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CANCER REHABILITATION AND THE FUNCTIONAL OUTCOMES : A SYSTEMATIC REVIEW

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ABSTRACT

Background: *Cancer rehabilitation is a subspecialty of rehabilitation medicine concerned with restoring and maintaining the highest possible level of function, independence, and quality of life to patients at all stages of their cancer diagnosis, including those undergoing potentially curative therapy, those receiving palliative care, and cancer survivors.*

Methods: *By comparing itself to the standards set by the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) 2020, this study was able to show that it met all of the requirements. So, the experts were able to make sure that the study was as up-to-date as it was possible to be. For this search approach, publications that came out between 2014 and 2024 were taken into account. Several different online reference sources, like Pubmed and SCIENCE DIRECT, were used to do this. It was decided not to take into account review pieces, works that had already been published, or works that were only half done.*

Result: *In the PubMed database, the results of our search brought up 961 articles, whereas the results of our search on SCIENCE DIRECT brought up 211 articles. The results of the search conducted for the last year of 2014 yielded a total 45 articles for PubMed and 34 articles for SCIENCE DIRECT. In the end, we compiled a total of 6 papers, 5 of which came from PubMed and 1 of which came from SCIENCE DIRECT. We included six research that met the criteria.*

Conclusion: *In summary, these findings give evidence that rehabilitative therapies are effective for people who have had cancer. The findings should be considered in light of the fact that several studies exhibited a moderate risk of bias and/or limitations in research quality. These findings may serve as a platform for future research aimed at developing clinical practice guidelines for rehabilitative therapies across cancer types.*

Keyword: *Cancer rehabilitation, Outcomes*

INTRODUCTION

Cancer rehabilitation is a subspecialty of rehabilitation medicine that focuses on restoring and maintaining the highest possible level of function, independence, and quality of life for patients at all stages of their cancer diagnosis, including those undergoing potentially curative therapy, palliative care, and cancer survivors. Cancer rehabilitation physicians assess and treat neuromuscular, musculoskeletal, and functional complications of cancer and cancer treatments, including acute and chronic pain, weakness, muscle spasms, myelopathy, radiculopathy, plexopathy, neuropathy, myopathy, deconditioning, contracture, spasticity, lymphedema, amputation, shoulder dysfunction, and gait disorders, among others.[1]

According to the World Health Organization, there were 18.1 million new cancer diagnoses and 9.6 million cancer-related deaths worldwide in 2018. Cancer affects one in every five men and one in every six women in the world, and it kills one in every eight men and one in every eleven women. This all leads to its extremely high illness burden. However, these numbers also show that a high proportion of cancer patients survive. This is reflected in increased survival rates for a variety of cancers, notably in high-income countries.[2]

Radiation fibrosis is a unique difficulty for cancer rehabilitation physicians since it can impact many systems, including the spinal cord, nerve roots, plexus, local nerves, and muscles, as well as their supporting structures. A full clinical evaluation, which includes an in-depth working knowledge of neuromuscular and musculoskeletal anatomy as well as specialized physical examination methods, allows the physiatrist to determine the exact cause of pain and functional problems. A safe and effective rehabilitation program will rely significantly on a correct diagnosis of the source of pain or dysfunction.[1]

The evidence broadly supports the benefits of rehabilitation interventions for cancer survivors; however, specific guidance for clinical decision-making based on high-quality evidence regarding rehabilitative interventions is currently limited10, particularly in terms of function—defined as the ability to perform the basic actions required for maintaining independence and carrying out more complex activities. The unique and stated goal of this evaluation was to assess the literature through the lens of measurable and meaningful changes in function. This is distinct from previous reviews, which aggregate and describe changes in clinical measurements of body structure or physiologic measures (impairments) induced by rehabilitation therapies.[3]

Physiologic measures such as VO2 or blood gases, as well as measures of body structure such as joint range of motion, muscle strength, or limb volume, are important for clinical assessment and decision-making regarding impairment; however, while these measures may correlate with and support function, they do not directly assess functional management of daily activities and participation in life roles. Importantly, statistical significance in physiological measurements in therapeutic trials may not translate into significant changes for patients or improvements in desired and necessary living activities.[3]

METHODS

Protocol

By following the rules provided by Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) 2020, the author of this study made certain that it was up to par with the requirements. This is done to ensure that the conclusions drawn from the inquiry are accurate.

Criteria for Eligibility

For the purpose of this literature review, we review published literature contains functional outcomes of cancer rehabilitation. This is done to provide an explanation and improve the handling of treatment at the patient. As the main purpose of this paper, to show the relevance of the difficulties that have been identified as a whole.

