

EFFECTS OF PSYCHOSOCIAL REHABILITATION IN PATIENTS WITH BREAST CANCER IN PRE-OPERATIVE PERIOD

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ABSTRACT

Objective: To compare physical, clinical and psychosocial outcomes in patients having undergone a clinical program of prehabilitation planned for breast cancer surgery versus those having undergone conventional surgical treatment only.

Study Design: Quasi-experimental study.

Place and Duration of Study: Fauji Foundation Hospital, Rawalpindi from January to June 2024.

Patients and Methods: The patients were randomized into Group P (n=30) to receive pre-habilitation for four weeks prior to surgery and Group S (n=30) to receive conventional surgical resection without the pre-habilitation program. Prehabilitation parameters were assessed for pain, disability, anxiety, depression, physical and mental well-being using standard questionnaires. Primary variables studied were median scores for SF-12, HADS and SPADI scoring systems assessed between both groups before and 4 weeks after surgery.

Results: Median values for anxiety component of HADS scoring showed values of 3.00 (1.00) in Group P versus 8.00 (1.00) for Group S ($p < 0.001$). Median values for depression component of the HADS scoring were 3.00 (1.00) versus 9.00 (1.00) between both groups ($p < 0.001$). Median pain scores on the SPADI were 20.00 (6.00) versus 20.50 (8.00) between Group P and Group S ($p = 0.982$). Median values for the disability component showed values of 22.00 (4.00) in Group P versus 22.00 (3.00) for Group S ($p = 0.514$).

Conclusion: We conclude that anxiety and depression levels were considerably improved with no clinical change in other parameters in the pre-habilitation program.

Keywords: Breast cancer, post-operative, prehabilitation, treatment, psychological outcomes

INTRODUCTION

Breast cancer is the most common cancer diagnosed in women globally.¹ It is estimated that in 2022 alone, 2.3 million women were diagnosed with the condition worldwide.² This staggering number is projected to increase in the next decade due to increase in the diagnosis of the condition and prevalence of risk factors.³ The treatment strategies involved include surgical and non-surgical options. Surgical option

remains the gold standard option for definitive treatment of the disease in tumors which are deemed operable at the time of diagnosis.⁴ Literature and studies have reported profound physical and psychosocial challenges faced by patients post-operatively. The cosmetics issues along with physical constraints hamper the quality of life and various program of rehabilitation have been developed to overcome these challenges.⁵ This key aspect of cancer care has for a long time been focused on the post-operative aspect of patient care. Other programs such as peri-operative care according to the enhanced recovery after surgery (ERAS) protocol also cater mostly for post-operative improvement.⁶

There is now growing interest in developing programs which cater for the pre-operative aspect of patient preparation. Pilot and feasibility studies done in the UK for colorectal and urogenital surgeries have proven

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beneficial in improving the overall physical and psychosocial profile of patients.^{7,8} The concept of prehabilitation is now gaining traction as a routine, effective method to improve the anxiety, fear, depression and physical status associated with a cancer diagnosis in patients and proposed to improve patient outcomes of post-operative recovery, rehabilitation and discharge.⁹ The program requires a multi-disciplinary approach and there is scant published data of prehabilitation programs both nationally and internationally. We aimed to incorporate physical, nutritional and psychosocial improvement parameters in a well-organized program in patients planned for a resectable breast cancer tumor. Our aim was to compare physical, clinical and psychosocial outcomes in patients having undergone a clinical program of prehabilitation planned for breast cancer surgery versus those having undergone conventional surgical treatment only to identify and design programs in helping patients to cope up with the physical and psychological distress of a major surgery that impacts them both cosmetically and mentally.

PATIENTS AND METHODS

This quasi-experimental study was carried out at the Fauji Foundation Hospital, Rawalpindi from Jan-Jun 2024 following Ethical Approval (vide letter no. 711/ERC/FFH/RWP dated 24/07/2023). Sample size was calculated keeping the confidence interval at 95%, power of test at 80% with anticipated proportion of patients expected to improve post-operative parameters after pre-habilitation therapy at 93% as compared to those without pre-habilitation at 64%.¹⁰ Minimum sample size came out to be 28 patients in each group to see a significant change according to the WHO calculator. We made two groups of patients with 30 patients in each group making the total study sample of 60 patients.

All ASA-II and III female patients diagnosed with non-metastatic breast cancer planned for an elective modified radical mastectomy (MRM) in the next 4 weeks were included in the study.

