RESEARCH ARTICLE

Editorial Process: Submission:02/25/2023 Acceptance:02/16/2024

Effect of Integrated Survivorship Model on Physical Health for Breast Cancer Survivors in Rural Area

Sandeep B Shinde[1]*, Ketaki Yogesh Kulkarni[1], Sanjaykumar Patil[2], Anand Gudur[3], Ravindra V Shinde[4], Radha P Bhende[1]

Abstract

Objective: The objective of this study was to evaluate the effect of the integrated survivorship model on the physical health of breast cancer survivors in rural areas. **Methods:** Ninety-two patients who were breast cancer survivors were selected as per inclusion criteria and divided into two groups (control group and intervention group). The participants were randomly allotted to two groups of 46 each. A 12-minute walk test, assessment of quality of life, and difficulty in return to work were used as outcome measures. The integrated survivorship model was implemented in one group for 3 months while the other group was a supporting group and was involved in household activities only. Pre-assessment and post-assessment were taken to evaluate the effect of the integrated survivorship model. All the statistical analysis was done using SPSS statistical Software (version 23.0 for Windows; SPSS, Inc., Chicago, USA) and the results were obtained. **Results:** The results revealed that the assessment of the 12-minute walk test, physical well-being, social/family well-being, functional well-being, and difficulty in returning to work showed extremely significant results in the intervention group with a p-value of less than 0.0001. Similarly, emotional well-being and additional concern domains showed significant results in the intervention group. Hence, the findings of this study revealed significance in post-assessment in all the outcome measures of the experimental group. **Conclusion:** The study showed that all the outcome measures such as the 12-minute walk test, assessment of quality of life, and difficulty in return to work were impaired in both groups before the study. The effect of the model showed a significant improvement in the intervention group after implementing the intervention.

Keywords: Lymphedema- return to work- physical health- physical well being

Asian Pac J Cancer Prev, **25 (2)**, 401-408

Introduction

The most frequent form of cancer among women is breast cancer. According to breast cancer statistics, in 2020, there were 2.3 million women diagnosed with breast cancer globally and at the end of 2020 every 14 seconds one woman was diagnosed with breast cancer somewhere in the world [1]. The incidences of breast cancer have increased since 2008 by 20 percent. According to National Cancer Registry Programme (NCRP) data, the estimated number of incident cases of cancer in India for the year 2022 was found to be 14,61,427 (crude rate:100.4 per 100,000). In India, one in nine people are likely to develop cancer in his/her lifetime. Lung and breast cancers were the leading sites of cancer in males and females, respectively [2].

Early detection and screening are crucial in preventing the growth of breast cancer. The symptoms of breast cancer include breast lumps, changes in size, shape, and appearance of the breast, changes in the skin such as redness, and nipple discharge or changes around the nipple and areola [3] Usually, the lump is the first common diagnostic sign and is always painless. Regular screening of risk factors can help prevent cancer. Common risk factors include age above 40-50 years, younger age of menarche, menopausal women, older age for the first childbirth, higher incidence of abortion, childbirth before 33 weeks of gestation, use of contraceptive pills, hereditary factor, family history, consumption of alcohol, smoking, lifestyle habits including improper diet and lack of physical activity, sleep awake cycle disturbances, etc. Along with these, other risk factors such as air pollution, socioeconomic status, etc. can have an impact on developing breast cancer [4]. Cancer survivorship starts

*[1]Department of Musculoskeletal Sciences, Krishna College of Physiotherapy, Krishna Vishwa Vidypeeth, KIMSDU, Karad, Maharashtra, India. [2]Department of Obstetrics & Gynecology, Krishna Vishwa Vidyapeeth, KIMSDeemed to be University, Karad, Maharashtra, India. [3]Deaprtment of Oncology, Krishna Vishwa Vidyapeeth, Krishna Institute of Medical Sciences Deemed to Be University, Karad, Maharashtra, India. [4]Department of Microbiology, Krishna Vishwa Vidyapeeth KIMS Deemed to be University, Karad, Maharashtra, India. *For Correspondence: drsandeepshinde24@gmail.com*

from the period of diagnosis throughout the life of the patient. According to the American Society of Clinical Oncology, survivorship can be explained into three levels. The first level is the acute level, which includes a period of diagnosis with its current active treatment. The second level or phase is called the extended phase, where the treatment takes off but the patient can experience its effects in every aspect. The third and last level is termed the permanent level, where the patient can experience long-term effects of treatment which remain throughout life [5]. Therefore, according to these levels, once the patient enters into survivorship, he/she remains a cancer survivor for life.

