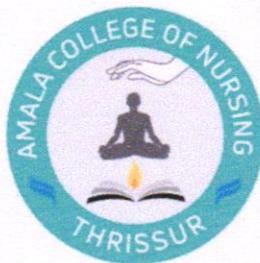




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Factors Associated with Caregivers Burden of Breast Cancer Patients – Review

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Abstract

Caring for a patient with a disease such as breast cancer, which requires prolonged and sophisticated treatment modalities, can cause a significant burden on the caregiver, which cannot be measured or explained in depth with existing scientific evidence. Caregivers play a vital role in caring for family members with breast cancer from the beginning until the patient's outcome. Although caregivers have been part of many studies conducted to assess the severity of their burden, also they receive less care from others and the health care team members. Research findings depict that majority of the caregivers experienced a significant amount of caregiver burden. The review has found that many factors may influence a caregiver's burden. The manifestation of burden may vary depending upon the stage of cancer diagnosis, disabilities in the patient, emotional and physical capabilities, financial and social support available, and many more factors. The caregiver burden impacts the patient's and caregivers' life and well-being. Research focusing on interventions to reduce the burden is needed in today's scenario. Early, appropriate, and timely interventions help the caregiver utilize their potential effectively to balance their dual responsibility.

Keywords: Breast Cancer, family Caregiver, Caregiver Burden, Concept analysis, Antecedents, Consequences Factors associated with caregiver's burden of breast cancer patients Review

1. Background

Breast cancer has become the most commonly diagnosed cancer, surpassing lung cancer with an estimated 22,61,419 new cases in 2020^{1,2}. The diagnosis of cancer has a dyadic effect among patients and caregivers. Apart from the emotional stress, fear, and pain following the surgical intervention induced in the patient, the vast responsibility of family and taking care of cancer patients falls upon the primary caregiver, which produces a disastrous effect. The caregivers of breast cancer patients often have extreme fatigue and burden. The ultimate factors contributing to caregivers' highest-burden are lack of time, social

and emotional dysfunction, pain, lack of sleep, and tiredness.³

The caregivers have a pivotal role in treating breast cancer patients compared to other debilitating illnesses such as neurotrauma or spinal cord injury. Breast cancer patients have few days of acute hospital admission, but the disease course has an extended duration after mastectomy. A caregiver then a health professional will care for the patient more effectively. During this period, they have to do many of the healthcare professionals' procedures, such as administration of medications, reassurance of the patient, encouraging mastectomy exercise, and other treatment aspects for managing the condition, for which they are inadequately trained.⁴

These challenges produce many physical, emotional, financial, social, and role changes that may affect the caregiver's quality of life. A cross-sectional study revealed a high level of burden experienced by the caregivers of breast cancer patients and needs intervention.^{6,7}

Hence, the diagnosis of breast cancer affects the patient and the caregivers. The darker side of this scenario reflects that the problems of caregivers are hardly understood. Therefore, this review has highlighted the difficulties faced by the caregivers of breast cancer patients and the core focus of the interventions to help them cope with their lifestyle and provide care to their loved ones.⁵

1. **Role changes**
2. **Occupational and Financial burden**
3. **Lack of training**
4. **Paucity of institutional facilities**
5. **Patient related precursor**
6. **Lack of time.**

1. **Physical problems**
2. **Emotional or psychological problems**
3. **Social isolation**
4. **Unmet selfcare needs**
5. **Socioeconomic.**

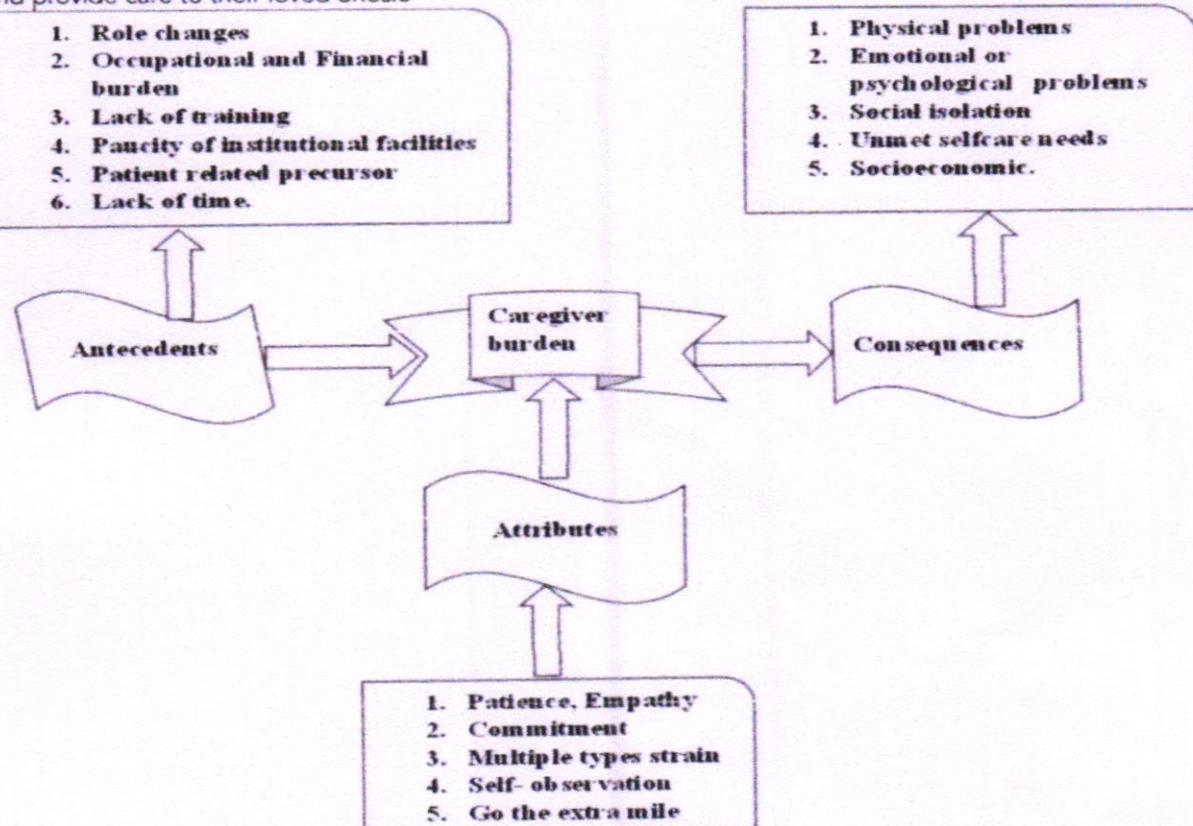


Figure 1 shows the schematic representation of the caregiver's burden.

Antecedents of caregiver burden

The antecedent is the events or attributes that must arise before the concept's occurrence.¹¹ After doing a detailed literature search, the following antecedent factors are identified.

