Volume 4, Issue 3, 2026

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

EXERCISE BARRIERS IN THE CONTEXT OF FATIGUE AND INTENSITY AND FREQUENCY OF PHYSICAL ACTIVITY PARTICIPATION IN CANCER PATIENTS

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DOI: https://doi.org/10.5281/zenodo.21455194

Keywords

Article History
Received: 01 January 2026
Accepted: 17 March 2026
Published: 31 March 2026

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Abstract

Objective: *to examine the exercise barriers along with fatigue levels and the frequency and intensity of exercise that cancer patients usually engage in.*

Methods: *A cross sectional survey with a convenience sample of 100 cancer patients was used. Standardized measures were used to evaluate fatigue (Multidimensional fatigue symptom inventory-short form) measure exercise frequency and intensity (Leisure).*

Results: *A 93% response rate was achieved. A total of 50.5% were male and 49.5% were female with majority with stage 4(62.4%) and stage 3(17.2%) lungs (17.2%), breast (15.1%), brain (14%), cervical (12.9%) and colorectal (10.85) cancer. A total of 89.2% reported fatigue with 84.6% experiencing on daily basis. A total of 96.8% received fatigue advice. A total of 16.1% reported to perform strenuous type of activity, 39.8% engage in moderate intense activity and 63.5% are engage in mild exercise per week. Barriers that interfered with exercise "often/very often" were mainly fatigue, lack of motivation and pain.*

Conclusion: *cancer patients experience significant level of fatigue during the cancer treatment and majority of patients are engage in very low intense physical activity. Exercise barriers found were mainly fatigue, lack of motivation and pain which can be alleviate through different techniques and strategies.*

INTRODUCTION

CHAPTER I

1. Exercise

Physical activity that is planned, organized and repetitive in order to improve body's conditioning. It includes strength training, flexibility and cardiovascular training for the purpose to maintain the body's overall health and condition. (1)

2. Barrier

Any condition, situation or hurdle that is responsible to keep individuals apart from any kind of advancement. (2)

3. Context

Situation in which something exists or happens which can offer assistance to clarify it. (2)

4. Fatigue

Cancer-related weariness may be a complex disorder, with physical, mental, and

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

emotional components and different causes, characterized by an unremitting and abnormal whole-body encounter of tiredness, diminished capacity for physical and mental work, or determined depletion, that'sunbalanced or disc onnected to effort and not soothed by rest. Fatigue is the most common symptom worldwide, not only affecting the cancer patients but also affecting other acute and chronic medical conditions. As with numerous other therapeutic concepts, it may be a term commonly used in ordinary dialect within the setting of tiredness, shortcoming, weariness, decreased strength, diminished physical execution or contin uance, sleepiness, lethargy, asthenia, trouble concentrating, diminished mem ory, or need of motivation, among others.(3)

Following is some significant features of fatigue associated with cancer that distinguish them from fatigue in healthy individual(3):

- More fast onset
- More vitality depleting (extraordinary un ordinary tiredness)
- More intense
- Longer lasting
- More serious
- More unrelenting
- More full of feeling and cognitive distress
- More abnormal require for rest
- So also display in all age bunches.

Cancer-related weakness may be a subjective involvement that features a clear detrimental effect on a cancer patient's quality of life and capacity to support the usual individual, proficient, and social connections. The escalated of cancer related fatigue shifts with tumor location. Factors that affect attributions of fatigue in cancer patients are(3):

- Tumor site
- Treatment stage
- Cancer treatment type
- Effectiveness of control of treatment side effects
- Patient's expectations and patient's health priorities.

5. Physical Activity

Any movement of body which is produced by skeletal muscles on the cost of energy is known as physical activity involving activities such as working, playing, carrying out households' chores, travelling and performing recreational activities. (4)

Generally the term "Physical activity" should not be mixed up with exercise, which is basically the type of physical activity and defined as planned, structured, repetitive body movements and aimed to improve one or more body functions. Other physical activities than exercise are also beneficial for health such as activity done during leisure time, for transport to get and from places or as a part of someone's work. Mild, moderate and vigorous-intensity, all these three are effective according to person's age. (5) In this article word physical activity is referred as exercise.(4)

Exercise recommendations according to World Health Organization (4):

Children And Adolescents (5 to 17 years)

- 60 minutes of moderate to vigorous intensity daily. (4)
- Activities that include muscle and bone strengthening 3 times a week. (4)

Adults (18 to 64 and more than 64)

- Either 150 minutes of moderate intensity exercise through a week or minimum 75 minutes exercise of vigorous intensity exercise in a week. Adults can perform these with a good combination.(4)
- Muscle strengthening activities should be included targeting large muscles or muscle groups for 2 to 3 days a week.(4)

Benefits of Exercises: Moderate intense activities and a very significant affect on overall body health. These types of activities include walking, cycling or doing sports. Instead of doing no exercise, little one is always better; by performing these moderate physical activities persons can achieve the recommended levels.Adequate amount and regular physical activity can help to (4):

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ISSN: (e) 3007-1607 (p) 3007-1593

- Improve Cardiovascular and skeletal muscle fitness. (4)
- Improve bone health. (4)
- Make person functionally stable. (4)
- Reduce the chance of chronic systemic diseases such as hypertension, diabetes, coronary artery disease, several types of cancers and mental illnesses.(4)
- Improve balance and decrease the falling risk. (4)
- Help to maintain energy balance and weight control.(4)

One of the leading risk factors for global morbidity and mortality is insufficient physical activity. 20 to 30% risk of death is present in people with insufficient physically activity than who are sufficient physically active. Certain reasons associated with environment also hinder persons to become physical active such as fear linked with violence, huge traffic, low quality air; pollution, lack of facilities (no parks, sidewalks or sport recreation facilities). Physical activity can be increased with proper awareness programs, a good motivation, utilizing the facilities provided by authorities.(4)

6. Cancer/malignancy

Cancer is major health care problem globally with the incidence rate of 10 million per year and has high mortality rate of 7 milliondeaths per year. The foremost common strong organs where malignancy arise are breast, lungs and gastrointestinal but worldwide commonest is skin cancer. Tobacco could be a major cause comprising 30% in etiology of cancers of lung, nasopharynx, bladder and kidney and all of these can be prevented by cessation of smoking. Further 30% can be the result of diet and alcohol causing cancer of stomach, colon, esophagus, breast and liver. Infections are responsible for 15% of cancer involving cervix, stomach, liver, nasopharynx and bladder.(5)

6.1 Ten Hallmarks of Cancer

1. Instability of genome and mutation
2. Resisting cell death
3. Sustain proliferative signaling
4. Evading growth suppressors
5. Enabling replicative immortality
6. Inducing angiogenesis
7. Activating metastasis and invasion
8. Reprogramming energy metabolism
9. Tumor promoting inflammation
10. Evading immune destruction. (6)

6.2 Environmental and Genetically Determinants

- Environmental factors initiating cancer:
- Occupational exposure= bladder/ lung/ mesothelioma
- Chemicals= acute myeloid leukemia
- Smoking=liver and bladder cancer
- Viral infection=Burkitt's lymphoma, nasopharyngeal cancer, cervical cancer, hepatocellular carcinoma
- Bacterial infection= Mucosa Associated Lymphoid Tissue, gastric cancer
- Parasitic infections= cholangiocarcinoma, squamous cell bladder cancer
- Dietary factors= colonic, gastric liver cancer
- Radiation= Basal Cell Carcinoma, melanoma, non melanocytic carcinoma, leukemia, solid tumors, cholangiocarcinoma, lung cancer, thyroid cancer and sarcoma
- Inflammatory disease= colon cancer
- Hormonal= vaginal, endometrial, breast cancers. (7)
- Genetic factors initiating cancers(8):
- Ataxia telangiectasia= Leukemia, lymphoma, ovarian, gastric, brain, colon
- Breast/ovarian= Breast, ovarian, colonic, prostatic, pancreatic
- Bloom's syndrome=Leukemia, tongue, esophageal, colonic, Wilms' tumor
- Cowden's syndrome= Breast, thyroid, gastrointestinal tract, pancreatic
- Familial adenomatous polyposis= Colonic, upper gastrointestinal tract
- Fanconianemia=Leukemia, esophageal, skin, hepatoma
- Gorlin's syndrome= Basal cell skin, brain
- Hereditary non-polyposis colon cancer = Colonic, endometrial, ovarian, pancreatic, gastric

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- Li–Fraumeni syndrome= Sarcoma, breast, osteosarcoma, leukemia, glioma, adrenocortical
- Melanoma= Melanoma
- Multiple endocrine neoplasia-1= Pancreatic islet cell, pituitary adenoma, parathyroid adenoma and hyperplasia
- Multiple Endocrine Neoplasia-2= Medullary thyroid, pheochromocytoma, parathyroid hyperplasia
- Neurofibromatosis 1=Neurofibrosarcoma, pheochromocytoma, optic glioma
- Neurofibromatosis 2= Vestibular schwannoma
- Papillary renal cell cancer syndrome= Renal cell cancer
- Peutz–Jeghers syndrome= Colonic, ileac, breast, ovarian
- Prostate cancer= Prostate
- Retinoblastoma= Retinoblastoma, osteosarcoma
- Von Hippel–Lindau syndrome=Haemangioblastoma of retina and CNS, renal cell, pheochromocytoma
- Wilms' tumor=Nephroblastoma, neuroblastoma, hepatoblastoma, rhabdomyosarcoma
- Xerodermapigmentosum= Skin, leukemia, melanoma (8)

16.3 Presenting Problems in Cancer

Within the early stages of cancer progression, the quantity of harmful cells is small and the persistent is usually asymptomatic. (9) With tumor enhancement, restricted signs or side effects generate due to mass impacts and/or invasion of nearby tissues.(9)

6.4 Symptom with Typical Site or Possible Tumor

- Hemorrhage: Stomach, colon, bronchus, endometrial, bladder, kidney
- Lump: Breast, lymph node (any site), testicle
- Bone pain or fracture: Bone (primary sarcoma, secondary metastasis from breast, prostate, bronchus, thyroid, kidney)
- Skin abnormality: Melanoma, basal cell carcinoma (rodent ulcer)
- Ulcer: Esophagus, stomach, anus, skin
- Dysphagia: Esophagus, bronchus, gastric
- Increasing constipation, abdominal discomfort or pain: Colon, rectum, ovary
- Airway obstruction, stridor, cough, recurrent infection: Bronchus, thyroid
- Odynophagia, early satiety, vomiting: Bronchus, stomach, esophagus, colon, rectum
- Abdominal swelling (ascites): Ovary, stomach, pancreas. (10)

6.5 Emergency Complications of Cancer

1. Spinal cord compression: commonly occur myeloma, prostate, breast and lung that includes bone. Earliest symptom is back pain on stress, dermatomal and motor changes below the level of injury occurs. Later, causes symptoms of cord and bowel and bladder.(11)
2. Superior vena cava obstruction: it is due to obstruction in vessel because of spreading tumor such as in lung, lymphoma and metastatic tumor. It could be due to central catheter or thrombophilia secondary to tumor. Patient may present with edema of arms, face, neck, distended veins and headache. (11)
3. Hypercalcemia: common metabolic complication usually in myeloma, breast cancer, non small cell lung cancer. Patient present with drowsiness, confusion, nausea vomiting, constipation, polyuria, polydipsia and dehydration.(11)
4. Neutropenic fever: defined as fever of 38 degree Celsius for over one hour in a patient with neutrophill count of less than 1.0x10 power 9/L. Hypotension is clinical characteristic which may progress to organ failure.(11)

6.6 Therapeutics in Oncology

Treatment of cancer can be curative or palliative according to the requirements. Palliative chemotherapy is commonest and used primarily for patients with metastases. Aim is to increase quality of life and decreasing the symptoms while decreasing the adverse effects. Adjuvant chemotherapy is given after the primary treatment targeting to achieve overall survival.