Patients with metastatic disease, major cardiac or respiratory disease, low ejection fraction, post chemotherapy, failure to complete the pre-habilitation program and those unwilling to be included in the study were excluded.

The study method included all patients as per the inclusion criteria furnished. The patients were divided into Group P (n=30) to receive pre-habilitation for four

weeks prior to surgery and Group S (n=30) to receive conventional surgical resection without under the pre-habilitation program. The program required a multi-disciplinary approach to patient assessment and standard assessment questionnaires were used to assess the patients and were translated into the language the understood for clarity and to remove any discrepancies with the results. The major interventions of the program included supervised exercise, nutritional directives, smoking cessation and psychosocial support. These parameters were assessed using the short form (SF-12) health survey to assess global health status, the hospital anxiety and depression scale (HADS) to assess mental wellness and shoulder pain and disability index (SPADI) to assess physical limitation of the affected side. The SF-12 scores the mental and physical component between scores of 0-100 with higher scores confirming to better quality of life (QOL).¹¹ The HADS score accounts for anxiety and depression and a score of 8 or more shows probability of anxiety and depression in the patient.¹² The SPADI score accounts for both pain and disability of the affected upper limb and higher values are associated with limitations in functional capacity.¹³

The program was started in conjunction with the anesthesia, nutritional, psychiatric, anesthesia and surgical departments. All consultants were requested to assess patients before and after the interventions and report their scoring systems accordingly unaware of the study protocol or its study outcomes. Patients added to the pre-habilitation groups were selected at random, but consent was taken from them to be included in the study. They were referred to the institute after being assessed by an anesthetist for surgical fitness and planned for surgery after 4 weeks for the condition. The supervised exercise portion consisted of resistance training (RT) thrice a week of all included patients undergoing two circuits of exercises to improve muscle strength, mobility and reduce fatigue of the upper body focusing on the upper limbs since these are the most affected after surgery and cause considerable morbidity. The first round consisted of chest press, calf raise, horizontal row and sit-stand) while the second round focused on (deadlift, shoulder press and extension exercises of the upper limbs). The initial repetition of the first week were between 8-12 and gradually increased to 28-36 at 4 weeks for all patients. Nutritional advice included an initial assessment of eating habits and removing high carbohydrate, low protein, processed foods and salt. Protein intake was encouraged since it promotes healthy wound healing and boosts immunity. All participants

were advised to consume 0.5–1g of protein per kg body weight daily, as assessed by a nutritionist. They were all advised to stop taking red meat since it is associated with an increased incidence of cancers. All diets were curated using ESPEN guidelines.¹⁴ We did not find the incidence of smoking very high in the study population but those who did smoke were advised smoking cessation using nicotine patches, gums and counselling sessions thrice a week. The reason was to reduce the risk of respiratory complications and improve tissue healing and prevent wound infections. The psychosocial aspect was catered for by an expert psychiatrist and employe counselling sessions to improve distress and anxiety levels which are reported to be high among cancer patients. The sessions were designed to reduce fear of surgery by making the patients aware of the procedure and what to expect, to boost confidence by providing options for cosmetic

improvement and quality of life through discussions and options available and patients were advised to undergo breathing exercises from videos to improve physiological symptoms and fatigue. These aspects have been reported to improve the overall mental status in cancer patients. After completion of four weeks, pre-operative scores were assessed and tabulated on forms and submitted in both groups. The patients were given the questionnaires before surgery in Group S and before pre-habilitation in Group P and this formed the baseline assessment. The scores were again assessed after 4 weeks and compared for differences.

Primary variables studied were median scores for SF-12, HADS and SPADI scoring systems assessed between both groups before and 4 weeks after surgery. Demographic data were statistically described in terms of mean and SD, frequencies, and percentages when