Role changes

Family functions in a peculiar way wherein all the family members have responsibilities and roles in maintaining balance and fulfilling all development aspects. The family has six dimensions to achieve this goal, communication, social factors, problem-solving, affective response, affective involvement, and behavioural control. These dimensions bring about a balance within the family. This balance can sometimes be disturbed and results in a change of role dynamics. The family has to make and adapt to many changes when there is a cancer patient in the family. Here the caretaker takes a dual role in caring

for the patient and fulfilling the responsibilities. If a family member is diagnosed with cancer, it can bring many changes in the family. It changes priorities and interactions among family members and results in an excessive burden on the caregiver. Cancer is a chronic and unpredictable disease. It changes the caregiver's life plans who has to put the patient on priority. Sudden changes may affect the stability of the functioning of the family. Cancer diagnosis also affects the external functioning of the family and disrupts their social life.¹²

The number of informal caregivers has also increased due to the global increase in cancer patients. They receive new responsibilities and are confronted with role transitions. Randomized control trials revealed that psychological psychoeducation, skill training, and therapeutic interventions have significantly reduced caregivers' burden, though with minor to moderate effects. These interventions are hence encouraged for those caring for cancer patients.¹³



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Occupational and Financial burden

Family is essential in supporting and caring for the patients, helping them manage and adapt to their disease. Many factors such as increased duration of care at home, decreased family size, and decreased hospitalization have increased the disease's burden. Most caregivers have to leave their job to care for the cancer-affected family member, which leads to a high financial burden.¹⁴ Thus, the caregivers require immense support to overcome this challenge in their social and family life. They require financial support to help them manage the burden of this disease. Training them with appropriate skills and palliative care has been found to lessen the burden of breast cancer among informal caregivers.¹⁵

Lack of training

A common challenge caregivers face today is psychological problems like anxiety, depression, and other psychological disturbances. The caregivers need training on administering medications, handling the equipment, managing the complications of chemotherapy and radiation therapy, procedures related to treatment, providing comfort to the patient, and when and how to report to the healthcare facility. Most caregivers have low health literacy, leading to an increased burden resulting in adverse consequences.¹³ Emotionally supporting themselves and getting proper training can help to overcome this challenge. The health system can help the caregiver obtain this training with proper guidance. The existing research could only reach the tip of the iceberg, and the rest is yet to be explored.¹⁶

A paucity of institutional facilities

Breast cancer requires specialized surgery, chemotherapy, radiation therapy, and palliative treatment. These facilities are not available in all hospitals, especially in developing countries. To avail effective treatment options, the caregiver must approach various hospitals or travel miles and miles with the patient. Also, the caregiver is exhausted in case of any emergency because of inadequate transportation facilities, longer distances to the treating hospital, and unavailability of effective care services nearby.¹⁷ Rising incidence rate, prolonged survival period, decreased stay in acute care facilities, and transformation of care to ambulatory care services lead to increased informal caregiver responsibility.¹⁸ Some studies state that a lack of workforce and poor organizational facilities also disturbs informal caregivers.¹⁷

Patient-related precursor

Many patient factors can influence the extent of the caregiver's burden. The diagnosis of cancer and its treatment can be overwhelming for the caregiver. Despite this, the unfavourable psychological reaction in the patient, such as melancholy, worry, mood swings, and social withdrawal, increases the depth of the caregiver's burden. Additional patient-related

factors are age, gender, treatment modality and duration, cancer symptoms' impact on the patient's daily life, and the patient's ability to cope with the diagnosis.¹⁹

Lack of time

The major challenge faced by family caregivers is a lack of time. The family caregivers need to find more time to meet the needs of the caregivers, apart from their daily routine from work and family life. Also, they must be physically and mentally involved in caring for patients. The majority of their routine tasks and other work remain unsettled, which causes the feeling of exhaustion and burnout among the caregivers.

Health consequences

The existing research shows breast cancer patients' caregivers have depression, fatigue, stress, and anxiety. The inadequacies and burdens experienced by caregivers are exhibited in various ways. The primary symptoms manifestation exhibited by caregivers are as follows:^{20,21,22}

Physical problems

The family caregivers of cancer patients suffer many physical problems that can affect the quality of care provided. It includes fatigue, high blood pressure, back pain, weight changes, arthritis, and headache. The previous research showed that informal caregivers have a lower immune function, delayed wound healing, increased blood glucose levels, and deranged lipid profiles, putting them at high risk of cardiovascular disease.²⁴ These problems occur due to decreased sleep, poor diet, and continued physical and emotional stress. Apart from this, due to the demands of caregiving and lack of time, informal caregivers cannot take adequate rest, maintain adequate nutrition, perform the exercise, and often neglect their physical health.²⁵ Some studies reveal that when the patient has to undergo particular treatment procedures, it causes caregivers to struggle to meet their own needs and the patient's needs simultaneously.²⁶ When they have prolonged physical issues, the quality of care decreases, leading to poor patient outcomes. As the patient requires continuous attention from the caregiver, they have limited time to seek medical attention. There is a significant relationship between the family caregivers and patients' behavioural characteristics, indirectly affecting the caregivers' burden.²⁷

Emotional or psychological problems

The challenges faced by family caregivers in caring for breast cancer patients cause enormous emotional and psychological problems. The caregivers are concerned about their capacity to balance the care demands with other routine tasks. They are also scared about their future and the outcome for the patient.¹⁶ To some extent, the caregivers are worried about their health which causes anxiety, fear, and depression among many informal caregivers. The main reasons for these psychological issues are fear



of cancer recurrence, interrupted family function, wrong perception of disease prognosis, and lack of adequate caregiver support and care²⁸. These issues can hurt their quality of life²⁹. Also, studies have proved that psychological issues increase as the caregivers gradually decline in their functional status³⁰. Some studies show that women and their husbands have significant psychological stress after mastectomy, which affects their relationship. Since the husband undertakes the domestic role too, he continues to experience stress in the future³¹. It may lead to adopting health risk behaviours such as smoking and the use of eliciting drugs²⁴. Many times, conversations regarding patient disease conditions with healthcare personnel are another cause to induce distress among caregivers. Factors such as lack of knowledge regarding the care methods, unavailability of various resources for patient care, and inability to cope with disease conditions add to this emotional stress^{32,33}. Studies show that caregivers anticipate voluntary participation in emergencies and guidance and seek compassion from their friends, extended family members, and even care recipients³⁴. Providing care for elderly cancer patients creates a multifaceted burden on caregivers. Identifying factors causing the burden is vital for providing critical support to caregivers³⁵.

