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Outcome of Fatigue Management on Quality of Life of Cancer Patients undergoing Chemotherapy

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Abstract: Background: Cancer-related fatigue is one of the most common consequences of cancer treatment, defined by the National Comprehensive Cancer Network as a distressing, persistent, subjective sense of physical, emotional, and/or cognitive tiredness. Fatigue is related to cancer or cancer treatment, which is not proportional to recent activity and interferes with usual functioning (Perdigão et al., 2019). Cancer-related fatigue (CRF) has been consistently rated as the most elusive, common, and severe symptom of patients undergoing chemotherapy. Despite its frequency and severity, CRF is poorly managed. ***Objective:*** To measure the effect of fatigue management on the quality of life of patients receiving chemotherapy. ***Method:*** Aquasi-experimentalstudy conducted in the outpatient of a Cancer Institute, Cairo, on a purposive sample of **110**chemotherapypatients.**Results:** Almost two-thirds of the studied patients (61.80%) had a low pre-intervention Quality of life while about one-quarter (25.50%) revealed a low post-intervention quality of life. Total fatigue was severe for nearly half of the sample (41.80%) in the pre-intervention phase and 10.90% had severe fatigue in the post-intervention phase. ***Conclusion****:* This study highlights that there was a highly significant improvement in patients' quality of life post fatigue management. Also, fatigue management improves patients' fatigue levels with significant differencespre and post-intervention. Finally, there were highly statistically significant negative correlations between fatigue level and quality of life pre-intervention (p-value<0.01). ***Recommendation:*** Further trials will clarify the understanding of the benefits of fatigue management for cancer patients. Educational programs about fatigue management should be routinely incorporated in future training to ensure improved nurses' knowledge and care provided to patients receiving chemotherapy. Further studies have to be conducted to assess predictors that may worsen fatigue levels among patients treated with chemotherapy.

Keywords: Cancer, Chemotherapy; Fatigue management; Quality of life

BACKGROUND

Cancer is currently the second leading cause of death and disability after cardiovascular disease **(Akin & Kas, 2019).** In oncology, an ever-increasing number of pharmacological and non-pharmacological strategies have been used to care for patients with cancer. However, the disease and its therapy trigger several signs and symptoms –such as fatigue. Advances in cancer treatments have considerably improved the survival rates, symptom palliation, and quality of life (QoL) of patients with various cancer types **(Hemanth et al., 2017).**

Cancer-related fatigue is one of the most common consequences of cancer treatment, defined by the National Comprehensive Cancer Network (2019) as a distressing, persistent, subjective sense of physical, emotional, and/or cognitive tiredness, related to cancer or cancer treatment, that is not proportional to recent activity and interferes with usual functioning **(Perdigão et al., 2019).**

Chemotherapy leads to various symptoms, and psychological distress, which contribute to a significant decrease in the QoL of the patients. Long-term fatigue has been described as one of the most common and distressing adverse effects of cancer and its treatment **(Poort et al., 2020).**

Patients undergoing to chemotherapy may develop short- and long-term functional and psychosocial deficits. The effective management of these deficits is vital for a better QoL, treatment, outcomes, and lower morbidity rates. Supporting patients' confidence in performing self-care and management of side effects may have a major impact on cancer patients' functioning and QoL **(Joly et al., 2019).**

The prevalence of fatigue among cancer patients has been estimated to be between 10% to 99% reaching 90.3% among patients receiving chemotherapy, with a marked effect on patients' QoL. Most studies have reported relatively high rates of moderate to severe fatigue 30%−60%, which may lead to treatment interruption **(Wright et al., 2019).**For patients undergoing chemotherapy, fatigue often worsens during treatment and declines again afterward. Furthermore, symptoms can persist over a long period after the completion of treatment **(Eylet al., 2020).**

