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Original article

Physiotherapy Interventions for Breast Cancer Survivors: Practice Patterns and Perceived Barriers in Tripoli, Libya

Ahlam Elkheshebi*, Aziza Abdel Kabir, Ashwaq Juma, Hamida Emsaed

Department of Physiotherapy, Faculty of Medical Technology, Tripoli University, Tripoli, Libya
Corresponding email. *a.elkheshebi@uot.edu.ly*

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ABSTRACT

Post-operative physiotherapy is a cornerstone in enhancing the quality of life and functional recovery of breast cancer survivors. Despite its recognized importance, there is a paucity of data regarding physiotherapy practices, referral patterns, and clinical challenges in the management of post-operative breast cancer patients in Libya. This study aimed to investigate the clinical practices, referral trends, and therapeutic interventions employed by physiotherapists in Tripoli, Libya, in managing post-operative breast cancer patients. Additionally, it sought to identify key barriers hindering the delivery of optimal physiotherapy care in this population. A descriptive cross-sectional study was conducted from June 4 to July 4, 2022, involving 35 physiotherapists working in major public hospitals and private rehabilitation centers across Tripoli. Participants were selected based on their prior experience with breast cancer patients. Data were collected using a structured, pre-validated questionnaire adapted from international sources, and data were analyzed using SPSS version 26. Most of the physiotherapists surveyed were female (74.3%) and between the ages of 25 and 35. While 60% had less than five years of experience managing breast cancer cases, nearly two-thirds (62.9%) reported not having received any formal training in oncology rehabilitation. Most participants treated fewer than 20 breast cancer patients per year, and 60% indicated that physiotherapy referrals were typically made only after surgery. The most reported barriers to effective care included patients' psychological distress (77.1%), followed by low adherence to treatment and insufficient professional training. Regarding treatment methods, passive mobilization, postural correction, and manual therapy were frequently used during the first two weeks post-surgery. Strengthening and range-of-motion exercises were usually introduced later in the subacute recovery phase, while electrotherapy was the least commonly applied. A statistically significant difference ($p < 0.001$) in the timing and frequency of interventions points to a lack of standardized physiotherapy practices across facilities. The findings underscore a pressing need for structured training programs, the development of standardized physiotherapy protocols, and the integration of physiotherapy services into the early stages of breast cancer care in Libya. Improving education for physiotherapists and refining referral mechanisms may substantially enhance rehabilitation outcomes and overall quality of life for breast cancer survivors. Furthermore, future research is recommended to assess the long-term effects of physiotherapy on physical and psychological outcomes in post-operative breast cancer patients. Larger, multi-center studies are needed to develop evidence-based guidelines suited to the Libyan context.

Introduction

Breast cancer continues to be a major global health concern and remains one of the leading causes of morbidity and mortality among women. Its incidence has shown a steady increase over recent decades, largely driven by aging populations, urbanization, and greater exposure to modifiable risk factors such as physical inactivity, obesity, smoking, and alcohol use [1]. Globally, it accounts for approximately 22.9% of all invasive cancers in women, making it the most frequently diagnosed cancer among females in both high- and low-income countries [2]. For example, in India alone, more than 100,000 new cases are diagnosed annually [3].

In many African countries, including Libya, the absence of comprehensive cancer registries continues to hinder accurate estimation of disease prevalence and impedes the development of effective public health strategies [4]. A recent review of national cancer data in Libya spanning from 2006 to 2022 documented a total of 6,158 cancer cases. Notably, 79.86% of these cases originated from the eastern region, compared to only 20.14% from the western region. Among all reported malignancies, breast cancer emerged as the most

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prevalent (23.2%), followed by colorectal and lung cancers, each comprising 15.1% of the total [5]. These figures underscore the urgent need to enhance cancer surveillance, early detection, and community awareness across the country.

Surgical treatment remains a cornerstone in breast cancer management, with procedures such as mastectomy, lumpectomy, and axillary lymph node dissection commonly performed. However, these interventions are often associated with a distressing complication known as Post-Mastectomy Pain Syndrome (PMPS) [6]. PMPS is a chronic neuropathic pain condition affecting the anterior chest, axilla, breast, and ipsilateral upper limb, and is defined by the persistence of pain for at least six months post-surgery [7]. It affects an estimated 20% to 68% of patients undergoing mastectomy [8], typically resulting from intraoperative injury or irritation of nerves like the intercostobrachial, long thoracic, thoracodorsal, or pectoral nerves [9].

