapy > A Guide to Chemotherapy.
- Aranda S, Jefford M, Yates P et al., (2012):** Impact of a novel nurse-led pre chemotherapy education intervention (ChemoEd) on patient distress, symptom burden, and treatment-related information and support needs: results from a randomised, controlled trial. *Ann Oncol*; 23(1):pp.222-231.
- Baghaei R, Sheykhi N, Mohammadpour Y, SHarifi M,(2013):** Evaluation of the effects of educational package on controlling the complications of chemotherapeutic agents on symptom scales of quality of life in patients with breast cancer undergoing chemotherapy .*J Urmia Nurs Midwifery Fac*;11(9):pp.667–79.
- Barandeh M, Babaei M, Mehdizadeh Torzani Z, Sharifiyan R, (2017):** Effect of self-care on quality of life in women with breast cancer undergoing chemotherapy. *J Urmia Nurs Midwifery Fac*; 15(3):pp.199–207.
- Bender CM, McDaniel RW, Murphy-Ende K, Pickett M, Rittenberg CN et al., (2002):** Chemotherapy-induced nausea and vomiting. *Clin J Oncol Nurs*; 6(2):pp.94–102
- Bender CM, McDaniel RW, Murphy-Ende K, Pickett M, Rittenberg CN, et al., (2002):** Chemotherapy-induced nausea and vomiting. *Clin J Oncol Nurs*; 6(2):pp.94-102.
- Benusiglio PR, Malka D, Rouleau E, De Pauw A, Buecher B, et al., (2013):** CDH1 germline mutations and the hereditary diffuse gastric and lobular breast cancer syndrome: a multicentre study. *J Med Genet*; 50(7):pp.486-489.
- Black JM & Hawks JH (2016):** Medical Surgical Nursing, 8th ed., Elsevier Inc, USA, pp.277-299.
- Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, et al., (2018):** Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin*; 68(6):

- pp.394-424 [PMID: 30207593 DOI: 10.3322/caac.21492]
- Cella DF, Tulsy DS, Gray G, Sarafian B, Linn E, et al., (1993):** The Functional Assessment of Cancer Therapy scale: development and validation of the general measure. *J. Clin. Oncol*; 11 (3): pp.570–579.
- Chailse P, Pandey R, Chailse H, (2012):** Self-care practices and their perceived effectiveness among fatigued cancer patients in Nepal. *Asia-Pacific E-Journal of Health Social Science*; 1(2):pp.1-4.
- Chan HK & Ismail S, (2014):** Side effects of chemotherapy among cancer patients in a Malaysian General Hospital: experiences, perceptions and informational needs from clinical pharmacists. *Asian Pac J Cancer Prev*; 15(13):pp.5305-9.
- Chun N & J. Ford, (2015):** Genetic testing in stomach cancer. DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology. 10th ed., Philadelphia, Pa, Lippincott Williams & Wilkins, pp.1-2280.
- Chung OK, Li HC, Chiu SY, Ho KY, Lopez V, (2015):** Sustainability of an Integrated Adventure-Based Training and Health Education Program to Enhance Quality of Life Among Chinese Childhood Cancer Survivors: A Randomized Controlled Trial. *Cancer Nursing*; 38(5): pp. 366-374.
- Daniels R & Nosek L (2012):** Contemporary Medical Surgical Nursing, 2nd ed., Australia, Delmar learning co, pp. 1701-1705.
- Davoodi A, Gholizadeh L, Rezazadeh H, Sheikalipour Z, Lakdizaji S, et al., (2015):** Effects of a self-care education program on quality of life of patients with gastric cancer after gastrectomy. *J Community Support Oncol*; 13(9):pp.330-336.
- Deka S, Mamdi N, Manna D, Trivedi V, Alky I, (2016):** cinnamates induce protein kinase c translocation and anticancer activity against breast cancer cells through induction of the mitochondrial pathway of apoptosis. *J Breast Cancer*; 19(4):pp.358–71.
- Dewit S, Kumagai C, Dallred C, (2016):** Medical surgical nursing concepts & practice, care of patients with cancer. 3rd ed., USA, Elsevier.pp.144-176.
