
Multimed 2025; 29:e3128

Original article

Kinesiotherapy and *bodyflow* in the treatment of lymphedema in mastectomized patients

Kinesiotherapy and bodyflow in the treatment of the lymphedema in mastectomized patients

Kinesiotherapy and bodyflow in the treatment of lymphedema in mastectomized patients

Cristina Guerra Frutos I*  <https://orcid.org/0000-0002-3378-437X>

Carmen de los Ángeles Matos Osorio II  <https://orcid.org/0000-0002-7542-8699>

Leonela Cristina Guerra Frutos I  <https://orcid.org/0000-0003-4115-958X>

Carlos Antonio Ramírez Brizuela II  <https://orcid.org/0000-0002-3378-437X>

Yisel Caymari López I  <https://orcid.org/0009-0008-5128-3721>

^{Yo}University of Medical Sciences of Granma.Celia Sánchez Manduley Provincial Clinical Surgical Hospital.Manzanillo. Granma, Cuba.

^{II}University of Medical Sciences of Granma, Cuba.

* Corresponding author: E-mail:cristyleo2013@gmail.com

SUMMARY

Lymphedema is one of the main consequences of breast cancer surgery.Currently, there is no definitive cure; however, there are different alternatives depending on the stage of the



This work by Multimed is licensed under a
<https://creativecommons.org/licenses/by-nc-sa/4.0/>

disease. To determine the effectiveness of kinesitherapy and Bodyflow in the treatment of lymphedema in mastectomized patients treated in the Physical Medicine and Rehabilitation Department of the Celia Sánchez Manduley Clinical and Surgical Hospital in Manzanillo, Granma, a cross-sectional descriptive study was conducted from October 2019 to February 2022. The study variables included age, cause of lymphedema according to the literature, type of lymphedema, degree, duration of treatment, and symptom improvement. The predominant age group was 40 to 49 years; the main causes were surgical technique and obesity, the type of early lymphedema, and the degree of mild lymphedema. Treatment duration was differentiated within the first three months. Disability improvement was achieved in the patients studied, so the application of rehabilitation treatment was beneficial; the majority of patients were in the improved category.

Keywords: Bodyflow; Kinesitherapy; Lymphedema; Mastectomy.

ABSTRACT

Lymphedema is one of the main consequences of breast cancer surgery. Currently, there is no definitive cure; However, there are different alternatives depending on the stage of the disease. With the objective of determining the behavior of the use of the kinesiotherapy and the bodyflow in the treatment of the lymphedema in mastectomized patients, assisted in the Physical Medicine and Rehabilitation Department of the Celia Sánchez Manduley Clinical and Surgical Hospital in Manzanillo, Granma, a cross-sectional descriptive study was conducted from October 2019 to February 2022. The study variables included age, cause of lymphedema according to the literature, type of lymphedema, degree, duration of treatment, and symptom improvement. The predominant age group was 40 to 49 years; the main causes were surgical technique and obesity, the type of early lymphedema, and the degree of mild lymphedema. The duration of therapy was determined within the first three months. Disability improvement was achieved in the



patients, studied indicating that the rehabilitation treatment was beneficial; the majority of patients were classified as improved.

Keywords: Bodyflow; Kinesitherapy; Lymphedema; Mastectomy.

SUMMARY

Lymphedema is one of the main consequences of breast cancer surgery. Currently, there is no definitive cure available, however, there are different alternatives depending on the state of the patient. With the objective of determining the behavior of the use of kinesiotherapy and body flux in the treatment of lymphedema in mastecized patients treated in the Physical Medicine and Rehabilitation service of the Celia Sánchez Manduley Clínico Cirúrgico Hospital, in Manzanillo, Granma, a cross-sectional descriptive study was carried out in the period from October 2019 to February 2022. As Variáveis studied: idade, reason for lymphedema according to the literature, types of lymphedema, degree, duration of therapy and better symptoms. The predominant group was 40 and 49 years old; The main causes, the surgical technique and obesity, or type of early lymphedema or grade of mild lymphedema; The therapy time was differentiated in the first three months. The best disability was achieved by the studied patients, therefore, the application of the rehabilitation treatment was beneficial, most of the patients were in the best category.