Breast cancer treatment can have adverse effects on health and physical functioning, which can lead to other co-morbidities [6]. Cancer survivorship affects the patient's quality of life, working capabilities, physical health, and much more in every aspect, including mental, emotional, social health, and activities of daily living. Therefore, cancer survivorship and sequel of cancer treatment should be managed hand in hand with other developing co-morbidities that come with ageing. Rural cancer survivors face various challenges due to a lack of health care services, including specialty health services for treating symptoms along with resources. Along with this, rural cancer survivors find it difficult to cope with the experience of the condition and the period of treatment due to a lack of awareness about the cancer and its survivorship and lack of psycho-social intervention, which affects health and quality of life [7].

A study analyzed spinal dysfunction in breast cancer survivors with lymphedema. The study included 116 breast cancer survivor women who were having lymphedema. Of these 116 subjects, 39 had undergone radical mastectomy (RM), 39 had undergone modified radical mastectomy (MRM), and 38 had undergone breast-conserving surgery (BCS). Assessment for spinal function was done by taking a range of motion using a goniometer, lymphedema measurement using tape, spinal stability test, and functional rating index. The spinal range of motion and strength and endurance of abdominals, extensors, and lateral muscles of the spine showed a significant reduction in patients suffering from lymphedema in breast cancer survivors. There was a marked effect seen on the quality of life of patients assessed by using the functional rating index due to spinal dysfunction in lymphedema patients.

According to a study conducted in 2020, breast cancer survivors in India faced various challenges such as anxiety, depression, fear of recurrences, and family, interpersonal relationships, financial problems, and employment. The study also highlighted the opportunities or resources that can be made available to these survivors, such as the inclusion of primary health centers for survivorship care, addressing problems of cancer survivors, self-help strategies, and cost-effective health care [8].

In India, the majority of women in rural areas are housewives with involvement in farming activities. Some women work in small or middle industries where due to complimentary symptoms they face difficulties in work. Commonly, they need expert advice or treatment for this which are cost-effective and easily available to people in rural areas as treatment facilities are concentrated in larger cities causing ignorance of symptoms. Additionally, due to a lack of awareness about the condition and outcomes of it, the patient lands in poor mental and physical health. Therefore, self-treatment strategies which are cost-effective and easy to do by themselves are needed to have a better quality of life.

Materials and Methods

This study commenced after approval from the institutional protocol and ethics committee. The study's primary goal was to evaluate the effectiveness of the integrated survivorship model on breast cancer survivors.

Participants

Ninety-two female breast cancer survivors between the ages of 40 and 65 were randomly selected for this study. Patients who were under active treatment were excluded. The patients were then randomly divided into two groups of 46 each. One group received the integrated survivorship model, while the other group was assigned to support groups that were involved in household activities only.

Procedure

All patients were approached and given a detailed explanation of the study. Written and verbal informed consent was obtained from each patient. Demographic information was documented before initiating the study. Pre-assessment of the patients was conducted using data collection tools for both groups. The model was implemented for three 3-month periods in one group, after which post-assessment was conducted and the results were interpreted.

Data collection tools

12 minutes' walk test

This test measures oxygen intake, cardio-respiratory function, and vital capacity of the patient while performing activities. In this test, the patient was instructed to walk continuously for 12 minutes in the corridor without stopping, and the distance covered by the end of 12 minutes was recorded [9].

Assessment of quality of life

The questionnaire consists of several components such as physical well-being, social/family well-being, relationship with a doctor, emotional well-being, functional well-being, and additional concerns. The patient was assessed using this questionnaire, in which they were asked to state how much each component of the questionnaire affects their quality of life. Both pre- and post-assessment scores were taken for the control and intervention groups to evaluate the results [10].

Difficulty in return to work

Most cancer survivors face difficulty in returning to work after treatment, especially women in rural areas who are housewives and involved in farming activities. Some women work in small or middle industries where they face difficulties due to complications [11]. The patients

were asked to state how much difficulty they faced while returning to work. Both pre- and post-assessment scores for the control and intervention groups were taken for evaluation.