Social isolation

Social isolation is common among breast cancer survivors and their caregivers. It happens because of the patient's fear of facing society due to marked body image disturbances after cancer treatment. As the cancer survivor is not going out of the home, the caregiver is forced to remain at home to avoid emotional and psychological loneliness for the patient. The caregivers also avoid social gatherings, meetings, public functions, and family activities. Hence, social relationships are disrupted and may lead to significant social isolation, which can neither be vented to the patient nor anyone else. In providing care to breast cancer patients, the caregiver's responsibilities inflict a considerable burden on the caregiver, and studies suggest that social support offers excellent support to the caregiver of cancer patients³⁶.

Unmet self-care needs

One of the difficulties that come across the family caregivers in performing their role in dealing with breast cancer patients is maintaining a balance in their caregiving role and meeting their wants. Providing care for patients with cancer is a complex and sequential process and can lead to an unstable and stressful life for a family caregiver and subsequently affect the person's holistic health. When this state persists for a distant future, it can reduce caregivers' standard and quality of living. Some studies state that caregivers of patients with cancer have broad and comprehensive unmet needs³⁷. Most studies of primary caregivers of cancer patients state various problems lining up from

reduced physical and mental health distress to unfavourable impact on professional life. These circumstances can lead to a rise in burden and a reduced standard of living for caregivers. Earlier cancer diagnosis and favourable response to therapy were productively correlated with the caregiver's standard of living. The long period of caregiving role and adverse effects of providing care in the caregiver's lives are also associated with decreased caregiver's standard of living. Most family caregivers take up their role unexpectedly without adequate preparation, leading to a poorer standard of living³⁸. Unmet wants of patients can raise the burden on the caregiver; and in turn, the difficulties faced by caregivers are closely related to the patient's comfort³⁹.

Socio-economic impact

The rapid increase in population and increased lifespan in high and low-income countries directly result in increased incidence and mortality rate of breast cancer, increasing the burden on caregivers. The majority of studies in developed countries stated that informal caregivers are more prone to all kinds of intellectual and somatic burdens⁴⁰. The incidence of cancer and the extent of the burden on caregivers have high significance on the country's economy. These can be influenced by the nation's socio-economic development, which may affect the availability of services for cancer caregivers. Studies showed that low socio-economic status could predict a high caregiver burden³⁶. Cancer caregivers suffer a high financial burden due to cancer treatment's duration, complexity, and cost⁴¹.

Attributes of caregiver's burden

Attributes of a caregiver's burden can be classified into three domains³⁸.

1. Caregiver-related attributes,
2. Patient-related attributes
3. Caregiver-patient dyadic attributes.

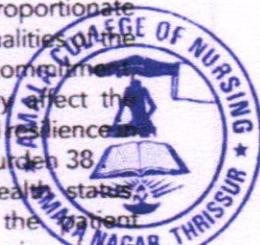
Caregiver-related attributes: These are the caregiver's socio-economic status, gender, and age, which may have an inevitable direct influence on the caregiver's burden. Female caregivers experience more caregiver burden compared to male caregivers³⁸. Elderly caregivers experience a higher burden compared to young adults. The socio-economic factors include the caregiver's education, occupation, and income. Studies indicate that high income and high-level education are proportionate to the caregiver burden. The inherent qualities of the caregiver, such as empathy, patience, commitment, and self-observation, can also inversely affect the caregiver's burden. Low self-efficacy and resilience in a caregiver results in a higher caregiver burden³⁸.

Patient-related attributes: The age, health status, stage of cancer, quality of life of the patient, influenced the caregiver burden. Caring for a younger patient and having more dependent children in the family can produce more burdens on the caregiver³⁸.

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Caregiver-patient dyadic attributes: It involves the quality or type of relationship between the caregiver and the patient. Informal caregiving is a dyadic process. It requires harmony and mutual satisfaction among the caregivers for a positive outcome. Spousal caregivers with reasonable marital satisfaction have demonstrated good mental well-being 38.

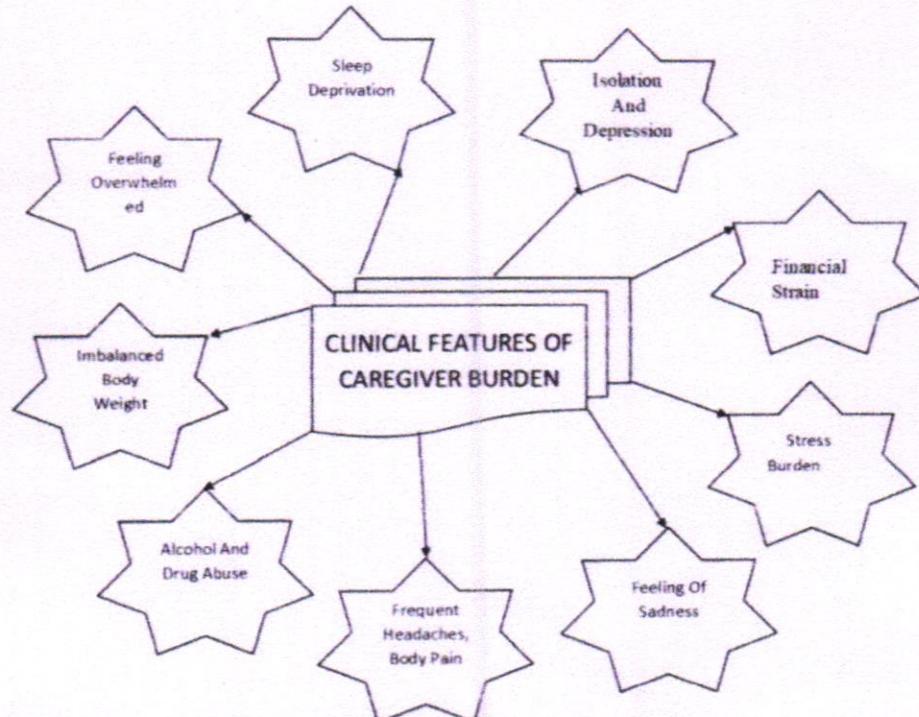


Fig 2 shows the symptoms experienced by the caregivers of breast cancer patients

Recommended interventions for caregivers of breast cancer patients

The caregiver burden significantly impacts breast cancer patients' physical and psychological well-being. Hence, an intervention must be implemented to support the caregivers and invoke positive

outcomes in the survivor. The intervention should address the caregiver's psychosocial, economic, and educational needs as they lack the preparation and knowledge to undertake the role of caregiver. The interventions offered for caregivers can be psychoeducational, skill training, and therapeutic 43,44.