Fatigue is a multifaceted, subjective condition. It can be described using a range of general characteristics (severity, negative sensations, and temporal features) and specific weaknesses (lack of energy, weakness, somnolence, difficulty in concentrating). Fatigue can be defined as a multidimensional phenomenon that evolves, compromising physical energy, mental capacity, and the patient's psychological condition with cancer. Management of fatigue focuses on symptom reduction or adherence to treatment programs (e.g., diet, sleep hygiene, or exercise) and is a part of the nursing intervention **(Moraes et al., 2020).**

It has been found that the QoL among cancer patients is significantly and negatively affected by the time the diagnosis of cancer is issued. A strong relationship between fatigue and poor QoL was observed in cancer patients (**Herscheet al., 2020**).Improving the QoL of cancer patients is expected to have significant benefits on their adaptation and motivation to continue receiving and completing chemotherapy with fewer side effects and increase their chances of being cured and surviving **(Montagnese et al., 2019).**

Fatigue associated with cancer probably has both physical and psychological causes. It is known that fatigue is the commonest side-effect of chemotherapy. As could be imagined, fatigue is correlated to the intensity of treatment and becomes a relevant toxic effect the more the treatment intensity is increased. This correlation could be predictive of the fatigue observed at some time after treatment. Managing fatigue requires a coordinated effort by all members of the health team including physicians, nurses, advanced practice nurses, social workers, physical therapists, cancer rehabilitation specialists, nutrition support teams, and mental health providers **(Noweet al., 2019).**

Nurses play anessential role in the management of fatigue in cancer patients undergoing chemotherapy. Some evidence-based nursing involvements are as follows :explain that fatigue can progress as a direct result of treatment; Recommend a diary of activities, fatigue severity, related feelings/symptoms and an evaluation of self-care activities; Grow an individualized plan for fatigue management; Notify patient and family that involvements such as energy protection, exercise, relaxation, psychosocial care and measures to enhance sleep quality and decrease concurrent symptoms must be effective in restrictive the severity of fatigue through chemotherapy; Explain energy conservation approaches and principles of cognitive-behavioral self-management to advance sleep quality; State the advantages of open communication between patient, family and care giving team to enable discussions on the experience of fatigue and its effects on daily life; Encourage attention reinstating activities such as contact to natural environments and pleasant distractions such as music; Deliver information about the importance of a balanced diet with suitable intake of fluid, calories (Tuominen et al., 2019).

Significant of study:

Cancer is a main life stressor that can disturb the physiological, psychological and physical state of the individual diagnosed. The cancer expedition can involve pain, weakness and fatigue, and can diminish functioning in relations of active daily living. The World Health Organization estimates that there were 24.5 million cases of newly-diagnosed cancer, and over 9.6 million deaths in 2017. The number of new cancer diagnoses is probable to increase in the next two decades by about 70% globally **(Fitzmaurice et al.,2019)**.

In Egypt, more than 134632 patients were diagnosed with cancer and number of deaths related to cancer 89042 in 2020 (**WHO, 2020**)

Cancer related fatigue is one of the most prevalent distressing cancers related to symptoms both during and after their treatment. It can impact on physical, emotional and cognitive function of the sufferers and it tends to worsen with the development of cancer and its treatment. Evidences were viewing that a patient with CRF has low QOL and deprived survival rate. It can also be a barrier to return to work for cancer fighters, so imposing an enormous burden on the family as well as in the community **(Islam, 2014)**.

METHODS

Aim: To measure the effect of fatigue management on the quality of life of cancer patients undergoing to chemotherapy

Hypothesis:

H^1: Fatigue management decreased fatigue levels among patients who undergoing to chemotherapy
H^2: Enhanced fatigue level had a positive effect on patients' quality of life

Research design:

Aquasi-experimental research design with a pre-post intervention assessment of the fatigue level and the QoL

Setting: The study was conducted in the chemotherapy outpatient of one of the Cancer hospitals in Cairo.

Sample Size: Based on Open Epi with 95% confidence interval, type 1 alpha error 0.05, type 2 (1-B error 80%), number of response distribution 50% the estimated sample size was110patients.