Integrated Survivorship Model
Work limitation

1. Kitchen activities
2. Small/middle industrial working
3. Farming activity

Barriers [12]
Work type and aspects

Work type or its aspects are the most significant barriers for breast cancer survivors. These include tasks, challenges while doing work, responsibility of work, risks, or hazards. In the rural Indian population, housewives do daily household activities like cooking, cleaning, brooming, and washing clothes, which require strength and flexibility. Industrial work or farming includes prolonged sitting and standing jobs, lifting heavy weights, and handling instruments. This continuous workload often feels difficult and physically challenging to patients due to medication, chemotherapy sessions, and other treatments.

Time restriction

Housewives work 24/7 at home, while workers and farmers usually work 8-10 hours daily. Their working patterns can be affected due to medication doses, chemotherapy or radiation therapy sessions, and further treatment appointments. Sometimes, due to household responsibilities and financial pressure, patients avoid treatment sessions.

Unco-operation by others

In the rural Indian population, housewives often feel uncooperative family members due to typical stereotypical beliefs, causing emotional and physical distress. Patients also experience uncooperation from coworkers and higher administrators, such as a lack of accessibility or instruments while working, lack of consideration in working hours or work type.

Strategies
Strategies about physical health

Proper nutrition and exercise are essential for better physical health. Regular physical activity can help improve muscle strength, flexibility, and overall physical function. Active exercises and flexibility exercises for both upper and lower limbs help the patient to perform activities of daily living. Physically challenging tasks can be tackled by incorporating strengthening exercises. Regular dietary intake including proteins and vitamin C, which is an antioxidant, can have a better detoxification effect. Regular screening can provide the status of health, which will, in turn, help to improve health and prevent further complications.

Work related strategies

Patients who experience forgetfulness or memory-related problems due to medication doses, pain, or the effect of chemotherapeutic drugs can maintain daily records of routine work and important notes to help them cope with the situation. Lack of awareness about breast cancer and challenges during survivorship can cause less discussion among coworkers and house members, resulting in a lack of emotional support. Therefore, it is important to educate patients about the condition and its management options through informative lectures and videos. Educating the patient about the use of tools and adapting ergonomically corrected postures while lifting and carrying heavy loads can reduce the physical demands of the patient. Coworkers can help by shifting the work according to work tasks and treatment sessions and providing necessary help while working and considering patients' health. Paid leaves should be given to the patient, which will relieve the financial burden of the patient along with some policies given by the government of India that should be incorporated by higher administrators for the patients.

A good environment that is free from dust and chemicals is essential for good cardio-respiratory health. In rural areas, shoulder complaints are common among housewives due to their daily activities in the kitchen, such as striking, chopping, lifting, and carrying heavy vessels. To perform all of these activities of daily living, complete or functional range of motion and grip strength are important components. Hence, early physical therapy should be included to maintain mobility and strength, and vocational rehabilitation should be focused on to help in resuming work efficiently [13].

Cosmoses
Barriers

Breast cancer survivors may experience several appearance changes due to radiation and chemotherapy treatment. These changes include hair loss leading to baldness, reduced hair from body parts, weight gain, skin changes such as a change in the texture of the skin, appearance of scars over the skin, blackening of the skin due to radiation and chemotherapy treatment [14].

In rural areas due to lack of awareness about these appearance changes can bother and might feel stressful to patients for social acceptance. Past experiences such as pain, surgical procedures, and postoperative periods add up to a stressful mentality. Very often, in rural areas due to cultural and stereotypical beliefs, people avoid inviting the patient for social gatherings, and functions or ignore / avoid meeting with the patient which affects mental health leading to depression, lack of confidence and motivation. Obesity or weight gain occurs commonly due to side effects of the drugs and reduced functional capacity due to impaired physical functioning which often disturbs patients' minds due to body image.

Strategies

To overcome the challenges of lack of awareness and social acceptance in rural areas, it is important to create awareness about appearance changes. This can be done by organizing camps by healthcare services who work in rural areas like primary and secondary healthcare workers. Asha workers can play the most important roles

in this by communicating to the public and giving brief information about the condition, complications occurring in survivorship and its management. Asha workers can take the help of local authorities who can help them to conduct surveys and informative lectures.

Education about appearance changes should be known to patients as hair loss or skin changes can be normal after discontinuing medication/drugs. But if the patient feels insecure about the body image then group therapy sessions of discussion, and counselling can help the patient to boost confidence about their body image or help to overcome stressful experiences. Group therapy will be more beneficial in this as sharing of own experiences can be helpful, as most of the patients can relate with it which will have a positive impact on mental health and will improve personal well-being.Obesity or weight gain can be corrected or managed by healthy lifestyle adaptations such as proper diet, exercise, sleep and mental health. Including proper protein and vitamin intake, daily exercise sessions for 1 hour, and enough sleep of 7-8 hours can help to control the weight gain.

