The effectiveness of the exercise program by the method Graham, in functional capacity and quality of life of women with mastectomy breast cancer.

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ABSTRACT

Breast cancer is the most frequently occurring disease in which the diagnosis may lead to extensive emotional, physical and social discomfort and audible feelings internal conflict emotions. Fear of activity makes patients insensitive causing the body to weaken. As a result of surgery created imbalances in body structures and orthostatic changes that alter the biomechanics of the body and which are maximized by weak as a result of inactivity. Modern studies have shown how the exercise and the exercise is generally to reverse many compared with the absence of motor activity. The purpose and primary objective of this randomized clinical study is to investigate the utility and effectiveness of alternative exercise program with the method Graham, in women with mastectomy with respect to the functional capacity and quality of life. The study included 37 women with breast cancer (n = 37), which had been lymphoid cleaning and removal volume which been allocated randomly separation by the process of the lottery the usual care (group A, n = 20) and the usual care group

Key Words: Breast cancer, Shoulder mobility, Quality of life, Graham, dynamic
and additional tweaks Graham (group B, n = 17). For the statistical analysis of the data used central tendency and dispersion measures and comparisons averages (pair sample t test) to investigate changes in the evaluated parameters of quality of life, functionality, physical activity and balance stability between different times evaluations (Start, week 4, week 8). There were also comparisons averages for independent samples (independent sample t test) to investigate the differences between the groups in each evaluated parameter at any time. The significance level was set at \( p \leq 0.05 \). Results: The study completed in eight weeks from January 2015 up to March 2015, with intermediate measurements in February. The findings of the study showed greater improvement in quality of life (questionnaire FACT B) to group routine care and additional tweaks Graham in connection with the group routine care in 4th (105.89 ± 22.02 vs 96.55 ± 15.86) and 8th week (113.28 ± 19.23 vs 95.38 ± 14.94) of the program for 4 and 8 weeks compared to baseline (95.51 ± 29.15 vs 95.10 ± 19.06) of the procedure (\( p < 0.05 \)).

INTRODUCTION

Breast cancer is one of the most common cancers and hitherto rehabilitation programs, in addition to surgery, focus on psychotherapy, social support and motor rehabilitation of the shoulder ipsilateral mastectomy [1]. In the available literature suggests that therapeutic interventions generally deal with some art (dance, painting, etc.) seems to positively influence the degree to which patients with breast cancer control stress levels and depression, but not the quality of life [2]. However, it has not detected any study to date which will evaluate the impact of the therapeutic action of the Technical Graham in women with mastectomy. Given the emotional and functional changes caused by the diagnosis of breast cancer, the main objectives of this study is to investigate whether through continuing education with the Graham method released the internal conflict of emotions to improve the quality of life as recorded through FACT B questionnaire, the effect of the functionality within the evaluation level of physical activity of the Beacke questionnaires and dynamic balance through trial Star test and gauge shoulder healthy and ipsilateral to the mastectomy.

After surgery, women usually exhibit estrogen withdrawal symptoms, arthralgias, fatigue, mood swings, anxiety, weight gain [3], peripheral neuropathy, reduced mechanical strength of bone, discomfort, pain, decreased range of motion and weakness in the muscles of the shoulders and arms lymphedema [4, 5]. These disorders reinforce the internal conflict of emotions that are created due to the diagnosis of cancer, loss of identity or sovereignty space [6] and may affect the daily operational activity and the overall functional ability associated with health and quality of life [3].
The technique involves exercise variant forms of classical ballet where through specific body movements of contraction or shrinkage trunk and members and after release or otherwise relaxation or extension thereof [7]. Also the technique through balance training with the center of gravity shifts into and out of the support base, achieves stretching for large muscle groups and neuromuscular facilitation exercises through diagonal motion patent, similar to the PNF [7]. PNF is used as a treatment in various musculoskeletal diseases, and in women with breast cancer to improve the quality of motion [7]. Through art Graham the spiral motion of the shank through rhythmic breathing sought physical training and improve the process of psycho-emotional awareness [8]. The study was approved by the National Committee on Bioethics and the Commissioner Privacy.