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Neoadjuvant chemotherapy is a kind where chemotherapy is introduced first rather than the cyto reduced treatment. This kind lowers the option of surgery. Chemoprevention is use of medicine to prevent developing cancer despite the high risk. (12)

6.7 Surgical Treatment

it has a high significance in cancer treatment mainly in these following situations:

1. Biopsy: histological or cytological identification of cancer is necessary and tissue of site can also provide significant information of tumor type and differentiation.(12)
2. Excision: most solid cancers are accurately treated with the local excision of tumor. Outcomes are dependent on surgical expertise and multidisciplinary team skills.(12)
3. Palliation: the fastest way of palliating symptoms is surgery. Its specific and beneficial role is in removal of cancerous masses that are unfortunately left after chemotherapy treatment(12).

6.8 Radiation Therapy

ionizing radiations are used for treating the some cancers that do not spread or are local in nature. These radiations can beproduced from decay of radioactive isotopes or by radiation beams of high energy ; three methods are used (12):

1. Teletherapy, treatment applied from a distance with linear accelerator.(12)
2. Brachytherapy: treatment applied directly on the tumor. Results in a very high dose of radiations introducing in the body.(12)
3. Intravenous injections of a radioisotope.(12)

Hormone therapy and immunotherapy are also included in treatment options. (12)

6.9 Oncology Rehabilitation

it includes wide range of therapies to restore its normal body functions, regain its strength, decrease stress and balance the energy levels. Customized physical therapy program including range of motion training with slight resistance training which targets to reduce fatigue and improve overall health. Through manual therapy cancer related pain and fatigue is treated and quality of life is improved. (13) Some manual techniques which are most commonly used, involve:

- Traditional massage
- Stone therapy
- Myofacial release
- Soft-tissue manipulation with passive stretching
- Aromatherapy
- Effleurage massage
- Friction
- Trigger point therapy
- Acupressure
- Reflexology. (13)

6.10 Side Effects of Oncology and its Treatment

That are usually managed by oncology rehabilitations are: anxiety and stress, intimacy challenges, balance, lymph edema, poor body image, malnutrition, digestive issues, memory and cognition issues, dry mouth, mucositis and mouth sores, eating difficulties, numbness, fatigue, pain, immobility, weight loss and sleeplessness. (13)

Previous researches showed some barriers that inhibit health care professionals to recommend physical activity to cancer patients due to lack of time, missing guidelines or may be a safety issue. (14)

Wide ranges of conditions are there where physical activity is contraindicated in cancer patient such as extreme anemia, fatigue, fever and acute infection.(14)

A significant understanding of the states of mind and instabilities of Health Care Professional toward restorative conditions as contraindications might offer assistance to distinguish where the most noteworthy require for assist, investigate and instr uction lies. More absolutely, it would offer assistance to create measures that are customized to the wants of the specific Health Care Professionals subgroups [doctors of diverse restorative specialties, oncology medical caretakers (Oncology Nurses)] as well as

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ISSN: (e) 3007-1607 (p) 3007-1593

to recognize particular restorative conditions where security concerns are particularly tall. (14) In this manner, the point of the show consider was (1) to explore to what degree particular therapeutic conditions and security issues are seen as having an impact on the achievability of physical activity during cancer treatment and (2) to investigate whether doctors of distinctive disci plines contrast in their recognition of the impact of therapeutic conditions on physical activity. In this manner, we expected that being recognizable with a specific therapeutic condition, which regularly comes beside the therapeutic spec ialization of the doctor, makes a difference doctors to survey the significance of that particular condition fittingly and certainly. A t long last, it ought to be exploratory examined whether the common recognition of restorative contraindi cations for physical activity is related with proficient factors and physi cal activity suggestion behavior. (14)

CHAPTER II
LITERATURE REVIEW

This study was conducted by J.M Blaney et al from UK, in August, 2017. The purpose of this study was to investigate the exercise barriers as well as fatigue levels and frequency and intensity of exercise that usually cancer patients engage in. Results showed most patients experience fatigue, are engage in mild intensity exercises and their major barrier to exercise is health and environmental factor. (2)

Marta Kramer Mikkelsena B et al conducted this study from Denmark in 2019. The aim was to explore attitudes towards Physical Activity and exercise among older cancer patients. Results indicated that a general positive attitude of physical activity is expressed but co morbidities and external circumstances prevent physical activity. (15)

Jun J. Mao, MD and MSCE conducted the study from Philadelphia in 2017. The point of study was to identify the factors that hinder patients to exercise during cancer treatment. Findings indicated that both psychological and physical factors were responsible including fatigue and pain linked with their cancer treatment. Few of them only increased their active status after diagnosing. (16)

This study was done by Charlotte IjsBrandy et al in 2019. The aim of study was to identify the patients' experienced barrier in implementing physical activity programs. Results showed that major exercise barrier was physical activity not tailored to patients by oncologists along with pain and fatigue. (17)

Thomas M Cascino conducted this study in 2019. The purpose of this study was to identify patient perceived barriers that correlate with objectively measured physical activity in cancer patients. Result showed that the barriers endorsed most strongly were lack of discipline, lack of energy and lack of interest which are associated with significant decrease in physical activity. (18)

Ruth E Ashton et al conducted this study in 2019. The point of study was to characterize fatigue and physical activity level in cancer patients. Results indicated that patients experience significant high levels of fatigue and did not meet the recommended guidelines for resistance based exercise. (19)

This study was done by Romero SAD et al in 2018. Objective of the study was to examine participants' characteristics linked with barriers to physical activity among cancer patients with pain. Results indicated that the majority of cancer patients with pain are not sufficiently participating in physical activity. Clinical characteristics are associated with patients' barriers. (20)

G. Prue et al conducted this study in 2005. Point of the study was to determine prevalence and pattern of cancer related fatigue. Results showed that fatigue was evident during and after cancer treatment and associated with inconsistency of fatigue pattern and related factors. (21)

Herbolsheimer F et al performed this study from Heidelberg university hospital, Germany in 2019. The purpose of the study was to examine paradigm shift from rest to activity. Outcomes showed that activity paradigm was much stronger

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ISSN: (e) 3007-1607 (p) 3007-1593

than rest paradigm in physicians' attitude. Recommendation paradigm was also high for physical activity in cancer patients. (22)

The study was done by Hardcastle SJ et al from Australia in 2018. The intention of study was to investigate attitudes of oncologists towards physical activity in cancer survivors. Result showed that oncologists had unassuming ability of promoting physical activity indicating low recommending rate. (23)

Martina Ferioli et al conducted this study from Italy in 2018. Aim of the study was explores the impact of physical activity on physical, psycho-physical and psychological aspects on adverse effects of cancer. Outcomes showed that physical exercise provides benefits on several symptoms of cancer and side effects derived from cancer treatments regarding physical, psychophysical and psychological aspects. (24)

Maxwell Smith C et al conducted this study from Australia in 2017. Plan of the study was to identify the barriers to physical activity and end result showed that psychological barriers, environmental barriers, knowledge of guidelines, lack of practitioner support and energy/age were the main barriers. (25)

The study was done by Adamsen L et al from Denmark in 2017. The aim of the study was to evaluate attitudes of patients towards physical activity during adjuvant cancer treatment. Result showed that recommendations from oncologists and medical attendants motivated the patients to create a positive attitude toward physical activity. (26)

LarrilynYelton and ShaliniForbis conducted this study from Ireland in 2016. The purpose of the study was to find out the barriers to physical activity in pediatric population. Outcomes showed that physicians don't show positive attitude towards promoting physical activity to patients during cancer treatment. (27)

This study was done by Henriksson A et al from Sweden in 2016. The purpose of the study was to describe cancer patients' perceived barriers to physical activity during adjuvant cancer treatment. Side effects of oncology treatment that might increase on physical exertion, concerns associated with patient's safety of physical activity during treatment are some barriers that are indicated as a result. (28)

Jenna Smith-Turchyn et al conducted this study from Ontario in 2016. Aim of the study was to determine the barriers of exercise promotion by health care professionals for women with breast cancers. Consequences showed that barriers to exercise promotion were at institutional, professional and patients' safety level. (29)

Lahart IM et al conducted the study from UK in 2015. The objective of study was to inspect the link between physical activity and recurrence of breast cancer and death. Study concluded that both factors are inversely proportional to each other in fact suitable exercise can decrease the risk of death and recurrence rate of breast cancer in survivors. (30)

Ji-Hye Park et al conducted this study from South Korea in 2015. The intention of the study was to examine attitudes and characteristics of oncologists toward exercise recommendation to their patients. End result showed most oncologist approved exercise as beneficial and important, some agreed that exercise is safe and few declared that cancer patients managed to exercise during treatment course. (31)

This study was conducted Gotte et al from Germany in 2014. The aim was to identify the exercise barriers and motivation, encouragement of parents and physicians. Outcomes showed barriers included were at physical, psychosocial, and organizational levels. (32)

Chung OK et al did the study from Hong Kong in 2014. Purpose of the study was to assess barriers to exercise. Result showed fear of academic faltering was the largest barrier reported. (33)

Gilliam MB et al conducted the research from Denmark in 2013. Purpose of the study was to identify the level of perceived benefits and barriers of physical activity in cancer survivors. Result showed more perceived benefits and less perceived barriers. (34)

Claire Spellman et al conducted this study from Australia in 2013. Point of the study was to examine the attitudes, knowledge and practices of clinical practitioners in promoting physical activity to cancer survivors of prostate.

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ISSN: (e) 3007-1607 (p) 3007-1593

Consequences showed that physical activity is not regularly promoted to cancer patients. (35)

Keats et al conducted the study in 2007 whose aim was to examine the factors that can manipulate motivation for exercise in the adolescent cancer survivors. Result showed self-efficacy, affective attitude (boring–interesting, enjoyable–unenjoyable), behavioral factors and lack of recommendation from physicians were responsible. (36)

This study was done by Jones LW et al from Canada in 2005. Idea of the study was to examine oncologists' attitudes towards recommending exercise to patients with cancer. Consequences showed that majority of oncologist favored exercise during cancer treatment with positive attitude. (37)

Jones LW et al conducted the study from Alberta, Canada in 2004. The intention of study was to evaluate the effect of oncologist's promotion of exercise on self reported exercise behavior after the initial diagnosis of cancer. Result showed an oncologist's recommendation has significant influence on motivation for physical activity. (38)

1. Objective of the Study

Objective of study was to find exercise barriers along with level of fatigue and frequency and intensity of physical activity in cancer patients.

2. Rational of the Study

Fatigue is the major symptom experienced by cancer patients which significantly affect their quality of life by interfering their activities of daily living and discouraging them to perform physical activity regularly. This study is done in order to identify the barriers of exercise in association of fatigue level and their frequency and intensity of physical activity. Through this study these barriers can be eliminated and vary techniques can be used to provide comfort to these patients and quality of life can be improved so they can live a healthy life with a good prognosis.

3. Significance of the Study

This study will be advantageous to evaluate the exercise barriers in context of level of fatigue and frequency and intensity of physical activity participation in cancer patients providing some insights into survivorship needs particularly in terms of becoming more physical active. This study will be helpful to improve quality of life of sufferers of cancer after identifying the barriers and level of physical activity they perform.

CHAPTER III
MATERIAL AND METHODS

1. Study Design

Study conducted was a cross-sectional study design

2. Participant Recruitment

The participants were from NIMRA hospital Jamshoro.

3. Duration of Study

Duration of study is around 3 months after the acceptance of proposal.

4. Sampling Technique

Convenient technique used

5. Sample Size

100 participants were taken for study

6. Sample Selection

6.1. Inclusion Criteria

- Participants who are willing for this study.
- Females and males were selected.

6.2. Exclusion Criteria

- Those who do not willing to participate were excluded.

7. Data Collection Method

The data was collected by distributing questionnaires.

8. Data Collection Tool

Adopted questionnaire from master article was used. Two standard scales are used. One scale named Multidimensional Fatigue Symptom Inventory-Short form (MFSI-SF) and another named, Leisure Score Index (LSI) of the Godin Leisure Time Exercise questionnaire to measure the cancer related fatigue and exercise frequency and intensity respectively.

9. Data Analysis Procedure

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ISSN: (e) 3007-1607 (p) 3007-1593

For evaluation of data SPSS version 22 will be used. Demographic data and variables were analyzed by descriptive method in terms of frequency and percentages.