Physical functioning

Breast cancer treatment can have long-term side effects that depend on the type, stage of the cancer, and treatment line chosen, as every treatment has its risks and benefits. It is important to educate patients about the side effects, preventive strategies, and management of complications to maintain physical well-being.

Common side effects/complications are

1. Lymphedema
2. Fatigue
3. Musculoskeletal complications
4. Respiratory complications
5. Neurological complications.

Lymphedema

Lymphedema is a condition that results in swelling of an affected arm due to impaired lymphatic circulation and drainage leading to blockage. Because of lymphedema, multiple restrictions can occur in daily living activities. The patient may be unable to do a full range of motion of the arm because of pain, swelling resulting in difficulty in holding/lifting objects, difficulty in dressing, and feeling of heaviness in the arm. In rural areas, in addition to daily living activities, most women work in farms and industries where multiple activities are done by manual handling, resulting in an increased level of severity of symptoms [15].

One of the evidence suggests that the severity of lymphedema is directly related to the nerves affected due to neural tissue impairment. This was seen because, in cases of lymphedema, there is an accumulation of fluid due to the removal of lymph nodes which causes stretching of nerve fibres within the skin, and compression on top of the nerve bundle which leads to nerve entrapment. This then increases the neural mechano-sensitivity and functional impairment of the shoulder as a protective neural response to movement or traction [16]. Strategies for resolving lymphedema include patient education and home care.

Patient's education

Early detection is indeed the key to managing lymphedema. Patients should be aware of its signs, symptoms, and further complications. Patient education is the first and foremost priority of a therapist. Patient education can be done by informative lectures, workshops, videos, and camps. Asha workers can help to educate the patient by communicating at the public level.

Home care

If lymphedema has occurred, proper care at home is necessary along with therapeutic management for preventing further complications. It involves elevation of the limb to decrease the swelling by assisting gravity, skin care by using natural ingredients containing soap which will maintain the pH which will help to maintain skin texture and proper bandaging should be done at home for compression effects, for which use of compression stockings, educating the patient about its wining on and off should be done wisely. Also, primary health care providers can use pneumatic compression devices with the help of a therapist and the self-massage technique can be taught to the patient for the affected part which will help to increase local circulation which will reduce swelling. Breathing exercises including diaphragmatic breathing, and ACBT (active cycle breathing technique) can help to relieve pain as well as improve lymphatic circulation. Lastly, active range of motion exercise can be given to maintain mobility of the affected arm which will prevent further complications. Similarly, if the patient shows sensory-motor impairment secondary to the lymphedema then the neurodynamic mobilization techniques can also be taught to the patient to minimize the pain and increase the mobility [17].

Fatigue

Cancer-related fatigue is caused by various underlying mechanisms that weaken the body or reduce its capacity to perform tasks. It mainly affects housewives who work continuously or do strenuous household chores, which limit their physical functioning. If proper care and treatment are not done, cancer-related fatigue can worsen.

Strategies

Yoga is a helpful and important traditional Indian practice that helps to reduce fatigue by combining movement, rest, and stress reduction with the release of endorphins, which give more energy. Pranayama, a practice of breath control, can also have a relaxing effect on the body. Aerobic exercises can help to increase functional capacity, and relaxation techniques can help to relax the fatigued muscles.

Musculoskeletal complications

Common musculoskeletal complications affect the shoulder, a key joint that enables upper limb movements. The shoulder is often involved due to its proximity to the breast and the invasive therapy in the chest and axilla [18]. Common shoulder related complications which occur are-

1. Glenohumeral impingement
2. Rotator cuff involvement
3. Frozen shoulder
4. Scapular winging

The patient often complains of pain, swelling, and restricted movements in the shoulder area, which limit the activities of daily living such as dressing, bathing, and throwing. Rotator cuff involvement can also occur in females who work as daily wage workers or on construction sites. Early physiotherapy after any rotator cuff injury can help improve the range of motion and strength of the shoulder joint and facilitate return to work [19]. Early and proper treatment can reduce the symptoms by using hot/warm water baths 3-4 times a day, which can ease pain and swelling by improving the local circulation. Exercises such as free exercises of the shoulder, pendulum exercises, wand exercises, shoulder stretches, and active range of motion exercises can be done using household objects such as towels and kitchen appliances, which can maintain flexibility and mobility. Once the mobility and flexibility are achieved by doing these exercises, muscle strengthening can be done by using weights and elastic bands. This can improve the strength, power, and endurance of the patient. Another common complication that occurs is postural changes. Due to surgical procedures, sometimes muscles along with lymph nodes are also excised. For example, in cases of radical mastectomy, pectoralis muscles are excised, which contract the chest and lead to tight back muscles and forward neck posture. For this, early postural correction with stretching and postural correction exercises can be done.