**Development of Technical Graham.**

Graham technique seeks to achieve the mastery of movement in five main categories: placement on the floor, sitting, lying, kneeling, standing, in the air and through drops using three levels in an upright, sitting back upright [9, 10]. The Graham argued that the motion on the floor introduces each component that is necessary to initiate other levels, through contraction and relaxation, the rotation of the trunk to be indicated as spiral [9, 10]. Continuous learning a dance model aims to improve coordination and efficiency abstaining as by the inactivity. Based skills’ training through repetition and improvement and this is a goal and motivation for participation [11, 12].

The method of Graham might say at first glance what is the evolutionary artistic extension of PNF treatments, where according to the PNF treatments exercises with diagonal motion patents are important in reducing pain and injury [13, 14, 7]. The method of Graham emphasizes trunk which rotates around its axis at forty-five degrees, so that one side can move forward and the other to move backwards, generating diagonal run similar exercise facilitation PNF patents. This technique has never been applied in research character previously and never on diseases to be able to compare the technical documentation of other diseases. Territorial exercise starts in 3 parts and is working to develop the body in the same way sitting and crawling similar to the preparation of an infant to stand on his feet [15, 7]. The various sections of floor exercises focus on working principles that reflect the wide range of motion that exists today in modern dance. There is a direct relationship in floor exercises, exercises in the center and on the ground (Barre). Our instructions for beginners according to Gutelius [16] are: to avoid any movement causes pain, gradually increasing frequency and intensity and always ask the motion learning teacher on these instructions based in our research program, a modified program for beginners 45 minutes of 1- 3 sets of 2-3 replicates for each section of each exercise three times a week.
METHODOLOGY

The process of measurement and execution of the intervention program took place in Evagoreio Foundation Cancer Association Limassol – Cyprus. And the extent of the study was from January 2015 to March of the same year.

I. Sample

In the study 37 Cypriot women involved, aged (56.32 ± 9.43) body mass (72.64 ± 11.26 kg), body height (1.58 ± 0.06) body mass index (BMI) (29.57 ± 5.97), which were referred to Evagorio for physiotherapy intervention through the oncology center or through private medical oncologists. Participating previously subjected to cleaning and removing lymphoid tumor breast (step 1 to 2), however without presenting metastasis. Of the total of 37 participants, 16 were operated on the right side and 21 on the left side then having undergone chemotherapy and radiation. Patients joined the research program 2-3 months after surgery and usually referred to the center by treating physicians to restore a few weeks or 1 month after surgery and submitted articles to usual care. Recruitment took test sample sampling means and then randomized by the method of lottery been allocated into two groups, the usual care group (group A, n = 20) and the usual care group and Graham Intervention (group B, n = 17 ) respectively. Before patients included in the study are informed of the purpose and content of and then taken the written consent of their participation both by themselves and by the responsible physician of the center. To conduct the study also received the approval of the National Authority Bioethics as well as the Data Protection Authority.

As exclusion criteria were defined as follows:

- Previous fracture, sprain, dislocation / subluxation shoulder instability in the legs.
- Old injury to the spine, sides and any major surgery than mastectomy, and
- Severe disorder of posture includes kyphosis, lordosis, scoliosis.
Total potential participating: 50 female patients with breast cancer which achieved lymph node cleaning.

Excluding two patients with complete mastectomy

Block 5 patients with metastatic type III-IV cancer.

Excluding one patient with complete double mastectomy

Number of patients in Criteria: 42

Refusal to participate: 7 patients

Patients remaining: 35

Add 2 new patients within criteria

Final Patient Total: 37

A group: usual care (n = 20)

B group: usual care and intervention Graham (n=17)

Figure 1. Patients’ Diagram Selection Process
II. research Design

The study has a total duration of 8 weeks, and during, the test group A were subjected to the usual care which included massaged, active and passive shoulder mobilization three times per week, the test group B than standard care involved in addition to a group modified program operating 45min duration of exercises based on the Graham method. At the beginning, in the middle (4 weeks) and the end (8 weeks) the program performed anthropometry to determine whether there identical sample in the division of each group, so an evaluation of fitness (flexibility, coordination) and quality of life (FACT B) with simultaneous recording of normal physical activity (BEACKE). The sequence of development of the study is presented in Figure 2.

