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Effects of Walking Exercise Program on Chemotherapy Induced Fatigue, Physical Functional Status, and Symptoms Distress Among Cancer Patients

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Abstract : *Numerous studies declared that exercise (including slight- to moderate-intensity walking exercise) has potential profits for people with cancer.*
The aim *of this study was to examine the effect of walking exercise program on chemotherapy induced fatigue, physical functional status, and symptoms distress among cancer patients.*
Methodology; *A quasi experimental design, pre and post intervention was used. A convenience sample of fifty eight cancer patients undergoing chemotherapy were randomly assigned to either control group (no 28), which received ordinary ward care or to a study group (no 30), which received walking exercise for 12-minutes per day, 5 days /week for 3 sequential weeks. Effects of the proposed walking exercise were assessed by four parameters; fatigue intensity, fatigue interference as measured by Brief Fatigue Inventory, physical functional status as measured with walking distance in twelve minute, and symptom distress, that measured by Symptom Distress Scale. Data were collected four times: before (baseline or day 1), day 7, day 14, and day twenty one of intervention.*
The results *showed that, patients in the three-week WEP group had a significantly reduction in fatigue intensity and fatigue interference, significantly increase the space walked in twelve -minute, and reduction in symptom distress than the participants in control group.*
Conclusion*; initial results suggest that the walking exercise program was socially accepted and successfully reduce fatigue, improve physical functional status, and reduce symptoms distress among cancer patients undergoing chemotherapy. Nurses should recognize that physical activity is also an efficient intervention for managing several dimensional symptoms in cancer patients receiving therapy.*
Keywords: *chemotherapy, fatigue, physical functional status, symptoms distress, walking exercise*

I. Introduction

Cancer is that the second most communal reason of death in industrial countries. Within the forthcoming eras, it's anticipated to become the primary reason of morbidity and mortality through the planet. It's a big ill health in several developing countries as a result of quite a half of the new cancer cases within the world occur in developing countries. Cancer Research Kingdom, (2015)[(1)] reported that an estimated 14.1 million new cases of cancer occurred worldwide in 2012 and more than 4 in ten cancers occurring worldwide are in developing countries. Incidence rate of cancer in Egypt was 166.6/100,000 and by 2050, a three-fold rise in occurrence of cancer in relation to 2013 was estimated [(2)]. Current developments in diagnosis and treatment of cancer patients have led to enhanced survival rates [(3)]. However, those are frequently accompanying with persistent physical and psychosocial complaints [(4)].

Physical complaints include reduced muscle strength, decreased lean body mass, decreased cardiorespiratory capability, lowered bone mass and tiredness [(5)]. Symptoms as a consequence of malignancy disease and its treatment are both prevalent and persistent regardless malignancy disorders, illness stage or treatment provided [(6-7)]. Symptoms such as fatigue and pain represent two of the greatest communal symptoms existing among individuals undergoing cancer treatment [(8-9)]**.** In spite of advances in pain management, pain still a common persistent symptom among persons with cancer. Estimates of pain incidence in cancer patient ranged from 14% to 100 % [(6)].

Approximately 70% to 90% of oncology patients suffer from fatigue during chemotherapy, and sometimes years after finishing the treatment, fatigue is considered a main problem for at least 30% of cancer survivors [(10-12)]. Generally, fatigue is a universal symptom that occurs in healthy individuals and persons with acute or chronic illness. In healthy persons, fatigue is a normal protective mechanism that helps maintain physical and psychological equilibrium and is easily relieved by rest; whereas, fatigue in cancer patients is more difficult to just treated by rest [(13)]. The National Comprehensive Cancer Network (NCCN), 2012 [(14)], outlined Cancer-related fatigue (CRF) as an overall lack of energy, intellectual impairment, somnolence, mood

disturbance, or muscle weakness .These symptoms occur with cancer and cancer therapy and aren't eased by rest or further sleep and infrequently interfere with daily activities [(15)].

CRF that accompanying with therapy has been connected with extra symptoms, including ache, trouble sleeping and muscle weakness [(16)]. It may act together with other common adversarial effects of therapy, such as nausea and vomiting, by aggregate their perceived severity [(17)]. Also depression and anxiety, may add to the progress of chronic CRF before and after therapy between patients having hard tumors [(18)]. Suffering fatigue leads in escaping of activities to relieve discomfort. Nevertheless, this leads to a vicious circle state of inactivity causing physical unfitness, poor muscle strength and accordingly easily fatigability and extra physical inactivity [(5)].

Patients reported that CRF is so stressful and has a countless influence on their quality of life than other symptoms associated with cancer such as pain, depression, and nausea [(19)]. It affects the capacity to work, walk little spaces, be friendly and fulfill the families' requirements. Additionally, CRF disturbs cancer management because it might hinder the scheduling or accomplishment of treatment programs as fatigue is a dose-limiting, adverse effect or because it diminishes the patient's enthusiasm to obey to therapy recommendations [(19)].