Respiratory complications

Radiation therapy is used to treat cancer in the affected breast, but it can also affect the surrounding and underlying structures such as the lungs, pleura, and mediastinum. This can cause the patient to experience dyspnea, cough, reduced chest expansion and mobility, and pain.

Strategies

For these basic breathing exercises, pursed lip breathing can increase the lung capacity. Thoracic expansion exercises and stretching exercises can improve mobility. Patients should learn about the dyspnea relieving position and how to cough effectively. Aerobic exercises such as walking and jogging can help improve the functional capacity.

Neurological complication

Chemotherapy drugs can have side effects on the nervous system, such as neuropathic pain and chemotherapy-induced peripheral neuropathy. These conditions cause the patient to experience pain, numbness, and tingling sensations. Nerve gliding exercises can help manage these symptoms by improving nerve movement and reducing pain. After the patient feels a decrease in symptoms, strengthening exercises can be done to improve muscle strength and endurance.

Results

All statistical analyses, including the calculations of the mean and standard deviation of the 12-minute walk test, quality of life questionnaire, and difficulty in return to work, were done using SPSS software. For the estimation of results, paired t-test was used and results were reported.

Table 1 shows the results of the 12-minute walk test for the control and intervention groups. The control group had a mean of 1300.7 and 1325.1 with standard deviations of 91.467 and 89.842 for pre-assessment and post-assessment, respectively. The intervention group had a mean of 1286.5 and 1464.8 with standard deviations of 98.245 and 97.792 for pre-assessment and post-assessment, respectively. The p-value was <0.0001, which indicated an extreme significance and improvement in the intervention group.

Table 2 represents an assessment of physical well-being in which the mean of a control group for pre-assessment and post-assessment was 8.239 and 7.609, respectively, with standard deviations of 0.7359 and 0.7142. Similarly, the intervention group showed a mean of 8.043 and 5.087, respectively, and a standard deviation of 0.8153 and 0.7839 for pre-assessment and post-assessment. The p-value was <0.0001, which suggests extreme significance and improvement in the intervention group.

Table 3 depicts the status of the relationship with the doctor in which the mean of a control group for pre-assessment and post-assessment was 6.000 and 5.761, respectively, with standard deviations of 1.193 and 1.139. Similarly, the intervention group showed a mean of 5.957 and 5.391, respectively, and a standard deviation of 1.192

Table 1. The Effect of 12 Minutes' Walk on Control and Experiment Pre and Post Intervention.

	Control Mean±sd	P-value	Experiment Mean±sd	p-value
12 minutes walk			Mean±sd	
Pre-experiment	8.2±0.74	<0.0001	8.0±0.82	0.001
Post experiment	7.7±0.71		5.1±0.79	

Table 2. The Status of Physical Well being on Control and Experiment Pre and Post Intervention.

	Control Mean±sd	P-value	Experiment Mean±sd	p-value
Physical Well being			Mean±sd	
Pre-experiment	8.2±0.74	<0.0001	8.0±0.82	0.001
Post experiment	7.6±0.71		5.1±0.79	

Table 3. Status of Relationship with the Doctoron Control and Eexperiment Pre and Post Intervention

	Control Mean±sd	P-value	Experiment Mean±sd	p-value
Relationship with the doctor				
Pre-experiment	6.0±1.2	<0.01	5.9±1.19	0.0219
Post experiment	5.8±1.13		5.39±1.18	

Table 4. Status of Social/ Family Well being on Control and Experiment Pre and Post Intervention

	Control Mean±sd	P-value	Experiment Mean±sd	p-value
Social / Family well being			Mean±sd	
Pre-experiment	8.23±0.74	<0.0001	8.04±0.81	0.0001
Post experiment	7.6±0.71		5.08±0.79	

Table 5. The Status of Emotional Well being on Control and Experiment Pre and Post Intervention

	Control Mean±sd	P-value	Experiment Mean±sd	p-value
Emotional well being			Mean±sd	
Pre-experiment	8.04±1.37	<0.114	7.80±1.72	0.0172
Post experiment	7.34±1.30		6.98±1.70	

and 1.183 for pre-assessment and post-assessment. The p-value was 0.0219, which suggests significance and improvement in the intervention group.