III. test Description:

Specifically evaluated body height, body mass, body fat, the range of movement of the shoulders and the dynamic balance in accordance with the procedures which are then grown. Physical tests shall in particular were in the lead 5 minutes warming up on a stationary bike. Record level of physical activity: The evaluation was conducted by the Modified Baecke Questionnaire level of physical activity [17]. Quality of life: quality of life was assessed by the health questionnaire and daily activity (FACT-B). V. Statistical analysis of results was performed with the statistical package SPSS-20 and statistical test pair sample t test and independent sample t test. In particular, used the statistical test independent sample t test for weight, BMI, fat, VEACKE, FACT B and STAR TEST each team in every week separately and statistical test pair sample t test to compare the groups in the couple of weeks first-4 is and 1 to 8 weeks, with a certain level of statistical significance in p≤0,05.

The evaluation of patients after surgery is done by the Special physiotherapist of Evagogeiou section. Also responsible for the execution of the exercises was also responsible the physiotherapist of the department which was aware of the technical Graham.

There was blindness to the measurements in the evaluation of weeks. Study was a randomized controlled trial.
**Analysis of results:**

Body fat control of the effect of the usual care or additional application of Graham method in body fat of the patients showed no differences between the groups in this parameter ($p > 0.05$) in any evaluation phase throughout the intervention (Start Week 4, week 8). Also, it appears that application of the method of Graham 8 weeks led to a significant variation in body fat ($p > 0.05$) and, although unexpected, limited presented.

**Physical Mass**

The application of the standard of care in the body mass of patients (Group A), made no major differences in this parameter ($p > 0.05$) in any evaluation process throughout the duration of the operation (Start, week 4, week 8, however, it seems that the implementation of the Graham method (Group B) for 8 weeks result in reduced physical. BMI mass (body composition mass index). The application of usual care (Group) in body mass index (BMI) of patients resulted in a decrease of the index at the 8th week of intervention compared with baseline. In contrast, the additional application of Graham method (Group B) for 8 weeks did not appear to cause significant variation sto BMI ($p > 0.05$). No difference was also shown between the groups in this parameter ($p > 0.05$) in any evaluation phase throughout the intervention (Start, week 4, week 8).

**Physical activity level (Baecke Questionnaire)**

Control the effect of usual care or additional application with the Graham method As at patients’ physical activities (Tab.1), showed small differences increase physical activity in this parameter ($p > 0.05$) throughout the intervention (Start, 4th week, 8th week) but no significant differences between them (Table 2). Also, it seems that application of the Graham method for 8 weeks did not result in a significant variation in physical activities in relation to usual care ($p > 0.05$).

**Life Quality Level (Questionnaire FACT B)**

The application of (Group usual care) in the patients’ quality of life (Tab.1) is not brought about a significant increase of the eighth week intervention compared to baseline. In contrast, the additional application of the method Graham (Group B) for 8 weeks appears to cause a significant difference in improvement of quality of life ($113.28 \pm 19.23$) compared with the start ($95.51 \pm 29.15$) ($p > 0.05$). There were differences between the groups in this parameter during the whole duration of the intervention. Improving shoulder mobility and the two groups gradually from the 4th to 8th week with more increase in internal rotation in the usual care group. Test Improved balance capacity observed in both groups.
Table 1
Differences (D) to the anthropometric characteristics between the individual measurements (4th week - Start week 8 - week 4) in each group as well as between the usual care group (A) and Graham intervention (B).