10. Budget

The amount of budget for the study will around Rupees 5,000 to 10,000.

Ethical Considerations

Questionnaire was distributed after the review of departmental ethical committee of IIRS. Consent form was attached with the questionnaire and the privacy of participants was also maintained. Data was only used for research propose and was remained confidential.

CHAPTER IV
RESULT

The questionnaires were distributed among 100 participants and 93 out of 100 responded. The first question asked was patients' age. 10(10.8%) patients were aged between 0-20 years, 9(9.7%) patients were aged between 21-40 years, high frequency of 70(75.3%) patients were aged between 41-60 years and 4(4.35%) patients were aged more than 60 years as shown in table IV-1, figure IV-1.

Out of 93 participants, 47(50.5%) were male and 46(49.5%) were female (table IV-2, figure IV-2).

Next question asked was regarding marital status. 59(63.4%) were married, 10(10.8%) were widowed, 22(23.7%) were single and 2(2.2%) were divorced. (Table IV-3, figure IV-3])

When question regarding employment status was asked, 31(33.3%) were home maker, 27(29.0%) were unemployed, 12(12.9%) were retired, 2(2.2%) were on long term sick leave, only one responded as part time worker and 20(21.5%) responded as others. (table IV-4, figure IV-4)

When I asked about diagnosis, out of 93, 14(15.1%) patients were of breast cancer, 16(17.2%) were of lungs cancer, 8(8.6%) were of bladder cancer, 5(5.4%) were of prostate cancer, 2(2.2%) were of throat cancer, 6(6.5%) were of lymphoma cancer, 10(10.8%) were of colorectal cancer, 3(3.2%) were of ovarian cancer, 4(4.3%) were of sarcoma, 12(12.9%) were of cervical cancer and 13(14%) were of brain cancer.(table IV-5, figure IV-5)

Out of 93, 58(62.4%) patients were at stage 4, 16(17.2%) were at stage 3, 9(9.7%) were at stage 2, 2(2.2%) were at stage 1 and 8(8.6%) were not sure about the stage of the disease. (Table IV-6, figure IV-6)

When question regarding type of treatment was asked, 63(67.7%) patients received chemotherapy and radiotherapy, 19(20.4%) received surgery, chemotherapy and radiotherapy, 6(6.5%) received chemotherapy and 5(5.4%) went under surgery process. (table IV-7, figure IV-7)

Response on question about treatment duration recorded as 40(43.0%) received treatment between 3-4years, 21(22.6%) received treatment between 5-7years, 12(12.9%) received treatment between 8-10years, 9(9.7%) received treatment between 1-2 years, 8(8.6%) received treatment for less than 1 year and only 3(3.2%) received treatment for more than 10 years. (table IV-8, figure IV-8)

4.2 Level Of Fatigue

Out of 93, 83(89.2%) patients reported that they are currently experiencing fatigue and 10(10.8%) patients reported that they are not currently experiencing fatigue indicating high level of fatigue.(Table IV-9, figure IV-9)

79(84.9%) patients experience fatigue on daily basis, 7(7.5%) experience fatigue on every other day, 6(6.5%) experience fatigue weekly and only one patient experience fatigue monthly, representing higher frequency of fatigue. (Table IV-10, figure IV-10)

When patients were asked that did they received any fatigue advice, 90(96.8%) responded yes and 3(3.2%) responded no. (Table IV-11, figure IV-11)

40(43.0%) patients received fatigue advice from Oncologist, 25(26.9%) received from Physiotherapists, 14(15.1%) received fatigue advice from General practitioner, 11(11.8%) received fatigue advice from Nurses and only 3(3.2%) received fatigue advice from other sources. (Table IV-12, figure IV-12)

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

When the question regarding format of advice was asked 85(91.4%) patients received through one to one consultation, 4(4.3%) received through information leaflet and 4(4.3%) received through other formats. (Table IV-13, figure IV-13)

On the question about advice recommendation, 53(57.6%) patients were recommended to exercise or keep active, 36(38.7%) were recommended to do rest or sleep, 3(3.2%) were recommended to perform in a pace and only one patient responded as other. (Table IV-14, figure IV-14)

To assess the cancer related fatigue, Multidimensional fatigue symptom inventory-short form questionnaire was used and upon analysis of score of each patient, the mean calculated of each component signifies that most patients suffer with physical fatigue with the mean of 15.97 , mean calculated for general fatigue was 8.82, mean calculated for emotional fatigue was 5.82, mean calculated for mental fatigue was 4.83 and for vigorous component mean calculated was 1.05 as shown in table tables IV-15. It shows that patients are experiencing high level of physical fatigue symptom during the preceding one week period.

Average calculated for total scoring of this scale for all patients was 34.44 indicating mostly patients are suffering from this symptom. (Table IV-16)

4.3 Physical Activity Frequency And Intensity

To measure the frequency and intensity of physical activity in cancer patients Leisure Score Index (LSI) of the Godin Leisure Time Exercise questionnaire was used. Results are as under:

Upon the question that how many times you do strenuous exercise per week, 78(83.9%) patients reported none, 8(8.6%) reported 2 times a week, 3(3.2%) reported 3 times a week, 3(3.2%) reported 3 times a week and only one patient reported 1 times a day. (Table IV-17, figure IV-15)

When patients were asked how many times you do moderate exercise per week, 56(60.2%) patients reported none, 18(19.4%) reported they do 4 times a week, 7(7.5%) reported 2 times a week, 7(7.5%) reported 3 times a week, 4(4.3%) reported 5 times a week and only one patient reported as one time a week. (Table IV-18, figure IV-16)

Out of 93 patients, 34(36.3%) patients reported none, 20(21.5%) reported as 3 times a week, 18(19.4%) reported as 4 times a week, 8(8.6%) reported as two times a week, 7(7.5%) reported as more than 5 times a week and 6(6.5%) reported as 5 times a week when question was asked that how many times you do mild exercise per week. (Table IV-19, figure IV-17)

After the analysis of interpreted score of Godin scale, outcomes were, out of 93, 27(29%) patients were considered as active, 9(9.7%) were marked as moderately active and rest 57(61.3%) were marked as insufficiently active/sedentary (table IV-20, figure IV-19) indicating high percentage of patients are not active and prefer to follow a sedentary lifestyle.

When question that do you engage in a physical activity to work up a sweat, was asked, 34(36.6%) patients reported as sometimes, 30(32.3%) reported as rarely/never and 29(31.2%) reported as often. (Table IV-21, figure IV-20)

Results indicate that frequency of physical activity participation is very low as maximum patients are not involved in any type of exercise, low intensity exercises are preferred by few patients and mostly patients sometimes or usually patients never or rarely involve in a physical activity that work up a sweat.

4.4 Exercise Barrier

Out of 93, 42(45.2%) reported fatigue, 21(22.6%) reported lack of motivation, 20(21.5%) reported pain, 6(6.5%) reported lack of facilities, 2(2.2%) reported joint stiffness, one patient reported illness or any other health problem and one patient reported weakness as often/very often a barrier that interferes with exercise participation. (Table IV-22, figure IV-21)

Table IV-1: Age of participants

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		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-20	10	10.8	10.8	10.8
	21-40	9	9.7	9.7	20.4
	41-60	70	75.3	75.3	95.7
	>60	4	4.3	4.3	100.0
	Total	93	100.0	100.0	

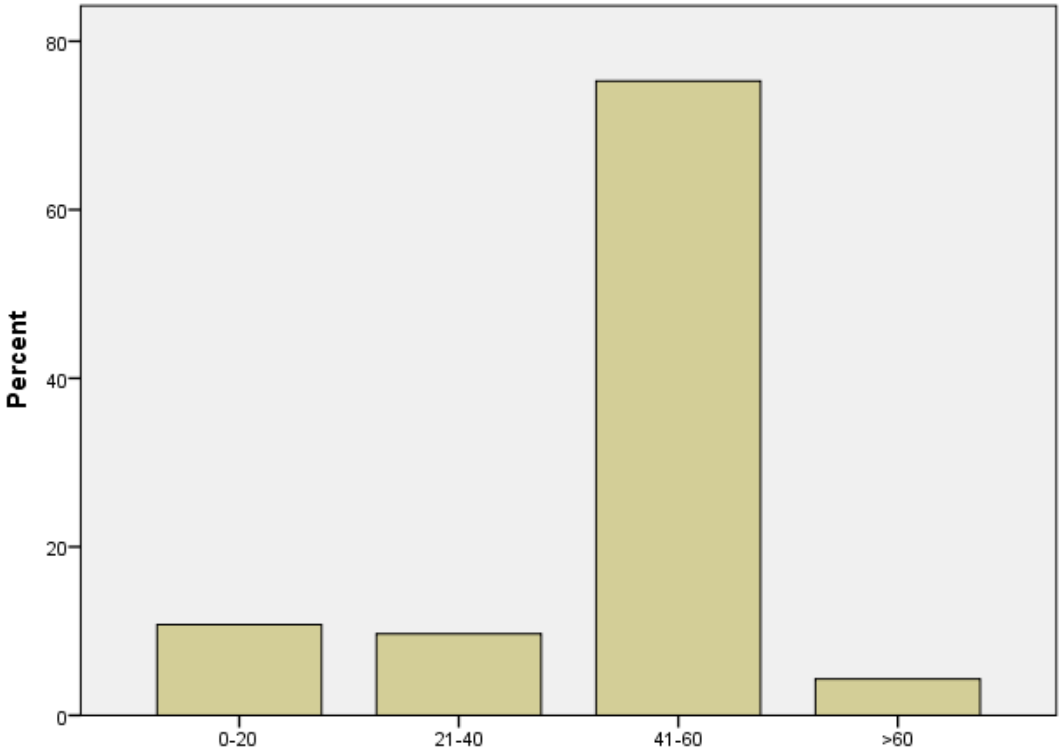


Table IV-1: Age of participants

Table IV-2: Gender of participants

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	47	50.5	50.5	50.5
	Female	46	49.5	49.5	100.0
	Total	93	100.0	100.0	

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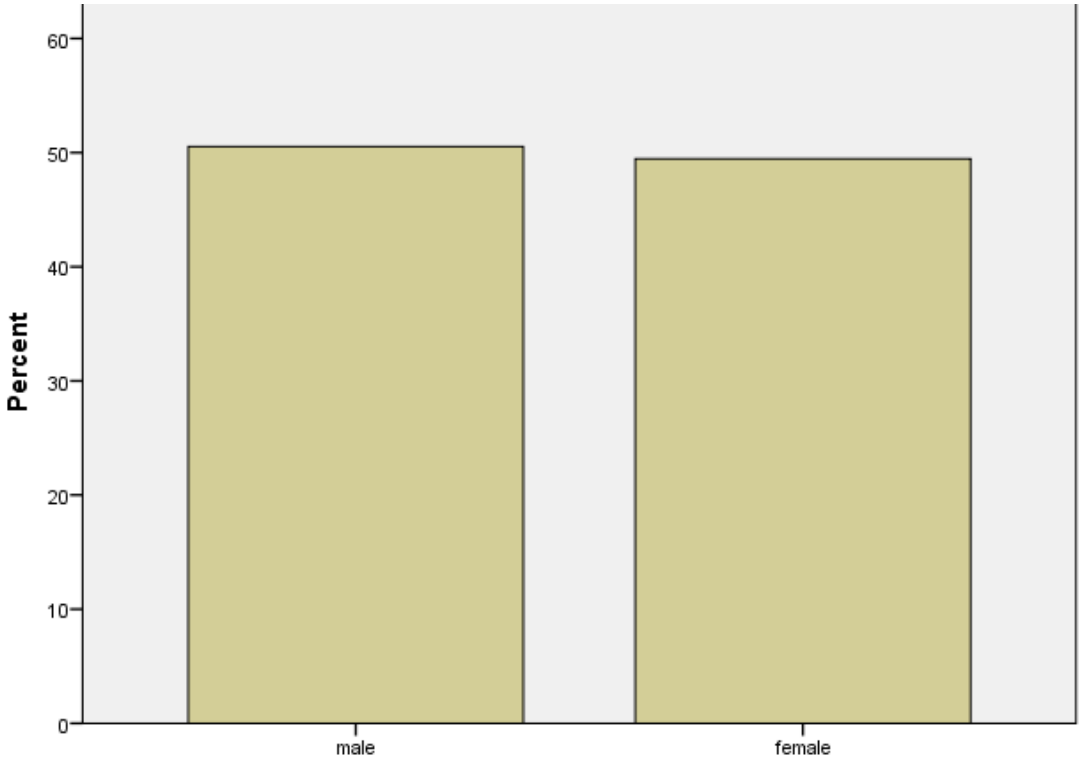