Table 4 represents the assessment of social/family well-being in which the mean of a control group for pre-assessment and post-assessment was 8.239 and 7.609, respectively, with standard deviations of 0.7359 and 0.7142. Similarly, the intervention group showed a mean of 8.043 and 5.087, respectively, and a standard deviation of 0.8153 and 0.7839 for pre-assessment and post-assessment. The p-value was <0.0001, which suggests extreme significance and improvement in the intervention group.

Table 5 shows an assessment of emotional well-being in which the mean of a control group for pre-assessment and post-assessment was 8.043 and 7.348, respectively, with standard deviations of 1.366 and 1.303. Similarly, the intervention group showed a mean of 7.804 and 6.978, respectively, and a standard deviation of 1.721 and 1.706 for pre-assessment and post-assessment. The p-value was 0.0172, which suggests significance and improvement in the intervention group. Table 6 represents the assessment of functional well-being in which the mean of a control group for pre-assessment and post-assessment was 8.413 and 7.826, respectively, with standard deviations of 0.9828 and 0.8513. Similarly, the intervention group showed a mean of 8.174 and 5.043, respectively, and a standard deviation of 0.9500 and 0.9418 for pre-assessment and post-assessment. The p-value was <0.0001, which suggests extreme significance and improvement in the

Table 6. The Status of Functional Well being on Control and Experiment Pre and Post Intervention

	Control Mean±sd	P-value	Experiment Mean±sd	p-value
Functional well being			Mean±sd	
Pre-experiment	8.41±0.93	<0.0003	8.17±0.95	0.0001
Post experiment	7.82±0.81		5.04±0.94	

Table 7. The Status of Additional Concerns on Control and Experiment Pre and Post Intervention

	Control Mean±sd	P-value	Experiment Mean±sd	p-value
Additional conerns			Mean±sd	
Pre-experiment	8.41±0.98	<0.0035	8.56±1.02	0.0015
Post experiment	7.96±0.89		7.82±1.01	

Table 8. The Status of Difficulty in Return to Work on Control and Experiment Pre and Post Intervention

	Control Mean±sd	P-value	Experiment Mean±sd	p-value
Difficulty in return to work				
Pre-experiment	8.63±0.82	<0.0001	8.5±0.91	0.0001
Post experiment	8.08±0.81		4.84±0.89	

intervention group. Table 7 depicts the assessment of additional concern in which the mean of a control group for pre-assessment and post-assessment was 8.413 and 7.957, respectively, with standard deviations of 0.9793 and 0.8933. Similarly, the intervention group showed a mean of 8.565 and 7.820, respectively, and a standard deviation of 1.025 and 1.018 for pre-assessment and post-assessment. The p-value was 0.0015, which suggests a very significant improvement in the intervention group.

Table 8 represents the assessment of difficulty to return to work in which the mean of a control group for pre-assessment and post-assessment was 8.630 and 8.087, respectively, with standard deviations of 0.8262 and 0.8117. Similarly, the intervention group showed a mean of 8.5 and 4.848, respectively, and a standard deviation of 0.9129 and 0.8936 for pre-assessment and post-assessment. The p-value was <0.0001, which suggests extreme significance and improvement in the intervention group.

Discussion

This study focused on the physical health of breast cancer survivors in rural areas. A key purpose was to determine the effect of the integrated survivorship model on their well-being. Breast cancer is the most common form of cancer among women and is commonly seen in 40-60 years of age. Lifestyle habits, menopausal status, diet, physical activity, and socioeconomic status can be among the risk factors for developing breast cancer. Treatment such as surgical procedure (mastectomy), chemotherapy, radiation, and medications impairs the health of the survivors by affecting physical capacity, psychological health and quality of life. Due to side effects, survivors often face challenges during work or difficulty in returning to work. A study was conducted on Breast Cancer Survivorship among Indian Women and found out that both urban and rural women are affected, but in rural areas, there is delay in making diagnosis, treatment and neglect in care. There is a need for additional information about Survivorship issues such as pain management, side effects of treatment, lymphedema, and surgery which should be discussed along with psychological issues [20].