The impact of PMPS extends well beyond physical discomfort. Chronic post-surgical pain often leads to reduced shoulder mobility, diminished muscle strength, and notable psychosocial distress, all of which can substantially impair quality of life (QoL) in breast cancer survivors [10]. Additional symptoms—such as lymphedema, numbness, stiffness, and shoulder dysfunction—further contribute to long-term functional limitations [11]. In many cases, persistent pain may also serve as a psychological trigger, reinforcing the fear of cancer recurrence and negatively affecting emotional well-being [12].

Given the multidimensional burden of PMPS, physical therapy has emerged as a key component in post-operative care. Interventions such as early mobilization, stretching, resistance exercises, and the use of modalities including transcutaneous electrical nerve stimulation (TENS), manual therapy, and acupuncture have shown efficacy in mitigating pain and restoring function [13,14]. Several studies emphasize that initiating physiotherapy soon after surgery can significantly enhance shoulder range of motion, reduce pain severity, and expedite overall recovery [15,16].

Despite the global recognition of physiotherapy's benefits in the management of PMPS and its contribution to post-surgical rehabilitation, there remains a significant gap in the literature concerning actual rehabilitation practices in Libya. Specifically, there is limited documentation regarding referral timelines, physiotherapeutic techniques employed, and the practical challenges faced by practitioners in delivering care to breast cancer patients. This study seeks to address these gaps by providing a contextual overview of current physiotherapy practices in Tripoli, Libya. It aims to explore existing deficiencies in referral pathways, the extent of professional training, and the availability of evidence-based interventions in the local setting.

Accordingly, the primary objective of this study is to describe the current physiotherapy approaches employed following breast cancer surgery in Tripoli, examine the factors influencing these practices, and identify key barriers to the delivery of effective and comprehensive rehabilitation services.

Methodology

This descriptive study was based on a cross-sectional survey conducted between June and July 2022. The target population included 35 physiotherapists working in ten public hospitals and private clinics across different areas of Tripoli, Libya. Participants were eligible if they held a Bachelor's, Master's, or PhD degree in physiotherapy and had clinical experience in managing post-operative breast cancer patients. Those without relevant experience were excluded.

Prior to data collection, official approvals were obtained from the physiotherapy departments of all participating hospitals and private centers. The study's purpose was explained to the department heads and clinical supervisors, who granted permission for the distribution of the questionnaire. Participation was voluntary, and informed consent was implied through completion and submission of the questionnaire.

The data collection tool was a structured questionnaire developed based on a critical review of relevant literature. To ensure content validity, the initial version of the questionnaire was piloted among academic and clinical colleagues, whose feedback was incorporated to refine clarity and relevance. The final questionnaire consisted of three parts: Demographic and professional background of physiotherapists, including gender, age, level of education, years of experience, work sector, and training background in breast cancer care.

Service delivery details, covering the number of breast cancer patients treated annually, patterns and timing of referrals, reasons for referral, and perceived barriers to physiotherapy service provision.

Therapeutic interventions focus on the timing and frequency of techniques used during various post-operative phases.

The questionnaire was designed in clear and accessible language to ensure participants could easily interpret and respond to all items.

After data collection, responses were coded and entered into the Statistical Package for Social Sciences (SPSS), version 26, for analysis. Descriptive statistics (frequencies, percentages, means, and standard deviations) were used to summarize the data. Inferential statistics, including the t-test, were used to examine

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differences in the application of therapeutic techniques across post-operative phases. A p-value of less than 0.05 was considered statistically significant.

Results

The demographic, educational, and professional characteristics of the participating physiotherapists offer crucial insights into the profile of the rehabilitation workforce involved in managing breast cancer cases in Tripoli. As presented in Table 1, many respondents were female (74.3%), reflecting the gender distribution commonly seen in the physiotherapy profession. The age distribution showed that nearly half of the participants (45.7%) were between 25 and 35 years old, followed by 34.3% who were in the 36–45 age group. Regarding educational background, more than half of the physiotherapists (54.3%) held a bachelor's degree, while 28.6% had a diploma. Advanced qualifications were less common, with 11.4% holding a master's degree and only 5.7% possessing a PhD. In terms of clinical experience related to breast cancer rehabilitation, the majority (60%) had less than five years of experience, and only a small proportion (11.4%) reported more than 15 years of practice in this area.