- Effendy C, Vernooij-Dassen M, Setiyarini S, Kristanti MS, Tejawinata S, et al., (2015):** Family caregivers' involvement in caring for a hospitalized patient with cancer and their quality of life in a country with strong family bonds. *Psychooncology*; 24(5):585-591.
- El-Nemer A, El-Zafrani M, El-Sayed H, Saadoon O, (2015):** Utilization of a Self-Care Educational Program for Alleviating Chemotherapy Induced Physical Side Effects. *Journal of Cancer Treatment and Research*; 3(1): pp. 8-16.
- Elsayed AA, (2015):** Supportive Care Needs in Relation to Psychological Distress Level among Women under Treatment for Breast Cancer. *Zagazig Nursing Journal*; 11(2): pp.95-110.
- Gaballah SH, Ahmed HM, Ibrahim NA, Gida N, (2018):** Implementation of self-care symptom management guidelines for patients with cancer receiving chemotherapy to enhance their quality of life, *Malaysian Journal of Nursing*; 10 (2): pp.120-130.
- Grabenbauer GG & Holger G, (2016):** Management of radiation and chemotherapy related acute toxicity in gastrointestinal cancer. *Best Pract Res Clin Gastroenterol*; 30(4):pp.655–664.
- Graham DY, (2015): Helicobacter pylori update:** Gastric cancer, reliable therapy, and possible benefits. *Gastroenterology*; 148(4): pp.719-731.e3.
- Han H, Zhang T, Jin Z, Guo H, Wei X, (2017):** Blood glucose concentration and risk of liver cancer: systematic review and meta-analysis of prospective studies. *Oncotarget*; 8(30):pp.50164-50173.

- Hanai A, Ishiguro H, Sozu T, Tsuda M, Arai H, et al., (2016):** Effects of a self-management program on antiemetic-induced constipation during chemotherapy among breast cancer patients: A randomized controlled clinical trial. *Breast cancer research and treatment*; 155(1):pp.99-107.
- Hardy SJ, Krull KR, Wefel JS, Janelsins M, (2018):** Cognitive Changes in Cancer Survivors. *Am Soc Clin Oncol Educ Book*; 23(38):pp.795-806.
- Haryani H, Rachmat K, Suseno P, Effendy C, (2017):** Implementation of self-care symptom management program to enhance the quality of life of cancer patients undergoing chemotherapy and their family caregivers. *Int J Res Med Sci*; 5(6): pp.2442-2448.
- Hashemi F & Shokrpour N, (2010):** The impact of education regarding the needs of pediatric leukemia patients' siblings on the parents' knowledge and practice. *The Health Care Manager*; 29(1): pp. 75-79.
- Hekmatpou D, Nasiri A, Mohaghegh F, (2019):** Investigating the Effect of Self-Care Training on Life Expectancy and Quality of Life in Patients with Gastrointestinal Cancer under Radiotherapy. *Asia Pac J Oncol Nurs*; 6(2):pp.198-205.
- Howell DM, Bezjak A, Sidani S, Dudgeon D, Husain A, et al., (2017):** Self management interventions for breathlessness in adult cancer patients. *The Cochrane Database of Systematic Reviews*, 2017(8), CD009623.
- Ignatavicius DD, Workman ML, Rebar C, (2018):** *Medical-Surgical Nursing-E-Book: Concepts for Inter-professional Collaborative Care*, Single Volume, 9th ed., Elsevier Health Sciences, pp.1-68.
- Johansson, A. C., Brink, E., Cliffordson, C., & Axelsson, M. (2018):** The function of fatigue and illness perceptions as mediators between self-efficacy and health-related quality of life during the first year after surgery in persons treated for colorectal cancer. *Journal of Clinical Nursing*; 27(7–8): pp.1537–e1548.
- Karimi S, Makhsofi BR, Seyedi-Andi SJ, Behzadi M, Moghohfeh Y, et al., (2017):** Surveying the effect of a self-care education program on severity of nausea and emesis in colorectal cancer patients under chemotherapy. *J Multidiscip Healthc*; 14(10):pp.301-307.