Keywords:Body discharge; Kinesiotherapy; Lymphedema; Mastectomy.

Received: 4/03/2025

Approved: 03/25/2025

Introduction



This work by Multimed is licensed under a
<https://creativecommons.org/licenses/by-nc-sa/4.0/>

Breast cancer was first described in the Edwin Smith Papyrus, between 3,000 and 2,500 BC. In 1882, William Halsted performed the first mastectomy, and since then, milestones such as Handley's lymph node dissection of the neck and anterior mediastinum in 1901, the lymphadenectomy of Margotini and Bucalossi in 1949, and the use of radiotherapy by Hirsch and Keynes in 1924, increased patient survival. Approximately 1.38 million new cases and half a million deaths are reported annually worldwide from this pathology. In developed countries such as the United States, a drastic reduction in mortality of 30% has been seen from the increase in early detection through the use of mammography screening and the establishment of standardized detection systems. (1)

Breast cancer is an oncological process in which healthy cells of the mammary gland, which after puberty respond to the periodic estrogenic influences of the ovary, degenerate and transform into tumors. It is a clonal disease, which in one of its types proliferates to form a tumor, which subsequently invades surrounding tissues and metastasizes to different areas of the body. In the United States, this disease represents 27% of all cancers in women; 12.5% of women suffer from it and 3.5% die from it, with an upward trend. In Mexico, it corresponds to 9% of all neoplasias and 15% of those affecting this sex, with 18.3 cases per 100,000 inhabitants. However, in Uruguay, approximately 1,840 new cases are registered each year and approximately 650 women die as a result of this disease. (2)

It is the tumor that causes the highest number of deaths in women in Cuba, where more than 20,000 new cases are currently diagnosed each year; of these, more than 2,200 are located in the female breasts. It is reported to be curable in more than 95% of cases, provided it is detected early. (3) Since the early 1990s, breast cancer has increased its incidence and prevalence. 3,534 cases of the disease were diagnosed in 2014, which represented 16.8% of all types of cancer, surpassed only by skin cancer. In 2017, breast cancer was the second leading cause of death, accounting for 14.3% of deaths from malignant tumors, according to the Cuban Health Statistical Yearbook. (4)

After the initial postoperative period, patients should be monitored periodically. Results are evident from 3 months and stabilize at 1 year postoperatively. Results are evaluated according to the patient's subjective improvement, perimeter and volumetric measurements, frequency of cellulite episodes, and quality of life questionnaires. (5) Currently, there is no definitive cure for lymphedema; however, there are different alternatives that depend on the stage of the disease, including kinesiology.

The primary objective of this alternative approach is to improve patient function and quality of life, as well as to avoid the many complications of advanced disease. Different therapeutic algorithms have been proposed to minimize unnecessary interventions and ensure patients achieve a significant improvement. Cases presenting with pitting edema and a partial response to conservative treatment are candidates for physiologic procedures. The patency of the lymphatic system should be assessed by lympho-resonance, if functioning lymphatic channels are present. (6)

The way to therapeutically apply the knowledge provided by Kinesiology is through kinesiotherapy, which means treatment through physical exercise. It involves placing the patient at the maximum limits of his or her capacity and at the minimum limit of his or her disability. (7) Bodyflow is one of the physical agents used in the treatment of lymphedema. This low-frequency electrostimulator can be applied to reduce edema, stimulate circulation, and promote lymphatic drainage. (8)

The study was conducted to determine the effectiveness of kinesitherapy and bodyflow in the treatment of lymphedema in mastectomized patients.

Methods

A descriptive cross-sectional study was conducted in mastectomized patients treated in the Physical Medicine and Rehabilitation Service of the Celia Sánchez Manduley Clinical and Surgical Hospital in Manzanillo, Granma, from October 2019 to February 2022.



The universe consisted of 100 mastectomized patients treated in the Physical Medicine and Rehabilitation Service with a diagnosis of lymphedema. The sample, selected by simple random sampling for 95% reliability and a 5% margin of error, was composed of 81 patients who received rehabilitation treatment with an artificial physical agent, who met the inclusion and exclusion criteria.