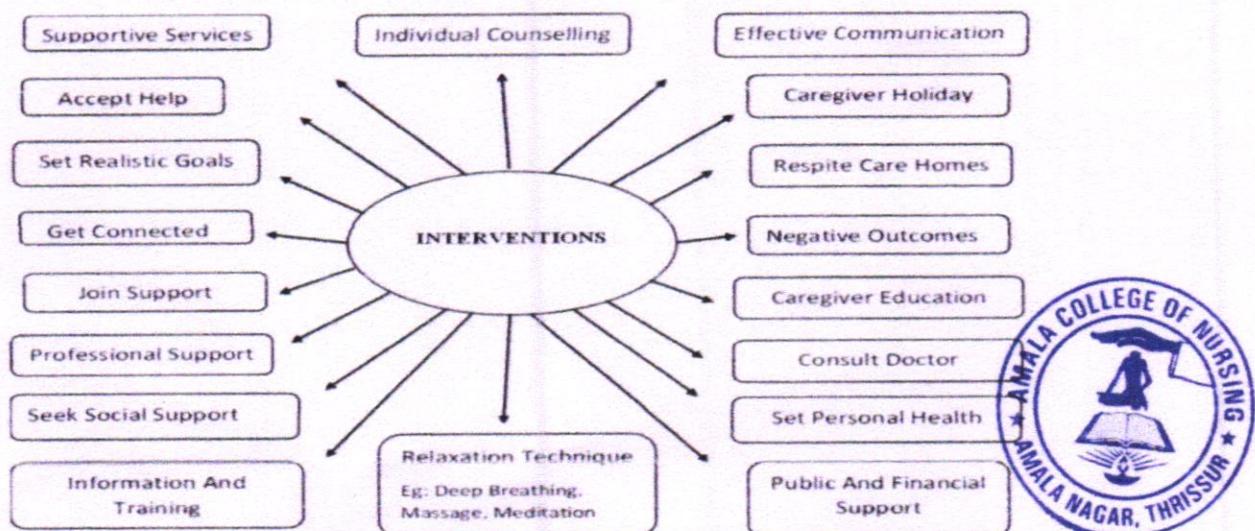


Fig 3 Illustrates the various interventions recommended for the caregivers of breast cancer

2. Conclusion

Caregivers have a significant role in the recovery of

breast cancer patients. They spend considerable time caring for the patient. The breast cancer diagnosis is an unexpected, deadly occurrence, so

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they feel unprepared to accept the diagnosis by the patient and caregivers. The healthcare providers can educate the caregivers and provide little guidance regarding patient care. In addition, emphasis on the importance of the caregivers' health and its impact on the patient outcome.

Reference

World Health Organization. Breast cancer now most common form of cancer: WHO taking action [Internet]. 2021 [Updated 2021 February 03].

Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, Bray F. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: a cancer journal for clinicians*. 2021 May;71(3):209-49.

Adili D, Dehghani-Arani F. The relationship between caregiver's burden and patient's quality of life in women with breast cancer. *Journal of Research in Psychological Health*. 2018 Aug 10;10(2):30-9.

Gabriel I, Aluko J, Okeme M. Caregiver burden among informal caregivers of women with breast cancer. *Biomed J Sci Tech*. 2019 Feb 8; 15:1-9.

Nejad ZK, Aghdam AM, Hassankhani H, Sanaat Z. The effects of a patient-caregiver education and follow-up program on the breast cancer caregiver strain index. *Iranian Red Crescent Medical Journal*. 2016 Mar;18(3).

Kajana VPM, Katta A, Bhimarasetty DM. Burden among family caregivers of breast cancer patients in north coastal Andhra Pradesh: a hospital based cross-sectional study. *Int J Community Med Public Heal* [Internet]. 2020 Mar 26

Alsirafy SA, Nagy R, Hassan AD, Fawzy R, Abdelhafeez AA, Husein MO, Almashiakhi MA, Alabdullateef SH, Alghamdi SA, Elyamany AM. Caregiver burden among family caregivers of incurable cancer patients in two eastern Mediterranean countries. *BMC Palliative Care*. 2021 Dec;20(1):1-8.

Kajana VPM, Katta A, Bhimarasetty DM. Burden among family caregivers of breast cancer patients in north coastal Andhra Pradesh: a hospital based cross-sectional study. *Int J Community Med Public Heal* [Internet]. 2020 Mar 26

Montgomery R. Using and interpreting the Montgomery Borgatta Caregiving Burden Scale. 2006; (January 2006):1-4.

Liu Z, Heffernan C, Tan J. Caregiver burden: A concept analysis. *International journal of nursing sciences*. 2020 Oct 10;7(4):438-45.

Brush BL, Kirk K, Gultekin L, Baiardi JM. Overcoming: A concept analysis. In *Nursing forum* 2011 Jul (Vol. 46, No. 3, pp. 160-168). Malden, USA: Blackwell Publishing Inc.

Andina MP, Pohan LD. Correlation Between Family Functioning and Caregiver Burden among Family Caregivers of Patients with Breast Cancer. 2019 Aug 1

Heckel L, Fennell KM, Reynolds J, Boltong A, Botti M, Osborne RH, Mihalopoulos C, Chirgwin J, Williams M, Gaskin CJ, Ashley DM. Efficacy of a telephone outcall program to reduce caregiver burden among caregivers of cancer patients [PROTECT]: a randomised controlled trial. *BMC cancer*. 2018 Dec;18(1):1-3.

Sahadevan, Namboodiri V. Depression in caregivers of patients with breast cancer: A cross-sectional study from a cancer research center in South India. *Indian J Psychiatry* [Internet]. 2019 May 1

Liu Y, Li Y, Chen L, Li Y, Qi W, Yu L. Relationships between family resilience and posttraumatic growth in breast cancer survivors and caregiver burden. *Psycho-oncology*. 2018 Apr;27(4):1284-90.

Given BA, Given CW, Kozachik S. Family support in advanced cancer. *CA: a cancer journal for clinicians*. 2001 Jul;51(4):213-31.

Gabriel I, Aluko J, Okeme M. Caregiver burden among informal caregivers of women with breast cancer. *Biomed J Sci Tech*. 2019 Feb 8; 15:1-9.

Jite IE, Adetunji AA, Folasire AM, Akinyemi JO, Bello S. Caregiver burden and associated factors amongst carers of women with advanced breast cancer attending a radiation oncology clinic in Nigeria. *African Journal of Primary Health Care & Family Medicine*. 2021;13(1):1-8.

Li Y, Wang K, Yin Y, Li Y, Li S. Relationships between family resilience, breast cancer survivors' individual resilience, and caregiver burden: A cross-sectional study. *International Journal of Nursing Studies*. 2018 Dec 1; 88:79-84.

Sahadevan S, Namboodiri V. Depression in caregivers of patients with breast cancer: A cross-sectional study from a cancer research center in South India. *Indian journal of psychiatry*. 2019 May;61(3):277.

Johansen S, Cvancarova M, Ruland C. The effect of cancer patients' and their family caregivers' physical and emotional symptoms on caregiver burden. *Cancer nursing*. 2018 Mar 1;41(2):91-9.

Bevans M, Sternberg EM. Caregiving burden, stress, and health effects among family caregivers of adult cancer patients. *Jama*. 2012 Jan 25;307(4):398-403.