Symptom distress is a personal experience threat patient with cancer. The significance of symptom distress is that it is related to different aspects of health and illness (i.e., treatment tolerance, quality of life, and survival) among cancer patients [(20)]. A recent analysis of the research literature shown that symptom distress refers to "the degree of physical or mental suffering, discomfort, or bother reported by individuals in relation to their perceptions of the symptom" [(21)]. It is an individual's perception that regulates the beginning, continuation, and termination of the actions to relieve, decrease, or prevents a single symptom or multiple symptoms experienced concurrently. Also, symptom distress is a major indicator in appraising symptom status as an outcome of symptom management [(21)].

Numerous studies declared that exercise (including light- to moderate-intensity walking exercise) has potential profits for people with cancer. The benefits shown in those studies and detected in clinical locations include enhanced physical vitality, improved appetite, and improved functional ability, with improvements in quality of life and in several features of psychologic state (e.g., enhanced outlook and sense of well-being, improved sense of guarantee, and the capacity to meet the challenges of cancer and its treatment) [(22-24)]. In addition, there are others several research studies describing the positive effects of exercise training in terms of cardiorespiratory endurance [(25)]; increased number of natural killer cells [(26)] preserved muscle mass; and better weight control [(27)]. Hoffman, (2006) [(28)], reported that when designing an exercise program for patients with cancer, the first concern is patient safety. A simple and culturally oriented exercise program should encourage participation. A walking-based exercise is an aerobic type of moderate physical activity that can work as an accepted choice because it relates to all activities of daily living that patients with cancer do during and after cancer therapy [(28)].

II. Significant Of Study

Traditionally in our culture ill persons are supposed to lack vitality and health is supposed to be most securely conserved by rest; consequently, exercise is usually not recommended for patients undertaking treatment. A socially acceptable and easily applied program, such as walking, may be benefit in decreasing fatigue associated with antineoplastic agent, symptom distress and help in improving physical function status for Egyptian cancer patients. The majority of studies on walking intervention use a treadmill as standard training equipment. In Egypt, the use of treadmill exercises is not a common form of therapy because of decreased access to exercise facilities. So the researchers decided to investigate the effect of supervised, on-site walking exercise on cancer patients taking chemotherapy.

III. Methodology

Aim;

This study amid to investigate the effect of walking exercise program (WEP) on chemotherapy induced fatigue, physical functional status, and symptoms distress among cancer patients.

Research hypotheses;

1. Patient in study group who will perform walking exercise will report less fatigue intensity and interference as measured by BFI scale when compared with patients in control group
2. Patient in study group who will perform walking exercise will show better physical functional status as measured with walking distance in twelve minutes (meters) when compared with patients in control group
3. Patient in study group who will perform walking exercise will report less symptom distress as measured by symptoms distress scale when compared with patients in control group

Research Design;

Pre and post intervention, quasi experimental research design was used.

Setting;

The current study was done in inpatients departments of Mansoura oncology center. It is affiliated to Mansoura University Medical centers and accepts patients with different types of cancer from Dakahlia Governorate and additionally nearby governorates.

Participants;

A fifty eight cancer patients undertaking chemotherapy was selected from target subject fulfilling the inclusion criteria and welcoming to participate in the study. They allocated randomly via simple random selection method into two groups, control and study group. Inclusion criteria were adult cancer patients (>18 years of age), undertaking chemotherapy, in a moderately functional state as rated by a score of 0-3 on the Eastern Cooperative Oncology Grouped Performance Status scale (ECOG-PS), [(29)] plus agree to participate in the study. The study excluded patients with previous history of cardiac disease or diabetes, anemia; dyspnoea; severe bone pain and metastasis.

Data collection;

The following tools were used in collection of data

1. Patients' demographic and medical data sheet, which collect data related to age, marital status, diagnosis, hemoglobin level, and performance standing as rated with the ECOG-PS, were assessed. This scale is largely applied to measure functional standing among oncology patients' [(29)]. Patient's replies to the ECOGPS ranged from 0 (fully active) to 5 (death), founded on self-care capacity and on the quantity of waking hours to the time of bed rest.
2. Fatigue was measured by Brief Fatigue Inventory (BFI) [(30)]. It is self-reported instrument consisted of nine items, three items measure fatigue intensity (fatigue at the moment, average fatigue intensity, and most awful fatigue level) and six items measure fatigue interference with everyday life in previous week. Reply for each item is rated on a ten-point measure, with 0 equivalents to no fatigue (or no interfering) at all and 10 equivalents to the most awful fatigue (or interfering) patient could see. The higher the total score, the more fatigue (intensity/ interfering) client suffer. This scale has been confirmed as suitable to be used among oncology client. The present research used the mean score of the three items of fatigue intensity subscale to point to fatigue intensity and the mean score of six items of fatigue interfering subscale used to denote influence of fatigue on daily lives of the patients '. The reliability of fatigue scale for the current study was evaluated by using test retest reliability on ten patients and Pearson correlation was 0.87
3. Physical Functional Status was measured by walking distance in twelve minutes (meters) which used as a pointer for variations in physical function in client with cancer [(31-32)].
4. Symptom Distress; is defined as the degree of discomfort reported by patients receiving chemotherapy. Supposed suffering was evaluated with Symptom Distress Scale [(33)], it includes 13- items. It is a self-administered tool used five points Likert scale, through 1 equal to no distress and 5 equal to severe distress. The reliability of the SDS for this study was evaluated by using test retest reliability on ten patients and Pearson correlation was 0.85.