In order for researchers to take part in the study, it was necessary for them to fulfil the following requirements: 1) The paper needs to be written in English. In order for the manuscript to be considered for publication, it needs to meet both of these requirements. 2) The studied papers include several that were published after 2013, but before the time period that this systematic review deems to be relevant. Examples of studies that are not permitted include editorials, submissions that do not have a DOI, review articles that have already been published, and entries that are essentially identical to journal papers that have already been published.

Search Strategy

We used "COVID 19" and “acute conjunctivitis” as keywords.The search for studies to be included in the systematic review was carried out using the PubMed and SCIENCE DIRECT databases by inputting the words: *((“cancer s”[All Fields] OR "cancerated"[All Fields] OR "canceration"[All Fields] OR "cancerization"[All Fields] OR "cancerized"[All Fields] OR "cancerous"[All Fields] OR "neoplasms"[MeSH Terms] OR "neoplasms"[All Fields] OR "cancer"[All Fields] OR "cancers"[All Fields]) AND ("rehabilitant"[All Fields] OR "rehabilitants"[All Fields] OR "rehabilitate"[All Fields] OR "rehabilitated"[All Fields] OR "rehabilitates"[All Fields] OR "rehabilitating"[All Fields] OR "rehabilitation"[MeSH Terms] OR "rehabilitation"[All Fields] OR "rehabilitations"[All Fields] OR "rehabilitative"[All Fields] OR "rehabilitation"[MeSH Subheading] OR "rehabilitation s"[All Fields] OR "rehabilitational"[All Fields] OR*

"rehabilitator"[All Fields] OR "rehabilitators"[All Fields]) AND (("functional"[All Fields] OR "functional s"[All Fields] OR "functionalities"[All Fields] OR "functionality"[All Fields] OR "functionalization"[All Fields] OR "functionalizations"[All Fields] OR "functionalize"[All Fields] OR "functionalized"[All Fields] OR "functionalizes"[All Fields] OR "functionalizing"[All Fields] OR "functionally"[All Fields] OR "functionals"[All Fields] OR "functioned"[All Fields] OR "functioning"[All Fields] OR "functionings"[All Fields] OR "functions"[All Fields] OR "physiology"[MeSH Subheading] OR "physiology"[All Fields] OR "function"[All Fields] OR "physiology"[MeSH Terms]) AND ("outcome"[All Fields] OR "outcomes"[All Fields]))) AND *((clinicaltrial[Filter]) AND (fft[Filter]) AND (humans[Filter]) AND (2014:2024[pdat]))* used in searching the literature.

Data retrieval

After reading the abstract and the title of each study, the writers performed an examination to determine whether or not the study satisfied the inclusion criteria. The writers then decided which previous research they wanted to utilise as sources for their article and selected those studies. After looking at a number of different research, which all seemed to point to the same trend, this conclusion was drawn. All submissions need to be written in English and can't have been seen anywhere else.