Jensen S, Given B. Fatigue affecting family caregivers of cancer patients. *Supportive care in cancer*. 1993 Nov;1(6):321-5.

Reinhard SC, Given B, Petlick NH, Bemis A. Supporting family caregivers in providing care. *Patient safety and quality: An evidence-based handbook for nurses*. 2008 Apr.

Abbasnezhad M, Rahmani A, Ghahramanian A, Roshangar F, Eivazi J, Azadi A, Berahmany G. Cancer care burden among primary family caregivers of iranian hematologic cancer patients. *Asian Pacific Journal of Cancer Prevention*. 2015;16(13):5499-505.

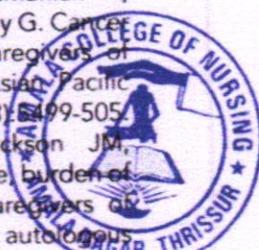
Johansson FG, Lachica EM, Fall-Dickson JM, Kennedy J. Psychological distress, fatigue, burden of care, and quality of life in primary caregivers of patients with breast cancer undergoing autologous bone marrow transplantation. In *Oncology Nursing Forum* 2004 Oct 31 (Vol. 31, No. 6, pp. 1161-1169).

Nicolaisen A, Hagedoorn M, Hansen DG, Flyger HL, Christensen R, Rottmann N, Lunn PB, Terp H, Soee

Prof. Dr. RAJEEV REGHUNATH

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K, Johansen C. The effect of an attachment-oriented couple intervention for breast cancer patients and partners in the early treatment phase: A randomised controlled trial. *Psycho-Oncology*. 2018 Mar;27(3):922-8.

Abbaszehdad M, Rahmani A, Ghahramanian A, Roshangar F, Eivazi J, Azadi A, Berahmany G. Cancer care burden among primary family caregivers of Iranian hematologic cancer patients. *Asian Pacific Journal of Cancer Prevention*. 2015;16(13):5499-505.

Din SH, Jaafar NR, Zakaria H, Saini SM, Ahmad SN, Midin M. Anxiety disorders in family caregivers of breast cancer patients receiving oncologic treatment in Malaysia. *Asian Pacific journal of cancer prevention: APJCP*. 2017;18(2):465.

Grunfeld E, Coyle D, Whelan T, Clinch J, Reyno L, Earle CC, et al. Family caregiver burden: results of a longitudinal study of breast cancer patients and their principal caregivers. *CMAJ [Internet]*. 2004 Jun 8 [cited 2021 Aug 4];170(12):1795-801. Available from: <https://www.cmaj.ca/content/170/12/1795>

Chronopoulou K, Sakkas D, Damigos D. Caregiving burden and psychological distress of breast cancer patients' husbands after mastectomy. *Int J Caring Sci*. 2016 Sep 1;9(3):909-13.

Given B, Wyatt G, Given C, Gift A, Sherwood P, DeVoss D, et al. Burden and Depression Among Caregivers of Patients with Cancer at the End-of-life. *Oncol Nurs Forum [Internet]*. 2004 [cited 2021 Sep 1];31(6):1105. Available from: [/pmc/articles/PMC1315286/](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1315286/)

Noveiri MJ, Shamsaei F, Khodaveisi M, Vanaki Z, Tapak L. Coping assessment tools in the family caregivers of patients with breast cancer: A systematic review. *Breast Cancer: Targets and Therapy*. 2020; 12:11.

Parsekar SS, Bailey A, VS B, Nair S. Exploring perceptions and practices of cancer care among caregivers and care recipients of breast cancer in India. *Psycho-Oncology*. 2020 Apr;29(4):737-42.

Ge L, Mordiffi SZ. Factors associated with higher caregiver burden among family caregivers of elderly cancer patients: a systematic review. *Cancer nursing*. 2017 Nov 1;40(6):471-8.

Nasrabadi AN, Sharif SP, Allen KA, Naghavi N, Nia HS, Salisu WJ, Yaghoobzadeh A. The role of socioeconomic status in the relationship between social support and burden among cancer caregivers. *European Journal of Cancer Prevention*. 2022 Mar 1;31(2):198-203.

Ashrafian S, Feizollahzadeh H, Rahmani A, Davoodi A. The unmet needs of the family caregivers of patients with cancer visiting a referral hospital in Iran. *Asia-Pacific journal of oncology nursing*. 2018 Jul 1;5(3):342-52.

Kim H, Yi M. Unmet needs and quality of life of family caregivers of cancer patients in South Korea. *Asia-Pacific journal of oncology nursing*. 2015 Jul 1;2(3):152-9.

Wang T, Molassiotis A, Chung BP, Tan JY. Unmet care needs of advanced cancer patients and their informal caregivers: a systematic review. *BMC palliative care*. 2018 Dec;17(1):1-29.

Gabriel I, Aluko J, Okeme M. Caregiver burden among informal caregivers of women with breast cancer. *Biomed J Sci Tech*. 2019 Feb 8;15:1-9.

Bradley CJ. Economic Burden Associated with Cancer Caregiving. *Semin Oncol Nurse [Internet]*. 2019 Aug 1 [cited 2021 Nov 24];35(4):333.

Langdon RJ, Yousefi PD, Relton CL, Suderman MJ. The Measurement of Caregiver Burden. *J Med Sci [Internet]*. 2003 [cited 2021 Nov 29];23(2):73-82.

Northouse LL, Katapodi MC, Song L, Zhang L, Mood DW. Interventions with family caregivers of cancer patients: meta-analysis of randomized trials. *CA: a cancer journal for clinicians*. 2010 Sep;60(5):317-39.

Aubin M, Vézina L, Verreault R, Simard S, Tremblay L, Desbiens JF, Dumont S, Fillion L, Maman JD, Gagnon P. Evaluation of an Intervention to Improve Supportive Care for Family Caregivers of Patients with Lung Cancer: Results of a Randomized Clinical Trial. *Journal of Pain and Symptom Management*. 2018 Dec 1;56(6): e51.



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A Study to Assess the Impact of Post COVID Rehabilitative Exercises on Physical and Mental Wellbeing of Post COVID 19 Patients

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Abstract

This study aimed to assess the impact of post-COVID-19 rehabilitative exercises on the physical and mental well-being of patients who have completed a rehabilitation program consisting of aerobic exercises, resistance training, and breathing exercises. The study used a quantitative research approach, data was collected from a sample of male and female patients aged 18 years and above.

Quantitative data analysis revealed significant improvements in physical and mental well-being scores after completing the rehabilitation program. Additionally, the study found that certain demographic factors such as age and gender may impact the effectiveness of the rehabilitation programs. Study also identified several themes related to participants' experiences with the rehabilitation program, including increased motivation and confidence, improved sleep, and enhanced overall well-being.