Participants*:* A purposive sample of patients who received chemotherapy in the designed cancer outpatient clinic at hospital was selected. The inclusion criteria were patients receiving chemotherapy in the outpatient and being aged>20 years

Tools of data collection:

An Arabic interview questionnaire was developed by the researchers after an extensive literature review. intended to measure the fatigue level and quality of life. It included four parts:

Part I: **Characteristics of the patient**: age, gender, education level, marital status, residence, and Job.

Part II: **Medical history**: the onset of cancer, history of surgical operation, type of cancer, and stage of cancer.

Part III: **The Revised Piper Fatigue Scale (PFS):**developed by **Piper et al., 1998**. consisting of 22 items and four subscales: behavioral/severity (6 items), affective meaning (5 items), sensory (5 items), and cognitive/mood (6 items).Each item scored from 1 to 10, with a high score meaning severe fatigue. Total fatigue was further categorized into mild fatigue if score <50%, moderate if score 50% to 70% and severe >70%.

Part IV:**SF-36 quality of life questionnaire: adapted from Zhu et al., 2016.** The SF-36 questionnaire consists of 36 items, which are used to calculate eight subscales: physical functioning (PF), role physical (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role emotional (RE), and mental health (MH). The first four scores can be summed up to create the physical composite score (PCS), while the last four will be summed to create the mental composite score (MCS). Scores for the SF-36 scales range between 0 and 100, with higher scores indicating a better HRQOL. Total quality of life is categorized as low-quality of life if the score is <50%, moderate if scores between 50% to 70%, and high-quality life >70%.

Pilot study:

A pilot study was conducted on a group of 11patients (10%). It was conducted before data collection to assess the feasibility and duration of data collection. No modification was carried out, therefore the participants in the pilot study were included in the study.

Validity: A group of five experts in community health nursing, adult health nursing and psychiatric nursing ascertained the content's validity; their opinions were elicited regarding the format, layout, consistency, accuracy, and relevancy of the tools.

Reliability: The adapted tools were tested for their reliability by using Cronbach's alpha coefficient test in SPSS program version 24 by a statistician. The Internal consistency reliability (Cronbach's α) for the fatigue scale is excellent (.0.924) and the quality of life is good (.0.878).

Study framework:

This study was carried out over six months from the beginning of March (2019) to September (2019).The researchers visited the outpatient chemotherapy at one of the cancer hospitals in Cairo, three times per week to collected the data during a face-to-face interview. The time needed for every patient was 30 minutes for filling the questionnaire sheet.

Preparation phase:

The participants were interviewed and given a brief summary of the study goal and significance. A structured interview questionnaire was created and administered to the sample at the start of the study (pre-intervention).

Implementation phase:

The researchers divided the study sample into ten groups each group including 11 patients. The researchers then provided a fatigue management program based on the needs of each patient.

The goal of the intervention was to teach patients about the causes of fatigue and give them measures for reducing its intensity, such as fatigue self-monitoring, energy dialogue, stress management, relaxing techniques, and control of variables that induce fatigue. During the educational session, visual and digital written resources were utilized. The intervention was supported by the distribution of an information flyer designed by the researchers. The study participants were given four sessions. The first session focused on evaluating cancer-related fatigue and quality of life and the aim of the study. The second session included an overview of cancer-related fatigue (causes, duration, complication). The third session included fatigue management techniques such as light rest, short naps or rest breaks**,** avoiding exercising too late in the evening, regular moderate exercise – especially walking, Nutritional education, mindfulness-based stress reduction, Exercise, yoga, massage technique, based on the needs of the patient.

Evaluation phase:

A post-intervention assessment was utilized after month of intervention to determine the effect of fatigue management on the quality of life of patient sunder going to chemotherapy.

Ethical Consideration:

Approval obtained from ethical committee of the faculty of nursing, Badr university in Cairo. Also, official permission from selected setting.