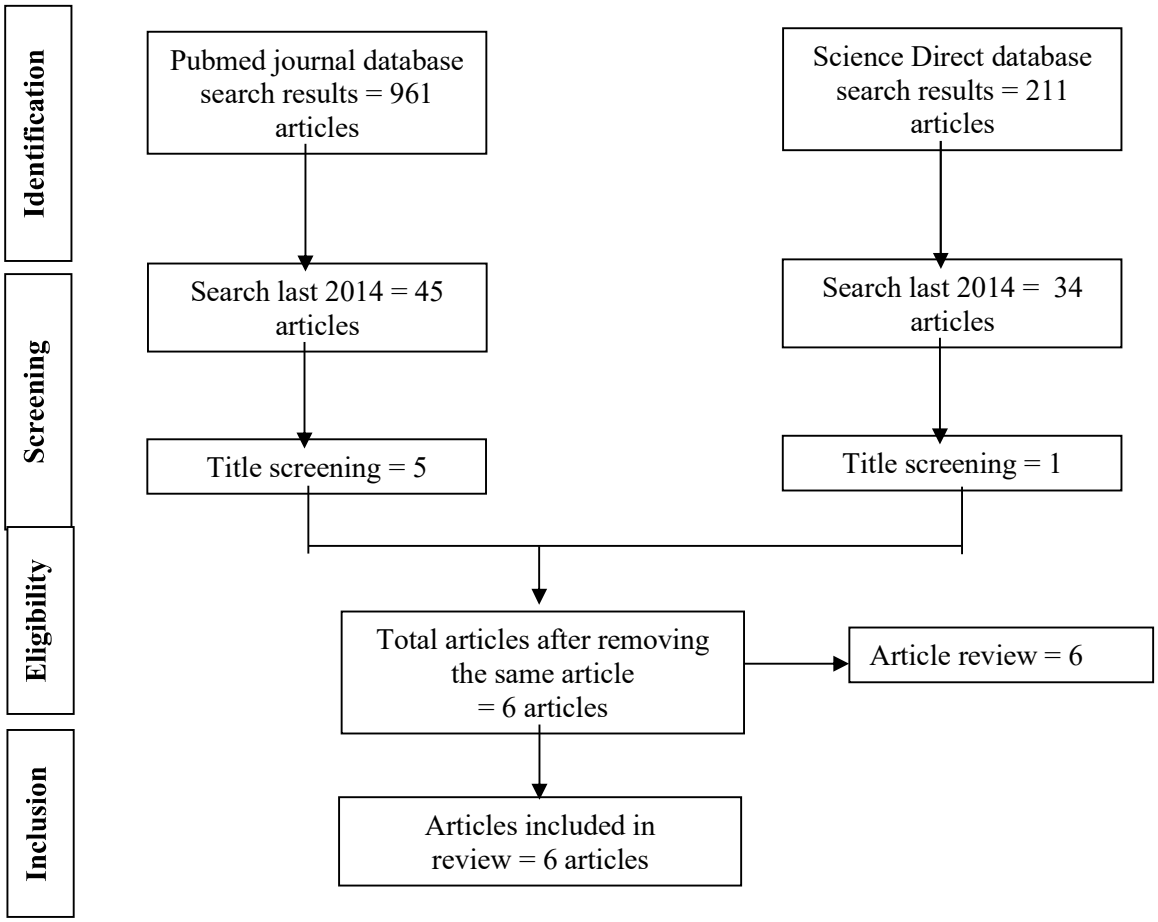

Figure 1. Article search flowchart

Only those papers that were able to satisfy all of the inclusion criteria were taken into consideration for the systematic review. This reduces the number of results to only those that are pertinent to the search. We do not take into consideration the conclusions of any study that does not satisfy our requirements. After this, the findings of the research will be analysed in great detail. The following pieces of information were uncovered as a result of the inquiry that was carried out for the purpose of this study: names, authors, publication dates, location, study activities, and parameters.

Quality Assessment and Data Synthesis

Each author did their own study on the research that was included in the publication's title and abstract before making a decision about which publications to explore further. The next step will be to evaluate all of the articles that are suitable for inclusion in the review because they match the criteria set forth for that purpose in the review. After that, we'll determine which articles to include in the review depending on the findings that we've uncovered. This criteria is utilised in the process of selecting papers for further assessment. in order to simplify the process as much as feasible when selecting papers to evaluate. Which earlier investigations were carried out, and what elements of those studies made it appropriate to include them in the review, are being discussed here.

RESULT

In the PubMed database, the results of our search brought up 961 articles, whereas the results of our search on SCIENCE DIRECT brought up 211 articles. The results of the search conducted for the last year of 2014 yielded a total 45 articles for PubMed and 34 articles for SCIENCE DIRECT. In the end, we compiled a total of 6 papers, 5 of which came from PubMed and 1 of which came from SCIENCE DIRECT. We included six research that met the criteria.

Chandwani, et al[4] (2014) showed that there were little differences between the active stretching (ST) and waitlist (WL) groups. Although physical therapy is a reimbursable expense in the United States and is likely to help patients recover faster, it is worth considering expanding to include services like yoga (YG).

Zhou, et al[5] (2017) showed that a six-month home-based, telephone-delivered exercise intervention focusing on brisk walking was found to be linked with better physical HRQOL in women with ovarian cancer. Given that improved HRQOL and exercise have both been linked to better overall survival in women with ovarian cancer, oncologists and primary care physicians should promote and refer people to clinic- or community-based exercise programs.

Brown, et al[6] (2018) showed that this randomized trial found that moderate-intensity aerobic exercise improves multiple HRQoL outcomes. However, a high-dose of aerobic exercise (300 min·wk−1) may be required to improve physical function, cancer-specific quality of life, sleep quality, and fatigue among early-stage colon cancer survivors. These data indicate that higher levels of aerobic exercise are required to improve HRQoL outcomes in colon cancer survivors.