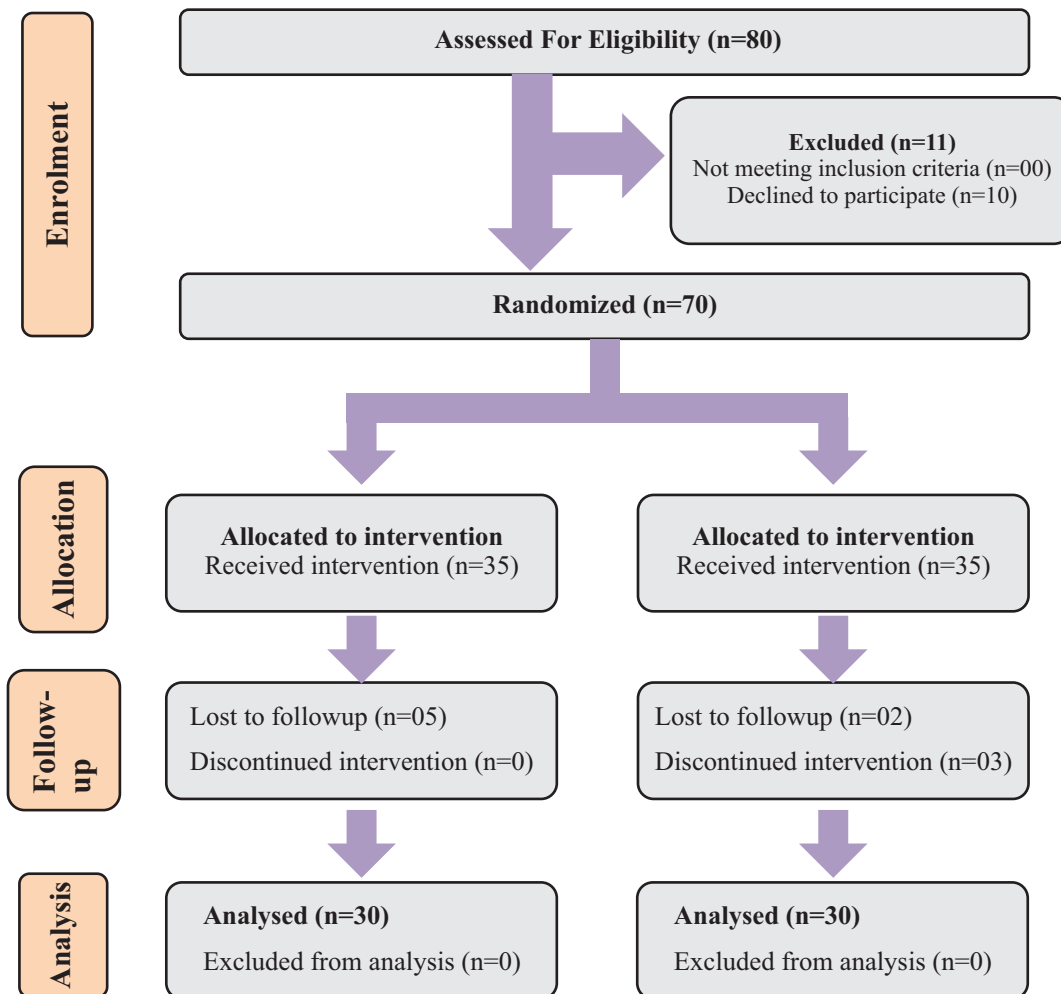


Figure 1 : Phases of the study

appropriate. T-test was used to compare statistically significant means between both groups. Chi-square test was used for frequency variables. Median values were compared using the Mann Whitney U test. The p value of <0.05 was considered statistically significant. All statistical calculations were performed using Statistical Package for Social Sciences 26.0

RESULTS

A total of 80 patients were assessed for eligibility to keep margin for lost to follow-up and patient reluctance or failure to complete the prehabilitation program. 10 patients declined to participate in the program and were excluded. 70 patients were randomized into the two groups. 05 were lost to follow-up in the conventional surgical group (Group S) while 02 were lost to follow-up and 03 discontinued program due to inability to continue course due to personal reasons. A total of 30 patients were analyzed in each of Group P and Group S for final analysis.

Mean age of patients in Group P was 57.70 ± 2.89 years versus 57.67 ± 2.39 years in Group S ($p=0.961$). Mean weight was 74.83 ± 3.63 kg in Group P versus 74.43 ± 3.57 in Group S ($p=0.669$). 05 (16.7%) patients were smoker and 25 (83.3%) were non-smoker in Group P versus 06 (20%) smokers and 24 (80%) non-smokers in Group S ($p=0.739$). 17 (56.7%) patients belonged to urban areas and 13 (43.3%) were from rural areas in Group P versus 20 (66.7%) in urban versus 10 (33.3%) patients were from rural areas ($p=0.426$) (Table-I).