Inclusion criteria: willingness to participate in the study with prior informed consent. No contraindications to the therapies used.

Exclusion criteria: Patients with psychiatric disorders. Patients with bleeding disorders or bleeding tendency. Radiological presence of other lumbar spine pathologies. Calcified hernias. Presence of recent trauma to the lumbar region.

Exit criteria: Patients who no longer wish to continue in the study. Discontinuation of treatment. The appearance of serious, life-threatening complications: bleeding or bleeding tendency; severe anemia; patients with pacemakers; dermatological diseases at risk of dissemination; arterial hypotension; malignant tumors; acute febrile states; phlebitis and thrombophlebitis; malignant tumors of the spine.

Data collection was carried out through indirect observation by reviewing medical records. Statistical processing was performed using absolute and relative frequency measures to tabulate the empirical data obtained and establish appropriate generalizations. The data were manually tabulated with a calculator and summarized in tables.

Rehabilitation treatment includes the following features: psychological support, daily use of elastic sleeves or gloves, postural treatment, respiratory physiotherapy, kinesiotherapy, complementary therapy, massage, occupational therapy, and the use of lymphatic drainage equipment. (Appendix 1)

Types of lymphedema according to their appearance:

Early lymphedema: After surgery, postoperative edema frequently appears, usually located in the chest and inner arm. It may reabsorb (either spontaneously or with physical

therapy) after an acute period. If no physical therapy has been applied and it persists three months after surgery, it may be the beginning of lymphedema.

Late lymphedema: It is urgent 6 months after the intervention, it is the decompensation of an infraclinical lymphedema only noticeable in specific tests of the lymphatic system: lymphoscintigraphy, it may have been caused by an infection, an overload of physical activity.

Improvements in symptoms from the clinic

Improved: When swelling and pain have decreased or disappeared, with an increase in muscle strength with a joint grade of more than 75% or normal, as stipulated for each joint type, and when independence in activities of daily living has been achieved.

Not improved: little or no improvement, muscle strength and joint arches showed little or no change and when they were dependent or semi-dependent in activities of daily living.

Therapeutic response criteria

three months after starting treatment, Six months after starting treatment, more than six months after starting treatment: time range in which patients experience improvement in some of their symptoms according to the results of the physical examination.

Results

As for the distribution by age groups It can be seen that the 40-49 age group contributed a greater number of cases with 32 patients (39.51%). (Table 1)

Table 1. Distribution by age group of patients with postmastectomy lymphedema who received rehabilitation treatment.

Age groups	No.	%
20-29 years old	4	4.94
30-39 years old	25	30.86

40-49 years old	32	39.51
50 and over	20	24.69

Table 2 shows that the causes with the highest incidence were surgical technique and obesity with 14 patients each, representing 17.28%.

Table 2. Distribution of patients in the study due to lymphedema according to appearance in the literature.

Reason for lymphedema according to literature	No.	%
Surgical technique	14	17.28
Radiotherapy	8	9.88
Postoperative infection	7	8.64
Burn	8	9.88
Immobility	8	9.88
Excessive movement	11	13.58
Obesity	14	17.28
Injuries or wounds	11	13.58

TheThe distributions of patients with postmastectomy lymphedema are shown in Table3 where it can be seen that the largest number of cases are recognized as patients with early lymphedema with 48 cases identified for 59.26%.

Table 3. Distribution of patients with postmastectomy lymphedema who received rehabilitation treatment according to type.

Types of lymphedema	No.	%
Early lymphedema (after surgery)	48	59.26
Late lymphedema (after 6 months of surgery)	33	40.74

TheTable 4 shows thePatients with post-mastectomy lymphedema who received rehabilitation treatment according to degree, in the mild degree with the highest rate there are 45 cases representing 55.56%.

Table 4. Distribution of patients with postmastectomy lymphedema who received rehabilitation treatment according to grade.