Ethical considerations:

The researchers obtained the required permissions from the Research Ethics Committee of Nursing College, Mansoura University. Official written approval for study conduction was attained from the hospital authority. Verbal explanation of the study nature and objective were reported to all research participants and informed approval was attained from each applicant. All patients were informed about their rights to agree or disagree to participate in the study and they were permitted to leave from the research at any point of time and this will not affect their care.

Procedures;

- Subjects were enrolled from an inpatient oncology wards at Oncology Center in Mansoura University Hospital.
- The current study used a pre and post intervention, quasi experimental research design to investigate the effects of planned walking exercise on patients with cancer undertaking chemotherapy. Sixty appropriate patients approached, fifty eight accept to share. The participants were allocated randomly to whichever study group which established the walking exercise intervention or a control group that received routine hospital care.
- The researchers developed the walking exercise intervention grounded on the rate of recurrence, length, and power of activity recommended by the American College of Sports Medicine [(34)] and review of literatures [(35-36)].

- Walking exercise intervention involved walking for 12 minutes in the hospital halls on 5 days each week. Staff nurse go with patients to follow the program and ensure patient safety. Patients were asked to walk at a speed as fast as he can tolerate. There were no adverse harms related to walking exercise intervention reported by study group.
- Outcome of walking exercise intervention was appraised with mean score of fatigue intensity, fatigue interference (with everyday life), the space walked in twelve -minute, and overall symptom distress. These measures were collected four times over the three weeks of walking exercise: day 1 before intervention (baseline), day 7 after starting walking intervention, day 14 (second week), and day 21 (third week) of walking exercises intervention. Data were collected from both study and control group at the same four time points.
- The BFI and SDS were back translated then introduced to ten faculties to verify the content validity of the translated versions of the instruments.
- At the first meeting with participants, all demographic and baseline data in both groups were collected.
- A pilot study was carried out on five cancer patients to test the simplicity and feasibility of the tools. Pilot subjects were later involved in the study as there was no essential adjustments.
- Data were collected from both study and control group at the same four points of times (day 1 (baseline-before starting walking intervention), day 7, day14, and day 21 after starting walking intervention).

Statistical analysis;

Data were analyzed using Statistical Package for the Social Sciences (SPSS) Version 16. Qualitative variables were presented as number and percentage. Quantitative variables were presented as mean ± SD. To check the difference between two groups independent t-test was used. $P \leq .05$ was considered statistically significant.

IV. Results

Table (1) Demographic and medical Characteristics' of the study participants

Items	Study G (n= 30)		Control G (n=28)		
	No	%	No	%	P
Age M ± SD	36.7 ±8.74		37.7±10.98		0.699
Hb level M ± SD	11.14 ±.802		10.8 ±.868		0.517
Marital Status					
Single	5	16.7	5	17.9	.352
Married	25	83.3	23	82.1	
Sex					
Male	14	46.7	13	46.4	.597
Female	16	53.3	15	53.6	
Education level					
Illiterate	0	0	3	10.7	.067
Secondary	16	53.3	18	64.3	
University	14	46.7	7	25	
Job					
Official	16	53.3	12	42.9	.051
Manual	14	46.7	16	57.1	
Residence					
Rural	14	46.7	14	50	.308
Urban	16	53.3	14	50	
Income					
Low	2	6.7	4	14.3	.056
Moderate	24	80	21	75	
High	4	13.3	3	10.7	
Diagnosis					
Colon Can	10	33.3	10	35.7	.082
Breast Can	4	13.3	5	17.9	
Lymphoma	2	6.7	5	17.9	
Others	14	46.7	8	28.6	

Table (1) shows the demographic and medical characteristics' of subjects in the both study and control group, which were not significantly dissimilar; this means that the participants were selected from identical population of cancer clients undergoing chemotherapy. Generally, participants in the two groups had similar age allocations; means were 36.7 ±8.74 and 37.7±10.98 years for study and control group respectively. More than half of the participants in both groups 53.3% and 53.6% respectively were female. Concerning educational level 53.3% in the study group and 64.3% in the control group were in secondary school. Also more than half (57.1%) of participants in the control group had manual work while 53.3% of the study group had official work. The majority of participants (80% and 75% respectively) were moderately income in both groups. In relation to diagnosis about third of participant (33.3 % and 35.7% respectively) in both groups were cancer colon.