- Kinoshita T, (2020):** Minimally invasive approaches for early gastric cancer in East Asia: current status and future perspective. *Transl Gastroenterol Hepatol*; 5; 5:20.
- Kodama MF, Júnior UR, Yukari JK, Zilberstein V, Ceconello I, et al., (2018):** Risk factors associated with the development of gastric cancer — case-control study, *Rev. Assoc. Med. Bras*; 64 (7):pp.611-619.
- Laugsand EA, Jakobsen G, Kaasa S, Klepstad P, (2014):** Inadequate symptom control in advanced cancer patients across Europe. *Support Care Cancer*; 19(12):pp.2005-2014.
- Lehto US, Ojanen M, Vakeva A, Dyba T, Aromaa A, et al., (2019):** Early quality-of-life and psychological predictors of disease-free time and survival in localized prostate cancer. *Quality of life research: an international journal of quality of life aspects of treatment, care and rehabilitation*; 28(3):pp.677–686.
- Lewis S, Heitkemper M, Dirksen S, (2012):** *Medical Surgical Nursing, assessment and management of clinical problem*, 6th edition, Mosby Company, pp.290 - 311.
- Lin Y, Docherty SL, Porter LS, Bailey DE (2020):** Common and Co-Occurring Symptoms Experienced by Patients with Gastric Cancer. *Oncol Nurs Forum*; 47(2):pp.187-202.
- Liu X, Baecker A, Wu M, Zhou JY, Yang J, et al., (2019):** Family history of liver cancer may modify the association between HBV infection and liver cancer

- in a Chinese population. *Liver Int*; 39(8): pp.1490-1503.
- Loewen S & Plonsky L, (2016):** An A-Z of applied linguistics research methods, 1st ed., London: Palgrave Macmillan, p.224.
- Mahdi NE & Mohammed YM, (2017):** Effect of educational guidelines intervention on symptoms burden and information regarding chemotherapy among patients with lung cancer. 8th international conference—faculty of nursing- Helwan University.
- Meyerowitz BE, Kurita K, D’Orazio LM, (2008):** The psychological and emotional fallout of cancer and its treatment. *Cancer J*; 14(6):pp.410–413
- Mollaoglu M & Erdogan G, (2014):** Effect on symptom control of structured information given to patients receiving chemotherapy. *Eur J Oncol Nurs*; 18(1):pp.78–84.
- Moorhead S, Swanson E, Johnson M, Maas M, (2018):** Nursing Outcomes Classification (NOC)-EBook: Measurement of Health Outcomes. 6th ed., Elsevier Health Sciences, UK.
- Mustafa M, Menon M, Kumar R, Illzam Elahee M, et al., (2017):** Gastric Cancer: Risk Factors, Diagnosis and Management. *IOSR Journal of Dental and Medical Sciences*; 16(03): pp.69-74.
- Nakagawa H, Fujita M, Fujimoto A, (2019):** Genome sequencing analysis of liver cancer for precision medicine. *Semin Cancer Biol*; 55: pp.120-127.
- National Cancer Institute, (2017):** Chemotherapy. Available at: <https://www.cancer.gov>.
- Othman A, Blunden S, Mohamad N, Mohd Hussin ZA, Jamil Osman Z, (2010):** Piloting a psycho education program for parents of pediatric cancer patients in Malaysia. *Psychooncology*; 19(3): pp.326-31.
- Pearce A, Haas M, Viney R, Pearson SA, Haywood P, et al., (2017):** Incidence and severity of self-reported chemotherapy side effects in routine care: A prospective cohort study. *PLoS One*; 12(10):e0184360.
- Phongnopakoon P, Kumsopha N, Invasa J, Chancharoen S, Jearanaikoon B, (2015):** Symptom Management Strategies of Patients with Solid Cancer during Receiving Naïve Chemotherapy. *The Bangkok Medical Journal*; 9, pp. 22-26.