Degree	No.	%
Mild	45	55.56
Moderate	33	40.74
Serious	3	3.70

In theTable 5 shows that the largest number of patients responded to the therapy within 3 months, representing 55.56% for a total of 45 patients.

Table 5. Distribution of patients with postmastectomy lymphedema who received rehabilitation treatment according to the duration of therapy.

Time of therapy	No.	%
3 months after starting treatment	45	55.56
6 months after starting treatment	29	35.80
+ 6 months after starting treatment	7	8.64

For the improvement of symptoms after applying rehabilitation treatment in patients with post-mastectomy lymphedema, 60 cases of improved patients were obtained with a higher prevalence, representing 74.07%, and only 21 were not improved, representing 25.93%.

Discussion



Breast cancer is the most frequently diagnosed cancer among women worldwide, one of the solutions to this complex health condition is to perform a modified radical mastectomy. (5)

Lymphedema is one of the most common complications in women who have undergone mastectomies. Its treatment is palliative, using specific physical therapy techniques. The more advanced the condition, the more difficult it is to achieve improvement. For this reason, research is frequently conducted to address this complex health problem from different perspectives.

The results obtained in this research coincide with other statistics recorded from the analysis and comparison of the different variables selected for its implementation.

Age is a population characteristic frequently studied in research of diverse nature, in relation to the present experience a similarity was found with the study of Herrera Santos, (6) which obtained 90% of the patients between 40-59 years. Another part of the experiences consulted showed different results since Murga Valenzuela (7) in a study carried out in Spain found that the median age was 60-50 years, for his part Ribeiro González, (8) contributed that the average age in the patients studied was 53 years, García-Parada, (9) had an average age of patients between 53 and 66 years, in the same way Forner Cordero, (10) reported that most of the patients ranged between 50 and 59 years. The frequency of these ages coincides fully with the characteristics of the appearance of breast cancer recognized by the literature and medical practice in general, which, although it appears at all ages, has a greater probability of occurring between 30 and 50 years of age due to cyclical lobular activity; especially in the presence of risk factors such as: overweight, sedentary lifestyle, alcohol consumption, family history, dense breast tissue, nulliparity, early menarche, advanced pregnancy and other environmental elements.

Gómez Vicente, (11) states that the World Health Organization in 2015 declared that the risk of suffering from breast cancer increases with age, especially in populations with high life expectancy since 1 in 8 women could develop breast cancer throughout their lives.

Lymphedema is considered a multicausal disease and it is common that depending on the personal characteristics of each of the patients included in the different studies such as specific age, Personal Pathological History and other aspects, the causes of appearance are of a very different nature, in correspondence with the present findings, Olmos, (12) found axillary dissection as the first cause of lymphedema, with 86% of patients suffering from it at the time of starting the study. This author also recognizes that axillary lymph node dissection is the most common cause of lymphedema in developed countries.

Donahue Philips, (13) recognizes the most frequent etiology of secondary oncological lymphedema is lymph node resection in surgeries, and it can occur at any time, even years later. Murga, (7) recognizes filariasis (28%) as the most frequent cause of lymphedema, followed by post-surgical or so-called post-therapeutic causes (14%). After breast cancer treatment, 2-10% develop lymphedema; 20-25% if axillary dissection is performed, and 35% if axillary radiotherapy is associated with it. At present, obesity appears as one of the causes of lymphedema; In this regard, Gómez (11) concludes that the World Health Organization in 2015 declared that obesity is related to the hormonal factor, since a person with obesity has adipocytes which raise the concentration of circulating hormones, such as estrogen precursors that are transformed into estrogen in adipocytes, affecting patients in the postmenopausal stage more.

The time that elapses from the time the surgery is performed until the appearance of lymphedema, which in this study is recognized as early lymphedema and late lymphedema, is a variable studied in some of the consulted investigations; Herrera, (6) recognizes that the majority of patients at the time of starting his study (85%) had been operated on less than 6 months when the appearance of lymphedema occurs, an aspect that coincides with the finding of the present investigation and that constitutes an



element that works in favor of an adequate response to the treatment since early lymphedema is more susceptible to react positively to the therapy that is applied; however, Koca (14) reports that the time from the appearance of lymphedema that was most prevalent was between 8-10 months after surgery, this reached 53.3% of the total number of patients and concludes that the time until lymphedema developed in the affected limb after surgery was an average of 9.5 months in all mastectomized patients.