Table (2): Comparing outcome measurements between study (n=30) and control (n=28) group in the first day (before intervention)

Outcome Measurements	Study group M ± SD	Control group M ± SD	t-test	p-value
Fatigue intensity	3.2±.653	2.9±.813	2.926	.046
Fatigue interference	3.4±.598	2.98±.722	3.601	.012
Symptoms distress	2.53±.301	2.12±.476	2.356	.042
the space walked in twelve -minute (m)	250±171	300±182.3	3.66	.009

Table (2) shows that the mean score of fatigue intensity and fatigue interference were statistically significantly higher in study compared to control group in the first day (before intervention) p values were .046 and .012 respectively. Also in relation to anxiety level, depression, and symptoms distress mean scores before intervention were statistically significantly higher in study compared to control group (p= .031, .001, .042 respectively). While the space walked in twelve - minutes was significantly lower among study group compared with control before intervention (p=.009).

Table (3): Comparing outcome measurements between study (n=30) and control (n=28) group in the 7th day after intervention

Outcome Measurements	Study group M ± SD	Control group M ± SD	t-test	P value
Fatigue intensity	4.2±1. 26	5.5±1.3	5.24	.024
Fatigue interference	4.26±.839	4.70± .866	4.99	.015
Symptoms distress	1.33±.479	1.90 ±.305	5.46	.001
the space walked in twelve -minute (m)	350±170	280 ±180	4.37	.043

It is clear from **table (3)** that there was an increase in the mean score of fatigue intensity and fatigue interference at the 7th day after 12- minute walking intervention among study and control group but there was no significant difference between them (p= .109 & .106 respectively). Also in relation to anxiety level, depression, and symptoms distress mean scores at the 7th day after 12- minute walking intervention there were no statistically significantly differences between study and control groups (p= .072, .078, .061 respectively). In relation to the mean score of the space walked in twelve - minutes was slightly lower among control group (289±172.3) compared with study group (303±171) but this difference not statistically significant (p=.059)

Table (4): Comparing outcome measurements between study (n=30) and control (n=28) group in the 14th day after intervention

Outcome Measurements	Study groupM ± SD	Control groupM ± SD	t-test	p-value
Fatigue intensity	4.18±1.432	4.39±1.923	4.426	.109
Fatigue interference	4.28±.998	4.48±1.122	3.648	.106
Symptoms distress	1.53±.301	1.91±.576	7.607	.061
the space walked in twelve -minute (m)	303±171	289±172.3	3.66	0.059

Table (4) showed a continuous increase in the mean scores of fatigue intensity and fatigue interference among control group at the 14th day after intervention and it were statistically significant higher than study group (p=.024 & .015 respectively). However, anxiety level, depression, and symptoms distress mean scores at the 14th day after 12- minute walking intervention were statistically significant higher among control group than among study group (p= .047, .021, .001 respectively). In relation to the mean score of the space walked in twelve - minutes was significantly lower among control group (280 ±180) compared with study group (350±170) (p=.043) at the 14th day of establishing walking program.

Table (5): Comparing outcome measurements between study (n=30) and control (n=28) group in the 21th day after intervention

Outcome Measurements	Study groupM ± SD	Control groupM ± SD	t test	P value
Fatigue intensity	4.4 ±.968	5.64 ±.807	4.34	.010
Fatigue interference	3.8 ±.626	5.2±1.628	4.52	.022
Symptoms distress	1.63±.479	1.96 ±.305	4.46	.021
the space walked in twelve -minute (m)	365 ±166	270 ±161.3	6.90	.033

Table (5) shows a continuous increasing in the mean scores of fatigue intensity and fatigue interference among control group and it were statistically significant higher than study group (p=.010 & .022 respectively) at the 21th day after intervention while anxiety level not significantly differed between study and control groups (.057). In relation to depression, and symptoms distress mean scores at the 21th day after 12- minute walking intervention were statistically significant higher among control group than among study group (p=.041, .021 respectively). In addition, the mean score of the space walked in twelve - minutes was significantly lower

among control group (270 ±161.3) compared with study group (365 ±166) (p=.033) at the 21th day of establishing walking program.

V. Discussion

Apparent progresses in cancer patients' survival highpoint the necessity to preserve their quality of life as high as possible [37]. Although for many years survival was the main concern in treatment choice, increasing importance is given to patient quality of life and complementary treatments are used to maximize the raise of physical wellness with meeting holistic and psychosocial needs [38-39]. Physical activities has become the foundation of this attitude in several disorders [40], and it is believable that it may help alleviate some of the hostile effects of therapy in cancer: reducing fatigue, enhancing cardiorespiratory fitness and physical condition, and support the immune system, and composed with these, improving quality of life [37, 40-42].