Overall, this study provides valuable insights into the effectiveness of post-COVID-19 rehabilitative exercises in addressing the long-term physical and mental health complications many patients experience after recovering from COVID-19. The findings of this study could inform the development of more effective rehabilitation programs for post-COVID-19 patients and contribute to the ongoing effort to improve the care and management of individuals recovering from COVID-19.

Keywords: COVID 19; Post COVID 19 syndrome; Rehabilitative exercises; Physical well-being; Mental well-being

Introduction

The COVID-19 pandemic has significantly impacted the physical and mental health of individuals worldwide. While many have been fortunate to recover from the virus, there is a growing concern for the long-term physical and mental health complications that some individuals may experience post-recovery [1]. Studies have shown that post-COVID-19 patients may experience symptoms such as fatigue, breathlessness, and reduced physical function for an extended period. Additionally, the pandemic's mental health toll cannot be overlooked, as individuals may experience anxiety, depression, and post-traumatic stress disorder (PTSD) due to the pandemic's effects [2].



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Rehabilitative exercises have been identified as a potential solution for addressing the physical and mental health complications of post-COVID-19 patients. Rehabilitation programs consisting of aerobic exercises, resistance training, and breathing exercises have shown promise in improving physical function and reducing symptoms in post-COVID-19 patients [3]. However, the effectiveness of such programs needs to be studied further, particularly in the long term.

Previous studies have highlighted the importance of exercise in improving physical and mental health outcomes in post-COVID-19 patients. However, few studies have assessed the effectiveness of a comprehensive rehabilitation program that includes different types of exercise and interventions.

This study aims to assess the impact of post-COVID-19 rehabilitative exercises on the physical and mental well-being of patients who have completed a rehabilitation program consisting of aerobic exercises, resistance training, and breathing exercises. A quantitative approach to data analysis will be used, with data collected from a sample of male and female patients aged 18 years and above.

The study hypothesizes that the rehabilitative exercises will lead to significant improvements in physical and mental well-being scores, as measured through standardized assessments. Additionally, the study aims to identify demographic factors such as age and gender that may impact the effectiveness of the rehabilitation program.

This study's findings could inform the development of more effective rehabilitation programs for post-COVID-19 patients and contribute to the ongoing effort to improve the care and management of individuals recovering from COVID-19. With the growing number of post-COVID-19 patients worldwide, addressing the physical and mental health complications of this population is crucial for ensuring optimal health outcomes.

Objectives

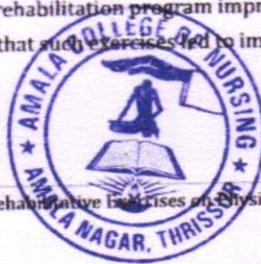
1. Assess the physical health and mental health of post COVID 19 subjects.
2. Assess the effectiveness of post COVID rehabilitative exercises on physical wellbeing of post COVID 19 subjects.
3. Assess the effectiveness of post COVID rehabilitative exercises on mental wellbeing of post COVID 19 subjects.
4. Find out correlation between physical wellbeing and mental wellbeing among post COVID 19 subjects.
5. Find out association of physical wellbeing and mental wellbeing among post COVID 19 subjects with selected demographic variables.

Review of Literature

COVID-19 Rehabilitation Programs: Several studies have highlighted the importance of rehabilitation programs for COVID-19 patients, particularly those who have experienced severe or critical illness. Such programs typically consist of a combination of aerobic exercises, resistance training, and breathing exercises to address the physical and mental health complications associated with COVID-19 [2].

Effects on Physical Health: The impact of post-COVID-19 rehabilitative exercises on physical health has been widely studied. A systematic review by Lau et al. (2021) found that such exercises led to improvements in respiratory function, exercise capacity, and muscle strength [4]. Another study by Wang et al. (2021) found that patients who participated in a rehabilitation program had better physical functioning and mobility compared to those who did not.

Effects on Mental Health: Post-COVID-19 rehabilitative exercises have also been shown to have a positive impact on mental health outcomes. A study by Li et al. (2021) found that participating in a rehabilitation program improved anxiety and depression symptoms in COVID-19 patients [5]. Another study by Hu et al. (2021) found that such exercises led to improvements in quality of life and overall mental well-being [6].



Demographic Factors: Several studies have explored the impact of demographic factors on the effectiveness of post-COVID-19 rehabilitative exercises. For example, a study by Liu et al. (2021) found that older patients and those with pre-existing medical conditions may require more tailored rehabilitation programs to achieve optimal outcomes [7]. Additionally, male patients may experience greater improvements in respiratory function compared to female patients (Simpson et al., 2021) [8].

Patient Experiences: Qualitative studies have explored patients' experiences with post-COVID-19 rehabilitative exercises. For example, a study by Thomas et al. (2021) found that patients reported increased motivation and confidence as a result of participating in such exercises. Another study by Li et al. (2021) found that patients reported improved sleep and overall well-being after completing a rehabilitation program [9].

Materials and Method

Research Approach: A quantitative research approach was used.

Research design: One group pre -test post-test pre experimental research design was adopted for this study.

Sampling: The non probability convenient sampling.

Sample size: 100 Post COVID 19 patients.

Setting: Post COVID 19 patients residing in different districts of Kerala with no current COVID 19 infection.

Independent variable: Post COVID rehabilitative exercise regimen given to the group.

Dependent variable: physical and mental wellbeing of post COVID patients

Inclusion criteria

- Nurses who tested COVID positive during last one year.
- Subjects available at the time of data collection.
- Subjects willing to participate in the study.
- Subjects who can read and understand English and Malayalam.
- Subjects between age group below 60 years.
- Subjects in both Genders.

Exclusion criteria

- Subjects who are under going treatment for any other psychiatric disorders/severe respiratory illness.
- Subjects who are pregnant.
- Subjects who are presently COVID19positive.
- Subjects who are not willing to participate.

Tool

Tool 1: Socio demographic data sheet.

Tool 2: Mental health inventory-18.

Tool 3: Physical Health Questionnaire.

Data collection procedure

Data collection was done through Google forms in samples who met the inclusion criteria. Pre-test data was collected using tool 1, tool 2 and tool 3. The structured teaching programme was administered via You Tube video after the pre-test. After one month the effectiveness of the programme was assessed using same tool.



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Data analysis

The data were analysed using descriptive and inferential statistics to determine the impact of post-COVID-19 rehabilitative exercises on the physical and mental well-being of post-COVID-19 patients.

Descriptive statistics were used to summarize the data collected from the study. Measures of central tendency, such as means and medians, were calculated to describe the distribution of the data. Measures of variability, such as standard deviations and ranges, were also calculated to describe the spread of the data.

Inferential statistics were used to test the hypotheses of the study. The primary hypothesis of the study is that post-COVID-19 rehabilitative exercises will improve the physical and mental well-being of post-COVID-19 patients. This hypothesis was tested using Paired t-test.