Employment setting varied, with 62.8% of respondents working in the public sector, 5.7% in private clinics, and 31.5% engaged in both sectors. Despite all participants having managed breast cancer patients, a notable 62.9% reported receiving no formal training in breast cancer rehabilitation. This highlights a critical gap in specialized education and underscores the need for targeted training programs to enhance the quality of care delivered to this patient population.

Table 1. Demographic and Professional Characteristics of Participating Physiotherapists.

Variables		F	%
Genders	Male	9	25.7%
	Female	26	74.3%
Age	25- 35 years	16	45.7%
	36-45 years	12	34.3%
	Over 45 years	7	20.0%
Level of education	BSc	19	54.3%
	Master's	4	11.4%
	PhD	2	5.7%
	diploma	10	28.6%
Experience of treating patients with breast cancer (years)	Less than 5 years	21	%60.0
	Between 6 and 10	9	%25.7
	Between 11 and 15	1	%2.9
	More than 15 years	4	%11.4
Work sector	Public		62.8%
	Private		5.7%
	Both		31.5%
Completed training in breast cancer care	Yes		37.1%
	No		62.9%

Insights into clinical workload and referral patterns are summarized in (Table 2). A significant majority (85.7%) of respondents reported treating fewer than 20 breast cancer patients annually, with only 11.4% managing between 20 and 50 cases, and 2.9% treating more than 50 patients per year. Regarding referral timing, 60% of physiotherapists stated that patients were referred only after surgery, while none received referrals solely before surgery. Only 11.1% reported receiving referrals both pre- and post-operatively, despite international emphasis on early intervention and prehabilitation. that patients were referred only after surgery, while none received referrals solely before surgery. Only 11.1% reported receiving referrals both pre- and post-operatively, despite international emphasis on early intervention and prehabilitation.

As for the reasons behind referrals, 77.1% of participants cited post-surgical complications, followed by pre-operative shoulder issues (31.4%), reflecting a largely reactive model of care. Barriers to effective physiotherapy service delivery were also identified: 77.1% of physiotherapists reported psychological factors among patients as a major challenge, while 25.7% cited noncompliance and lack of professional training. Additionally, 17.1% reported that a limited number of physiotherapy appointments hindered comprehensive care delivery.

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Table 2: Number of Breast Cancer Patients Treated Annually, Referral Patterns, Reasons for Referral, and Main Barriers to Physiotherapy Care

Variables		F	%
Number of patients with breast cancer treated per year	less than 20	30	%85.7
	between 20 and 50	4	%11.4
	more than 50	1	%2.9
Routine referral of patients to physical therapy	just before surgery	0	%00.0
	Before surgery and after surgery	4	%11.1
	only after surgery	21	%60.0
	Not seen routinely	9	%25.7
	I don't know	2	%5.7
Reasons for referral to physical therapy	Shoulder problems before surgery	11	%31.4
	Complications after surgery	27	%77.1
	Other physical problems	4	%11.4
	the age	1	%2.8
Main barriers when caring for patients	Psychology factors	27	%77.1
	Patient noncompliance	9	%25.7
	lack of time	5	%14.2
	lack of training	9	%25.7
	Limited number of physical therapy appointments	6	%17.1

The data presented in (Table 3) highlights the frequency and timing of physiotherapeutic interventions across various postoperative stages in breast cancer patients. In the first two weeks after surgery, the most utilized intervention was passive mobilization, reported by 57.1% of respondents. This was followed by manual therapy (45.7%) and body posture correction (48.6%). Whill between 2 to 4 weeks postoperatively, physiotherapists shifted toward more active interventions. Shoulder stretching exercises and strengthening exercises (both general and shoulder-specific) were reported by 40% and 34.3% of participants, respectively. In the 1 to 3 months postoperative phase, the most frequently applied interventions were general fitness exercises (40%), shoulder strengthening (25.7%), and shoulder range of motion exercises both below and above 90 degrees (28.6%). By the 3 months postoperative, interventions such as shoulder ROM above 90 degrees (22.9%) and manual lymphatic drainage (8.6%) were increasingly introduced.

