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# Importance of Physical Therapy Approaches to Improve Quality of Living in Cancer Patient: A Review

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## Abstract

**Background:** Cancer is a non-communicable disease which can be widely spread all over the world. In India, it is a second most cause of morbidity and mortality. Based on the increasing trends of cancer patients during the last few decades, the numbers of cancer patients have been predicted and over 8.8 lakh deaths by the end of 2020 in India. Cancer cases are increasing rapidly among Indian population, because of the low awareness and late detections. There is evidence that physiotherapy approaches prevent the complications and side effects after and during treatment and improve the quality of life in cancer patients. **Aim and Objective:** To analyse the importance of physical therapy rehabilitation in cancer patients. **Methodology:** Various articles from following databases like Science Direct, PubMed, Biomed Central, JAMA, Scholar and Cochrane were retrieved. Total 27 articles were included in the study, and based on their findings a review was made. **Result and Conclusion:** From the analyses it is concluded that physiotherapy is very effective in cancer patients. After rehabilitation cancer patients can function at a minimum level of dependency and optimize their quality of care regardless of their life expectancy. So, it is important that awareness about physical therapy techniques and its effects to the cancer patients is necessary.

**Keywords:** Cancer, non-communicable disease, quality of life, physiotherapy

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## INTRODUCTION

India is the second most populous country of the world. Being a developing country; India has many concerns to deal with e.g. poverty, illiteracy, hunger, unemployment, diseases etc. Currently, India is dealing with the burden of non-communicable diseases [1]. Non-communicable diseases are emerging as a major public health problem globally. It is not only the disease of developed countries but also affecting the developing countries. Cancer, a non-communicable disease originating as the pandemic of this century, as per Indian population census data, cancer is the second most common disease responsible for maximum mortality with about 0.3 million deaths per year [2]. According to National Cancer Institute "Cancer is a term used for diseases in which abnormal cells divide without control and are able to invade other tissues. Cancer cells can spread to other parts of the body through the blood and lymph systems".

According to World Cancer Research Fund International (2008) there were an estimated 12.7 million cancer cases all over the world. The number is expected to rise to 21 million by 2030 [3].

## CANCER SCENARIO IN INDIA

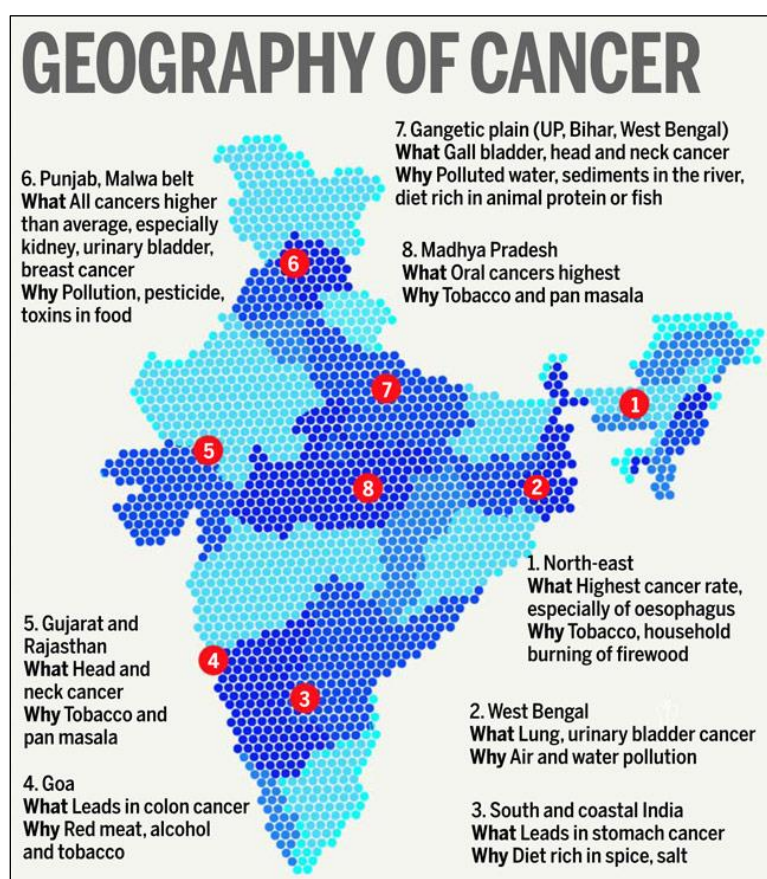
Cancer is the second most leading cause of death. Day by day cancer cases are increasing rapidly among Indian population because of low awareness and late detection. Based on the increasing trends of cancer patients during the last few decades, the numbers of cancer patients have been predicted by the end of 2020 in India [4]. According to National Institute of Cancer Prevention and Research estimated number of people living with the disease in India is around 2.5 million. Every year, over 7 lakhs new cancer patients registered. Cancer-related deaths is 5, 56,400 per year and most of deaths occurs in the age group between 30–69 years. One woman dies of cervical cancer every 8