A study on the experiences and needs of breast cancer survivors in Karnataka, India revealed that they faced various challenges in terms of financial, social, physical, spiritual and psychological aspects. The study suggested that family, community, and health care support are essential for improving their quality of life Another study from limited resource settings examined the survivorship issues and quality of life of breast cancer survivors and controls. The study used SF-36 and FACT-B questionnaires and found that: - The most prevalent survivorship issues among survivors were fatigue (60%), restriction of shoulder movement (59.6%), body and joint pain (63.5%), chemotherapy-induced stoppage of menstruation (73.3%) and loss of sexual desire (60%). - The issues that had the greatest negative impact on quality of life scores were emotional distress (r = -11.375), fatigue (r = -9.27) and premature menopause (r = -2.085) and its related symptoms. - The study recommended proper management and support care for these issues in limited resource areas [21].

According to this study, the patients who were in extended or permanent survivorship faced decreased work capacity. This was due to the long-term effects of the treatment, which mainly consisted of lymphedema, fatigue, musculoskeletal complications, respiratory complications and neurological complications. The mental health of the patients was also impaired because of negative body image, depression, and lack of confidence. Patients faced challenges during survivorship owing to the lack of special healthcare facilities nearby, leading to neglect of the symptoms and deterioration in their health. Patients had difficulty while working as adequate survivorship care with guidelines was not explained by the healthcare administrators. Challenges such as lack of knowledge about their condition, its treatment strategies with outcomes and appropriate survivorship care were contributing factors.

We designed an integrated model of cancer survivorship care that addressed the barriers faced by patients in their daily lives, such as work limitations, challenges with cosmetics, physical functioning impairments (e.g., pain, shoulder disorders), and lack of adequate health care facilities. The model included self-management strategies for these issues, as well as exercises and dietary recommendations to improve quality of life. After implementing the model, we found that the patients' physical capacity and psychosocial well-being improved significantly. They also reported fewer challenges in returning to work or performing their work tasks. The limitations of this study were its restricted geographical scope and short duration.

In conclusion, this study demonstrated that breast cancer survivors experienced difficulties and challenges in various aspects of their lives, such as physical capacity, quality of life, and return to work. These were assessed by a questionnaire and a 12-minute walk test. By incorporating an integrated survivorship model that included regular exercises and self-management strategies, the study improved the survivors' quality of life and reduced their challenges.

Author Contribution Statement

Ketaki Kulkarni, Sandeep Shinde and Radha Bhende conducted an observational study for this manuscript, developed the introduction section conducted a discussion of the study, and findings collected data and analyzed data. Dr Sanjay kumarPatil, Dr Ravindra Shinde and Dr Anand Gudur provided a description of the background information, collected data and analyzed data, and participated in the manuscript. All the authors read and approved the final manuscript..

Acknowledgements

Ethics committee

The study was approved by the institutional ethical committee of Krishna Vishwa Vidyapeeth deemed to be University Karad, Maharashtra.

Funding source

The study was funded by Krishna Vishwa Vidyapeeth deemed to be a university, Karad, Maharashtra, India.

Statement conflict of interest

The authors declare that there are no conflicts of interest concerning the content of the present study.