Notably, electrotherapy was the least commonly used intervention across all phases, with 77.1% of physiotherapists reporting they never used it. In contrast, manual lymphatic drainage (MLD) showed growing recognition, with 31.4% applying it in the early stages.

Overall, the findings suggest a structured but varied pattern of physiotherapeutic care, with a cautious start focusing on passive techniques, followed by a progressive increase in active and functional rehabilitation strategies. The statistical significance of all applied interventions ($p < 0.001$) indicates meaningful variation in practice patterns.

Table 3: Frequency and Timing of Physiotherapeutic Interventions Across Postoperative Phases in Breast Cancer Patients

Technique	0–2 Weeks (%)	2–4 Weeks (%)	1–3 Months (%)	Over 3 Months	Never Used (%)	Mean ± SD	t-test	p-value
Body posture correction	48.6	17.1	5.7	5.7	20.0	2.004 ± 1.24	7.590	0.000
Shoulder stretching exercises	20.0	40.0	17.1	8.6	14.3	1.601 ± 1.02	10.030	0.000
Strengthening exercises (general)	17.1	40.0	20.0	8.6	14.3	1.573 ± 1.01	10.420	0.000
Shoulder strengthening	20.0	34.3	25.7	00.0	5.7	1.290 ± 0.87	11.790	0.000
Shoulder ROM < 90°	14.3	25.7	28.6	8.6	20.0	1.694 ± 1.14	11.170	0.000
Shoulder ROM > 90°	8.6	14.3	28.6	22.9	25.7	1.623 ± 1.17	13.430	0.000

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Manual therapy	45.7	37.1	5.7	00.0	8.6	1.485 ± 0.95	8.082	0.000
General fitness exercises	11.4	17.1	40.0	5.7	20.0	1.629 ± 1.06	12.240	0.000
Passive mobilization	57.1	22.9	8.6	00.0	11.4	1.599 ± 0.90	7.292	0.000
Electrotherapy	5.7	5.7	2.9	2.9	77.1	1.526 ± 0.85	20.490	0.000
Manual lymphatic drainage	31.4	31.4	20.0	8.6	5.7	1.395 ± 0.88	10.050	0.000

Discussion

The main objective of this study is to evaluate the current physiotherapy practices for post-operative breast cancer patients in Tripoli. The findings revealed that many participating therapists were female (74.3%), aged between 25–35 years (45.7%), and held a bachelor's degree (54.3%). Most respondents were primarily employed in the public sector (62.8%). Although all participants reported previous experience treating post-mastectomy patients, 62.9% had not received formal training, highlighting a critical gap in professional development.

In the current study, most participating physiotherapists 85.7% reported treating fewer than 20 breast cancer patients per year in hospitals covered by the study, suggesting limited access or under-referral to physiotherapy. This proportion is significantly higher than the 44% reported in Mazuquin's study [17], indicating a possible disparity in service provision in the Libyan context.

Furthermore, most referrals (60%) occurred only in the postoperative phase. While this practice is consistent with international trends [17], it underscores missed opportunities for initiating preoperative rehabilitation. A similar pattern was noted in hospitals in Al-Zawia [18], where physiotherapy referrals were generally delayed until the later stages of treatment. These findings point to systemic barriers in the early integration of physiotherapy into the breast cancer care pathway, suggesting a lack of coordination between surgical teams and physiotherapists from the point of diagnosis.

International evidence supports the importance of structured, early physiotherapy following breast cancer surgery. For example, Klein et al. (2021) [19] reported that early, therapist-delivered exercise programs improved both physical function and psychological outcomes in women undergoing treatment for breast cancer. Their findings emphasized that early intervention helps patients regain a sense of control and confidence, particularly in an otherwise disempowering cancer care journey.

The predominant reason for referral in this study was post-surgical complications (77.1%), which contrasts with lower referral rates due to complications reported in Brazil and the UK (46%) [17]. In Tripoli, the leading barrier to physiotherapy referral and delivery was patients' psychological factors (77.1%), followed by lack of therapist training and patient noncompliance (25.7%). Al-Zawia [18] study revealed similar challenges, including psychological factors, poor awareness among physicians, and institutional challenges such as equipment shortages and unclear referral systems. International [17] literature, the main barriers to caring for patients following breast reconstruction surgery were the delayed initiation of physiotherapy in Brazil (31.4%) and the limited number of therapy appointments in the United Kingdom (25%).