Table IV-2: Gender of participants

Table IV-3: Marital status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	married	59	63.4	63.4	63.4
	widowed	10	10.8	10.8	74.2
	single	22	23.7	23.7	97.8
	divorced	2	2.2	2.2	100.0
	Total	93	100.0	100.0	

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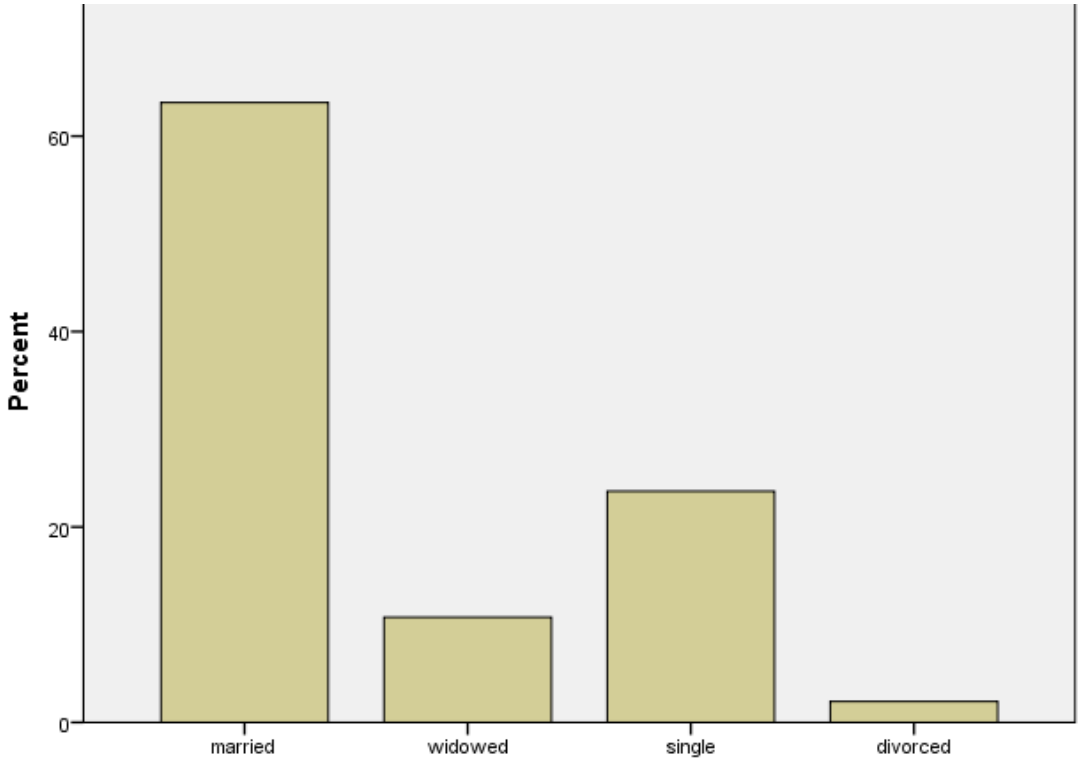


Figure IV-3: Marital status

Table IV-4: Employment status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	retired	12	12.9	12.9	12.9
	part time	1	1.1	1.1	14.0
	long term sick leave	2	2.2	2.2	16.1
	home maker	31	33.3	33.3	49.5
	un employed	27	29.0	29.0	78.5
	other	20	21.5	21.5	100.0
	Total	93	100.0	100.0	

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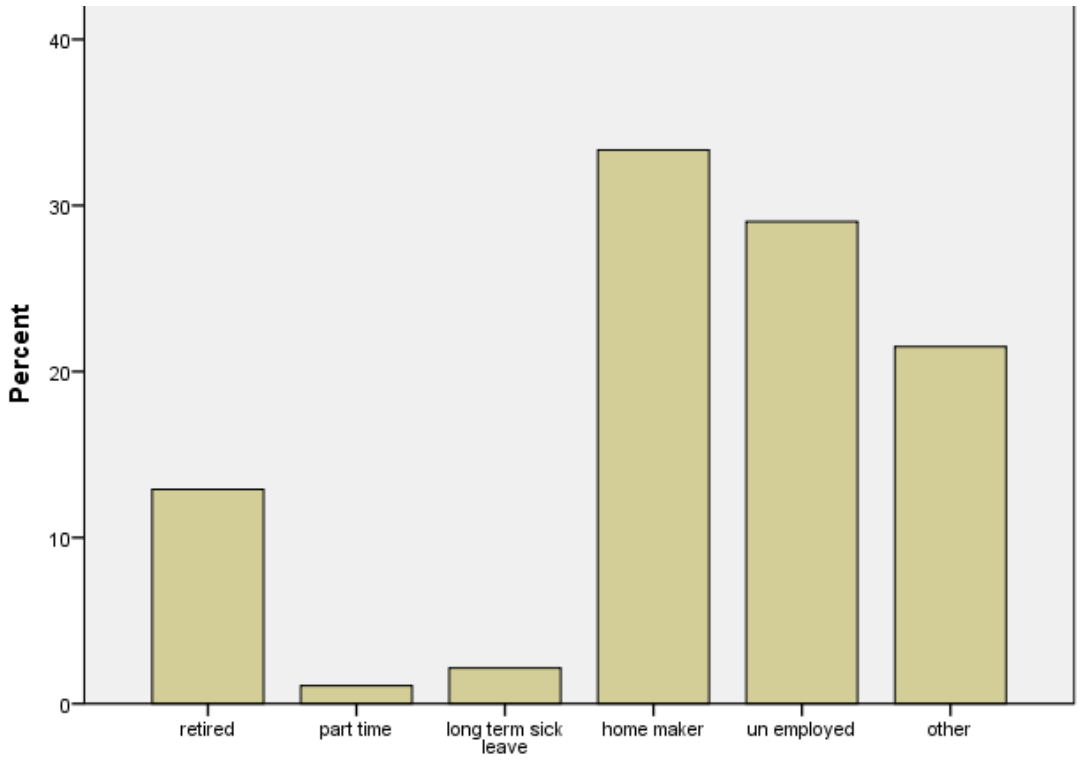


Figure IV-4: Employment status

Table IV-5: What is the diagnosis?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Breast	14	15.1	15.1	15.1
	Lungs	16	17.2	17.2	32.3
	Bladder	8	8.6	8.6	40.9
	Prostate	5	5.4	5.4	46.2
	Throat	2	2.2	2.2	48.4
	Lymphoma	6	6.5	6.5	54.8
	Colorectal	10	10.8	10.8	65.6
	Ovarian	3	3.2	3.2	68.8
	Sarcoma	4	4.3	4.3	73.1
	Cervical	12	12.9	12.9	86.0
	Brain	13	14.0	14.0	100.0
	Total	93	100.0	100.0	

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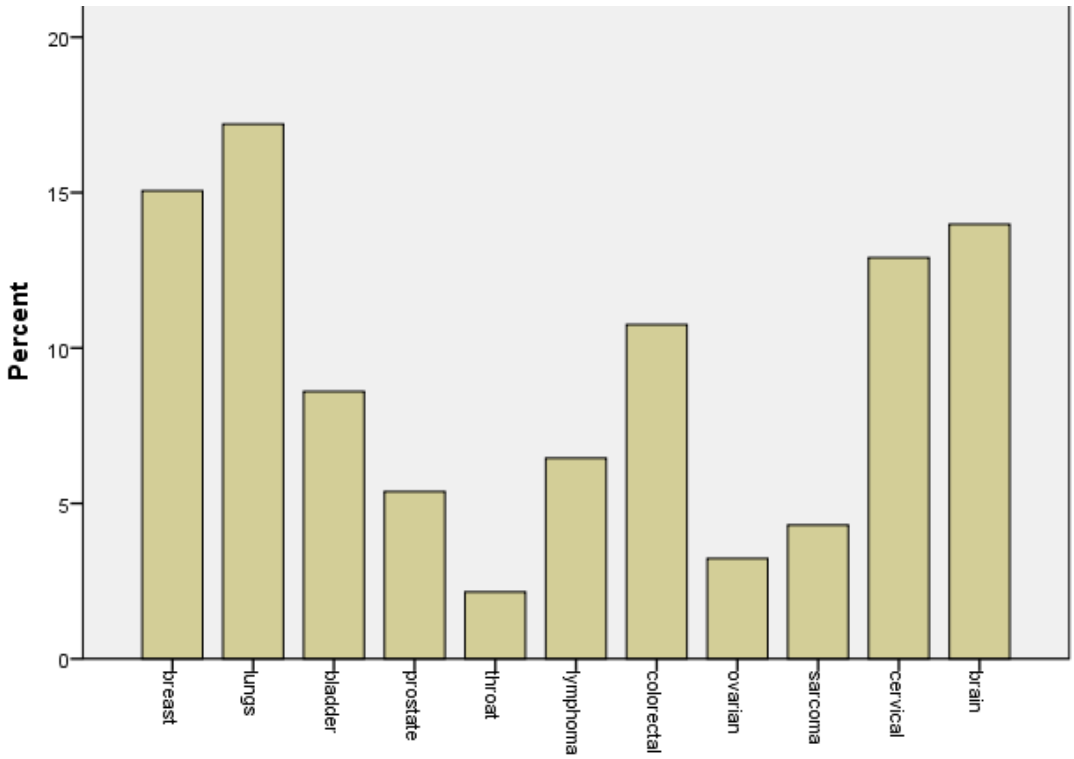


Figure IV-5: what is the diagnosis?

Table IV-6: What is the stage of disease?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	stage 1	2	2.2	2.2	2.2
	stage 2	9	9.7	9.7	11.8
	stage 3	16	17.2	17.2	29.0
	stage 4	58	62.4	62.4	91.4
	don't know	8	8.6	8.6	100.0
	Total	93	100.0	100.0	

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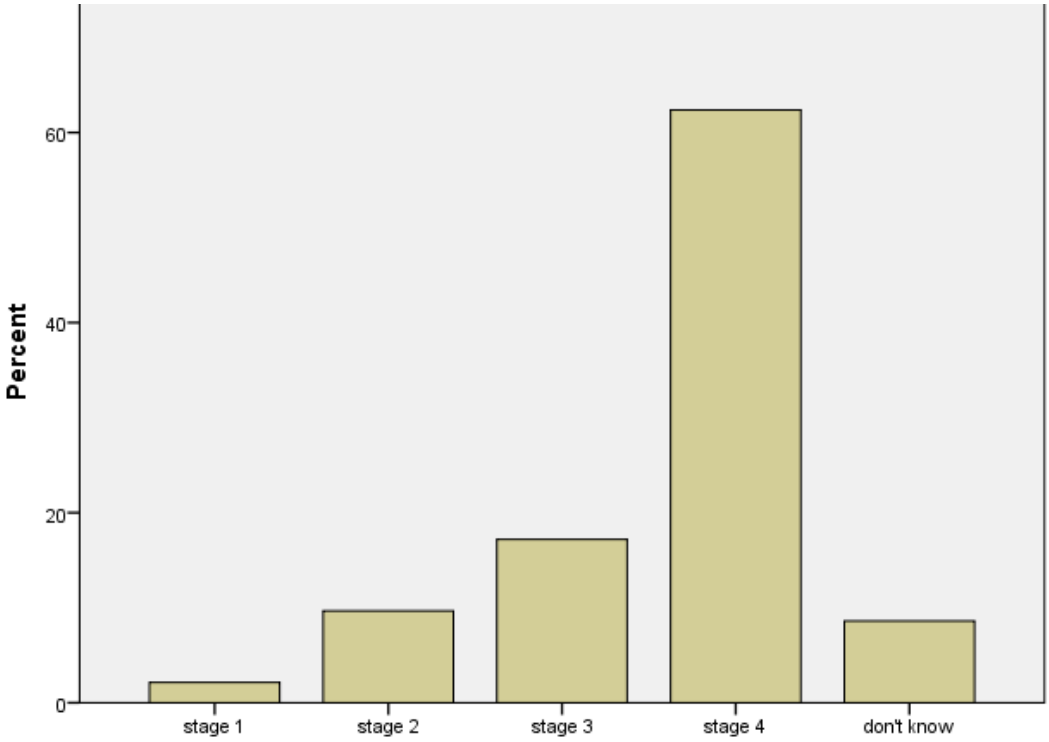


Figure IV-6: what is the stage of disease?