Consent was obtained from each patient before participation and the participants were informed of their right to refuse or withdraw from the study at any time and given information about the purpose of the study and the time of completion of the study. In addition, participants who agreed to participate in the study were assured that all information obtained would be kept confidential and there were no personal identifiers in the questionnaire.

Data Analysis

All data obtained were collected and analyzed with SPPS version 24 software. Descriptive statistics and confidence intervals were used to analyses participant characteristics, demographics and prevalence of needs. Statistical characteristics of continuous variables were presented in the form of arithmetic means, standard deviations, and medians. Statistical characteristics of step and qualitative variables were presented in the form of numerical and percentage distributions. Cronbach's α composite scales and the subscales were used to assess internal consistency. The relations between unmet needs and quality of life were analyzed using linear regression. The correlations were determined using the Pearson test, while $\chi 2$ was used for the comparison between the groups. Significance was assessed at the level of $p < 0.05$ and $P<0.01$. Missing data were excluded from all analyses.

Findings:

As shown in table (1), this study is conducted on 110patients. Regarding their characteristics, the patients age between 20-71 years with mean value (±SD) of age is 39.6±4.79years old. More than half of them (50.9%) are females. As regard their educational level, more than one third of them (34.5%) have secondary education. Nearly two thirds of them (60.9%) are from urban area. In addition, their marital status, almost three quarters of them (73.6%) are married. Also, 70% of them are working.

The medical history of the studied patient in Table (2) shows that the onset of cancer (months) of almost three-quarters is≤ 6 months (73.6%). The majority (95.4%) did not have a surgical history. (30.9%) had breast cancer, and1.8% had bladder cancer. (80%) being in the 3^{rd} stage.

Table (3) illustrates the levels of fatiguepre and post-intervention of fatigue management among studied patient. There was improvement of patient after received intervention of fatigue management with highly statistically significant difference p<0.01**. behavioral/severity had higher mean pre intervention (46.73±4.50),and decreased after intervention (19.52±3.97)

Regards effective meaning, has mean pre intervention was (39.80±3.90) and post intervention (17.31±2.64) as regard to sensory has mean pre intervention (40.11±5.60) and post intervention (20.07 ± 4.61). In addition to cognitive/mood, has mean pre intervention (44.80±7.24) and post intervention (21.67 ± 4.70). A highly statistically significant difference (Chi-square=8.026, p<0.01**) was observed between pre and post-intervention for all studied characteristic.

Table (4) compared the quality of life pre and post-intervention among the studied samples. It shows a statistically significant difference between pre and post-intervention for Physical functioning(Chi-square=4.908, p<0.05*) and a highly statistically significant difference (p<0.01**) between pre and post-intervention in all the studied characteristics.

Figure (1) represents the total quality of life pre and post-intervention fatigue management. Almost two third of the studied patients (61.80%) have low pre-intervention QoL while about one-quarter (25.50%) have low post-intervention QoL.

Figure (2) shows total fatigue pre and post-intervention of the studied patients. It reveals that nearly half (41.80%) have severe fatigue pre-intervention while 10.90% have severe fatigue post-intervention.

As shown in table (5), highly statistically significant negative correlations exist between Fatigue level and Quality life pre-intervention(r=-.657, p=0.01**), and so between Fatigue level and Quality life post-intervention(r=-.599, p=0.01**)

DISCUSSION

Patients with cancer commonly report a lack of energy during their disease and treatment. Fatigue might be caused by the disease itself, antineoplastic therapy, or a variety of physical and mental co morbidities. Fatigue is multimodal, with different levels of perceived energy, mental capacity, and psychological health. It can make it difficult to function daily, affecting one's quality of life, self-care abilities, and willingness to continue therapy. In some cancer patients with stable illness who are having chemotherapy, fatigue is the most significant impediment to functional recovery **(Hemanth et al., 2017).**