minutes and every two women newly diagnosed with breast cancer in which one woman dies of it in India. As many as 2,500 persons die every day due to tobacco-related diseases in India. Cancers of oral cavity and lungs in males and cervix and breast in females account for over 50% of all cancer deaths. In India top five cancers in men are lip/oral cavity, lung, stomach, colorectum and pharynx cancer and in women breast, cervix, colorectum, ovary and lip/oral cavity cancer are common which account for 47.2% of all cancers. The absolute number of cancer deaths in India is projected to increase because of population growth and increasing life expectancy. India is a culturally diverse country, with huge regional and rural-to-urban variation in lifestyles and in age-specific adult death rates [5].

### CANCER BURDEN AND RISK FACTORS

Cancer is the second most common cause of death worldwide after cardiovascular diseases [6]. Cancer can impose a substantial burden

through long-term human suffering for individuals and families, economic impact on active members of society and high costs for health-care systems [7]. Cancer is a multifactorial disease due to a combined effect of genetic and external factors acting concurrently and sequentially. Overwhelming evidence indicates that the predominant contributor too many types of cancer is the environment. Environmental factors that represent risks for the development of cancer typically affect the general population through exposures that cannot be directly controlled by the individual. These factors can be found in the environment as physical (ionizing and non-ionizing radiation such as exposure to radon or ultraviolet (UV) radiation, respectively), chemical (such as asbestos, dioxins and other pollutants found in industrial emissions and second-hand smoke, contaminants or natural constituents found in food and drinking water such as pesticide residues, arsenic or aflatoxins), and biological carcinogens (such as certain viruses).



**Fig. 1:** State wise Distribution of Cancer and Risk Factors.

Source– Ref.: <https://www.thebetterindia.com/74188/cancer-awareness-india/>

Carcinogenic effects in human beings result from exposure to radiation, air pollutants, food and water components or contaminants, as well as daily consumer exposure from man-made products. These exposures may occur on multiple occasions and in various settings during the course of a life time, from households and schools, to the working environment. Children, including the embryo, fetus, infant and all life stages until the completion of adolescence are often at greater risk from environmental hazards than adults [6]. The major environmental risk factors for cancer are carcinogen and co-carcinogen exposure in tobacco, insufficient exercise and above all an unhealthy diet [8].

### **SOCIO-ECONOMIC IMPACT OF CANCER IN INDIA**

Cancer care cost has significant impact not only over the patient but also on his/her family members. This impact can be seen highly on the lowest and middle income group family. It has also impact on the people's ability to work which are further responsible for poverty. Cancer is very complex socio-economic situation and cancer patients has negatively implication on owns credit and access to loan, and if one person of family is affected by cancer then all family has suffered by many socio-economic problems [3]. A diagnosis of cancer often leads to catastrophic personal health expenditures. Such expenditures can push entire families below the poverty line and threaten social stability [9].

### **CANCER PREVENTION AND TREATMENT**

In spite of good advancements for diagnosis and treatment, cancer is still a big threat to our society [4]. Thus there is an urgent need to accelerate cancer control measures in population at large [10]. Cancers of multiple types remain one of the foremost challenging and significant obstacles faced by health providers with numbers rising to an epidemic in recent years [11]. A cancer diagnosis can have a huge impact on most patients, families, and caregivers. Feelings of depression, anxiety, and fear are very common and are normal responses to this dreadful disease [12]. Government of India developed the first statement on cancer control as early as 1971. The National Cancer

Control Programme for India was formulated in 1984 with four major goals:

1. Primary prevention of tobacco related cancers.
2. Early detection of cancers of easily accessible sites.
3. Augmentation of treatment facilities, and
4. Establishment of equitable, pain control and Palliative care network throughout the country.