Table IV-7: Which type of treatment you received?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Surgery	5	5.4	5.4	5.4
	Chemotherapy	6	6.5	6.5	11.8
	chemotherapy and radiotherapy	63	67.7	67.7	79.6
	surgery, chemotherapy and radiotherapy	19	20.4	20.4	100.0
	Total	93	100.0	100.0	

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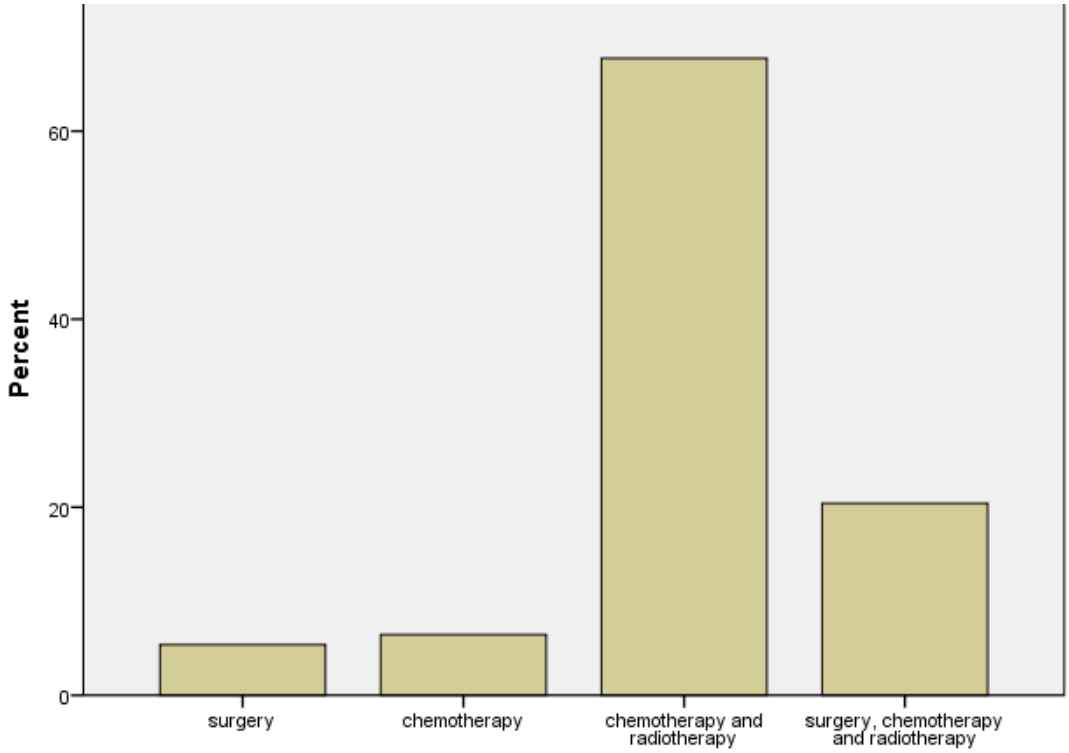


Figure IV-7: which type of treatment you received?

Table IV-8: Duration of treatment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<1	8	8.6	8.6	8.6
	1-2 years	9	9.7	9.7	18.3
	3-4 years	40	43.0	43.0	61.3
	5-7 years	21	22.6	22.6	83.9
	8-10 years	12	12.9	12.9	96.8
	>10 years	3	3.2	3.2	100.0
	Total	93	100.0	100.0	

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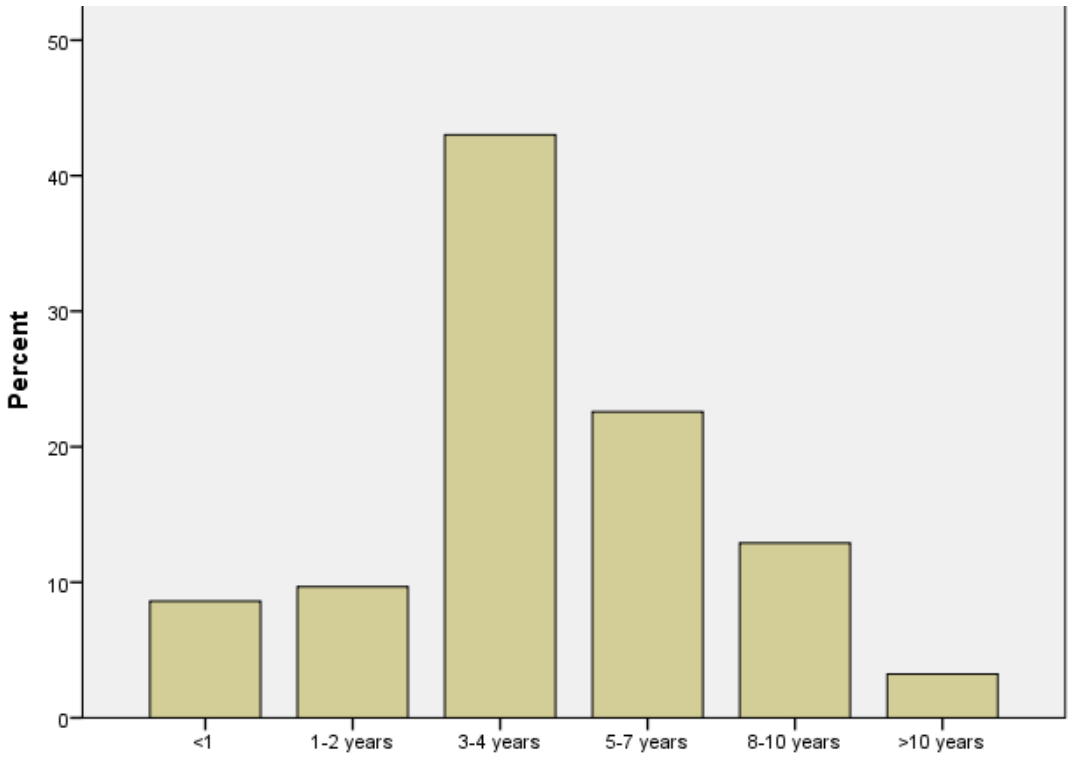


Figure IV-8: what was the duration of treatment?

Table IV-9: Are you currently experiencing fatigue?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	83	89.2	89.2	89.2
	No	10	10.8	10.8	100.0
	Total	93	100.0	100.0	

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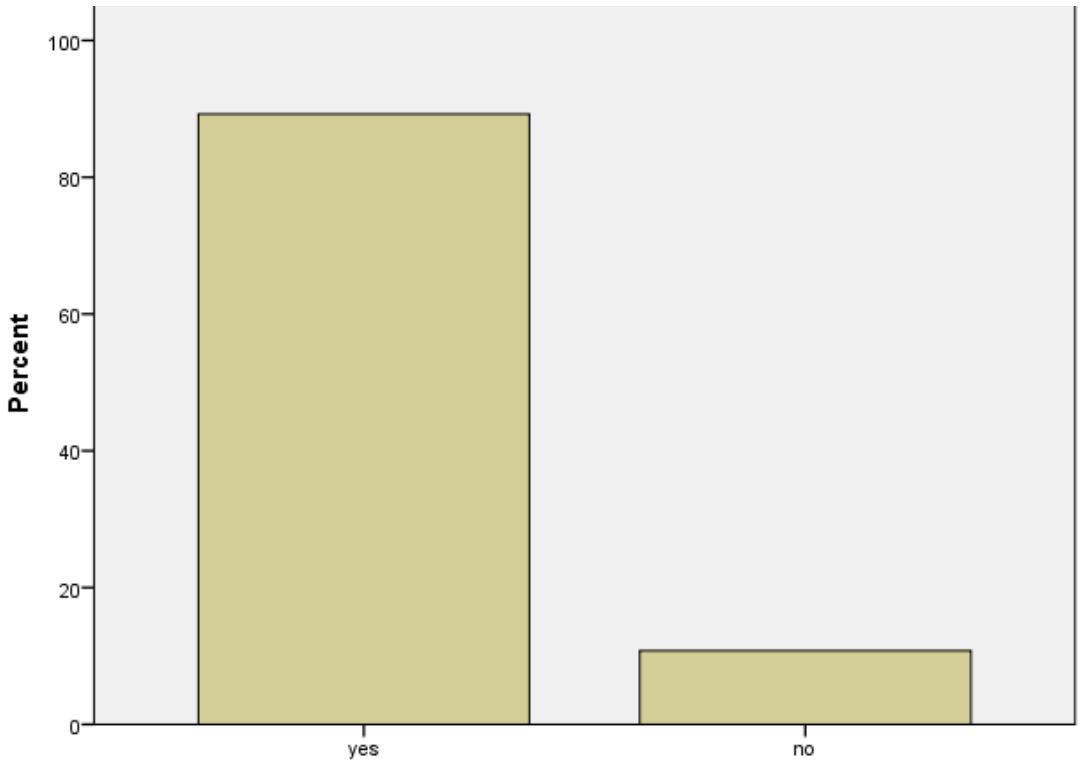


Figure IV-9: Are you currently experiencing fatigue?

Table IV-10: What is the frequency of fatigue?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Daily	79	84.9	84.9	84.9
	Every other day	7	7.5	7.5	7.5
	Weekly	6	6.5	6.5	6.5
	Monthly	1	1.1	1.1	1.1
	Total	93	100.0	100.0	

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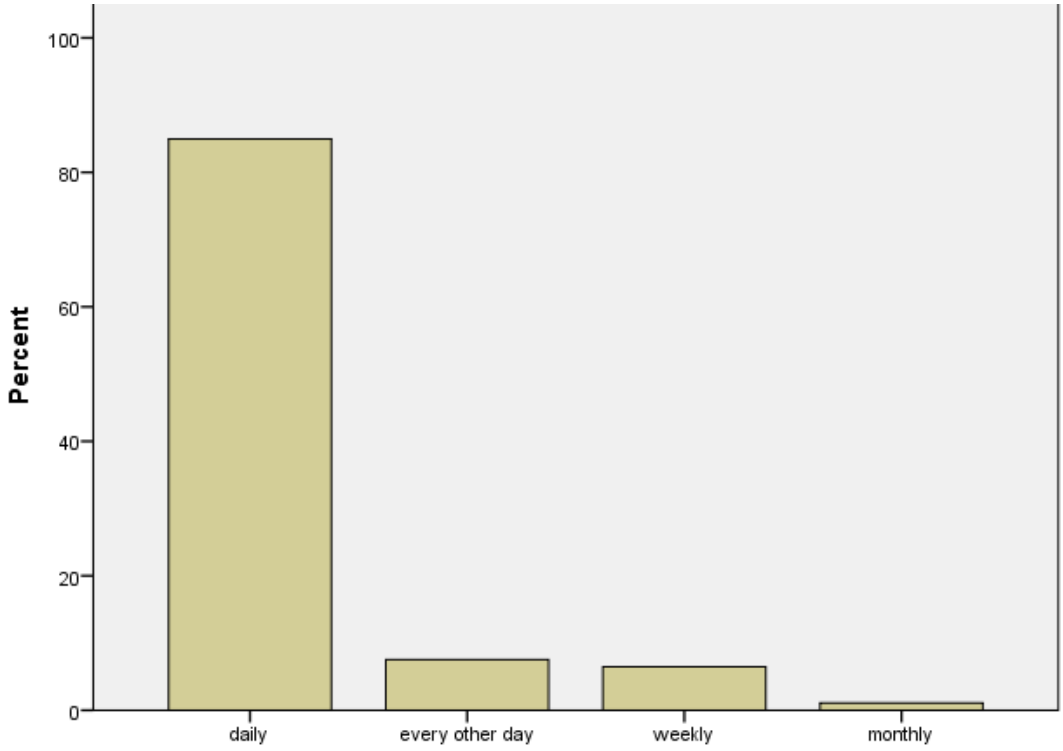


Figure IV-10: what is the frequency of fatigue?

