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Effect of Telerehabilitation Versus In-Clinic Rehabilitation Delivery on Self-Efficacy in Breast Cancer–Related Lymphedema

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Background: Individuals with breast cancer–related lymphedema (BCRL) require self-management strategies to reduce risk of infection, exacerbation, and/or progression of lymphedema. The coronavirus pandemic thrust the medical field into the world of telehealth; both patients and providers were forced to reduce in-person treatments and engage in this new platform of rehabilitation delivery. The role of telehealth in promotion of self-management for BCRL is unknown. **Purpose:** This study examines self-efficacy during cancer rehabilitation for in-clinic versus telehealth visits among individuals with BCRL during the pandemic quarantine April to November 2020. **Methods:** Forty women who recently completed oncology rehabilitation for BCRL were asked to complete demographics and 2 Likert surveys, including the Exercise Self-Efficacy Scale (ESES) and the Self-Care Self-Efficacy Scale (SCSE), to compare the efficacy of telehealth versus in-person treatment modalities. **Results:** Thirty-two participants completed the survey and indicated that the percentage of telehealth visits was less than face-to-face visits. Despite this, the participants indicated numerous positive moderately strong correlations between self-care self-efficacy and exercise self-efficacy for both types of visits ($P < .05$). **Limitations:** Self-report surveys by a convenience sample, multifactorial characteristics of rehabilitation treatment across modes, and varying severity of lymphedema may limit study findings. **Conclusion:** Telehealth provided safe and effective care to participants and bolstered confidence in self-care and self-management of BCRL. Data support that telehealth visits can be considered an essential part of comprehensive cancer rehabilitation care. Future research is needed to establish and optimize practice guidelines in both health delivery systems. **(Rehab Oncol 2023;41:82–88)** *Key words: lymphedema, oncology, self-management, telehealth*

Rehabilitation Oncology
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The authors declare no conflicts of interest.

Online Publication date: December 20, 2022

Received: October 27, 2021; Accepted: August 2, 2022

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DOI: 10.1097/01.REO.0000000000000326

The coronavirus 2019 (COVID-19) pandemic has accelerated the growth of telehealth services across the United States. This effect has fostered creativity in health care delivery. Given the complexity of cancer services during a pandemic, many people who underwent cancer treatment were unable to access rehabilitation and exercise services.[1]

Quality care of individuals living with a cancer diagnosis requires a team-based approach. A recent review underscored that telehealth is an essential tool in the delivery of cancer care to enable timely ongoing support for exercise interventions for those affected by cancer.[1] It is essential for survivors of cancer to continue to engage in and

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maintain regular exercise under the guidance of qualified health professionals incorporating evidence-based clinical guidelines.

Because of the COVID-19 pandemic, follow-up cancer care has been severely affected with increased concerns regarding risk of infection associated with hospital or clinic attendance, as well as reduced workforce and workflow constraints.[2] The effect of COVID-19 on survivors of cancer extends beyond medical complications of the illness itself to include exacerbation of physical and psychosocial challenges, related to reduced access to medical and support services.[2] Survivors likely to be disproportionately impacted by COVID-19–related closures include individuals requiring manual treatment to address chronic impairment–related side effects, including breast cancer–related lymphedema (BCRL). Survivors of breast cancer requiring manual techniques demonstrate increased distress with interruptions to rehabilitation services.[3]

Roughly 1 in 5 survivors of breast cancer will develop upper extremity lymphedema.[4] Incidence of upper extremity lymphedema varies on the basis of the extent of axillary surgery,[5,6] radiation therapy,[7] and time frame of assessment[8] in addition to lifestyle[9] and additional adjuvant treatment factors.[4,10] A prospective surveillance model is recommended to provide proactive education to individuals at risk for BCRL, as well as to provide clinical assessment and identification of breast cancer–related impairments and functional limitations.[11] Proactive education allows increased confidence in the ability to self-identify lymphedema symptoms and manage risk factors and improves adherence to risk reduction strategies.[12] Early identification of BCRL and self-management strategies may prevent progression to advanced clinical stages.[13-15]