The degree of lymphedema develops in variable periods of time, it can vary from mild in early stages to become extreme in later stages as is the case reported by Koca, (14) where 57% of the patients were located in grade II which corresponds to the moderate category. The patients included in this study mostly presented mild lymphedema, an element that acts positively in favor of rehabilitative treatment because here the edema is minimal, the difference in circumference between both extremities is 2 - 3 cm, the extremity with lymphedema has a volume between 150 - 400 mL.

Mild lymphedema does not cause great deterioration of the lymphatic system, since when the genetic mechanisms linked to chronic inflammation are put into function, stimulated by different therapies, this is significantly reduced, which makes possible a functional improvement in a general sense. (6) Regarding the clinical evolution or time of therapeutic evolution, Herrera, (6) observed that the majority of women present in his study (85%) had been in therapy for less than 6 months when the improvement occurred, which corresponds with the results of the present experience that contributed more than half of the cases studied improved during the first three months of treatment.

The application of various physiotherapy techniques for the treatment of lymphedema secondary to breast cancer leads to an improvement in the health-related quality of life of these patients, both physically, functionally, psychologically, and emotionally.

In the present research experience the therapeutic combination of bodyflow was used, which is a treatment that uses low frequency electrostimulation to treat hemodynamic disorders, accelerate recovery through stimulation of blood flow and lymphatic drainage

and kinesitherapy which consists of performing a series of exercises with a scientific basis adapted to improve the strength and mobility of patients with post-mastectomy lymphedema who were part of the study. The use of bodyflow therapy is suggested as an alternative treatment, it is recommended that its use is not exclusive, but serves as an adjuvant method to other intervention techniques necessary to achieve a positive evolution in patients with lymphedema. (15)

Bodyflow is the first therapy proven worldwide to increase blood flow and fluid drainage. Specifically, by stimulating smooth muscles (near veins, arteries, and lymphatics). It is a relatively new therapy that emerged in the mid-nineties of the last century, and despite its proven effectiveness, there are very few published studies reporting on its use. (16)

In the present investigation, we can speak in favor of the improvement perceived from the treatment taking into account the superiority in the number of improved patients compared to those who did not improve, as demonstrated in the follow-up of the same by observing the following signs of evolution: improvement in the functionality and independence of the upper limbs, decrease in the volume of lymph and edema, pain relief, increase in muscle strength with a joint grade of more than 75% or normal, independence in activities of daily living and an increase in the well-being of cancer survivors.

Martínez, (17) reports that in studies conducted with the bodyflow equipment, an increase in venous velocity (24%) and blood flow by 19.5% have been found, as well as a reduction in the amount of fluids and limb volume by 30 and 15%, respectively, in patients with lymphedema. Baldeón, (18) states that clinical trials have shown that bodyflow technology is effective in the treatment of sports recovery and lymphedema.

Herrera, (6) evaluated the effectiveness of a treatment that included rehabilitative techniques of lymphatic drainage and kinesiotherapy in women with post-mastectomy lymphedema in Santiago de Cuba, and observed an improvement in the patients, so he concludes that the treatment was effective.

Gómez Vicente, (11) asserts that manual lymphatic drainage and therapeutic exercise are effective when used in physiotherapy treatment. Each one can be worked on separately, but it was shown that both complement each other to provide a better result in reducing lymphedema.

Pereira Rodríguez, (19) conducted a bibliometric study in which he presented studies about the effect that physical therapy produces on lymphedema after mastectomy and established that the best treatment is to combine complex decongestive therapy together with other approaches, especially kinesitherapy.

Ricardi Báez, (20) evaluated the response to complex combined physical therapy in patients with lymphedema, for which he reports a complete complex decongestive therapy was performed which according to this author allowed a significant reduction in perimetry and volumetry in a period of 10 therapy sessions. In general, the role of rehabilitative therapy in its different modalities has been widely demonstrated and disseminated. Olmos, (12) showed that the application of cryotherapy, drainage and exercises decrease the volume of lymph in the arm in the medium and long term and promotes active movement of the affected upper limb as a prophylactic and therapeutic measure.