Table IV-11: Any fatigue advice given to you?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	90	96.8	96.8	96.8
	No	3	3.2	3.2	3.2
	Total	93	100.0	100.0	

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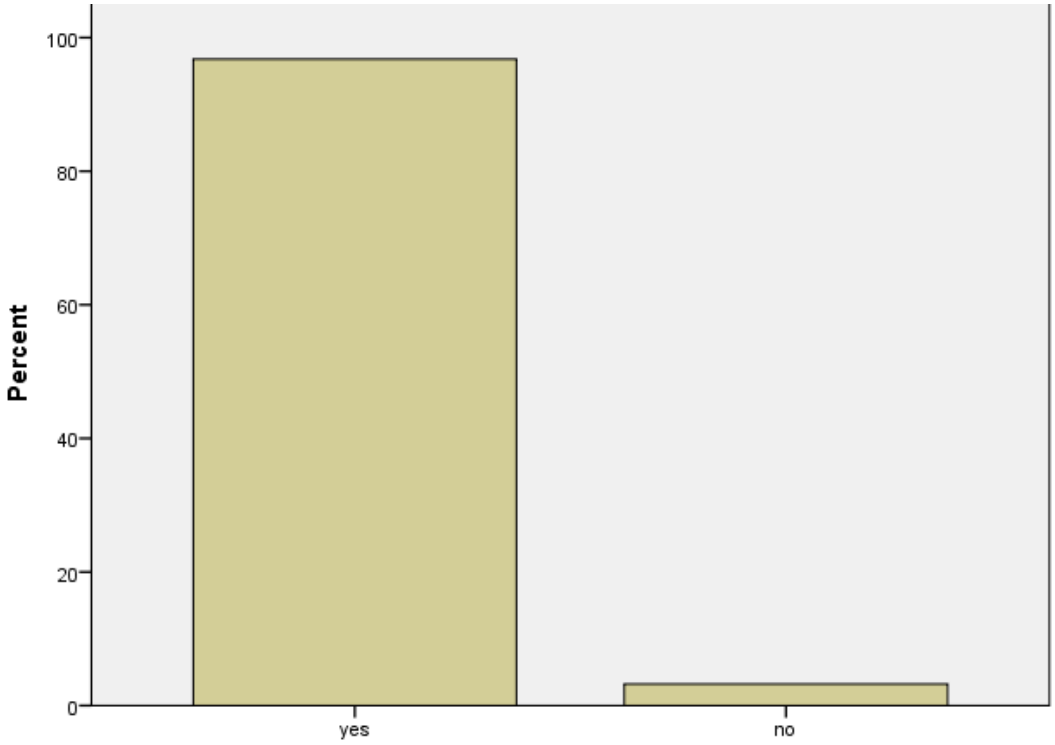


Figure IV-11: Any fatigue advice given to you?

Table IV-12: Who provided fatigue advice?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Nurse	11	11.8	11.8	11.8
	General practioner	14	15.1	15.1	15.1
	Oncologist	40	43.0	43.0	43.0
	Physiotherapist	25	26.9	26.9	26.9
	Other	3	3.2	3.2	3.2
	Total	93	100.0	100.0	

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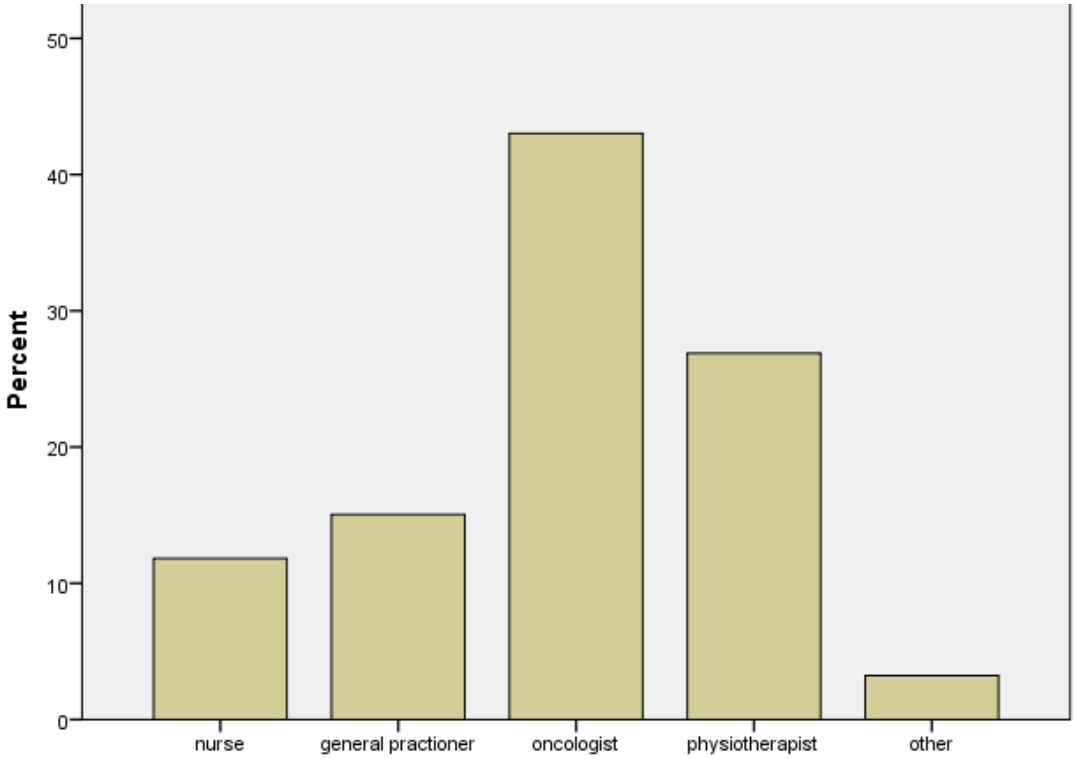


Figure IV-12: who provided fatigue advice?

Table IV-13: What was the format of advice?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	One to one consultation	85	91.4	91.4	91.4
	Information leaflet	4	4.3	4.3	4.3
	Other	4	4.3	4.3	4.3
	Total	93	100.0	100.0	

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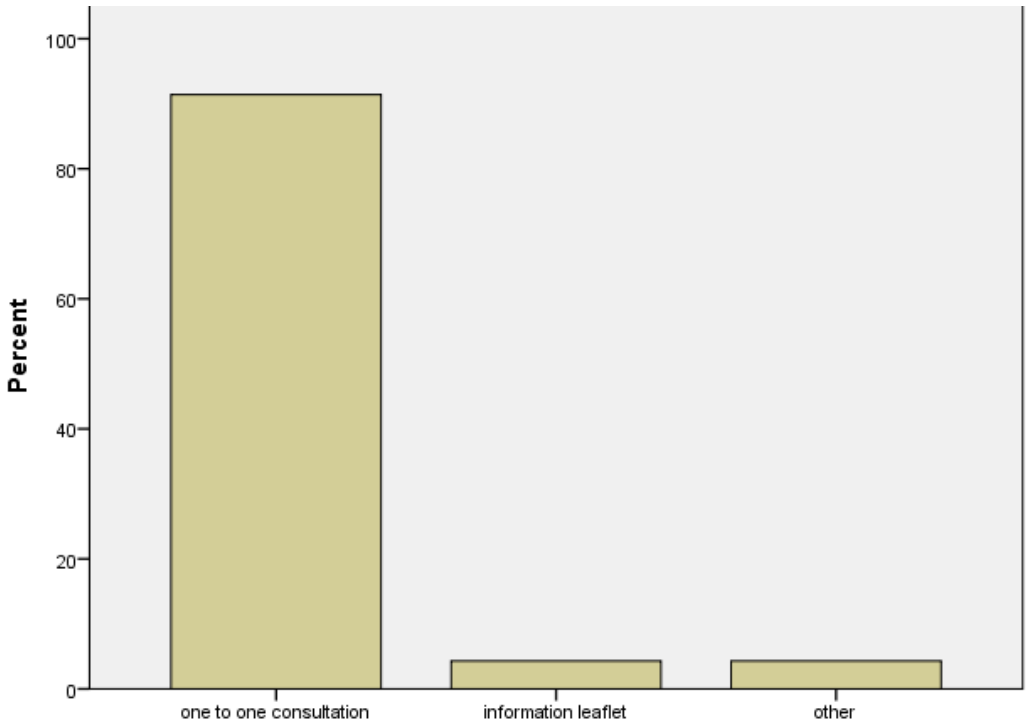


Figure IV-13: what was the format of advice?

Table IV-14:What was the recommended advice?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Exercise or keep active	53	57.0	57.0	57.0
	Rest or sleep	36	38.7	38.7	38.7
	Pacing	3	3.2	3.2	3.2
	Others	1	1.1	1.1	1.1
	Total	93	100.0	100.0	

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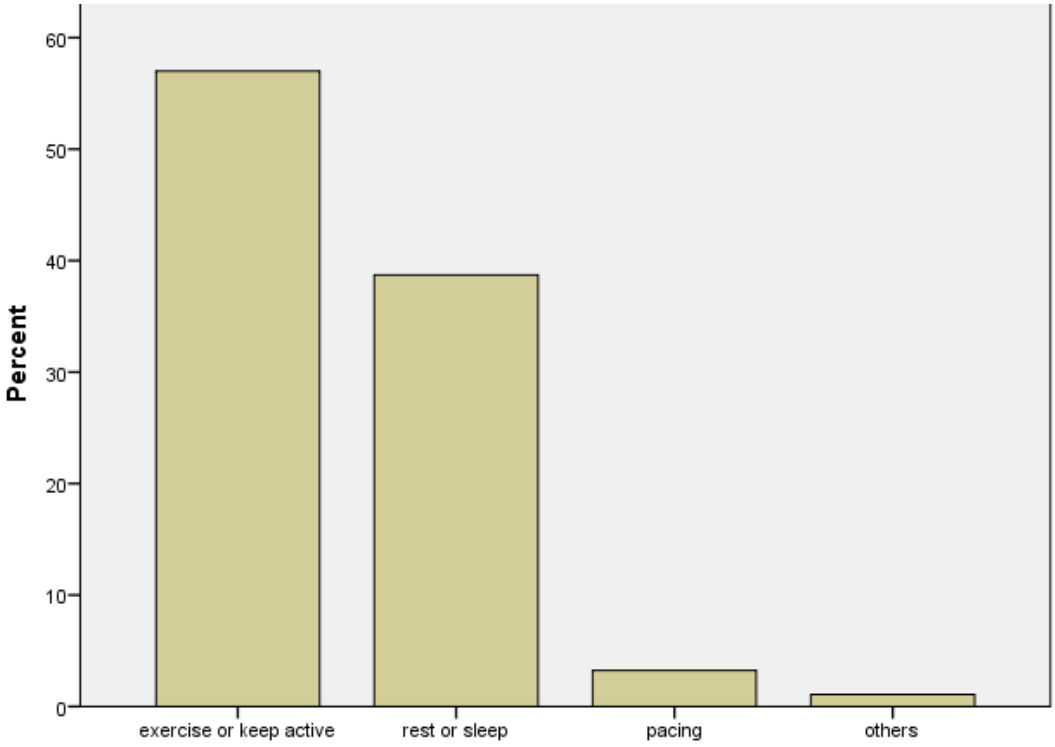


Figure IV-14: what was the recommended advice?