Telehealth implementation in the oncology population has demonstrated increases in physical activity,[16,17] improved quality of life, increased self-efficacy, and reduced depression, distress, and stress.[18] Use of telehealth to facilitate education and improve health-related self-efficacy for management of various chronic conditions has been well documented.[19,20] According to Bandura,[21] self-efficacy regulates an individual's motivation to persevere in the face of difficulties through cognitive, motivational affective, and decisional processes. Among survivors of cancer, a positive relationship exists between increased self-efficacy and improved health behaviors,[22] distress, and quality of life.[18,23-25] Individuals with BCRL require iterative education to instill the ability to self-manage the condition, and it is necessary to reduce risk of infection and reduce hospitalization rates and health care costs.[13,26] However, telehealth to promote self-efficacy in management of BCRL has yet to be explored.

Thus, the current study used a retrospective cohort to explore perceptions of telehealth versus in-clinic treatment delivery for BCRL management. The effect of telehealth treatment on self-efficacy for the management of BCRL was examined. It was hypothesized that use of telehealth services in rehabilitation would support improved self-management strategies versus in-clinic visits. Understanding perceptions regarding telehealth versus in-clinic treatment will allow for improved delivery of care.

METHODS

Participants

Individuals who previously received cancer-related rehabilitation services for BCRL at a single accredited cancer center between April and November 2020 were identified. A convenience sample of 40 women with a diagnosis of BCRL were invited to enroll in the retrospective cohort study. Participants were contacted via phone call and provided verbal informed consent to participate, with rights of subjects protected. Inclusion criteria for participation included a diagnosis of BCRL and rehabilitative treatment received between April and November 2020. Individuals not willing to participate or provide consent were excluded. Study approval was granted through Internal Review Boards at Christiana Care Health System and Stockton University.

Survey Measures

Upon agreement to participate, the participants were sent an e-mail link to complete an electronic survey regarding their rehabilitation experience and self-efficacy for managing their condition. The electronic survey was provided through Qualtrics (Provo, Utah) and was anonymous. Included within the survey were 2 valid and reliable instruments, the Exercise Self-Efficacy Scale (ESES)[27] and the Self-Care Self Efficacy scale (SCSES). The ESES is a self-reported scale ranked from 0 to 100, with 0 anchoring not confident and 100 extremely confident, which captures how the responder feels about his or her exercise habits.[28] The total score is calculated by summing up the responses to each of the 10 questions. A higher number on the score represents a higher self-efficacy for exercise. The SCSES[29] included 10 items, which ranked via (1) not confident, (2) somewhat confident, and (3) extremely confident, and measured effective and sustainable self-care behavioral changes. Cultural ideation shapes the ways individuals interpret and report their self-care self-efficacy, and the SCSES has cross-cultural and cross-national utility for research.[29] Participant satisfaction for in-clinic and telehealth visits was assessed with 4 questions, 2 questions per visit type. Using an 11-point scale ranging from 0 "worst" to 10 "best," the participants were asked to rate their in-clinic and telehealth experiences. In addition, a Likert scale was used to rank telehealth and in-clinic experiences from "Greatly exceeded expectations" to "Definitely did not meet expectations."

Data Analysis

Data analysis was performed with SPSSv25 (27.0, IBM Corp, New York). Aggregate data were de-identified and used to statistically examine overall satisfaction with

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telehealth and in-person rehabilitation sessions as well as the relationships between frequency of services, self-efficacy, and participant satisfaction. Participant characteristics were used in aggregate for demographic and covariate analysis. Specifically, the Self-Efficacy Scale was analyzed separately for each item. Self-efficacy was assessed for both each item and for a total scale score. This provides information on individual-specific efficacy along with overall average self-efficacy score.