The current study tries to create an imperative input to our understanding of the beneficial effects of exercise in patients with cancer and offer logical proof on the efficacy of exercise during chemotherapy. The purpose of this study was to examine the effects of walking exercise program (WEP) on fatigue experience, physical functional status, and symptoms distress among cancer patients receiving chemotherapy. This initial investigation presents promising results regarding the efficacy of walking intervention for the improvement of cancer related fatigue, physical functional status, and symptoms distress among cancer patients.

As regard to the background features of subjects in both groups were not significantly dissimilar, this means that they were pinched from homogenous population of cancer patients. While fatigue intensity and fatigue interference were significantly higher among study group than control group at the beginning but with successive weeks it were continuously increased among control group and were significantly higher than among study group. Those finding prove the first research hypothesis which stated that, patient in experimental group who will perform walking exercise will experience less fatigue intensity and interference as measured by BFI scale when compared with patients in control group. Those findings were supported with findings of certain researches which have found that oncology clients who were active and perform exercise during the treatment phase enhances their practical capability and suffer less emotional distress and fatigue [43-46].

Also those findings were supported with the findings of Puetz and Herring (2012) [47] in their meta-analysis of difference effects of exercise on fatigue related to cancer through and after treatment, they found that exercise decreases cancer-related fatigue between patients through and after cancer therapy. These effects are weakened differentially over the treatment course and recovery. Also exercise has a soothing effect in patients during treatment and a restorative effect post-treatment. Another study done on breast cancer survivors who were, on average, 6 months post diagnosis found that, increased physical activity was consistently related to improved physical functioning, reduced fatigue and bodily pain, and the patients were better able to pursue daily activities [32]. In contrast, Braam, van der Torre, Takken, Veening, and et al. (2013) [48], find in their reviewing article that the level of daily activity, health-related quality of life, fatigue, and adverse events no statistically significant differ between the intervention and control group.

In relation to physical functional status which measured with the space walked in twelve - minutes was significantly improved among patients in study group through 3 weeks while participants in control group decreased their walking space. These results powerfully propose that the 12m – walking exercise intervention is actual preserve cancer patients' vitality during therapy and improve their performance capabilities. This revealed through increased walked distance in relation to baseline, this prove that patients' physical functional capabilities can be enhanced by a short-term daily walking program, simply twelve minutes per day, but continuous for three weeks. So, the second research hypothesis has been proved and the suggestions that ''daily energy outflow is the top indicator for physical capability'' [49] and that exercise can decrease fatigue through ''regulation of physical efficacy and act.''[50]. Moreover, our results encounter customary opinions about disease and recovery by giving proof that a short-term, slight, and regular walking exercise intervention can meaningfully improve cancer-related fatigue and also rise clients' vigor. It also was efficient in reducing patients' suffering from further symptoms. Those findings may be promptly clarified with the conception of symptom grouping. Symptoms which frequently band with fatigue are pain, disturbance of sleep, and depression [51-52]. This means that interferences to decline fatigue should have a significant influence on lessening symptoms that band with fatigue.

Study findings supported with Chang, Lai, Shun, Lin, et al (2008)[36] who examine the effects of a three-week walking exercise program (WEP) on fatigue-related experiences of acute myelogenous leukemia (AML) patients receiving chemotherapy. Their findings revealed that AML patients in the three-week WEP group had a significantly greater increase in the space walked in twelve -minute than the control group. Patients in the WEP also had lower levels of fatigue intensity and interference, symptom distress, anxiety, and depressive status than the control group. Also the current study's finding supported with the results of previous studies which reported that exercise programs have various benefits for cancer patients, including reduced fatigue, increased functional capacity[53], decreased depression, improved sleep patterns[54-55], and improved overall quality of life[56-57].

Naraphong, (2013)[58] in his study to investigate the effects of a culturally sensitive exercise program (CSEP) on fatigue, sleep, mood, and symptom distress among Thai women with breast cancer receiving adjuvant chemotherapy found that, CSEP established in this study was practicable and related to their lifestyle as stated by research participants. Walking was described as the favored exercise for Thai women being treated for early-stage breast cancer. Subjects in the CSEP group had a significant improvement in physical fitness as measured by a 12-minute walk test than subjects in control group at after interference. Subjects in the CSEP group had lesser levels of fatigue, mood disturbance, and symptom distress. Those findings were in covenant with the results of the current study.

VI. Conclusion

In conclusion, patients receiving chemotherapy will benefit more from walking exercise intervention because it will reduce their level of fatigue, reduce their symptom distress and improve their functional capacity so it will improve their overall quality of life

Relevance to clinical

Walking is a safe, society accepted, easily practice, and needs no preparation or training, in addition it found to be effective and bring many privileges for cancer patients so it is highly recommended for the nursing staff to encourage their patients to practice it daily according to their tolerance.