The current study demonstrated that the mean age of studied patients was 39.6±4.79 years. More than half were females with, more than one-third having secondary education and nearly two-thirds were from urban areas. In addition, almost three-quarters were married. These results are supported by the study conducted on 362 patients undergoing chemotherapy by **O'Regan et al., 2019** who reported that less than two-thirds of patients were female, and less than three-quarters were married. Also, **Goudarzian et al., 2019**performed a study on 380 Iranian cancer patients and stated that more than half were female, more than one third had diploma education and the majority were married

According, to a medical history the onset of cancer (months) of almost three-quarters of was ≤ 6 months. The majority did not have a history of surgical operation. In addition, almost one-third of them suffered from breast cancer, while 1.8% had a bladder cancermost of them being in the 3rd stage.These results agree with the study by **Herrmann et al., 2018**cross-sectional survey using a discrete choice design of 159 adult medical oncology patients stated that half of the sample suffered from breast cancer, and aminority from lung cancer. While, it contradicts findings of **Almohammadi, et al. 2020**who useda quantitative non experimental approach on 30 cancer patients and found that most of studied patients were not exposed to surgery.

Regarding the fatigue level among patients, the current study reveals that near half of them have severe fatigue pre-intervention while more than one-third had mild fatigue post-intervention with a highly statistically significant difference (Chi-square=8.026, p<0.01**) between pre and post-intervention as regard all features studied. These results may be due to effective educational programs prepared by researches dependent on patients' needs at the pre-intervention stage. These results cohort with **Qi et al., 2020** who found that music interventions can be considered an alternative therapy for relieving fatigue in cancer patients who are undergoing active treatment or have completed treatment. In addition, **Jhambet al., 2019** concluded this meta-analysis highlights the importance of developing optimal monitoring strategies to reduce fatigue and improve the quality of life of patients with cancer. **Van Vulpen et al., 2020** conduct an intervention study and reported that exercise interventions had statistically significant beneficial effects on fatigue (β= −0.17 [95% confidence interval (CI) −0.22; −0.12]).**Jiang et al.,2020** revealed that aerobic and resistance exercise can be regarded as beneficial to CRF in breast cancer patients, and limited evidence exists that yoga affected reducing fatigue.

According to quality of life, our study represents that almost two-thirds of the studied patients (61.80%) had low quality of life pre-intervention while about one-quarter of them (25.50%) have low post-intervention. Furthermore, there was a highly significant improvement in patients' quality of life post fatigue management at a p-value<0.01**.These results attributed to different ways of fatigue management learned from the patients as fatigue self-monitoring, energy dialogue, stress management, relaxing techniques, and control of variables that induce fatigue. These results are similar to **Dikmen &Terzioglu, 2019** who detected that Reflexology and PMR exercises given to gynecologic cancer patients during chemotherapy were found to decrease pain and fatigue and increase QoL. Likewise, **Herschelet al., 2021** detected that Fatigue self-management education had a positive effect on patient quality of life. Meanwhile, **Xu et al., 2019** detected that e-health based self-management is effective for cancer-related fatigue and self-efficacy, but not the quality of life.

Furthermore, there were highly statistically significant negative correlations that exist between Fatigue level quality type of life preintervention at p-value<0.01**. These results regular to **Akin and Kas Guner (2018)** found an association between higher self-efficacy beliefs and lower fatigue which authors noted can positively influence an individual's quality of life during chemotherapy. **Inglis et al., 2019** reported that breast cancer patients experience significant fatigue and anxiety up to six months post-chemotherapy which is associated with worse quality of life.

CONCLUSION

This study highlights that there was high significant improvement at patients' quality life post fatigue management. Also, fatigue management improve patents' fatigue level with significant difference pre and post intervention fatigue management. Finally, there was highly statistically significant negative correlations exist between Fatigue level and Quality life pre intervention at p value <0.01**.