<table>
<thead>
<tr>
<th></th>
<th>Usual Care (A) x±sd (min, max)</th>
<th>P value</th>
<th>Usual Care + Graham (B) x±sd (min, max)</th>
<th>P value</th>
<th>Group B vs Group A x±sd (min, max)</th>
<th>P value</th>
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</thead>
<tbody>
<tr>
<td><strong>body Fat</strong></td>
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<tr>
<td>4th week - start 8th week - start</td>
<td>0.50±3.22% (-1.00, 2.02%)</td>
<td>0.489</td>
<td>-0.90±2.93% (-2.4, 0.60%)</td>
<td>0.223</td>
<td>1.41±3.13 (-0.66, 3.48%)</td>
<td>0.176</td>
</tr>
<tr>
<td>8th week - start</td>
<td>1.62±3.07% (0.18, 3.05%)</td>
<td>&lt;0.029</td>
<td>0.48±2.33% (-0.71, 1.69%)</td>
<td>0.401</td>
<td>1.13±2.78 (-0.71, 2.98%)</td>
<td>0.222</td>
</tr>
<tr>
<td><strong>weight</strong></td>
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<tr>
<td>4th week - start 8th week - start</td>
<td>0.09±1.37kg (-0.55, 0.74kg)</td>
<td>0.761</td>
<td>-0.45±2.14 (-1.56, 0.64kg)</td>
<td>0.391</td>
<td>0.55±1.76 (-0.63, 1.74kg)</td>
<td>0.350</td>
</tr>
<tr>
<td>8th week - start</td>
<td>-0.27±1.74kg (-1.09, 0.54kg)</td>
<td>0.491</td>
<td>-2.39±7.71 (-6.36, 1.57kg)</td>
<td>0.219</td>
<td>2.11±5.40 (-1.47, 5.71kg)</td>
<td>0.240</td>
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<td><strong>(BMI)</strong></td>
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<tr>
<td>4th week - start 8th week - start</td>
<td>-1.17±4.46kg/m² (-3.26, 0.91 kg/m²)</td>
<td>0.253</td>
<td>-0.29±1.06 kg/m (-0.84, 0.25 kg/m²)</td>
<td>0.273</td>
<td>-0.88±3.65 (-3.13, 1.37) kg/m²</td>
<td>0.432</td>
</tr>
<tr>
<td>8th week - start</td>
<td>-1.00±4.59 kg/m² (-3.14, 1.14 kg/m²)</td>
<td>0.342</td>
<td>-0.23±0.90 kg/m (-0.69, 0.22 kg/m²)</td>
<td>0.298</td>
<td>-0.76±3.41 (-3.06, 1.53) kg/m²</td>
<td>0.504</td>
</tr>
</tbody>
</table>

* Significant difference from baseline (p <0.05)
# Important difference compared with the usual care group (p <0.05)
### Table 2

*Differences (D) in Physical Activity and Quality of Life among individual measurements (4th week - Start, week 8 - week 4) in each group as well as between the usual care group (A) and Graham intervention (B).*

<table>
<thead>
<tr>
<th></th>
<th>Usual Care (A) x±sd (min, max)</th>
<th>P value</th>
<th>Usual Care + Graham (B) x±sd (min, max)</th>
<th>P value</th>
<th>Group B vs Group A x±sd (min, max)</th>
<th>P value</th>
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<tr>
<td><strong>(Beacke)</strong></td>
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<tr>
<td>4th week - start</td>
<td>0.07±0.99 (-0.38, 0.54)</td>
<td>0.736</td>
<td>0.12±1.03 (-0.40, 0.65)</td>
<td>0.623</td>
<td>-0.04±0.99 (-0.72, 0.62)</td>
<td>0.883</td>
</tr>
<tr>
<td>8th week - start</td>
<td>0.11±1.26 (-0.42, 0.71)</td>
<td>0.677</td>
<td>0.38±1.14 (-0.19, 0.97)</td>
<td>0.179</td>
<td>-0.26±1.20 (-1.07, 0.54)</td>
<td>0.504</td>
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<td><strong>(FACT B)</strong></td>
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<tr>
<td>4th week - start</td>
<td>1.45±10.04 (3.25, 6.15)</td>
<td>0.526</td>
<td>10.38±12.91 (3.74, 17.02)</td>
<td>&lt;0.004</td>
<td>-8.93±12.15 (-16.59, -1.26)</td>
<td>&lt;0.024#</td>
</tr>
<tr>
<td>8th week - start</td>
<td>0.28±11.97 (-5.31, 5.88)</td>
<td>0.917</td>
<td>17.77±15.98 (9.55, 25.99)</td>
<td>&lt;0.000</td>
<td>-17.49±16.34 (-26.83, -8.14)</td>
<td>&lt;0.001#</td>
</tr>
</tbody>
</table>

* Significant difference from baseline (p <0.05)

# Important difference compared with the usual care group (p <0.05)
Testing research hypotheses:

- Accept Alternative hypothesis H1: The exercise by the combination of ordinary and extra care Graham intervention bring improvements in quality of life through the (Questionnaire FACT B) mastectomy in women compared to usual care as the only intervention.