Limitations

Limitations of the present study are the relatively small sample size and used convenient sample not random one so generalization well became difficult. In addition short period of follow up consider another limitation for this study.

Recommendation

1. Nurses should recognize that physical activity is also an efficient intervention for managing several dimensional symptoms in cancer patients receiving therapy.
2. Nurses should inspire their patient to be more active and start an exercise program to decline severity of fatigue and other symptoms distress and improve their functional capabilities.
3. Nevertheless of whether the exercise turns out to be effective, we can be assured that the intervention is harmless and does not bring any added risk for patients with cancer.
4. Initial results suggest that the walking exercise program was socially accepted and successfully increased physical activity in patients with cancer undertaking chemotherapy. The study can be replicated in a large population of cancer patients during chemotherapy.
5. Imminent researches needed to inspect more efficient walking methods to build up practical standing. For instance, clients may profit more from a daily walking program of 30 or 40 minutes or from more recurrent (3-4 times) of daily 10-m walk

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References

[1]. Cancer Research UK. Worldwide cancer statistics. Accessed nov 12, 2015. www.cancerresearchuk.org/
[2]. Ibrahim A S., Khaled H M., Mikhail N H., Baraka H., and Kamel H. Cancer Incidence in Egypt: Results of the National Population-Based Cancer Registry Program. Journal of Cancer Epidemiology. Volume 2014, Article ID 437971, 18 pages http://dx.doi.org/10.1155/2014/437971
[3]. IKCnet (2009) Dutch Cancer Registration. Survival. http://wwwikcnetnl
[4]. Courneya KS. Exercise in cancer survivors: an overview of research. Med Sci Sports Exerc. 2003;35(11):1846–52.
[5]. Lucia A, Earnest C, Perez M. Cancer-related fatigue: can exercise physiology assist oncologists? Lancet Oncol. 2003;4 (10):616–25.
[6]. Patrick D, Ferketich S, Frame P, et al. National Institutes of Health state of the science conference statement: Symptom management in cancer: Pain, depression and fatigue. J Natl Cancer Inst Monogr. 2004; 32:9–16.
[7]. Lawrence DP, Kupelnick B, Miller K, Devine D, Lau J. Evidence report on the occurrence, assessment, and treatment of fatigue in cancer patients. J Natl Cancer Inst Monogr. 2004; 32:40–50.
[8]. Luctkar-Flude M, Groll D, Tranmer J, Woodend K. Fatigue and physical activity in older adults with cancer: A systematic review of the literature. Cancer Nursing. 2007; 30:E35–E45. [PubMed: 17876176]
[9]. Laird BJA, Scott AC, Colvin LA, McKeon AL, Murray GD, Fearon KCH, Fallon MT. Pain, depression and fatigue as a symptom cluster in advanced cancer. J Pain & Symptom Management. 2011 Mar 12:1–11. E-Pub.
[10]. Harrington, C. B. Hansen, J. A. Moskowitz, M. Todd, B. L. and Feuerstein, M. "It's not over when it's over: long-term symptoms in cancer survivors-a systematic review," International Journal of Psychiatry in Medicine. 2010, vol. 40, no. 2, pp. 163–181.
[11]. Vrettos I., Kamposioras K., Kontodimopoulos N.et al., "Comparing health-related quality of life of cancer patients under chemotherapy and of their caregivers," The Scientific World Journal, vol. 2012, Article ID 135283, 9 pages