RECOMMENDATION

Further trials are justified to enhance the understanding benefits of fatigue management for cancer patients. Educational programs about fatigue management should be routinely incorporated in future training to ensure improved nurses' knowledge that enhances care provided to patients. Further study to assess predictors that may worsen fatigue levels among patients related to chemotherapy.

All patients with cancer should be educated about CRF so that they can recognize and anticipate fatigue patterns. Cancer-related fatigue has been highlighted as being a common occurrence in patients receiving chemotherapy; it is, therefore, necessary to use an assessment tool that can detect accurate and varying levels of CRF, whilst also demonstrating noteworthy changes over time.

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Conflicts of Interest

There are no affiliations that may result in a conflict of interest. Implementation of this research was from own funds; no organization's subsidy

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RESULTS

Table (1): Distribution of studied patients according to their characteristics (n=110)

Items	**N**	**%**
Age:		
20 - <30	20	18.2
30 - <40	19	17.3
40 – 50	71	64.5
Mean SD	39.6±4.79	
Gender		
Male	54	49.1
Female	56	50.9
Educational level:		
None	10	9.1
Read and write	13	11.8
Preparatory school	20	18.2
Secondary school	38	34.5
University	29	26.4
Residence		
Rural	43	39.1
Urban	67	60.9
Marital status		
Married	81	73.6
Not married	29	26.4
Job		
Work	77	70
Without work	33	30

Table (2): Distribution of studied patients according to their medical history(n=110)

Variables	**n**	**%**
Onset of cancer (months):		
<6	29	26.4
≥6	81	73.6
History of surgical operation:		
No	105	95.4
Yes	5	4.6
Type of cancer:		
Breast cancer	34	30.9
Colon cancer	19	17.3
Lung cancer	18	16.4
Cancer of lymph nodes	20	18.2
Gastro-intestinal cancer	15	13.6
Bladder cancer	2	1.8
Cervical cancer	2	1.8
Stage of cancer:		
2nd stage	17	15.5
3rd stage	88	80
4th stage	5	4.5

Table (3): Distribution of studied patients according to their fatigue level pre and post-intervention(n=110)

	Pre (n=110)		**Post (n=110)**		**P value**
	n	**%**	**n**	**%**	
Behavioral/severity	Mean SD 46.73±4.50		Mean SD 19.52±3.97		T 9.114 <0.01**
Mild Moderate Severe	7 64 39	6.4 58.2 35.4	37 59 14	33.6 53.7 12.7	Chi-square 7.066 <0.01**
Affective meaning	Mean SD 39.80±3.90		Mean SD 17.31±2.64		T 10.500 <0.01**
Mild Moderate Severe	13 62 35	11.8 56.4 31.8	40 58 12	36.4 52.7 10.9	Chi-square 8.002 <0.01**
Sensory	Mean SD 40.11±5.60		Mean SD 20.07 ± 4.61		T 9.908 <0.01**
Mild Moderate Severe	9 61 40	8.2 55.4 36.4	41 59 10	37.3 53.6 9.1	Chi-square 7.999 <0.01**
Cognitive/mood	Mean SD 44.80±7.24		Mean SD 21.67 ± 4.70		T 10.102 <0.01**
Mild Moderate Severe	10 51 49	9.1 46.4 44.5	39 54 17	35.4 49.1 15.5	Chi-square 6.548 <0.01**
Total	Mean SD 171.44 ± 26.90		Mean SD 98.09 ±11.08		T 14.666 <0.01**
Mild Moderate Severe	11 53 46	10 48.2 41.8	43 55 12	39.1 50 10.9	Chi-square 8.026 <0.01**

Slight significant <0.05 **high significant if p value <0.01**

Table (4): Distribution of studied patients according to their quality of life pre and post-intervention(n=110)