Comparison between primary variables showed that on SF-12 questionnaire assessing physical and mental health, median scores for the physical component were 45.00 (5.00) in Group P versus 46.00 (10.00) in Group S ($p=0.204$). Mental wellness scores on the same questionnaire for Group P were 43.00 (4.00) versus 46.00 (10.00) for Group S ($p=0.028$). Median values for anxiety component of HADS scoring showed values of 3.00 (1.00) in Group P versus 8.00 (1.00) for Group S ($p<0.001$). Median values for depression component of the HADS scoring were 3.00 (1.00) versus 9.00 (1.00) between both groups ($p<0.001$). Median pain scores on the SPADI were 20.00 (6.00) versus 20.50 (8.00) between Group P and Group S ($p=0.982$). Median values for the disability component showed values of 22.00 (4.00) in Group P versus 22.00 (3.00) for Group S ($p=0.514$) (Table-II) (Figure-II).

Table-I: Demographic and operative characteristics between both groups (n=60)

Variable	Group P (n=30)	Group S (n=30)	p Value
Mean Age (Years)	57.70±2.89	57.67±2.39	0.961
Mean Weight (Kg)	74.83±3.63	74.43±3.57	0.669
Smoker			
• Yes	05 (16.7%)	06 (20%)	0.739
• No	25 (83.3%)	24 (80%)	
Residence			
• Urban	17 (56.7%)	20 (66.7%)	0.426
• Rural	13 (43.3%)	10 (33.3%)	

Table-II: Comparison of questionnaire scores between both groups (n=60)

Variable	Group P (n=30)	Group S (n=30)	p Value
Median SF-12 questionnaire values			
• Physical component	45.00 (5.00)	46.00 (10.00)	0.204
• Mental component	43.00 (4.00)	46.00 (10.00)	0.028
Median HADS scoring questionnaire values			
• Anxiety component	3.00 (1.00)	8.00 (1.00)	<0.001
• Depression component	3.00 (1.00)	9.00 (1.00)	<0.001
Median SPADI scoring values			
• Pain component	20.00 (6.00)	20.50 (8.00)	0.982
• Disability component	22.00 (4.00)	22.00 (3.00)	0.514

DISCUSSION

The study was carried out with two aims in mind. The team at the institute intended to introduce prehabilitation programs which have now been widely applied to various surgical setups globally. The type of surgeries and their assessment protocols have shown diversity in the results for a pre-habilitation program and that is why we wanted to see whether breast cancer patients can benefit from this or not. The second aim was to assess whether these programs can be successfully carried out in our setups or not considering patient