There are four principal approaches to cancer control, i.e., prevention, early detection, diagnosis /treatment and palliative care [13]. According to National Cancer Institute the types of treatment will depend on the type of cancer and how advanced it is. Some people with cancer will have only one treatment. But most people have a combination of treatments, such as surgery with chemotherapy and/or radiation therapy. Some may have immunotherapy, targeted therapy, or hormone therapy. After or during treatment there are many side effects or complication occur e.g. Lymphedema, frozen shoulder, nerve damage, limb amputation, weakness and paralysis, numbness and tingling (peripheral neuropathy), joint mobility, and balance and coordination problems. Physical Therapy approaches help patients improve movement, strengthen weakened muscles, and learn new ways to move and improvement in the quality of survival. Physical therapist has a role in reducing the risk of cancer, and helping people recover from its effects [14].

### **AIM AND OBJECTIVES**

This study aims to provide a review of published data on the Importance of Physical Therapy in cancer. This review serves as awareness of Physical Therapy in cancer patients for prevention of adverse effects after and during treatment.

### **METHODOLOGY**

A comprehensive review was undertaken by searching the Google, PUBMED, Research Gate on line, for research articles and reports published between and. The database search terms included keywords such as cancer, cancer burden in India, cancer and physiotherapy, Physiotherapy treatment. A variety of combinations of these words were entered.

**RESULT**

Total 27 studies were taken in which 11 was review, 4 were experimental studies, 9 RCTs, 1

case study, 1 survey study and 1 was prospective study. Following are the author name, study nature, title of the study and conclusion of the study.

**Table 1:** Description of Author, Study Design, Title and Conclusion of the Studying Articles.

AUTHOR	STUDY NATURE	TITLE	CONCLUSION
Granger CL 2016 [15]	Review	Physiotherapy management of lung cancer	This study concluded that physiotherapy is effective in lung cancer to prevent deterioration and to maximise or restore physical status prior to, during and following treatment.
Deura I et al. 2015 [16]	Review	Incidence and risk factors for lower limb lymphedema after gynecologic cancer surgery with initiation of periodic complex decongestive physiotherapy	CDP reduce lower limb lymphedema after retroperitoneal lymphadenectomy for gynecologic cancer.
Groef AD et al. 2015 [17]	Review	Effectiveness of Postoperative Physical Therapy for Upper-Limb Impairments After Breast Cancer Treatment: A Systematic Review	Multifactorial physical therapy (ie, stretching, exercises) and active exercises were effective to treat postoperative pain and impaired ROM after treatment for breast cancer.
Arbane G et al. 2014 [18]	RCT	Effect of postoperative physical training on activity after curative surgery for non-small cell lung cancer: a multicentre randomised controlled trial	A hospital plus home exercise programme showed little benefit in unselected patients with NSCLC following surgery. Regardless patients had recovered their pre-operative exercise tolerance levels by 4 weeks after surgery.
Ecclestone, C et al. 2014 [19]	Review	Prevention of lymphedema following complete decongestive physiotherapy in breast cancer patients: A literature review	The study concluded that CDP is effective in preventing lymphedema after breast cancer treatment.
Labon ER et al. 2014 [20]	Experimental	Efficacy of Physiotherapy for Urinary Incontinence following Prostate Cancer Surgery	The findings show that a physiotherapy program can improve or fully restore continence after prostate cancer surgery.
McClellan 2013 [21]	Review	Exercise programs for patients with cancer improve physical functioning and quality of life	Exercise programs for patients who have completed their treatment for cancer result in positive effects in a range of health indicators including physical functioning and quality of life.
Morano, MT et al. 2013 [22]	RCT	Preoperative Pulmonary Rehabilitation Versus Chest Physical Therapy in Patients Undergoing Lung Cancer Resection: A Pilot Randomized Controlled Trial	Findings suggest that 4 weeks of PR before lung cancer resection improves preoperative functional capacity and decreases the postoperative respiratory morbidity.
Tatham B et al. 2013 [23]	Review	The Efficacy of Exercise Therapy in Reducing Shoulder Pain Related to Breast Cancer: A Systematic Review	Results suggest that exercise targeting shoulder pain related to breast cancer treatment may be effective.
Chou YH et al. 2012 [24]	Case Report	Manual Lymphatic Drainage and Kinesio Taping in the Secondary Malignant Breast Cancer-Related Lymphedema in an Arm With Arteriovenous (A-V) Fistula for Hemodialysis	The Kinesio Taping could help to improve lymphatic uptake. The 12-session therapy created an excellent effect. We do not think the kinesio taping could replace short stretch bandaging, but it could be another choice for contraindicating pressure therapy patients, and we should pay attention to wounds induced by kinesio tape.
Sendin NL et al. 2012 [25]	RCT	Effects of Physical Therapy on Pain and Mood in Patients with Terminal Cancer: A Pilot Randomized Clinical Trial	The study concluded that the combination of massage and exercises can reduce pain and improve mood in patients with terminal cancer.
Devoogdt N et al. 2011 [26]	RCT	Effect of manual lymph drainage in addition to guidelines and exercise therapy on arm lymphoedema related to breast cancer: randomised controlled trial	Manual lymph drainage in addition to guidelines and exercise therapy after axillary lymph node dissection for breast cancer is unlikely to have a medium to large effect in reducing the incidence of arm lymphoedema in the short term.
Carvalho APV et al. 2010 [27]	Review	Exercise interventions for shoulder dysfunction in patients treated for head and neck cancer	Finding suggests that exercise is effective to increase shoulder mobility.