- Accept the null hypothesis Ho: The exercise by combining ordinary care and additional Graham intervention does not result in greater improvement in dynamic balance capacity (Star Test) women mastectomy than the usual care as the only intervention.

- Accept the null hypothesis Ho: The exercise by combining ordinary care and additional Graham intervention does not result in greater improvement in range of motion of the shoulder girdle (Goniometric) and physical activity in women mastectomy than the usual care as the sole intervention.

DISCUSSION

This investigation showed how the technique graham contributes to improving the quality of life. Also improving balance capacity of the lower parts with respect to improving shoulder mobility [18,19, 20, 21]. An Improving shoulder mobility and the two groups gradually from the 4th to 8th week with more increase in internal rotation in the usual care group. Quality of life from the present study revealed at the end of two months, quality of life (Table 1 and 2) by adding the usual care of Graham method (group B). The results of the study week showed improvement from baseline Graham 105.89 ± 22.02, p value <0.05, for 8 weeks also appears to make a significant difference in improvement of quality of life (113.28 ± 19.23) compared to baseline (95.51 ± 29.15). (P> 0.05). Performance in the dynamic balance in the Star Test Improved balance capacity observed in both groups after a survey by SEPT test can also be used in closed kinetic chain rehabilitation process as proved how can be a powerful means of bringing about the rebirth neuromuscular control after damage [22, 23] that in the case of this study concerned the traffic education upper limb and trunk technical graham. This verifies the capability of improving the balancer capacity of the lower end with respect to improving mobility upper torso where modern studies [18,19, 20, 21], showed the test star correlation with coordination of the shank and the dynamic stability and the effect of core failure associated with fatigue and dynamic balance in an upright position or even shoulder pain or elbow seem to affect the balance in the lower limbs [18,19, 20, 21]. Shoulder Mobility the investigation revealed improve shoulder mobility all movement tracks in two groups gradually from the
4th to 8th week to further increase the internal rotation in the usual care group and this perhaps because the technique Graham focuses on upper limb exercises with external rotation. Studies [24] stated how the shoulder abduction and shoulder flexion is limited and the outer rotation associated with the kidnapping, confirming the results of the present study where we improve the mobility of shoulder and the two groups the continuous mobilization. This restriction appears to be caused by traction exerted pain cavity axillary scar of the chest wall and the upper limbs. May postoperative mastectomy, during chemotherapy and after irradiation there is pain and muscle spasms throughout the cervical region of the shoulder of the levator of the major and minor round and infraspinatus muscle as also show sensitivity at palpation, limiting the active movement of the shoulder [25]. And while it is given the limitation gearing shoulder after mastectomy [26], pain and loss of arm strength occur regardless of the type of surgical operation [26, 27] from our study revealed improvement of the movement of the operated shoulder and healthy in flexion, extension, abduction and out but turning the internal rotation seems to be more improved in the A group [28, 18]. According to studies [29], the reasons for the difference of shoulder movement due to either breast asymmetry due to the intervention or the fear of abdominal scar. Along the way people after gaining range of motion means the usual care can be integrated together in group projects, weekly routine. The limitations in the present study were to modify the program of exercises of Graham technics where adapted to novice levels as described by Graham in intermediate level novice dancers, but merely exercises which need more familiarization time [11, 29, 30]. The weakness of this research on the Graham method involved little familiarization time with the program. Limiting factor, it was also a small intervention holding room, which was modified to serve 17 patients in group exercise, as required for such activities room properly configured with parquet, mirrors, so there is comfort in traffic. As therapeutic interventions ormonoexartisis as zoladex, femara is long-term use may need more individual control exercise on this factor as a longer follow-margin beyond two months.

REFERENCES


2. Boehm, K, Holger Cramer, Staroszynski, T. and Ostermann, T. Arts Therapies for Anxiety, Depression, and Quality of Life in Breast Cancer Patients: A Systematic


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