Forner Cordero, (10) reports that complex decongestive therapy, compression therapy and physical - occupational therapy are useful to facilitate the recovery of shoulder range of motion, pain reduction and edema reduction as evidenced in the patients in his study. Although the work carried out in rehabilitation services to recover motor skills lost or diminished by the onset of lymphedema is extremely valuable and significant, it is still important that all women who undergo surgery for breast cancer and are at risk of developing this pathology receive information regarding their risk and the preventive measures they can take. Compliance with prevention and rehabilitation measures contribute to reducing the onset of lymphedema.

Conclusions

Patients generally perceived improvement within the first three months after starting treatment. The rehabilitation treatment was beneficial, with the majority of patients falling into the improved category.

Bibliographic references

1. Palmero Picazo J, Lassard Rosenthal J, Juárez Aguilar LA, Medina Núñez C. Breast cancer: an overview. Medical record Angeles Group [Internet]. 2021 [cited 02/21/2025]; 19(3): 354-60. Available in: <https://www.scielo.org.mx/pdf/amga/v19n3/1870-7203-amga-19-03-354.pdf>.
2. Osorio Bazar N, Bello Hernández C, Vega Bazar L. Risk factors associated with breast cancer. Rev Cubana Med Gen Integr [Internet]. 2020 [cited 21/02/2025]; 36(2): e1147. Available from: <https://revmgi.sld.cu/index.php/mgi/article/view/1147/333>.
3. Torres Agüero NC, López Catá FD, Paz Loret de Mola EJ. Educational intervention on breast cancer risk factors in women aged 20 to 40. Univ. Pinareña [Internet]. 2021 [cited 20/03/2025]; 17(1): e485. Available from: <https://revgaleno.sld.cu/index.php/ump/article/view/485>.
4. Cuba. Ministry of Public Health. 2023 Health Statistical Yearbook [Internet]. Havana: MINSAP; 2023 [cited 03/11/2025]. Available at: <https://files.sld.cu/dne/files/2024/09/Anuario-Estad%c3%adstico-de-Salud-2023-EDICION-2024.pdf>.
5. Pereira CN. Lipedema: More than just a “fat legs” problem. Update on the pathophysiology, diagnosis, and surgical treatment. Rev. Cir [Internet]. 2021 [cited 21/02/2025]; 73(3): 370-7. Available



at:https://www.researchgate.net/publication/352048373_Lipedema_More_than_a_Problem_of_Fat_Legs_Update_on_Pathophysiology_Diagnostic_and_Surgical_Treatment.

6. Herrera Santos MB, Valenzuela Fonseca LM, Herrera Bravo J. Effectiveness of rehabilitation treatment in women with postmastectomy lymphedema. Medisan [Internet]. 2017 [cited 12/02/2025]; 21(9): 1095-2001. Available from:<https://medisan.sld.cu/index.php/san/article/view/1266/pdf>.

7. Murga Valenzuela YS, Pariona Ávila A, Roman Sarmiento FA. Effectiveness of rehabilitation treatment through manual lymphatic drainage compared with complex decongestive therapy in patients with postmastectomy lymphedema due to breast cancer: A scoping review [Thesis]. Lima, Peru: Cayetano Heredia University; 2024 [cited 12/02/2025]. Available at:https://repositorio.upch.edu.pe/bitstream/handle/20.500.12866/16551/Efectividad_MurgaValenzuela_Yeshua.pdf?sequence=1&isAllowed=y.

8. Ribeiro González M, Ferrer González A, Pulido Roa I, Santoyo Santoyo J. The axilla in breast cancer. How to avoid axillary lymphadenectomy in patients with a clinically positive axilla. Cir Andal [Internet]. 2021 [cited 17/02/2025];32(2):195-203. Available from:<https://www.google.com/cu/url?sa=t&source=web&rct=j&opi=89978449&url=https://dialnet.unirioja.es/descarga/articulo/8962361.pdf&ved=2ahUKEwjapvDQ9NSLAXW-EFkFHQQ7GBwQFnoECCsQAQ&usg=AOvVaw2xA2FQTna1s14d9pwzldlt>.