- Raeisi A, Janbabaei GH, Malekzadeh R (2019):** Iranian Annual of National Cancer Registration Report, Islamic Republic Iran, Ministry of health and Medical Education, Health and Treatment Deputy, Center for Disease Control and Prevention, Non communicable Disease Unit, Cancer office, 2008-2009. Mirmah publisher, Tehran. Iran. Available at: https://sghc.iums.ac.ir/files/sghc/files/pdf/Gozaresh_
- Rashad A, Ismail M, Mohamed H, Mahmoud O, (2015):** Utilization of a Self-Care Educational Program for Alleviating Chemotherapy Induced Physical Side Effects. *Cancer Treatment and Research*; 3(1): pp.8-16.
- Ringnér A, Karlsson S, Graneheim U, (2014):** A person-centered intervention for providing information to parents of children with cancer. Experiences and effects. *European Journal of Oncology Nursing*; 19(3): pp.318-24.
- Robison JG & Smith CL, (2016):** Therapeutic massage during chemotherapy and/or biotherapy infusions: patient perceptions of pain, fatigue, nausea, anxiety, and satisfaction. *Clin. J. Oncol. Nurs*; 20 (2):pp.e34–e40.
- Roe H & Lennan E, (2014):** Role of nurses in the assessment and management of chemotherapy-related side effects in cancer patients. *Nursing: Research and Reviews*; 4,pp.103-115
- Rosenberg C, Flanagan C, Brockstein B, (2016):** Promotion of self-management for post treatment cancer survivors:

- evaluation of a risk-adapted visit. *J Cancer Surviv*; 10(1):pp.206-219.
- Rustøen T, Cooper BA, Miaskowski C, (2010):** The importance of hope as a mediator of psychological distress and life satisfaction in a community sample of cancer patients. *Cancer Nurs*; 33(4):pp.258-267.
- Rustoen T, Valeberg BT, Kolstad E, Wist E, Paul S, et al., (2014):** A randomized clinical trial of the efficacy of a self-care intervention to improve cancer pain management. *Cancer Nurs*; 37(1):pp.34-43.
- Safarzade A, Roshan R, Shams J, (2013):** Effectiveness of stress management and relaxation training in reducing the negative affect and in improving the life quality of women with breast cancer. *J Res Psychol Health*; 6(4):pp.21-35.
- Şahin ZA & Ergüney S, (2016):** Effect on Symptom Management Education Receiving Patients of Chemotherapy. *J Cancer Educ*; 31(1):pp.101-107.
- Salehi M, Shahidsales S, Seilaniantousi M, Noforesti G, (2017):** 61P No change in the mean age of diagnosis of breast cancer during 30 years from 1981 to 2011 in the northeast of Iran, report of six thousand patients, *Annals of Oncology*; 28(10):p.17.
- Salehi S, Tajvidi M, Ghasemi V, Raei Z, (2016):** Investigating the effect of nurses' supportive and educative care on the quality of life in breast cancer patients referred for radiotherapy in Seyedoshohada hospitals in Isfahan in 1392]. *J Clin Nurs Midwifery*; 5(2):pp.9-18.
- Shahraki N, Kiyani F, Salar A, Saeedinezhad F, (2020):** Probing the Impact of Self-Care Education on the Quality of Life of Women with Breast Cancer Undergoing Chemotherapy: A Quasi-Experimental Study, *Med Surg Nurs J.*; 8(4):e100865.
- Sharifi M, Mikaili P, Baghaei R, Hajilou M, f Mohammadpour Y, (2013):** Evaluation of the effect of chemotherapy on functional scales of quality of life of patient with breast cancer. *Iran J Breast Dis*; 6(2):pp.26-34.
- Skierucha M, Milne AN, Offerhaus GJ, Polkowski WP, Maciejewski R, et al., (2016):** Molecular alterations in gastric cancer with special reference to the early-onset subtype. *World J Gastroenterol*; 22(8):pp.2460-2474.
- Smyth EC, Verheij M, Allum W, Cunningham D, Cervantes A, et al., (2016):** ESMO Guidelines Committee. Gastric cancer: ESMO clinical practice guidelines for diagnosis, treatment and follow-up. *Ann Oncol*; 27(5):v38-v49.