Furthermore, the study analyses the relationship between physical and mental well-being outcomes and various patient characteristics such as age, gender, religion, occupation, socio-economic status etc.

Overall, the data analysis of this study provides valuable insights into the impact of post-COVID-19 rehabilitative exercises on the physical and mental well-being of post-COVID-19 patients and informs future clinical practice for the rehabilitation of post-COVID-19 patients.

Result

Section A: Distribution of Subjects According to Demographic Variables

The characteristics of the study population were as follows:

- Majority (66%) of the subjects studied were in the age group of 18-28 years.
- More than half of them were females (66%).
- Most of them (65%) belonged to Christian community.
- Regarding to marital status, majority(68%) were unmarried.
- Majority of the study participants (63%) were graduates.
- Most of the study subjects (37%) were working under private sector.
- Majority of the participants (84%) had nuclear families.
- A large proportion (79%) were from panchayath area.
- Majority of the study subjects (76%) belongs to APL category.
- Regarding dietary habit, most of them (84%) are on mixed diet.
- 7 of the study subjects were admitted in hospital during COVID 19 infection.
- Majority of the subjects (72) received information regarding COVID 19 from social media.
- Most of the subjects (90) received 2 doses of COVID 19 vaccination
- Majority of the subjects (68%) were not aware about post-COVID 19 rehabilitative exercises.
- About 8% of the study subjects are having co-morbidities, among which 5 of them have DM.

Section B: Classification of Subjects Based on Mental Health Inventory and Physical Health Inventories Score Before and after Administration of Post Covid Rehabilitative Exercises

Among 100 samples selected for the study, in pre-test majority (69%) of the subjects had better mental health, 20% had good mental health and 11% had poor mental health. In post-test, majority (70%) had good mental health, 26% had better mental health and 4% had poor mental health.



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With respect to pre-test level of physical health, majority (47%) had a better physical health, 45% good physical health and 8% poor physical health. Regarding post-test physical health status 58% had good physical health, 36% had better physical health and 6% had poor physical health.

Section C: Analysis of Effectiveness of Post Covid Rehabilitative Exercises on Mental Health of Subjects

Mental health inventory score	Mean	SD	't' value	P value
Pre-test	63.9517	2.4903	7.956	0.00001
Post-test	66.3230	2.1812		

Table 1: Mean, standard deviation and 't' value of pre-test and post-test mental inventory scores of subjects.

Table 1 depicts that mean post-test mental health inventory score was significantly higher than the mean pre-test mental health inventory score. The calculated 't' value 7.956 is and p value is <0.00001, hence the result is significant at p<0.05.

Section D: Analysis of Effectiveness of Post Covid Rehabilitative Exercises on Physical Wellbeing of Subjects

Mental health inventory score	Mean	SD	't' value	P value
Pre-test	4.4046	1.5128	1.202	0.232
Post-test	4.6999	1.4456		

Table 2: Mean, standard deviation and 't' value of pre-test and post-test physical health scores of subjects.

Table 2 depicts that mean post-test physical health inventory score was higher than the mean pre-test health physical inventory score. The calculated 't' value is 1.202 and p value is 0.232 hence, the result is not significant at p<0.05.

Section E: Analysis of Correlation among Mental Wellbeing and Physical Wellbeing

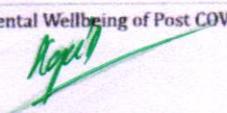
Variables	Mean	Pearson's Correlation Coefficient (r)	P value
Mental wellbeing	63.9517	0.113	0.265
Physical Wellbeing	4.4046		

Table 3: Correlation of mean mental wellbeing score with physical wellbeing score of subjects.

Table 3 reveals that Pearson's correlation coefficient value of mental wellbeing with physical wellbeing among post COVID-19 patients is 0.113 and p value is 0.265. Hence there is a positive correlation between mental wellbeing and physical wellbeing of post COVID-19 patients which is not statistically significant.



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Section F: Association of Subjects According to Pre-Test Mental Wellbeing and Selected Demographic Variables

Sl. No	Demographic variables	Mental Well-being			Chi-square	P value	Significance
		Good	Better	Poor			
1.	Age in year				9.825	0.132	NS
	18-28	9	51	6			
	29-38	6	8	3			
	39-48	1	6	1			
	49-58	4	4	1			
2.	Sex				7.309	0.026	S
	Male	9	18	7			
	Female	11	51	4			
3.	Marital status				13.277	0.001	S
	Married	9	15	8			
	Unmarried	11	54	3			
4.	Education				17.934	0.001	S
	High School	1	3	1			
	Higher Secondary	8	1	3			
	Graduate and above	11	45	7			
5.	Area of residence				15.283	0.004	S
	Panchayth	14	60	5			
	Municipality	5	7	3			
	Corporation	1	2	3			
6.	Socio-economic status				7.80	0.020	S
	APL	18	53	5			
	BPL	2	16	6			
7.	Admission in hospital during COVID 19				28.375	0.00001	S
	Yes	1	1	5			
	No	19	68	6			
8.	Vaccination status				4.228	0.120	NS
	Second dose	18	64	8			
	Booster dose	2	5	3			
9.	Type of family						NS
	Joint family						
	Extended Family						
	Nuclear Family						

Table 4: Association between Pre-test Mental Wellbeing and selected Demographic variables such as age, sex, marital status, education, area of residence, socio-economic status, admission in hospital during COVID 19 and vaccination status.



Section 6: Association of Subjects According to Pre-Test Physical Wellbeing and Selected Demographic Variables

Sl. No	Demographic variables	Mental Well-being			Chi-square	P value	Significance
		Good	Better	Poor			
1.	Age in year				6.416	0.372	NS
	18-28	30	32	4			
	29-38	7	8	2			
	39-48	6	1	1			
2.	Sex				1.607	0.447	NS
	Male	18	13	3			
	Female	27	34	5			
3.	Marital status				3.031	0.219	NS
	Married	18	11	3			
	Unmarried	27	36	5			
4.	Education				4.781	0.310	NS
	High School	2	2	1			
	Higher Secondary	11	17	4			
	Graduate and above	32	28	3			
5.	Area of residence				6.88	0.142	NS
	Panchayth	36	39	4			
	Municipality	7	6	2			
6.	Socio-economic status				7.087	0.029	S
	APL	36	37	3			
	BPL	9	10	5			
7.	Admission in hospital during COVID 19				41.144	0.0001	S
	Yes	1	1	5			
	No	44	46	3			
8.	Vaccination status				2.178	0.337	NS
	Second dose	41	43	6			
	Booster dose	4	4	2			
9.	Type of family				16.604	0.002	S
	Joint family	4	5	3			
	Extended Family	1	1	2			
	Nuclear Family	40	41	2			

Table 5: Association between Pre-test Physical Wellbeing and selected demographic variables such as age, sex, marital status, education, area of residence, socio-economic status, admission in hospital during COVID 19 and vaccination status.