	Pre (n=110)		**Post (n=110)**		**P value**
	N	**%**	**N**	**%**	
Physical functioning	90.13 ± 8.90		83.01 ± 7.60		T 3.992 <0.05*
High	24	21.8	45	40.9	Chi-square
Moderate	29	26.4	45	40.9	4.908
Low	57	51.8	20	18.2	<0.05*
Role physical	80.2±7.85		65.4 ± 6.39		T 6.801 <0.01**
High	22	20	42	38.2	Chi-square
Moderate	28	25.5	38	34.5	7.111
Low	60	54.5	30	27.3	<0.01**
Bodily pain	85.1±6.99		76.1 ± 5.01		T 7.221 <0.01**
High	10	9.1	39	35.5	Chi-square
Moderate	30	27.3	37	33.6	6.234
Low	70	63.6	34	30.9	<0.01**
General health	66.89±6.27		55.32 ± 4.37		T 7.001 <0.01**
High	12	10.9	40	36.4	Chi-square
Moderate	29	26.4	43	39.1	6.500
Low	69	62.7	27	24.5	<0.01**
Vitality	58.70 ± 5.00		51.09 ± 4.72		T 6.999 <0.01**
High	13	11.8	42	38.2	Chi-square
Moderate	31	28.2	38	34.5	7.222
Low	66	60	30	27.3	<0.01**
Social functioning	78.5 ± 7.10		66.4 ± 5.8		T 6.000 <0.01**
High	11	10	47	42.8	Chi-square
Moderate	26	23.6	38	34.5	5.907
Low	73	66.4	25	22.7	<0.01**
Role emotional	68.09 ± 6.54		52.05 ± 5.23		T 5.887 <0.01**
High	9	8.2	45	40.9	Chi-square
Moderate	33	30	42	38.2	6.133
Low	68	61.8	23	20.9	<0.01**
Mental health	64.7 ± 5.09		57.4 ± 6.66		T 6.714 <0.01**
High	13	11.8	46	41.8	Chi-square
Moderate	28	25.4	35	31.8	5.100
Low	69	62.7	29	26.4	<0.01**
Total	592.3 ± 89.3		506.7 ± 60.7		T 9.624 <0.01**
High	12	10.9	47	42.7	Chi-square
Moderate	30	27.3	35	31.8	8.005
Low	68	61.8	28	25.5	<0.01**