[12]. North American Nursing Diagnosis Association, Nursing diagnosis. Fatigue, 2012, http://nandadiagnosis.blogspot.no/2011/09/nursing-diagnosis-for-fatigue.html
[13]. Prue, G., Rankin, J., Allen, J., Gracey, J., & Cramp, F. (2006). Cancer-related fatigue: A critical appraisal. European Journal of Cancer, 42(7), 846-863.
[14]. National Comprehensive Cancer Network (NCCN) (2012). NCCN clinical practice guide-lines in oncology: cancer-related cancer related fatigue VI; Available at www.nccn.org/professionals/physician_gls/PDF/fatigue.pdf/. Accessed april 12, 2012.
[15]. Intercultural Cancer Council (ICC) .Fatigue & Cancer, Fact Sheet, 19 nov. 2008: Email: info@iccnetwork.org • Website: http://iccnetwork.org.
[16]. Cleeland CS (2007). Symptom Burden: Multiple Symptoms and Their Impact as Patient-Reported Outcome. J.Nat. Canc. Institute Monographs, 37:16-21
[17]. Naga, B and Kassab, M. Fatigue experience among cancer patients receiving chemotherapy. Journal of Research in Nursing and Midwifery (JRNM) Vol. 2(1) pp. 1-5, January, 2013.
[18]. Wasteson E, Brenne E, Higginson I, Hotopf M, loyd-Williams M, Kaasa S.(2009). Depression Assessment and Classification in Palliative Cancer Patients: a systematic literature review. J. Palliative Med., 23(8):739–75.
[19]. Morrow G.: Cancer-Related Fatigue: Causes, Consequences, and Management, The Oncologist May 2007 vol. 12 Supplement 1 1-3.
[20]. Stark L., Tofthagen C., Visovsky C., & McMillan S. The Symptom Experience of Patients with Cancer. J Hosp Palliat Nurs. 2012; 14(1): 61–70.
[21]. Fu, M. R., LeMone, P., & McDaniel, R. W. (2004). An integrated approach to an analysis of symptom management in patients with cancer. Oncology Nursing Forum, 31(1), 65-70.Dodd et al., 2001
[22]. Milne HM, Wallman KE, Gordon S, et al.: Effects of a combined aerobic and resistance exercise program in breast cancer survivors: a randomized controlled trial. Breast Cancer Res Treat 108 (2): 279-88, 2008.
[23]. Schneider CM, Hsieh CC, Sprod LK, et al.: Effects of supervised exercise training on cardiopulmonary function and fatigue in breast cancer survivors during and after treatment. Cancer 110 (4): 918-25, 2007.
[24]. Mustian KM, Griggs JJ, Morrow GR, et al.: Exercise and side effects among 749 patients during and after treatment for cancer: a University of Rochester Cancer Center Community Clinical Oncology Program Study. Support Care Cancer 14 (7): 732-41, 2006
[25]. Courneya KS, Segal RJ, Mackey JR, et al. Effects of aerobic and resistance exercise in breast cancer patients receiving adjuvant chemotherapy: a multicenter randomized controlled trial. J Clin Oncol. 2007; 25:4396-4404.
[26]. Na YM, Kim MY, Kim YK, et al. Exercise therapy effect on natural killer cell cytotoxic activity in stomach cancer patients after curative surgery. Arch Phys Med Rehabil. 2000;81:777-779
[27]. Schmitz KH, Ahmed RL, Troxel A, et al. Weight lifting in women with breast-cancer-related lymphedema. N Engl J Med. 2009;36:664-673.
[28]. Hoffman, L. (2006). How to keep your patients moving. Journal of Supportive Oncology, 4(3), 153.
[29]. Gridelli C, Ardizzoni A, Le Chevalier T, et al. Treatment of advanced non-small-cell lung cancer patients with ECOG performance status 2: results of an European Experts Panel. Ann Oncol 2004; 15(3):419-426
[30]. Mendoza TR, Wang XS, Cleeland CS, et al. The rapid assessment of fatigue severity in cancer patients: use of the Brief Fatigue Inventory. Cancer 1999;85(5):1186-1196.
[31]. Schwartz AL, Mori M, Gao R, Nail LM, King ME. Exercise reduces daily fatigue in women with breast cancer receiving chemotherapy. Med Sci Sports Exerc 2001;33(5):718-723.
[32]. Mock V, Pickett M, Ropka ME, et al.: Fatigue and quality of life outcomes of exercise during cancer treatment. Cancer Pract 9 (3): 119-27, 2001 May-Jun. [PUBMED Abstract.
[33]. McCorkle R, Young K. Development of a symptom distress scale. Cancer Nurs 1978;1(5):373-378.
[34]. American College of Sports Medicine. ACSM's guidelines for exercise testing and prescription, 6th ed. Malvern, PA: Lea & Febiger, 2000
[35]. Burns KJ, Camaione DN, Chatterton CT. Prescription of physical activity by adult nurse practitioners: a national survey. Nurs Outlook 2000; 48(1):28-33.
[36]. Chang P, Lai Y, Shun S, Lin L, et al. Effects of a Walking Intervention on Fatigue-Related Experiences of Hospitalized Acute Myelogenous Leukemia Patients Undergoing Chemotherapy: A Randomized Controlled Trial. Journal of Pain and Symptom Management. May 2008.Vol. 35 No. 5; 524-534.
[37]. Coleman MP, Forman D, Bryant H, Butler J, Ratchet B, Marine C, et al. Cancer survival in Australia, Canada, Denmark, Norway, Sweden, and the UK, 1995–2007 (the International Cancer Benchmarking Partnership): an analysis of population-based cancer registry data. Lancet. 2011;377(9760):127–38
[38]. Deng GE, Rausch SM, Jones LW, A G, Kumar NB, Greenlee H, et al. Complementary Therapies and Integrative Medicine in Lung Cancer: Diagnosis and Management of Lung Cancer, 3rd Ed: American College of Chest Physicians Evidence-based Clinical Practice Guidelines. Chest J. 2013;143(5_suppl):e420S–36S.
[39]. Rueda JR, Solà I, Pascual A, Subirana Casacuberta M. Non-invasive interventions for improving well-being and quality of life in patients with lung cancer. Cochrane Database Syst Rev. 2011;9:CD004282.
[40]. Williams NH. Promoting Physical Activity in Primary Care. BMJ. 2011; 343:d6615.
[41]. Lakoski SG, Eves ND, Douglas PS, Jones LW. Exercise Rehabilitation in Patients with Cancer. Nat Rev Clin Oncol. 2012;9(5):288–96.
[42]. Cramp F, Byron-Daniel J. Exercise for the management of cancer-related fatigue in adults. Cochrane Database Syst Rev. 2012;11:CD006145.
[43]. Andersen C, Rørth M, Ejlertsen B, Stage M, Møller T, Midtgaard J, et al. The Effects of a Six-week Supervised Multimodal Exercise Intervention During Chemotherapy on Cancer-related Fatigue. Eur J Oncol Nurs. 2013;17(3):331–9.
[44]. Adamsen L, Quist Q, Andersen C, Møller T, Herrstedt J, Kronborg D, et al. Effect of a Multimodal High Intensity Exercise Intervention in Cancer Patients Undergoing Chemotherapy: Randomized Controlled Trial. BMJ. 2009;339:b3410.
[45]. Wenzel JA, Griffith KA, Shang JJ, Thompson CB, Hedlin H, Stewart KJ, et al. Impact of a Home-Based Walking Intervention on Outcomes of Sleep Quality, Emotional Distress, and Fatigue in Patients Undergoing Treatment for Solid Tumors. Oncologist. 2013; 18(4): 476 – 84.
[46]. Griffith K, Wenzel J, Shang JJ, Thompson C, Stewart K, Mock V. Impact of a Walking Intervention on Cardiorespiratory Fitness, Self-reported Physical Function, and Pain in Patients Undergoing Treatment for Solid Tumors. Cancer. 2009;115 (20):4874–84.
[47]. Puetz T and Herring M. Differential Effects of Exercise on Cancer-Related Fatigue during and Following Treatment; A Meta-Analysis. 2012 American Journal of Preventive Medicine. Volume 43, Issue 2, Pages;1–24.