Physiotherapy plays a pivotal role in the multidisciplinary management of breast cancer, particularly following mastectomy or breast reconstruction. International guidelines emphasize the integration of physiotherapy across all stages of care to prevent and manage complications such as lymphedema, restricted shoulder mobility, pain, and general functional impairment.

For instance, the National Institute for Health and Care Excellence (NICE) guideline NG101 on "Early and locally advanced breast cancer: diagnosis and management" recommends that patients receive individualized physiotherapy programs with information, supervised exercise, and ongoing support to enhance functional recovery after surgery [20].

Similarly, the American Cancer Society (ACS) supports early physiotherapy to address shoulder stiffness, fatigue, and pain, promoting a gradual return to daily activities and improving quality of life (ACS, 2020) [21]. The European Society for Medical Oncology (ESMO) also encourages comprehensive rehabilitation, including prehabilitation (preoperative assessment and exercise) and postoperative programs tailored to each patient's surgical type and functional status [22].

Despite these well-established recommendations, implementation is often inconsistent, particularly in resource-limited settings. As seen in the Libyan context, physiotherapy is underutilized due to delayed referrals, lack of standardized protocols, and insufficient integration within oncology teams. This gap in care can result in prolonged recovery, chronic pain, and reduced physical and psychological outcomes.

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Early physiotherapy involvement also fosters patient empowerment, enhances self-efficacy, and improves adherence to recovery pathways, as evidenced by trials such as the Prevention of Shoulder Problems (PROSPER) programme [23]. Therefore, strengthening physiotherapy services and ensuring their early involvement across all stages of breast cancer care is essential for improving outcomes and reducing the long-term burden of disability among survivors.

During the early postoperative phase (i.e., the first two weeks), the most frequently employed physiotherapy techniques among therapists in Tripoli included passive mobilization (57.1%), postural correction (48.6%), and manual therapy (45.7%). These findings partially align with those of Mazuquin et al. (2021) [17], who reported early implementation of shoulder mobility exercises—typically limited to less than 90° of elevation—along with postural correction and, to a lesser extent, manual therapy. Although the present study focuses on physiotherapy management following mastectomy rather than breast reconstruction, comparisons with international studies such as Mazúquin et al. (2021) [17] remain relevant. Despite differences in surgical procedures, both patient groups commonly experience upper limb dysfunction, postural alterations, and the need for gradual restoration of shoulder mobility, making certain therapeutic goals and challenges comparable. Similar trends were also observed by De Groef et al. (2015) [24], who underscored the importance of early mobilization, even though the application of manual therapy varied across settings.

Between the second and fourth postoperative weeks, commonly adopted interventions included stretching (40%), general strengthening exercises (40%), and shoulder-specific strengthening exercises (34.3%). These practices are consistent with findings from international literature, such as the UK-Brazilian survey [17], which reported that physiotherapy programs for both mastectomy and breast reconstruction patients generally follow progressive exercise principles. In both groups, therapists typically restricted shoulder mobility to 90° during the initial two weeks to minimize the risk of wound complications, with gradual progression to a full range of motion between weeks two and four. Strengthening exercises were commonly introduced by the end of the first postoperative month, while advanced functional activities such as sports were typically initiated after three months. This phased approach is supported by evidence indicating that progressive rehabilitation protocols are associated with improved functional outcomes and pain reduction at six months [24], increased muscle strength at 12 months (Campbell et al., 2020) [25], and no significant increase in the risk of complications such as lymphedema (Potter et al., 2013) [26]. Nevertheless, it is important to acknowledge that many of these international studies have methodological limitations and often exclude patients who underwent breast reconstruction procedures [27]. Furthermore, Al-Zawia's study reveals that the physiotherapists' Shared techniques included postural correction, passive mobilization, and MLD.

Manual lymphatic drainage (MLD) was recommended mainly within the first four weeks after surgery by 31.4% of respondents. This finding aligns with international evidence highlighting the potential short-term benefits of MLD in reducing the risk of secondary lymphedema. For example, Zimmermann et al. [28] demonstrated that when MLD was applied immediately after breast cancer surgery, it effectively prevented secondary lymphedema of the arm at six months, regardless of the type of surgery performed. However, findings from Liang M et.al (2020) [29] suggest that while MLD significantly reduces the incidence of lymphedema within the first month post-surgery, its long-term preventive effect was not statistically significant. These mixed results emphasize the need for more robust, long-term studies to clarify the role of MLD in the continuum of post-operative care. The relatively modest rate of MLD use among respondents in our study may reflect this ongoing debate and the absence of unified national guidelines in Libya regarding the timing and necessity of MLD in breast cancer rehabilitation.