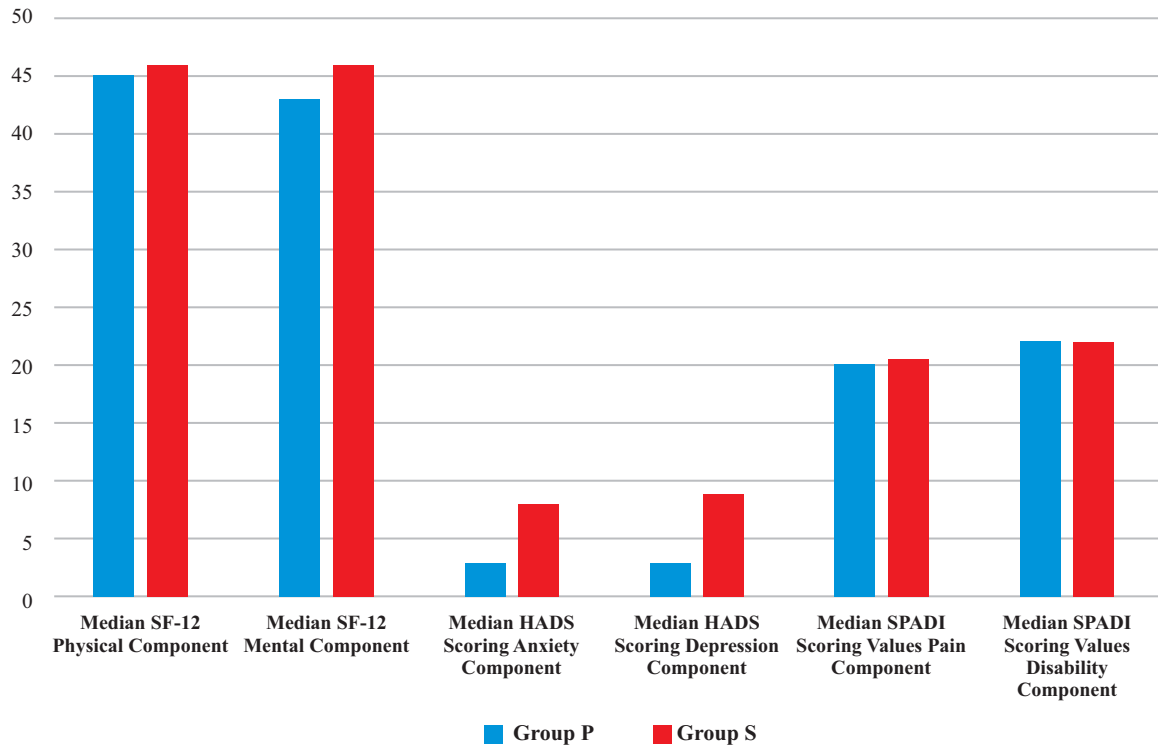


Figure - 2: Median questionnaire scores between both groups

compliance owing to monetary constraints in our country and long distances to centers of excellence for these sessions and programs. We were successful in achieving complete compliance in the pre-rehabilitation group except for very few patients who left mid-program citing family obligations and resource constraints.

Our study results provided considerable insights that multi-disciplinary approach although beneficial did not yield very promising results in all areas of patient assessment and improvement.¹⁵ The main profound effect seen was in the improvement in all forms of mental status improvement be it anxiety, depression or psychosocial improvement. The results of the questionnaire were statistically significant for the HADS scoring, both the anxiety and depression components and also the mental status improvement in the SF-12 health survey questionnaire.¹⁶ Our study did find that compared to studies carried out by Wu et al and Toohey et al, which concluded that only anxiety was improved, and no improvement was seen in other parameters^{10,17}, we saw a marked improvement in all assessment protocols of mental health showing improvement in anxiety, depression as well as psychosocial mental health. But other studies carried out in developing countries by

Brahambhatt et al showed results confirming to our study¹⁸ A careful assessment by our team inferred that the social demographic and educational status in our country especially for females does not provides enough chances for education on breast cancer and its awareness and the mental part of the assessment had improved profoundly for these patients because compared to the developed world, these patients were counselled and became comfortable with respect to what to expect surgically, cosmetically and became aware that they have options and a good chance of survival post-surgery. This resulted in better mental status, decreased anxiety and depression.

We, do, however, propose that since psychosocial aspect remains the major issue addressed, a multi-modal prehabilitation program may be designed excluding the nutritional, physical and pain focused programs and instead focus on improving the stress, anxiety and depression level in these patients.

RECOMMEDATIONS

The study recommends a focused multi-modal prehabilitation program for improvement of stress, anxiety and depression in patients with breast cancer undergoing

surgical resection.

CONCLUSION

We conclude anxiety and depression levels were considerably improved with no clinical change in other parameters in the pre-habilitation program

Limitations

The limitations are that the study is single center only. A multi-center study would result in a wider demographic area with more confirmative results.