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RESULTS

Participants

A total of 48 women with a diagnosis of BCRL were initially contacted via phone call regarding study participation. A maximum of 3 attempts were made to contact eligible participants. Of the 48 women contacted, 8 did not answer or provide a return call. The remaining eligible individuals consented to participation. Although 40 individuals initially participated in the study, 32 completed all survey questions. Of the 32 individuals, all were female with a breast cancer diagnosis ranging from stage I through stage IV (Table 1), with varied diagnoses including ductal carcinoma in situ, inflammatory breast cancer, and metastatic disease. Age ranged from 19 to 78 years ($M = 59.78$, SD = 12.38 years). More than a quarter of women reported minority status while most participants (65.6%) indicated White. Education was also provided with more of a mixed distribution than race (Table 1). For this analysis, education was then collapsed into those with 4-year college degrees and above and those without.

Information was obtained from participants including total visits and more specifically their telehealth visits. The majority of participants indicated 20 or less visits. The breakdown is as follows: 6 participants (18.75%) received "no telehealth visits"; 22 participants (68.75%) received "less than 25% visits via telehealth"; 2 participants (6.25%) received "25% to 50% of their visits via telehealth"; and 2 (6.25%) participants received "50% or more telehealth visits." Given the unequal distribution of telehealth visits, differences between percentage of telehealth and other variables were unattainable. Twenty-two of 26 participants responded that telehealth either met or exceeded their expectations. Three participants reported having technical issues while on zoom. However, despite these more favorable ratings of telehealth, 100% of participants who received both visit types indicated that they prefer in-clinic over telehealth.

TABLE 1
Demographics

	Sample = 32
Age range, y	59.78 (SD: 12.38)
19-78	
Race	
White	21 (65.6%)
Black or African American	8 (25.0%)
American Indian or Alaskan Native	1 (3.1%)
Asian	1 (3.1%)
Other	1 (3.1%)
Education	
Less than high school	2 (5%)
High school graduate or GED	4 (10%)
Some college	4 (10%)
2-y degree	6 (15%)
4-y degree	7 (17.5%)
Professional degree	9 (22.5%)
Cancer stage	
Stage 1	7 (21.9%)
Stage 2	11 (34.4%)
Stage 3	9 (28.1%)
Stage 4	1 (3.1%)
Unknown	2 (6.2%)

Participants were asked about specific rehabilitation services they received: 23 of 29 responded. Primary treatments rendered across inpatient and telehealth visits included 52% with difficulty moving an upper extremity, followed by 30% with chemotherapy-induced neuropathy and 18% with complaints of cancer-related fatigue. None of the participants had difficulty moving lower extremities. Given limited variance and small sample size, a correlation coefficient matrix was performed to explore the relationship between telehealth and self-efficacy. Both telehealth and in-clinic experience ratings demonstrated significant moderate to strong correlations for all components of the SCSE (Table 2). Ratings of telehealth experience and ESES were not significantly correlated for 4 of 5 questions (Table 3). Significant correlations were noted

TABLE 2
Self-Care Self-Efficacy Scale

Self-Care Self-Efficacy Scale	Telehealth	In-Clinic
Keep yourself stable and free of symptoms	N = 28 ($r = 0.507$); $P = .006$	N = 32 ($r = 0.694$); $P = .000$
Follow treatment plan you have been given	N = 28 ($r = 0.616$); $P = .000$	N = 31 ($r = 0.515$); $P = .003$
Persist in following treatment plan even when difficult	N = 28 ($r = 0.402$); $P = .002$	N = 28 ($r = 0.671$); $P = .000$
Monitor your condition routinely	N = 28 ($r = 0.673$); $P = .000$	N = 31 ($r = 0.493$); $P = .005$
Persist in monitoring when difficult	N = 28 ($r = 0.673$); $P = .000$	N = 31 ($r = 0.493$); $P = .005$
Recognize changes in health as they occur	N = 28 ($r = 0.516$); $P = .005$	N = 32 ($r = 0.697$); $P = .000$
Evaluate the importance of your symptoms	N = 28 ($r = 0.476$); $P = .01$	N = 32 ($r = 0.593$); $P = .000$
Do something to relieve your symptoms	N = 28 ($r = 0.581$); $P = .001$	N = 32 ($r = 0.609$); $P = .000$
Persist in finding a remedy for your symptoms	N = 28 ($r = 0.567$); $P = .002$	N = 31 ($r = 0.564$); $P = .001$
Evaluate how well the remedy works	N = 28 ($r = 0.598$); $P = .002$	N = 31 ($r = 0.603$); $P = .000$