Regarding the use of electrotherapy, 77.1% of respondents in the current study reported avoiding its application due to concerns about cancer recurrence. This cautious approach contrasts with findings from a study conducted by Khalleefah. A et al. 2024, in which 79% of physiotherapists in Al-Zawiya hospitals reported utilizing electrical stimulation, such as 47% use iontophoresis iodine and TENS, and 32% use bio stimulation laser as part of the rehabilitation process for post-mastectomy patients [18]. Recent randomized trials suggest that electrotherapy modalities may provide significant clinical benefits when used appropriately as part of a combined rehabilitation program. For instance, Hemmati et al. (2022) [30] demonstrated that adding either therapeutic ultrasound or faradic current to complex decongestive therapy (CDT) resulted in greater reductions in lymphedema volume, pain, and functional disability compared to CDT alone. Additionally, systematic reviews advise caution: electrical stimulation should be avoided over areas of known malignancy, as it might theoretically promote cellular proliferation, though it may be useful in palliation and pain relief [31]. Despite the protective stance prevalent among Libyan therapists, the controlled use of modalities such as ultrasound, faradic current, TENS, or NMES—when individualized and carefully applied—could enhance outcomes in pain reduction, wound healing, and lymphedema management. These findings highlight the need for national guidelines to better delineate indications, contraindications, and safe protocols for electrotherapy in post-mastectomy and breast reconstruction care.

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The research team sought to determine whether participants' educational background and clinical experience influenced their therapeutic choices. Statistical analysis revealed a significant association between years of professional experience and the use of postural correction and electrotherapy ($p < 0.05$). In contrast, academic qualifications did not demonstrate a statistically significant impact on these practices. These findings suggest that in the Libyan context, clinical experience plays a more substantial role than formal education in shaping physiotherapists' therapeutic decision-making.

Overall, this study shed light on the clinical physiotherapy practices for post-operative breast cancer patients in Libya by exploring referral patterns, the timing and diversity of rehabilitation interventions, and the barriers faced by physiotherapists in this field. The findings revealed notable delays in referrals to physiotherapy services, which predominantly occurred after surgery, along with variability in the selection and application of therapeutic techniques across different regions. The study also identified multiple challenges, including psychological barriers among patients, a lack of specialized training, and the absence of standardized rehabilitation protocols, all of which hinder the effectiveness of care. These insights underscore the urgent need to integrate physiotherapy into the continuum of care from the point of diagnosis and to develop evidence-based national protocols to improve the quality of services provided to breast cancer patients in Libya.

To improve outcomes for breast cancer survivors in Libya, there is an urgent need to strengthen the role of physiotherapy across the continuum of care. This includes developing and enforcing national, evidence-based physiotherapy protocols for breast cancer management that incorporate preoperative, immediate postoperative, and long-term rehabilitation stages. Furthermore, continuous professional development programs should be established to enhance therapist competence, particularly in the use of modalities like electrotherapy and manual lymphatic drainage. Improved interdisciplinary coordination between surgeons and physiotherapists is crucial to facilitate early referral and comprehensive care. Additionally, educational campaigns targeting both healthcare professionals and patients are recommended to address misconceptions and encourage greater engagement with physiotherapy services. Lastly, multicenter national studies are warranted to evaluate the effectiveness of current practices and monitor the implementation of standardized rehabilitation pathways aimed at enhancing functional recovery and quality of life among breast cancer survivors.

Conclusion

This study highlights the vital role of physiotherapy in the postoperative management of breast cancer patients in Libya. Persistent challenges—such as delayed referrals, absence of standardized rehabilitation protocols, and insufficient specialized training—continue to limit the effectiveness of physiotherapeutic care. Therapeutic decisions appear to rely more on clinical experience than on formal, evidence-based education. To improve patient outcomes, it is imperative to integrate physiotherapy services early within the cancer care continuum, strengthen interdisciplinary collaboration, and establish national guidelines that promote structured, stage-specific rehabilitation.

Conflict of interest. Nil

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