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Discussion

The present study aimed to assess the effectiveness of post-COVID-19 rehabilitative exercises on the mental and physical well-being of post-COVID-19 patients in the districts of Kerala. The study had five objectives, including assessing the physical and mental health of post-COVID-19 subjects, identifying the effectiveness of post-COVID-19 rehabilitative exercises on physical and mental well-being, finding out the correlation between physical and mental well-being among post-COVID-19 subjects, and finding out the association of physical and mental well-being with selected demographic variables.

The study found that most of the participants were in the age group of 18-28 years, female, Christian, unmarried, graduates, working in the private sector, and from a nuclear family. Most of them were from a panchayath area and belonged to the APL category. In terms of dietary habits, most of them were on a mixed diet. The study also found that the majority of the participants did not have an awareness of post-COVID-19 rehabilitative exercises.

Based on the results presented, the study found that post-COVID-19 rehabilitative exercises were effective in improving the mental well-being of post-COVID-19 patients. However, the study found only a slight improvement in physical well-being. When compared with the literature review, the finding on the positive effect of rehabilitative exercises on mental well-being is consistent with previous studies. For instance, a study by Taneja et al. (2021) found that exercise-based rehabilitation programs had positive effects on the psychological well-being of post-COVID-19 patients [10]. Similarly, a study by Grabowski et al. (2021) found that physical therapy interventions improved physical function and quality of life among COVID-19 survivors [11].

However, the finding of a slight improvement in physical well-being is not consistent with some previous studies. A systematic review by Huang et al. (2021) found that rehabilitation interventions, including exercise-based interventions, had significant effects on improving physical function among COVID-19 survivors [12].

One possible explanation for the discrepancy between the present study and previous studies is the differences in the sample characteristics and interventions used in the studies. For instance, the present study was conducted among post-COVID-19 patients in districts of Kerala, was limited to a time period of one month and it was administered in online mode, while some of the previous studies were conducted in other regions or countries. Moreover, the type, duration, and intensity of rehabilitative exercises used in the present study may have been different from those used in other studies.

The study also found a significant correlation between mental and physical well-being among post-COVID-19 patients. However, the association of mental and physical well-being with selected demographic variables was not significant.

Overall, the study implies that post-COVID-19 rehabilitative exercises are effective in improving the mental well-being of post-COVID-19 patients, but their effectiveness in improving physical well-being needs further investigation. The study also highlights the need for creating awareness about post-COVID-19 rehabilitative exercises among the general public. The study's limitations include small sample size and limited geographical scope. The study recommends further research with larger sample sizes and wider geographical coverage.

Conclusion

The study investigated the effectiveness of post-COVID-19 rehabilitative exercises on the physical and mental well-being of post-COVID-19 patients in the districts of Kerala. The study found that the rehabilitative exercises were effective in improving the mental well-being of the patients, as evidenced by significant improvements in the scores of anxiety and depression scales. However, the study found only slight improvement in physical well-being.

As healthcare providers, nurses play a crucial role in promoting rehabilitative exercises for post-COVID-19 patients. Nurses can educate patients about the benefits of exercise for their physical and mental well-being, including improved lung function, muscle strength, and mood. They can also assist patients in developing an individualized exercise plan based on their specific needs and abilities.

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ties, and monitor their progress over time. Nurses can collaborate with other healthcare professionals, such as physical therapists, to ensure that patients receive appropriate exercise interventions and are safe during their exercise routines. In addition, nurses can provide emotional support to patients who may be struggling with anxiety, depression, or fear related to their recovery process. By promoting and supporting post-COVID-19 rehabilitative exercises, nurses can help patients to achieve optimal physical and mental health outcomes.

Overall, the study provides important insights into the potential benefits of post-COVID-19 rehabilitative exercises in improving the mental well-being of patients, highlighting the need for healthcare professionals to incorporate such exercises as part of the rehabilitation program. The findings of this study contribute to the growing body of research on the importance of rehabilitative exercises for post-COVID-19 patients, particularly in improving their mental well-being. However, further research is needed to explore the optimal types, duration, and intensity of rehabilitative exercises that can improve physical well-being among post-COVID-19 patients. Healthcare providers and policymakers can use the results of this study to design effective rehabilitative programs for post-COVID-19 patients, considering the importance of mental health in the overall recovery process.

Nursing implications

The findings of the study are relevant to nursing field especially in the community area.

Nursing Service

1. The nurses, especially those who are working in the community field can utilize the knowledge regarding post COVID-19 rehabilitative exercises in educating the post COVID-19 individuals and family members.

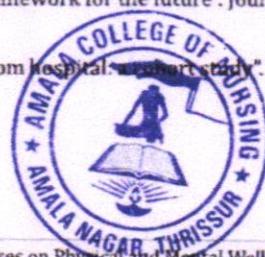
References

1. World Health Organization. "Coronavirus Disease (COVID-19) Weekly Epidemiological Update". (2020).
2. Greenhalgh T, et al. "Management of post-acute COVID-19 in primary care". British Medical Journal 370 (2020).
3. Liu K, et al. "Respiratory rehabilitation in elderly patients with COVID-19: a randomized controlled study". Complementary Therapies in Clinical Practice 39 (2020).
4. Lau HM, et al. "A randomised controlled trial of the effectiveness of an exercise training program in patients recovering from COVID-19". Australian Journal of Physiotherapy 67.4 (2021): 231-239.
5. Li J, et al. "Rehabilitation of patients with COVID-19". Expert Review of Respiratory Medicine 15.7 (2021): 877-883.
6. Hu J, et al. "The effect of rehabilitation intervention on quality of life and psychological status of patients with COVID-19: A systematic review and meta-analysis". International Journal of Environmental Research and Public Health 18.3 (2021): 1231.
7. Liu K, et al. "Respiratory rehabilitation in elderly patients with COVID-19: A randomized controlled study". Complementary Therapies in Medicine (2020).
8. Simpson R, Robinson L and Sharma P. "Respiratory rehabilitation after severe COVID-19: a novel solution to reduce pulmonary sequelae". Journal of Rehabilitation Medicine 53.9 (2021): jrm00211
9. Li J, et al. "Rehabilitation of patients with COVID-19". Expert Review of Respiratory Medicine 15.7 (2021): 877-883.
10. Taneja N, Joshi A and Kaur N. "Effects of exercise-based rehabilitation on physical and psychological wellbeing in COVID-19 patients: A systematic review and meta-analysis". Journal of Bodywork and Movement Therapies 27 (2021): 388-395.
11. Grabowski DC, et al. "COVID-19 pandemic and post-acute care: A strategic framework for the future". Journal of General Internal Medicine 36.7 (2021): 2046-2052.
12. Huang C, et al. "6-month consequences of COVID-19 in patients discharged from hospital: a cohort study". The Lancet 397.10270 (2021): 220-232.

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