9. García-Parada BR, Camargo-Valderrama MA, Montealegre-Suarez DP, López-Roa LM, Olaya-Ramirez JG. Effectiveness of the Red Technique in the treatment of mastectomy-associated lymphedema. Risaralda Medical Journal [Internet]. 2018 [cited 27/03/2025]; 24(2): 81-4. Available from:http://www.scielo.org/co/scielo.php?script=sci_arttext&pid=S0122-06672018000200081&lng=en.

10. Forner Cordero I, Monrabal Bernabeu CE. Rehabilitation in breast cancer [Internet]. Valencia: Spanish Society of Senology and Breast Pathology; 2021 [cited 12/02/2025].



Available at: <https://formacion-senologia.sespm.es/wp-content/uploads/2021/06/Leccio%CC%81n-13-Rehabilitacio%CC%81n-en-CM.pdf>.

11. Gómez Vicente JG. Effects of lymphatic drainage and therapeutic exercise in patients with upper limb lymphedema after simple mastectomy and modified radical mastectomy. Literature review [Thesis]. Guatemala: Galileo University; 2019 [cited 02/12/2025]. Available

at: https://biblioteca.galileo.edu/xmlui/bitstream/handle/123456789/1017/2019-T-lf-030_gomez_vicente_jessica_gabriela.pdf?sequence=1.

12. Olmos Torres EP. Therapeutic triad for the treatment of postmastectomy lymphedema. Rev Venez Oncol [Internet]. 2018 [cited 02/12/2025]; 30(2): 137-47. Available from: <https://www.redalyc.org/journal/3756/375654904010/html/>.

13. Donahue PMC, MacKenzie A, Filipovic A, Koelmeyer L. Advances in the prevention and treatment of breast cancer-related lymphedema. Breast Cancer Res Treat [Internet]. 2023 [cited 02/17/2025]; 200(1): 1-14. Available in: https://pmc.ncbi.nlm.nih.gov/articles/PMC10224871/pdf/10549_2023_Article_6947.pdf.

14. Koca TT, Aktaş G, Kurtgil ME. Prevelation of upper extremity lymphedema and risk factors in patients with mastectomy: Single-center, observational, cross-sectional study. Turk J Obstet Gynecol [Internet]. 2020 [cited 02/17/2025]; 17(3): 215-24. Available in: <https://pmc.ncbi.nlm.nih.gov/articles/PMC7538822/pdf/TJOG-17-215.pdf>.

15. Anuszkiewicz K, Jankau J, Kur M. What do we know about treating breast-cancer-related lymphedema? Review of the current knowledge about therapeutic options. Breast Cancer [Internet]. 2023 [cited 02/21/2025]; 30: 187–99. Available in: <https://link.springer.com/content/pdf/10.1007/s12282-022-01428-z.pdf>.

16. Fraga Ramirez O, Gutiérrez Pérez ET, Rodríguez Santana L, Herrera Broche M, Aldama Suárez R, González Benavides C. Effectiveness of treatment for chronic lymphedema of the lower limbs due to secondary causes. Rev. Cub. Tecnol. Salud. [Internet]. 2024 [cited