Table 1. The litelature include in this study

Author	Origin	Method	Sample	Result
Chandwani et al, 2014[4]	Germany	Randomized controlled study	294 patients	The YG group had significantly greater increases in physical component scale scores compared with the WL group at 1 and 3 months after XRT (P = .01 and P = .01). At 1, 3, and 6 months, the YG group had greater increases in physical functioning compared with both ST and WL groups (P < .05), with ST and WL differences at only 3 months (P < .02). The group differences were similar for general health reports. By the end of XRT, the YG and ST groups also had a reduction in fatigue (P < .05). There were no group differences for mental health and sleep quality. Cortisol slope was steepest for the YG group compared with the ST and WL groups at the end (P = .023 and P = .008) and 1 month after XRT (P = .05 and P = .04).
Zhou et al, 2017[5]	USA	Randomized controlled study	74 patients	A total of 74 women were randomly assigned to exercise and 70 to attention control. A total of 113 (78.5%) of the participants completed the six-month assessment. Adherence to the exercise intervention was excellent (166.0±66.1 minutes/week in the exercise arm). At six months, women in the exercise arm had improved physical HRQOL (SF-36 Physical Component Summary Score) compared with the control arm,

				1.8 (SD = 1.1) vs –2.0 (SD = 1.2) , respectively (group difference = 3.7, SD = 1.2, 95% confidence interval [CI] = 0.7 to 6.8, *P* = .02). No group differences were seen for change in mental HRQOL. There was a statistically significant improvement in the fatigue score (Functional Assessment of Cancer Therapy–Fatigue) for exercisers (4.0, SD = 1.1, 95% CI = 1.8 to 6.2, *P* < .001) but not for controls (1.2, SD = 1.2, 95% CI = –1.1 to 3.5, *P* = .31), with a between-group difference of 2.8 (SD = 1.5, 95% CI = –0.2 to 5.7, *P* = .06).
Brown et al, 2018[6]	USA	Randomized controlled study	39 patients	Over six months, the low-dose group completed 141±10 min·wk^{-1} of aerobic exercise, and the high-dose group completed 247±11 min·wk^{-1} of aerobic exercise. Over six months, exercise improved the physical component summary score of the SF-36 (P_{trend}=0.002), the FACT-C (P_{trend}=0.025), the PSQI (P_{trend}=0.049), and the FSI (P_{trend}=0.045) in a dose-response fashion. Between-group standardized mean difference effects sizes for the above-described findings were small to moderate in magnitude (0.35–0.75). No dose-response effects were observed for the mental component summary score of the SF-36, the FCRI, or bowel function.
El-Jawahri et al, 2016[7]	USA	Randomized controlled study	160 patients	Intervention patients had less increase in depression, lower anxiety, no difference in fatigue, and less increase in symptom burden. At 3 months, intervention patients had higher QOL and less depression but no significant differences in anxiety, fatigue, or symptom burden. From baseline to week 2 after HCT, caregivers of intervention patients vs controls reported no significant differences in QOL or anxiety but had a smaller increase in depression (mean, 0.25 vs 1.80; mean difference, 1.55; 95%CI, 0.14–2.96; *P* = .03).

Cnossen et al, 2017[8]	Netherlands	Randomized controlled study	50 patients	Associations between 6- and 12-week exercise performance levels and age, gender, tumour site and stage, treatment, intervention format (online or booklet), number of coaching sessions, and baseline HNC symptoms (EORTC-QLQ-H&N35) were investigated. Adherence rate at 6 weeks was 70% and decreased to 38% at 12 weeks. In addition, exercise performance levels decreased over time (during 6 weeks: 34% moderate and 26% high; during 12 weeks: 28% moderate and 18% high).
Raz et al, 2016[9]	USA	Randomized controlled study	71 patients	A total of 71 survivors (33=control, 38=intervention) were accrued. There was no difference in age, baseline performance status, or stage of disease between groups. Patients in the intervention group had significantly less distress (mean 1.0 vs 4.0, $p<0.001$, range 0–10) and more favorable mean FACT-L scores (126.1 vs 98.7, $p<0.001$, range 0–140) and LCS scores (29.4 vs 23.6, $p<0.001$, range 0–32) at 12 months. The mean scores of all categories of questions in FACT-L (physical, social/family, emotional, and functional well-being) were significantly more favorable in the intervention group at 12 months.

El-Jawahri, et al[7] 2016) showed that among people at a single institution receiving hematopoietic stem cell transplantation (HCT) for hematologic malignancy, using inpatient palliative care instead of routine transplant care resulted in a reduced decline in quality of life 2 weeks following transplantation. Further research is required to replicate the findings and analyze long-term consequences and costs.