- Soliman G, El Gahsh N, Shehata O, (2018):** Effect of a planned educational program regarding post-mastectomy exercises on living activities among breast cancer patients. *National Journal of Advanced Research*; 4(1): pp.1-11
- Song Y, Lv X, Liu J, Huang D, Hong J, Wang W, (2016):** Experience of nursing support from the perspective of patients with cancer in mainland China. *Nursing & Health Sciences*; 18(4):pp.510- 518.
- Tuominen L, Stolt M, Meretoja R, Leino-Kilpi H, (2019):** Effectiveness of nursing interventions among patients with cancer: An overview of systematic reviews. *J Clin Nurs*; 28(13-14):pp.2401-2419.
- Valeberg BT, Rustøen T, Bjordal K, Hanestad BR, Paul S et al., (2008):** Self-reported prevalence, etiology, and characteristics of pain in oncology outpatients. *Eur J Pain*; 12(5):pp.582-590.
- Valeberg BT, Rustoen T, Bjordal K, Hanestad BR, Paul S, et al., (2008):** Self-reported prevalence, etiology, and characteristics of pain in oncology outpatients. *Eur J Pain* 12(5):pp.582-590
- Van Dijk-Lokkart EM, Braam KI, Huisman J, Kaspers GJ, Takken T, et al., (2015):** Factors influencing childhood cancer patients to participate in a

- combined physical and psychosocial intervention program: Quality of Life in Motion. *Psychooncology*; 24(4): pp.465-471.
- Venerito M, Vasapoli R, Rokkas T, Malfertheiner P, (2018):** Gastric cancer: epidemiology, prevention, and therapy. *Helicobacter*; 23 (1):e12518.
- Wang Z, Butler LM, Wu AH, Koh WP, Jin A, et al., (2016):** Reproductive factors, hormone use and gastric cancer risk: the Singapore Chinese Health Study. *Int J Cancer*; 138(12): pp.2837-2845.
- White LL, Cohen MZ, Berger AM, Kupzyk KA, Bierman PJ,(2019):** Self-Efficacy for Management of Symptoms and Symptom Distress in Adults with Cancer: An Integrative Review. *Oncol Nurs Forum*; 13(46):pp.113–128.
- Willén L, Berglund A, Bergström S, Bergqvist M, Öjdahl-Bodén A, et al., (2019):** Educational level and management and outcomes in non-small cell lung cancer. A nationwide population based study. *Lung Cancer*, 131: pp.40-46.
- Williams PD, Lopez V, Piamjariyakul U, Wenru W, Hung GT, et al., (2010):** Symptom monitoring and self-care practices among oncology adults in China. *Cancer Nursing*; 33(3): pp.184-193.
- Wochna Loerzel V, (2015):** Symptom Experience in Older Adults Undergoing Treatment for Cancer. *Oncol Nurs Forum*; 42(3): E269-78.
- Wochna Loerzel V, (2018):** Symptom Self-Management: Strategies Used by Older Adults Receiving Treatment for Cancer. *Clin J Oncol Nurs*; 1; 22(1):pp.83-90.
- World Cancer Research Fund/American Institute for Cancer Research (2018):** Continuous Update Project Report: Diet, Nutrition, Physical Activity and Stomach Cancer. London: World Cancer Research Fund International.
- Xie J, Zhu T, Lu Q, Xu X, Cai Y, Xu Z,(2020):** The effects of add-on self-care education on quality of life and fatigue in gastrointestinal cancer patients undergoing chemotherapy. *BMC Complement Med Ther*; 20(1):p.15.
- Yuan C, Wei C, Wang J, Qian H, Lev EL, et al., (2014):** Testing measurement invariance of the Chinese version of the Strategies Used by Patients to Promote Health among patients with cancer. *Journal of Nursing Measurement*; 22(2):pp.184–200.
- Yuce UÖ & Yurtsever S, (2017):** Effect of education about oral mucositis given to the cancer patients having chemotherapy on life quality. *J Cancer Educ*; 34(1):pp.35-40.
- Zhang W, Wang J, Gao J, Li HL, Han LH, et al.,(2019):** Pre diagnostic level of dietary and urinary isoflavonoids in relation to risk of liver cancer in Shanghai, China. *Cancer Epidemiol Biomarkers Prev*; 28(10): pp.1712-1719.