Ilgin D <i>et al.</i> 2010 [28]	Experimental	The effect of in-patient chest physiotherapy in lung cancer patients	ICP programs are beneficial to lung cancer patients by reducing respiratory symptoms, pain, and improving health-related quality of life and exercise capacity.
McNeely ML <i>et al.</i> 2010 [29]	Review	Exercise interventions for upper-limb dysfunction due to breast cancer treatment.	Exercise can result in a significant and clinically meaningful improvement in shoulder ROM in women with breast cancer.
McNeely M.L 2010 [30]	RCT	Early physiotherapy after surgery for breast cancer can reduce the incidence of lymphoedema in the following 12 months	A relatively short term early physiotherapy program involving manual lymph drainage, scar massage, exercise can reduce the incidence of lymphedema in first 12 months after surgery for breast cancer.
Lacomba, MT <i>et al.</i> 2010 [31]	RCT	Effectiveness of early physiotherapy to prevent lymphoedema after surgery for breast cancer: randomised, single blinded, clinical trial	Early physiotherapy could be an effective intervention in the prevention of secondary lymphoedema in women for at least one year after surgery for breast cancer involving dissection of axillary lymph nodes.
Donnelly CM <i>et al.</i> 2009 [32]	Survey study	Physiotherapy management of cancer-related fatigue: a survey of UK current practice	Physiotherapists' management of CRF includes recommending and using exercise and teaching energy conservation techniques. Therapists recommend and/or use exercise with a variety of cancer populations, across all stages of the disease trajectory, in particular during advanced stages of the disease.
Beurskens CHG <i>et al.</i> 2007 [33]	RCT	The efficacy of physiotherapy upon shoulder function following axillary dissection in breast cancer, a randomized controlled study	Physiotherapy reduces pain and improves shoulder function and quality of life following axillary dissection after breast cancer.
Rezende LFD <i>et al.</i> 2006 [34]	RCT	Two exercise schemes in postoperative breast cancer: comparison of effects on shoulder movement and lymphatic disturbance	At the end of 42 days of follow-up, the movements of flexion, extension, abduction and external rotation of the shoulder were better rehabilitated in the directed group.
Didem K <i>et al.</i> 2005 [35]	Experimental	The Comparison of Two Different Physiotherapy Methods in Treatment of Lymphedema after Breast Surgery	In the patients with upper extremity lymphedema, the shoulder mobility can be increased and edema can be decreased by the use of complex physiotherapy programs.
Gordon LG <i>et al.</i> 2005 [36]	Experimental	The Impact of Rehabilitation Support Services on Health-related Quality of Life for Women with Breast Cancer	Early physiotherapy after surgery has the potential for short-term functional, physical and overall HRQoL benefits.
Johansson K 2005 [37]	Review	Is physiotherapy useful to the breast cancer patient?	It is concluded that physiotherapy is beneficial in breast cancer patients. It reduced fatigue, lymphedema, nausea, body fat, anxiety and depression and increased muscle strength, lean body mass, aerobic capacity, enhanced immune function, and improved quality of life in cancer patients.
Lauridsen, MC <i>et al.</i> 2005 [14]	RCT	The effect of physiotherapy on shoulder function in patients surgically treated for breast cancer: A randomized study	Physiotherapy improves the shoulder function in patients surgically treated for breast cancer.
McCallin, M <i>et al.</i> 2005 [38]	Review	How effective are physiotherapy techniques to treat established secondary lymphoedema following surgery for cancer? A critical analysis of the literature.	From this review it is evident that while CPT may be an effective treatment regimen for secondary lymphedema.
Hinrichs CS <i>et al.</i> 2004 [39]	Review	The effectiveness of complete decongestive physiotherapy for the treatment of lymphedema following groin dissection for melanoma	With a decrease in lymphedema of 60%, CDP may provide relief for patients with lymphedema following groin dissection.
Johansson K <i>et al.</i> 2001 [40]	Prospective study	Arm Lymphoedema, Shoulder Mobility and Muscle Strength after Breast Cancer Treatment? A Prospective 2-year Study	Postoperative physiotherapeutic management needs to pay special attention to early impairments after breast cancer treatment particularly to the group receiving radiotherapy to the axilla area. Physiotherapeutic treatment might be introduced during the period when radiotherapy is being given.