[48]. Braam KI1, van der Torre P, Takken T, Veening MA, van Dulmen-den Broeder E, Kaspers GJ. Physical exercise training interventions for children and young adults during and after treatment for childhood cancer. Cochrane Database Syst Rev. 2013 Apr 30;4:CD008796. doi: 10.1002/14651858.CD008796.pub2.
[49]. Berthouze SE, Minaire PM, Castells J, et al. Relationship between mean habitual daily energy expenditure and maximal oxygen uptake. Med Sci Sports Exerc 1995;27(8):1170-1179
[50]. Winningham ML. Strategies for managing cancer- related fatigue syndrome: a rehabilitation approach. Cancer 2001;92(4 Suppl):988-997
[51]. Miaskowski C, Dodd M, Lee K. Symptom clusters: the new frontier in symptom management research. J Natl Cancer Inst Monogr 2004;32:17e21.
[52]. Shun SC, Lai YH, Jing TT, et al. Fatigue patterns and correlates in male liver cancer patients receiving transcatheter hepatic arterial chemoembolization. Support Care Cancer 2005; 13(5):311-317.
[53]. Mock, V., Frangakis, C., Davidson, N. E., Ropka, M. E., Pickett, M., Poniatowski, B., McCorkle, R. (2005). Exercise manages fatigue during breast cancer treatment: A randomized controlled trial. Psycho-Oncology, 14(6), 464-477.
[54]. Daley, A. J., Crank, H., Saxton, J. M., Mutrie, N., Coleman, R., & Roalfe, A. (2007). Randomized trial of exercise therapy in women treated for breast cancer. Journal of Clinical Oncology, 25(13), 1713-1721.
[55]. Rabin, C., Pinto, B., Dunsiger, S., Nash, J., & Trask, P. (2009). Exercise and relaxation intervention for breast cancer survivors: Feasibility, acceptability and effects. Psychooncology, 18(3), 258-266.
[56]. Campbell, A., Mutrie, N., White, F., McGuire, F., & Kearney, N. (2005). A pilot study of a supervised group exercise programme as a rehabilitation treatment for women with breast cancer receiving adjuvant treatment. European Journal of Oncology Nursing, 9(1), 56-63. doi: 10.1016/j.ejon.2004.03.007
[57]. Headley, J. A., Ownby, K. K., & John, L. D. (2004). The effect of seated exercise on fatigue and quality of life in women with advanced breast cancer. Oncology Nursing Forum, 31(5), 977-983.
[58]. Naraphong, W. Effects of a Culturally Sensitive Exercise Program on Fatigue, Sleep, Mood, and Symptom Distress among Thai Women with Breast Cancer Receiving Adjuvant Chemotherapy: A Pilot Randomized Controlled Trial. A dissertation submitted to the Graduate School of the University of Cincinnati. 2013.