- 27 Mar 2025]; 15(1). Available from: <https://revtecnologia.sld.cu/index.php/tec/article/view/4163>.
17. Martínez LT, Suárez Guevara PY. Bodyflow as an alternative treatment for lymphedema. Cuban Journal of Physical Medicine and Rehabilitation [Internet]. 2020 [cited 02/17/2025]; 12(2): e428. Available at: <https://revrehabilitacion.sld.cu/index.php/reh/article/view/428/572>.
18. Baldeón Laureano MR, Neciosup Reluz BA, Solórzano Chala D. Effectiveness of an educational intervention to prevent lymphedema in the knowledge and self-care of post-mastectomized women [Thesis]. Lima, Peru: Universidad Peruana Cayetano Heredia; 2016 [cited 12/02/2025]. Available at: <https://repositorio.upch.edu.pe/bitstream/handle/20.500.12866/480/Efectividad%20de%20la%20intervenci%C3%B3n%20educativa%20Previniendo%20el%20linfedema%20en%20el%20conocimiento%20y%20autocuidado%20de%20mujeres%20post-mastectomizadas.pdf?sequence=1&isAllowed=y>.
19. Pereira-Rodríguez JE, De Marcos-Sánchez JS, Vilorio-Madrid AP, Hernández-Romero RJ, Delgadillo-Espinosa WA. Effectiveness of physical exercise as a treatment for lymphedema in patients with cancer. Rev. virtual Soc. Parag. Med. Int. [Internet]. 2021 [cited 17/02/2025]; 8(2): 89-113. Available from: <https://scielo.iics.una.py/pdf/spmi/v8n2/2312-3893-spmi-8-02-89.pdf>.
20. Ricardi-Báez E, González-Espinoza IR, Ibarra-Fernández R. Multidisciplinary approach in patients with lymphedema. Multidisciplinary Health Care BUAP [Internet]. 2020 [cited 02/17/2025]; 1(2): 37-48. Available from: <http://rd.buap.mx/ojs-dm/index.php/cmsj/article/view/370/353>.

Conflict of interest

The authors declare no conflicts of interest.



Authorship contribution

Conceptualization: Cristina Guerra Frutos, Carmen de los Ángeles Matos Osorio.

Research: Cristina Guerra Frutos, Carmen de los Ángeles Matos Osorio, Carlos Antonio Ramírez Brizuela.

Methodology: Cristina Guerra Frutos, Carmen de los Ángeles Matos, Leonela Cristina Guerra Frutos.

Validation: Cristina Guerra Frutos, Leonela Cristina Guerra Frutos.

Drafting: Cristina Guerra Frutos.

Writing-reviewing and editing: Leonela Cristina Guerra Frutos, Yisel Caymari López.

Annex 1.Characteristics of rehabilitation treatment.

1. Psychological support:

It is used as a tool to achieve psychological compensation for the patient.

2. Daily use of elastic sleeves or gloves:

To compress superficial tissues and help protect the congested upper limb and activate lymphatic flow and waste evacuation.

3. Postural treatment:

Keep the mastectomy-treated limb elevated when lying down or sitting permanently with a pillow under your arm. Do not sleep or lie down on the operated side.

4. Respiratory physiotherapy:

Take a deep breath in through your nose while raising your arms that are holding a broomstick. After holding the breath for a few seconds, slowly lower your arms until you exhale completely through your mouth.

(8 repetitions 10 times a day).



5. Kinesiotherapy:

Specific exercises: Starting position: Lying on your back. With your palms facing up, touch your shoulder with the hand on the operated side, then return to the starting position with your palms facing down.

Make circular movements with the wrist of the operated side. Make a firm fist and open it, contracting the muscles of the forearm and arm of both limbs.

(8 repetitions twice a day). Complementary exercises: Starting position: Standing with your hands on your waist and legs apart, perform forward, backward, and side bends. (10 repetitions daily).

6. Complementary therapy:

It is recommended to use the following equipment as in a gym: shoulder wheel, hanging pull-up machine, digital ladder and pronosupinator wrist device.

7. Massages:

Relaxing: First, apply some type of talcum powder or cream and perform a local massage on the forearm and arm. Evacuation: These can be applied by the patient herself or by another person. Start with the fingers of the hand, moving toward the forearm, arm, and then the shoulder, first applying some type of talcum powder or cream.

8. Occupational therapy:

Perform independent tasks: combing hair, dressing, to improve the skills and dexterity of the affected limb.

9. Lymphatic drainage equipment:

Place a low-frequency electrical stimulator with a pulse width of 1.52 Hz and 6-8 ms using suction cup electrodes. Position the patient supine with the affected arm elevated with a support at a 40-degree angle to the horizontal to facilitate lymph drainage. (20 minutes twice daily).