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TABLE 3
Exercise Self-Efficacy Scale

Exercise Self-Efficacy Questions	Telehealth	In-Clinic
When I am worried about my appearance due to swelling and/or compressions garment	NS	N = 30 ($r = 0.375$); $P = .041$
When I am experiencing lymphedema-related symptoms (eg, pain, heaviness, numbness/tingling, swelling)	NS	N = 31 ($r = 0.602$); $P = .000$
When I fear making my lymphedema worse	N = 25 ($r = 0.375$); $P = .06$	N = 28 ($r = 0.364$); $P = .057$[a]
When I am unsure what exercise advice to follow	NS	NS
When I am not certain whether I am doing an exercise correctly	NS	N = 29 ($r = 0.338$); $P = .073$[a]

Abbreviation: NS, not significant.
[a]Approaching significance.

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for in-clinic experience and ESES for 2 of 5 questions, with 1 additional question approaching significance.

Finally, the total self-efficacy score for self-care was computed for both modes of delivery by summing participants' responses to all 10 items and dividing by 10. The semantic differential scale ranges from 1 = not confident to 5 = extremely confident and the total confidence score for participants ranged from 2.80 to 4.80, with a mean of 4.3097 (SD: 0.53), indicating an above average total confidence score.

Exploring the relationship between education, self-efficacy, and self-management, independent *t* tests were analyzed between 2 levels of education (4-year degree or more and less than 4-year degree). Again, education was collapsed to create a new variable with 2 levels because of the low and unequal sample size between multiple levels of education. Results indicate only 1 difference, that is, approaching a statistically significant difference between education and patients' response on the question "when I fear making my lymphedema worse"; those with less than a 4-year degree (N = 16) resulted in a mean of 3.00 (SD: 1.36) and participants with a 4-year degree or more (N = 13) had a mean of 3.83 (SD: 1.03), $t = -1.840$ ($df = 25$), $P = .07$. Other differences may exist, but with such a low sample size for each level of education, there may not be enough power to identify these differences in this study.

DISCUSSION

Statistical analysis demonstrates the potential for telehealth as an effective alternative to in- person treatment for individuals with BCRL undergoing oncology-related rehabilitation. Participants responded that overall they felt more confident in progressing their treatment plan, and monitoring their conditions at home, even when difficult. The ability to monitor and recognize changes in a condition, as well as self-manage symptoms, is particularly important for individuals with lymphedema.[12,14,15,30]

Previous literature indicates that early identification reduces progression to lymphedema of greater severity.[31] Left unmanaged, lymphedema can result in a chronic inflammatory state within the tissue, increasing risk of tissue fibrosis, infection, and impaired wound healing.[32] Despite the self-efficacy reported for monitoring and managing BCRL, all participants reported a preference for in-clinic treatment. However, when in-clinic visits are unavailable, these results indicate that positive telehealth experiences (regardless of preference) may result in self-efficacy for the management of BCRL.

All individuals in the current study preferred in-clinic treatment versus telehealth. This finding is supported by recent literature.[33] The current study examined participant experiences in 2020, during the height of the 2020 COVID-19 pandemic, during closure, and subsequent limited return to in-person rehabilitation treatments. The nature of closures and reopening of services required instinctive and impromptu clinician treatment planning for telehealth visits, as well as participant adeptness at managing telehealth platforms. The average age of the participants sampled was 60 years, and it is plausible that comfort level in the online platform may have played a role; however, only 3 of 29 individuals in the study reported technology issues while using telehealth services. Favorability and preference for in-clinic versus telehealth visits may also have been influenced by distress associated with limitations in access to services during the COVID-19 pandemic,[3] compounded by potentially limited development of a therapeutic alliance with telehealth treatments versus in-person treatments.[34,35] Telehealth was a new platform of care delivery for the 3 therapists providing care to participants within the current study. The ease of adjustment to and adeptness at telehealth may have differed across therapists and influenced treatment approaches, patient satisfaction, and development of self-efficacy among participants. Development of telehealth-based treatment plans with assessment of comfort with technology, ease of use, access, and education level may improve individual treatments and, therefore, may further increase the efficacy of these visits in turn bolstering confidence in individuals with BCRL. Further clinician training to foster the patient therapist relationship may also improve ratings of telehealth versus in-clinic treatments.