Table IV-15: MEAN (Components of Multidimensional fatigue symptom scale-short form)

		General fatigue	Physical fatigue	Emotional fatigue	Mental fatigue	vigorous
N	Valid	93	93	93	93	93
Mean		8.82	15.97	5.82	4.83	1.05

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Table IV-16: MEAN(Score interpretation of Multidimensional fatigue symptom scale-short form)

N	Valid	93
Mean		34.44

Table IV-17:How many times you do strenuous exercises per week?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	none	78	83.9	83.9	83.9
	1	3	3.2	3.2	87.1
	2	8	8.6	8.6	95.7
	3	3	3.2	3.2	98.9
	4	1	1.1	1.1	100.0
	Total	93	100.0	100.0	

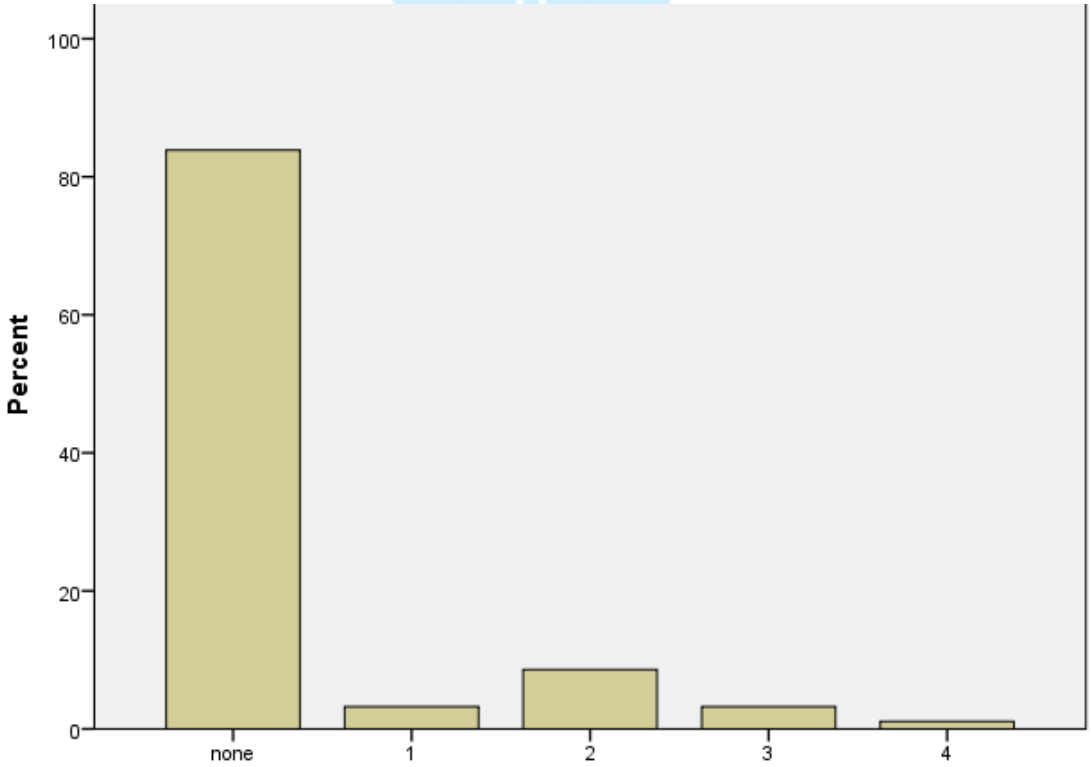


Figure IV-15: How many times you do strenuous exercises per week?

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Table IV-18: How many times you do moderate exercises per week?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	none	56	60.2	60.2	60.2
	1	1	1.1	1.1	61.3
	2	7	7.5	7.5	68.8
	3	7	7.5	7.5	76.3
	4	18	19.4	19.4	95.7
	5	4	4.3	4.3	100.0
	Total	93	100.0	100.0	

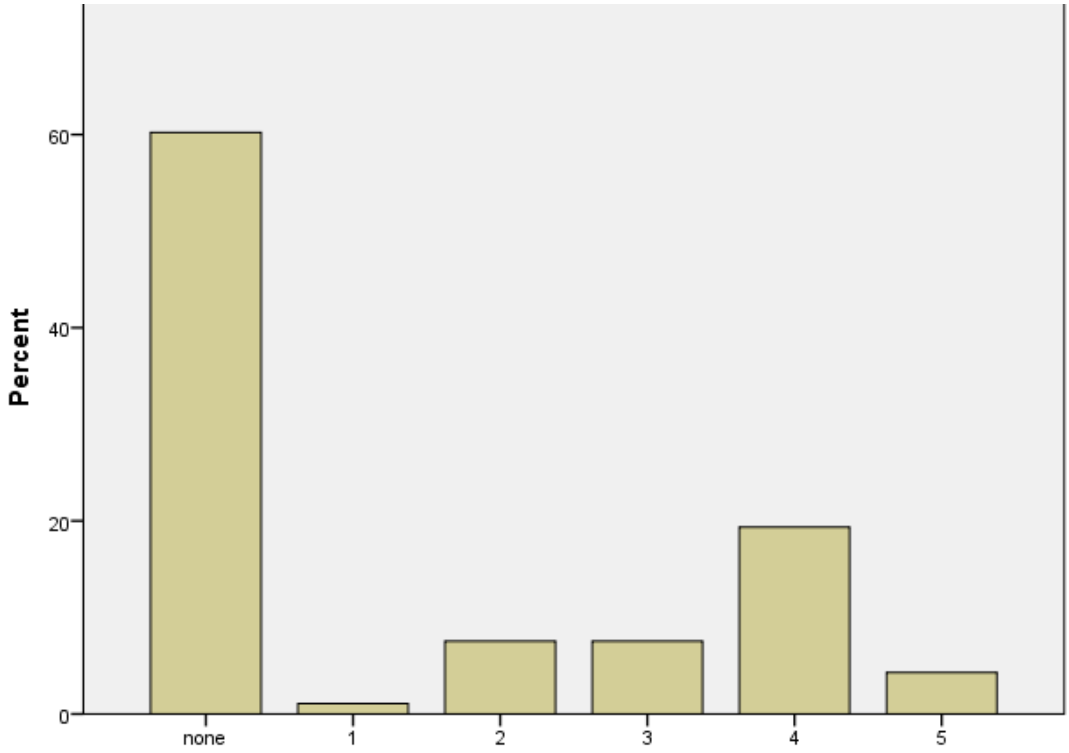


Figure IV-16: How many times you do moderate exercises per week?

Table IV-19: How many times you do mild exercises per week?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	none	34	36.6	36.6	36.6
	2	8	8.6	8.6	45.2
	3	20	21.5	21.5	66.7
	4	18	19.4	19.4	86.0
	5	6	6.5	6.5	92.5
	>5	7	7.5	7.5	100.0
	Total	93	100.0	100.0	

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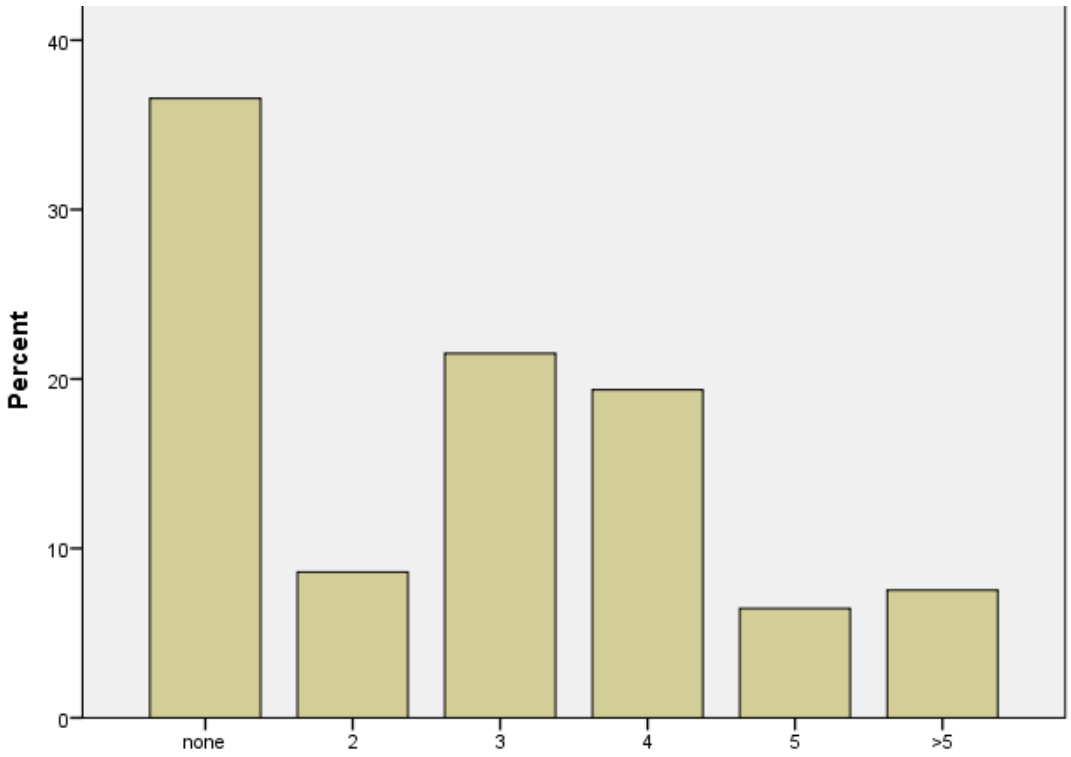


Figure IV-17: How many times you do mild exercises per week?

Table IV-20: Godin Scale Score interpretation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Active	27	29.0	29.0	29.0
	Moderately Active	9	9.7	9.7	38.7
	Insufficiently active/sedentary	57	61.3	61.3	100.0
	Total	93	100.0	100.0	

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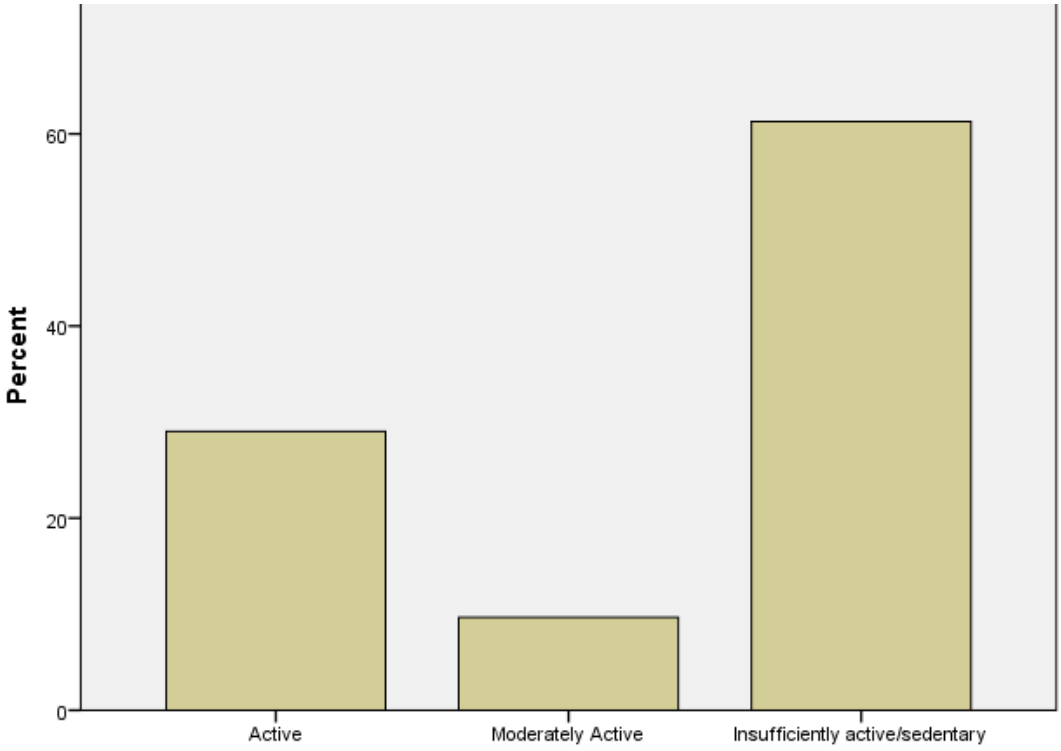