Slight significant <0.05 **high significant if p value <0.01**

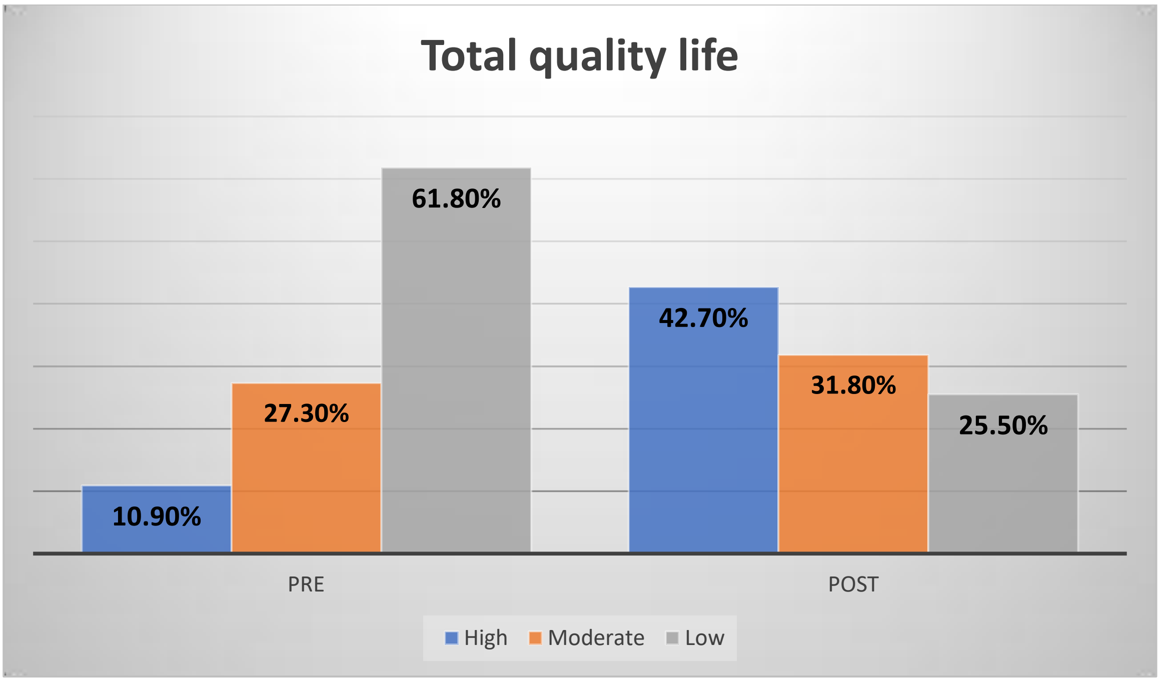

Figure (1) Distribution of studied patients according to their total quality of life pre and post-intervention(n=110)

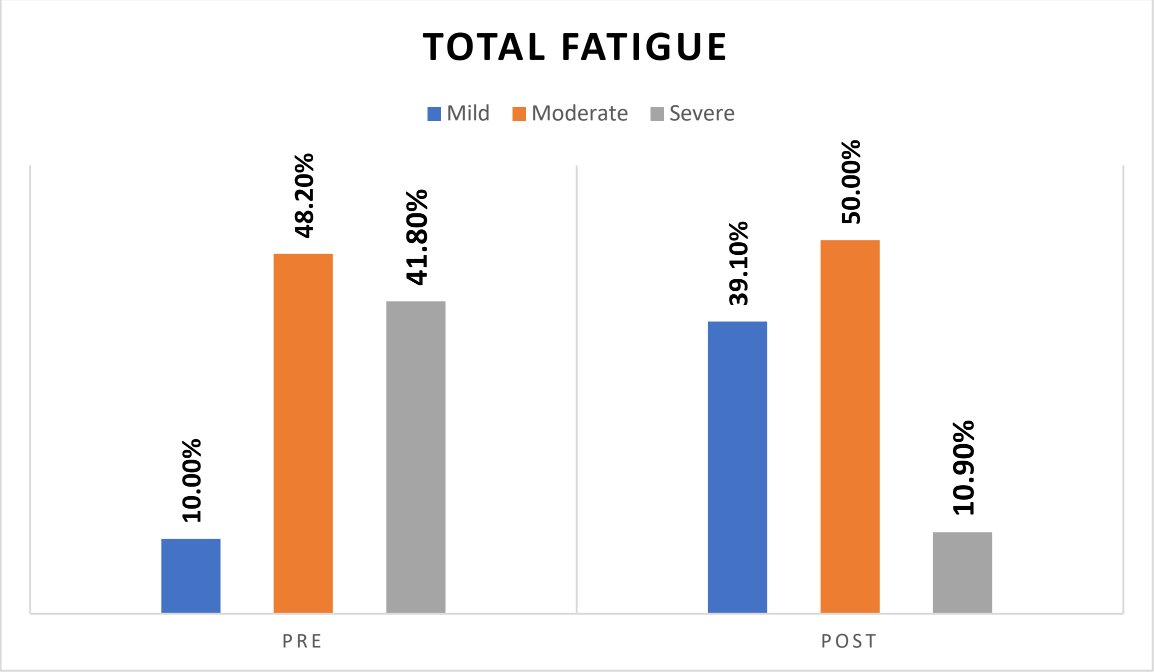

Figure (2) Distribution of studied patients according to their total fatigue pre and post-intervention(n=110)

Table (5) Correlations between studied variables.

	r.	p. value
Fatigue level and Quality of life pre-intervention	-.657	<0.01**
Fatigue level and Quality of lifepost-intervention	-.599	<0.01**

Slight significant <0.05 **high significant if p value <0.01**