Self-efficacy for exercise did not demonstrate a significant relationship with positive experiences in telehealth; however, it was noted in 2 of 5 components with in-person visits. The findings indicate that self-efficacy for exercise was not related to positive telehealth experiences. The ability to promote activity through

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telehealth-based rehabilitation in the oncology population has shown limited promise.[36] It is important to note that women were not solely treated for complications from BCRL but additional cancer-related impairments including chemotherapy-induced neuropathy, shoulder dysfunction postsurgery, and cancer-related fatigue secondary to previous or concurrent treatment. The clustering effect of side effects[37] may have limited the focus on exercise implementation. Complete decongestive therapy for lymphedema consists of 2 phases. The initial phase (phase 1) focuses on reduction of the affected part and improvement of the tissue through manual lymphatic drainage, short stretch compression bandaging, exercise, and skin care. Phase 2, the maintenance phase, consists of ongoing self-management to maintain gains achieved in phase 1 through self-lymphatic drainage, exercise, continued skin care and monitoring, and compression.[38,39] The ability to demonstrate improved tissue texture, mobility, and girth within a treatment session versus participant performance of techniques in this population may have increased favorability to in-clinic treatments. However, the ability to manage the condition is paramount to reducing infection risk, as well as reducing exacerbations and progression of the condition.

Similar self-efficacy scores for self-management of BCRL indicate that the self-management phase can be provided effectively using telehealth. In a recent study, teaching self-manual complete decongestive therapy to women with BCRL proved effective in maintaining or improving the benefits of complete decongestive therapy and can be used as a self-care tool in the management of BCRL[40]. Research in telehealth use in other chronic conditions indicates telehealth to promote improved self-efficacy and self-reliance.[41] The participants in the current study may also be best served through a combination of in-clinic manual treatment as needed, with telehealth to foster self-reliance and self-efficacy; however, further research is required to fully elucidate.

Rehabilitation practitioners must be prepared to embrace technologies and service delivery models valued in the new post-COVID-19 health care environment. Telehealth will be valued for its effectiveness and cost-efficiency in addition to the cultivation of self-efficacy.[42] Stakeholders and policy makers must realize that oncology rehabilitation services delivered via telehealth technologies can empower people to be active participants in improving quality of life and are an integral component in achieving optimal survivorship.[43-45]

Limitations

A convenience sample of individuals with BCRL limits its generalizability of this study results to additional oncologic cohorts. In addition, 8 participants did not complete the study providing response rate and nonresponse errors, which may also limit generalizability. The grade of lymphedema and phase of treatment was not disclosed within the current survey due to potential recall bias; therefore, it is unknown how the grade/severity of lymphedema and requirement of manual treatment influenced current results. Familiarity with rehabilitative services was also not assessed in the current survey. The therapist-client relationship is critical for success and may have been influenced by use of telehealth treatment at initiation of treatment versus later within the rehabilitation interval as well as by differences in therapist approach to telehealth. Given the small sample size, the power to run varied analyses was limited. Three participants noted technology issues; however, the type of issue was not identified in the current study. Future studies examining barriers to telehealth care delivery among various populations may provide greater insight into technology issues. More studies on a larger scale are needed to confirm these study findings.

CONCLUSION

There is value for telehealth to rehabilitate women with a diagnosis of BCRL. Further research needs to distinctly explore self-efficacy across various modes and dosage of delivery. Rehabilitation practitioners must advocate for inclusion in future studies and articulate the distinct value of telehealth in rehabilitation for cancer survivorship, chronic disease management, and health promotion. Further research is necessary to validate the efficacy and cost-effectiveness of rehabilitation assessments and interventions delivered through telehealth technologies.

ACKNOWLEDGMENTS

The authors thank Lisa Marshall, owner of Specialty Rehabilitation Inc, and staff for optimal patient care during the COVID-19 pandemic.

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