## DISCUSSION

The present study outlines the development and research evaluates the effectiveness of exercise interventions undertaken with people with cancer. Our study supports and updates the findings of previous reviews and identified that exercise is of benefit to people with cancer. In the present study after review the literature it is found that physiotherapy reduce the complication after surgery in cancer patients and improve quality of life. Lauridsen *et al.* (2005) in their study concluded that physiotherapy improve the shoulder function significantly in patients treated surgically for breast cancer. The effect of the treatment was influenced by the type of surgery performed, and in mastectomised patients, also by the application of radiation therapy [14]. Beurskens CH *et al.* (2007) in his study showed that physiotherapy, which began two weeks after surgery, improved shoulder function and quality of life and reduced shoulder pain in patients with axillary dissection in breast cancer with substantial effect sizes. Handgrip strength showed a positive trend, however this was not markedly impaired postoperatively. The volume of the related arm showed little change with edema commonly occurring at a later stage after surgery. Significant improvement in the psychosocial situation was measured by the SIP [33]. Fong DYT, *et al.* (2012) in his study also found that Exercise programs improve physical functioning and quality of life in cancer patients [30]. Morano *et al.* (2013) by his study supports that 4 weeks of PR (strength and endurance training) and CPT (breathing exercises) before lung cancer resection improves preoperative functional capacity and decreases the postoperative respiratory morbidity. [22] some literature shows that physiotherapy program can improve or fully restore continence after prostate cancer surgery [20]. There are a lot of complications can occur post operator in cancer patients. Physiotherapy may have effective to reduce these complications. McCallin M., in his study evident that there is no effective single intervention to treat secondary lymphoedema. A combined approach of CPT appears to produce significant reductions in swelling that may be well maintained in compliant patients [21]. So, by the review of literature in the present study we found that physiotherapeutic approaches helps

in cancer patient preoperatively and postoperatively, but there is need to new studies with large sample size are necessary to determine the best scheme of rehabilitation exercise for cancer patients.

## CONCLUSION

In this present study, by reviewing the literature it is found that specific strengthening exercises improve both function and quality of life in cancer patients. Exercise plays a vital role in improving cardiopulmonary function, psychological events, muscular strength, and endurance in cancer patients. There are many evidences which show that Complex decongestive physiotherapy reduces lymphedema post surgery in cancer patients. Physiotherapy treatment depends on the stage or severity of disease and timing relative to treatment.

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