Cnossen, et al[8] (2017) showed that head and neck cancer patients adhered to a guided home-based preventive exercise program during chemoterapy to swallowing sparing intensity modulated radiation therapy (SW-IRT) at a high rate for the first six weeks of therapy, but then declined. Exercise performance levels were low, particularly in individuals receiving chemotherapy in conjunction with SW-IMRT.

Raz, et al[9] (2016) showed that an interdisciplinary supportive care strategy improves psychological distress and health related quality of life (HRQOL) 12 months after lung cancer surgery. This study has significant implications for enhancing the HRQOL of lung cancer survivors following surgery. Further research is needed to incorporate the transdisciplinary customized therapies utilized in this study into clinical practice for lung cancer survivors.

DISCUSSION

This systematic review involved a total of 688 data of patients with cancers that got rehabilitation therapy in 6 observational studies. The cancer rehabilitation specialist's major focus is to restore and maintain function, independence, and quality of life. This contrasts with several other oncology professions' emphasis on length of life. While these competing responsibilities appear to be diametrically opposed, they can and should be complementary, benefiting the patient's overall condition greatly. Cancer rehabilitation is a budding and growing specialty that has not established widespread foothold in most cancers.

Every year, more people are diagnosed with cancer. Survival rates have increased in recent decades due to advances in diagnoses and therapy. As a result, healthcare systems are dealing with an increasing number of cancer survivors, many of whom are suffering from a variety of short- and long-term side effects of their disease or treatment. The term "survivor" has several definitions. In this evaluation, the term "survivors" refers to anyone who has completed acute treatment, is presently recuperating, and may be receiving post-acute rehabilitation care. To reduce patients' impairment after acute therapies, it is critical to give options for rehabilitation and long-term care.[10]

For many people with advanced cancer, survival entails dealing with a chronic and difficult illness. Many patients develop long-term disability, need constant care and support. Because these abnormalities are frequently overlooked or mistreated, disability may result. The symptoms and impairments may be related to the cancer itself but also to the therapies. The occurrence of treatment-associated impairment among cancer survivors may grow in parallel with the number of treatments.[11]

Functional disability is frequently associated with considerable psychological morbidity. Up to 15-25% of patients with advanced cancer suffer from depression, and many endure worry, pain, and worries as a result of the uncertainties of a cancer diagnosis. Patients with advancing disease experience also muscle weakening, which impacts severely on their autonomy and QoL.[11]

Improved oncological treatment extends the life of individuals with advanced cancer. Rehabilitation has been proved to help people live longer lives. Research emphasizes the importance of rehabilitation for people with advanced disease, yet it is also underutilized. The reasons for its suboptimal utilization include a lack of understanding about the benefits of rehabilitation, a lack of recommendations from oncologists, and a lack of resources.Functional disability is frequently associated with considerable psychosocial morbidity. Up to 15-25% of patients with advanced cancer suffer from depression, and many endure worry, pain, and worries as a result of the uncertainties of a cancer diagnosis. Patients with progressing disease develop muscle weakness, which has a negative influence on their autonomy and quality of life.[11]

The term "rehabilitation" refers to "a set of interventions designed to optimize functioning and reduce disability in individuals with health conditions, in interaction with their environment" . Numerous clinical guidelines recommend cancer rehabilitation, which can include a variety of interventions such as physical therapy and activity (e.g., exercises, yoga, lymphatic drainage), supportive medications (e.g., for pain or insomnia), psychological interventions (e.g., resiliency training, coping strategies, relaxation techniques), and assistance with social (re)integration (e.g., returning to work). Such interventions might be administered as inpatient care in rehabilitation centers or as ambulatory or home care for outpatients.[10]

Regardless of setting or type, the effectiveness of interventions must be assessed in order to determine their benefits to patients and justify their use. While anti-cancer treatment research is primarily concerned with survival or tumor response, rehabilitation "aims to maximize a person's ability to live, work, and learn". Thus, interest in rehabilitation research and evaluation leads to improved patient functioning and health-related quality of life. To assess such outcomes, several clinical outcome evaluations are available, ranging from clinician or proxy ratings to testing patients' performance on preset tasks, and eventually to patients' self-reports. Patient-reported outcomes are becoming increasingly important as attempts to deliver patient-centered research and therapies expand.[10]

CONCLUSION

In summary, these findings give evidence that rehabilitative therapies are effective for people who have had cancer. The findings should be considered in light of the fact that several studies exhibited a moderate risk of bias and/or limitations in research quality. These findings may serve as a platform for future research aimed at developing clinical practice guidelines for rehabilitative therapies across cancer types

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