Figure IV-19: Godin scale score interpretation

Table IV-21: Do you engage in a activity long enough to work up a sweat?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Often	29	31.2	31.2	31.2
	sometimes	34	36.6	36.6	67.7
	rarely/never	30	32.3	32.3	100.0
	Total	93	100.0	100.0	

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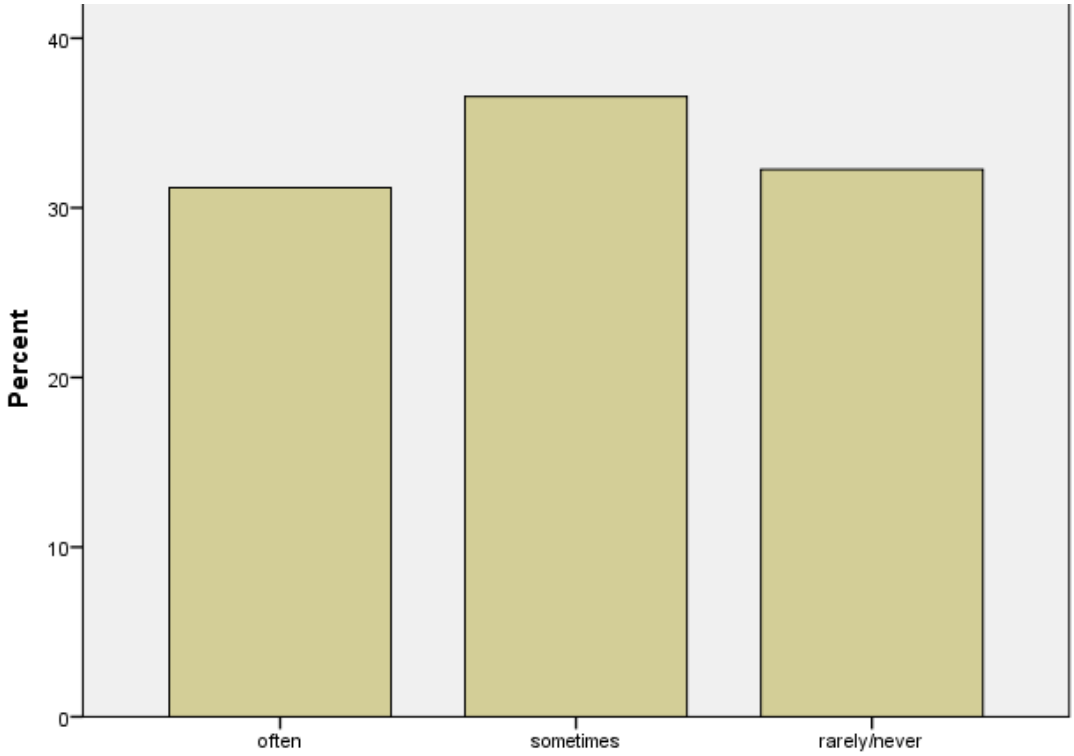


Figure IV-20: Do you engage in a activity long enough to work up a sweat?

Table IV-22: What you think is the barrier that often interferes with exercise participation?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	illness/other health problems	1	1.1	1.1	1.1
	joint stiffness	2	2.2	2.2	3.2
	Fatigue	42	45.2	45.2	48.4
	Pain	20	21.5	21.5	69.9
	lack of motivation	21	22.6	22.6	92.5
	lack of facilities	6	6.5	6.5	98.9
	weakness	1	1.1	1.1	100.0
	Total	93	100.0	100.0	

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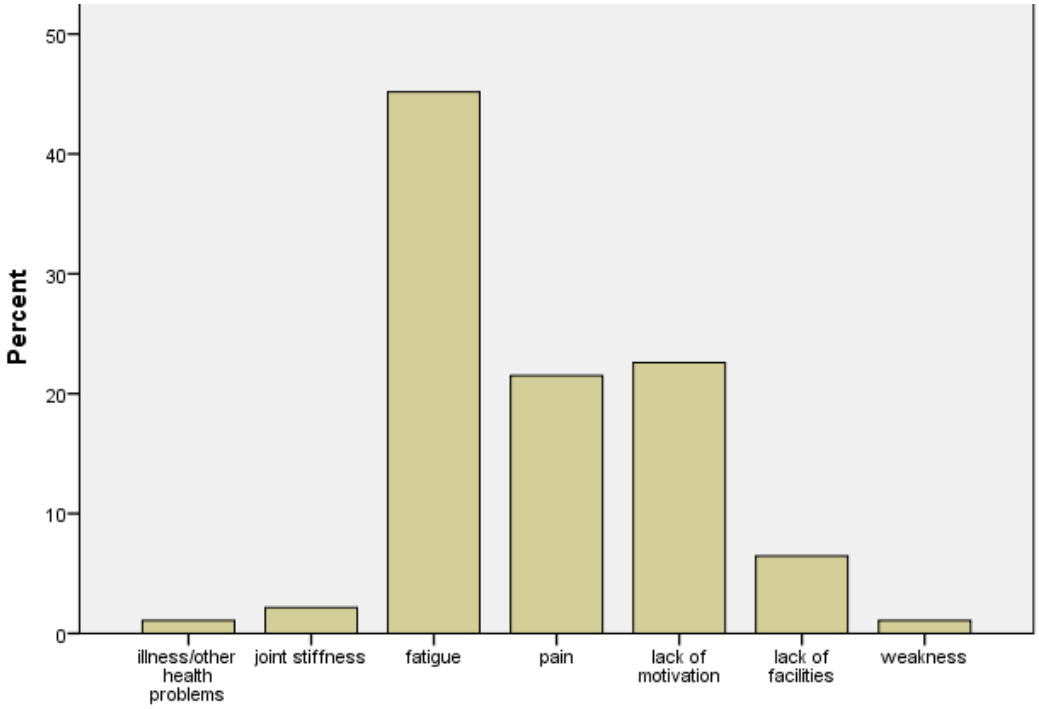


Figure IV-21: What you think is the barrier that often interferes with exercise participation?

CHAPTER V
DISCUSSION

This study determines cancer patients' exercise barriers as well as level of fatigue and their physical activity participation they usually engage in. Data was collected from nuclear institute of medicine and radiotherapy hospital Jamshoro. Usually data collection is difficult as patients of this type of population are usually not in a condition to participate in research programs but with the co operation of health care professionals and attendants majority of patients participated voluntarily and provided true data. Some of them filled questionnaires by their own and some replied to the questions through interview process because of severe weakness. It was a very good experience for me to collect data because interaction with patients is always a best part of anything. Patients with different diagnosis, with different stages of disease and received different kind of treatments participated. Every age participant participated with almost equal gender percentages. 100 questionnaires were printed out but responded rate was 93.

Usually it is assumed that fatigue is very common and chronic symptom among this population. According to this study significantly high percentage of participants was currently experiencing fatigue with majority experiencing fatigue on daily basis. Same questionnaire based survey was done previously by J.M Blaney in 2013 reporting similar results that majority patients were experiencing fatigue on daily basis. (2)

In this study, majority received the fatigue advice and most of it was given by oncologists and physiotherapists where as in previous study (2) majority did not receive any fatigue advice, and if received, high percentage was provided by nurses and general practitioners. In another questionnaire survey reported that only 14% of cancer patients were recommended strategies to control cancer related fatigue which indicates that patients do not receive sufficient education in recent past years. (39)

Previous study (2) showed that format of advice regarding fatigue was given mostly given through one to one consultation and similar results are reported in this study that majority of patients received the fatigue advice through one to one

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consultation as they have to continue follow up their visits for so long.

In this study highly recommended advice for fatigue control was to exercise or stay active (57%) and to rest or sleep (38.7%) but in previous study [16] both advices, to exercise and to rest was equally recommended to patients. Donnelly et al determined that around 70% of physiotherapists reported lack of guidelines regarding exercise as a barrier to prescribing physical activity along with insufficient resources and less amount of referral from consultants. (40)

In this study, multidimensional fatigue symptom inventory short form scale was used to assess cancer related fatigue. It consists of five components named as general, physical, mental, emotional and vigorous, each of six items. Score is then calculated and all points are summed up and vigorous component is then subtracted to calculate the exact prevalence of fatigue. High points indicate cancer related fatigue is present. After the interpretation of scores of each component of multidimensional fatigue symptom inventory short form scale, average result was high for physical fatigue where as previous study showed that majority patients scored high points in general fatigue component. (2)

Another standard scale is used named as Leisure score index of Godin scale in this study. Patients are asked to report how many times in a week they perform strenuous, moderate and mild type of exercises. Then each component's score is multiplied with a constant. High points indicate patient is active and low indicates sedentary life style. In this study, after the analysis of score, significantly high percentage of people are sedentary, less percentage of patients are active and few are moderately active. It was also found that majority of patients are not engage in any type of physical activity. Previous researches (2, 41-43) also reports that cancers patients are not engaged in sufficient amount of physical exercise. It indicates that high amount of people don't have a quality of life along with chronic disease. Romero SAD et al also conducted a study and concluded that majority cancer patients with are not involved in any kind of physical activity. (20)

Participating and meeting the guidelines recommended by world health organization can be beneficial in this population especially when receiving long term chemotherapy treatment as it can affect the overall condition of patient and bounding them to bed. Cancer patients' perceived barriers play a major role in this regard. In this study major barriers perceived by mostly patients were fatigue, lack of motion and pain. In previous study (2) perceived barriers were health and environmental factors. In another research study (19) fatigue is the major barrier that affects physical activity levels in cancer patients. One more study (17) reported that physical activity not tailored to patients and fatigue with pain is the major factors that interfere with physical activity.Jun J Mao et al conducted another study that reported that psychological and physiological factors were barriers to exercise. (16)

Current study is suggestive that mostly patient are not motivated to do exercise so that can affect their general health and conditioning. Recommendation for exercise is not enough to make patient ready for exercise programs. Continuously reminding them, asking about exercise records, telling them the benefits of exercises and referring them to physical therapists could really work in order to increase physical activity participation of cancer patients suffering mainly with cancer related fatigue. Such strategies should be introduced and explained to patients so that they can overcome the major symptom fatigue and can spend their lives with quality. Available facilities should be utilized in order to increase the physical activity as some patients also complained of lack of facilities.

CHAPTER VI
CONCLUSION

This current study shows that majority of cancer patients are experiencing fatigue on daily basis, majority are receiving fatigue advice with equal ratio of to exercise and to rest. It also showed that most of cancer patients are not engaged in any type of physical activity and few are engaged in mild intensity exercises. Mostly patients' perceived barrier in this study was fatigue, lack of motivation and pain and these can be alleviated

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through optimum amount of physical activity with optimum intensity according to each patient's health condition.

CHAPTER VII
RECOMMENDATIONS

This was a convenience sample of cancer patients from Nuclear Institute of Medicine and radiotherapy hospital Jamshoro in which majority were of stage 4 disease. I would recommend that in future this study should be conducted in other major cities of Pakistan so that different strategies and plans should be made at country level to overcome the existing problem. In future, data should be collected from large sample size to include more patients with other stages of disease and various diagnoses. Future research should also take in account co morbidity data when interpreting fatigue in cancer patients and should include those cancer patients who do not receive any kind of cancer treatment to determine level of fatigue in those patients as well.

ACKNOWLEDGEMENT

I'm very glad to express my utmost gratitude to all those people who have made this thesis study a possible one.

First and foremost I'm grateful to ALLAH, The most beneficent and the most merciful, who gave me insight, enabled and guided me to accomplish this work.

I owe an immense debt of gratitude to respectable supervisory committee. I appreciate Dr Muhammad Zubair and Dr. Shujaatfor his valuable guidance, motivation and encouragement throughout my research work.

I highly appreciate Dr. Muhammad Ahmed Qureshi efforts of for her sincerity and constant guidance, attention and valuable time throughout my thesis work.

Special thanks to clinicians that gave up their time to participate in the study.

At the end my I appreciate my supportive classmates who never let me down and ready to help whenever I needed.

Last but not the least; I'm greatly thankful to my parents and my siblings for their support and kindness throughout my career..

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