References

1. Arnold M, Morgan E, Rumgay H, Mafra A, Singh D, Laversanne M, et al. Current and future burden of breast cancer: Global statistics for 2020 and 2040. Breast. 2022;66:15-23. https://doi.org/10.1016/j.breast.2022.08.010.
2. Sathishkumar K, Chaturvedi M, Das P, Stephen S, Mathur P. Cancer incidence estimates for 2022 & projection for 2025: Result from national cancer registry programme, india. Indian J Med Res. 2022;156(4&5):598-607. https://doi.org/10.4103/ijmr.ijmr_1821_22.
3. Barlow WE, Lehman CD, Zheng Y, Ballard-Barbash R, Yankaskas BC, Cutter GR, et al. Performance of diagnostic mammography for women with signs or symptoms of breast cancer. J Natl Cancer Inst. 2002;94(15):1151-9. https://doi.org/10.1093/jnci/94.15.1151.
4. Momenimovahed Z, Salehiniya H. Epidemiological characteristics of and risk factors for breast cancer in the world. Breast Cancer (Dove Med Press). 2019;11:151-64. https://doi.org/10.2147/bctt.S176070.
5. Anbari AB, Wanchai A, Graves R. Breast cancer survivorship in rural settings: A systematic review. Support Care Cancer. 2020;28(8):3517-31. https://doi.org/10.1007/s00520-020-05308-0.
6. Palesh O, Scheiber C, Kesler S, Mustian K, Koopman C, Schapira L. Management of side effects during and post-treatment in breast cancer survivors. Breast J. 2018;24(2):167-75. https://doi.org/10.1111/tbj.12862.
7. McNulty JA, Nail L. Cancer survivorship in rural and urban adults: A descriptive and mixed methods study. J Rural Health. 2015;31(3):282-91. https://doi.org/10.1111/jrh.12106.
8. Shinde S, Patil S. Challenges and opportunities for breast cancer survivorship care in india during covid-19 pandemic. Int J Pharm Sci. 2020;11:1190-7. https://doi.org/10.26452/ijrps.v11iSPL1.3589.
9. Cooper KH. A means of assessing maximal oxygen intake. Correlation between field and treadmill testing. Jama. 1968;203(3):201-4.
10. Brady MJ, Cella DF, Mo F, Bonomi AE, Tulsky DS, Lloyd SR, et al. Reliability and validity of the functional assessment of cancer therapy-breast quality-of-life instrument. J Clin Oncol. 1997;15(3):974-86. https://doi.org/10.1200/jco.1997.15.3.974.
11. Schmidt ME, Scherer S, Wiskemann J, Steindorf K. Return to work after breast cancer: The role of treatment-related side effects and potential impact on quality of life. Eur J Cancer Care (Engl). 2019;28(4):e13051. https://doi.org/10.1111/ecc.13051.
12. Sun W, Chen K, Terhaar A, Wiegmann DA, Heidrich SM, Tevaarwerk AJ, et al. Work-related barriers, facilitators, and strategies of breast cancer survivors working during curative treatment. Work. 2016;55(4):783-95. https://doi.org/10.3233/wor-162449.
13. Shinde S, Arulekar R, Dhane S, Bhende R, Saptale A, Disabilities Editor I. Comprehensive functional and vocational rehabilitation of a kitchen worker with kienbocks disease. Int J Disabil Sports Health Sci. 2023;6. https://doi.org/10.33438/ijdshs.1191467.
14. Lewis-Smith H, Diedrichs PC, Harcourt D. A pilot study of a body image intervention for breast cancer survivors. Body Image. 2018;27:21-31. https://doi.org/10.1016/j.bodyim.2018.08.006.
15. Davies C, Levenhagen K, Ryans K, Perdomo M, Gilchrist L. Interventions for breast cancer-related lymphedema: Clinical practice guideline from the academy of oncologic physical therapy of apta. Phys Ther. 2020;100(7):1163-79. https://doi.org/10.1093/ptj/pzaa087.
16. Shinde S, Ghadage P, Disabilities Editor I. Return to job of a construction worker by comprehensive functional and vocational rehabilitation. Int J Disabil Sports Health Sci. 2022;5. https://doi.org/10.33438/ijdshs.1106819.
17. Joshi D, Shah S, Shinde SB, Patil S. Effect of neural tissue mobilization on sensory-motor impairments in breast cancer survivors with lymphedema: An experimental study. Asian Pac J Cancer Prev. 2023;24(1):313-9. https://doi.org/10.31557/apjcp.2023.24.1.313.
18. Richmond H, Lait C, Srikesavan C, Williamson E, Moser J, Newman M, et al. Development of an exercise intervention for the prevention of musculoskeletal shoulder problems after breast cancer treatment: The prevention of shoulder problems trial (uk prosper). BMC Health Serv Res. 2018;18(1):463. https://doi.org/10.1186/s12913-018-3280-x.
19. Shinde S, Joshi D, Patil S, Pawar P. Estimation of neural tissue mobility in breast cancer survivors with lymphedema. Asian Pac J Cancer Prev. 2022;23(10):3355-60. https://doi.org/10.31557/apjcp.2022.23.10.3355.
20. Srivastava S, Kumar A. Breast cancer survivorship among indian women: An overview. Asia J Nurs Educ Res. 2022;12:262-6. https://doi.org/10.52711/2349-2996.2022.00056.
21. Kaur N, Gupta A, Sharma AK, Jain A. Survivorship issues as determinants of quality of life after breast cancer treatment: Report from a limited resource setting. Breast. 2018;41:120-6. https://doi.org/10.1016/j.breast.2018.07.003.