Conflict of interest: none

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Authors' Contribution

Bisma Nauman: Conception, Analysis, Conduction

Sarah Haque: Analysis, Critical Review

Taib Khurshid: Conduction, Analysis

REFERENCES

- Breidenbach C, Heidkamp P, Hiltrop K, Pfaff H, Enders A, Ernstmann N, et al. Prevalence and determinants of anxiety and depression in long-term breast cancer survivors. *BMC Psychiatry*. 2022;22(1):101. Available from: <http://dx.doi.org/10.1186/s12888-022-03735-3>
- Giaquinto AN, Sung H, Miller KD, Kramer JL, Newman LA, Minihan A, et al. Breast cancer statistics, 2022. *CA Cancer J Clin*. 2022;72(6):524–41. Available from: <http://dx.doi.org/10.3322/caac.21754>
- Houghton SC, Hankinson SE. Cancer progress and priorities: Breast cancer. *Cancer Epidemiol Biomarkers Prev*. 2021;30(5):822–44. Available from: <http://dx.doi.org/10.1158/1055-9965.EPI-20-1193>
- Magnoni F, Galimberti V, Corso G, Intra M, Sacchini V, Veronesi P. Axillary surgery in breast cancer: An updated historical perspective. *Semin Oncol*. 2020;47(6):341–52. Available from: <http://dx.doi.org/10.1053/j.seminoncol.2020.09.001>
- Burguin A, Diorio C, Durocher F. Breast cancer treatments: Updates and new challenges. *J Pers Med*. 2021;11(8):808. Available from: <http://dx.doi.org/10.3390/jpm11080808>
- Jogerst K, Thomas O, Kosiorek HE, Gray R, Cronin P, Casey W 3rd, et al. Same-day discharge after mastectomy: Breast cancer surgery in the era of ERAS®. *Ann Surg Oncol*. 2020;27(9):3436–45. Available from: <http://dx.doi.org/10.1245/s10434-020-08386-w>
- Briggs LG, Reitblat C, Bain PA, Parke S, Lam N-Y, Wright J, et al. Prehabilitation exercise before urologic cancer surgery: A systematic and interdisciplinary review. *Eur Urol*. 2022;81(2):157–67. Available from: <http://dx.doi.org/10.1016/j.eururo.2021.05.015>
- Garoufalia Z, Emile SH, Meknarit S, Gefen R, Horesh N, Zhou P, et al. A systematic review and meta-analysis of high-quality randomized controlled trials on the role of prehabilitation programs in colorectal surgery. *Surgery*. 2024;176(5):1352–9. Available from: <http://dx.doi.org/10.1016/j.surg.2024.07.009>
- Martin D, Besson C, Pache B, Michel A, Geinoz S, Gremeaux-Bader V, et al. Feasibility of a prehabilitation program before major abdominal surgery: a pilot prospective study. *J Int Med Res*. 2021;49(11):3000605211060196. Available from: <http://dx.doi.org/10.1177/03000605211060196>
- Wu F, Laza-Cagigas R, Pagarkar A, Olaoke A, El Gammal M, Rampal T. The feasibility of prehabilitation as part of the breast cancer treatment pathway. *PM R*. 2021;13(11):1237–46. Available from: <http://dx.doi.org/10.1002/pmrj.12543>
- Jankowska A, Golicki D. Self-reported diabetes and quality of life: findings from a general population survey with the Short Form-12 (SF-12) Health Survey. *Arch Med Sci*. 2022;18(5):1157–68. Available from: <http://dx.doi.org/10.5114/aoms/135797>
- Annunziata MA, Muzzatti B, Bidoli E, Flaiban C, Bomben F, Piccinin M, et al. Hospital Anxiety and Depression Scale (HADS) accuracy in cancer patients. *Support Care Cancer*. 2020;28(8):3921–6. Available from: <http://dx.doi.org/10.1007/s00520-019-05244-8>
- Saoji KK, Gawande V, Dulani R. A comparative study of disability and pain assessment by shoulder pain and disability index (SPADI) score in patients of adhesive capsulitis treated by hydrodilatation with and without corticosteroids. *Int J Curr Res Rev*. 2020;35–40. Available from: <http://dx.doi.org/10.31782/ijcrr.2020.3540>

14. Muscaritoli M, Arends J, Bachmann P, Baracos V, Barthelemy N, Bertz H, et al. ESPEN practical guideline: Clinical Nutrition in cancer. *Clin Nutr.* 2021;40(5):2898–913. Available from: <http://dx.doi.org/10.1016/j.clnu.2021.02.005>
15. Knoerl R, Giobbie-Hurder A, Sannes TS, Chagpar AB, Dillon D, Dominici LS, et al. Exploring the impact of exercise and mind-body prehabilitation interventions on physical and psychological outcomes in women undergoing breast cancer surgery. *Support Care Cancer.* 2022;30(3):2027–36. Available from: <http://dx.doi.org/10.1007/s00520-021-06617-8>
16. Casanovas-Álvarez A, Sebio-Garcia R, Masià J, Mateo-Aguilar E. Experiences of patients with breast cancer participating in a prehabilitation program: A qualitative study. *J Clin Med.* 2024;13(13):3732. Available from: <http://dx.doi.org/10.3390/jcm13133732>
17. Toohey K, Hunter M, McKinnon K, Casey T, Turner M, Taylor S, et al. A systematic review of multimodal prehabilitation in breast cancer. *Breast Cancer Res Treat.* 2023;197(1):1–37. Available from: <http://dx.doi.org/10.1007/s10549-022-06759-1>
18. Brahmabhatt P, Sabiston M, Lopez C, Chang E, Goodman J, Jones J, et al. Feasibility of prehabilitation prior to breast cancer surgery: A mixed-methods study. *Front Oncol.* 2020;10:571091. Available from: <http://dx.doi.org/10.3389/fonc.2020.571091>