Evaluation And Re-Evaluation Of Post-Mastectomy Pain Syndrome By Breast Cancer Edge Task Force Outcomes: Clinical Measures Of Pain After Pain Management Protocol Of Physiotherapy

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Abstract

Introduction In many societies, the prevalence of chronic pain following breast cancer therapy ranges from 25% to 60%. Patients undergoing surgery may be more likely to experience chronic, often neuropathic pain after surgery due to the mechanism of post-mastectomy pain syndrome (PMPS), pain sensitivity, and/or central sensitization. PMPS is evaluated and reevaluated using the Evaluation Database to Guide Effectiveness (EDGE) task force outcome measurements. Methods. 10 female patients from a Baheya Center for Early Detection and Treatment of Breast Cancer facility were diagnosed with PMPS following mastectomy. The purpose of this study is to evaluate PMPS in patients who have had mastectomy before and after a pain treatment protocol of six physiotherapy sessions, followed by follow-up.

Results. A total of 10 women answered the questionnaires and showed changes in patient feeling is heavy sensation according to the McGill pain Questionnaire-short form (MPQ-S.F) results (p-value = 0.02), and in patient's activities of daily living (ADLs) disability is recreation according to the Pain disability index (PDI) results (p-value = 0.02), and in neuropathic signs and symptoms is tingling sensation according to the Neuropathic pain scale (NPS) results (p-value = 0.02), and in patient's physical well-being is a feeling of nausea (p-value = 0.03) and spending time in bed (p-value = 0.04).

Conclusions. According to this study, there have been initial improvements in the feeling of heaviness, neuropathic symptoms like tingling and discomfort in the hands and feet, physical wellbeing, and facial expressions.

Trial Registration. NCT05458154

Keywords. Breast cancer; Post Mastectomy Pain Syndrome; EDGE Task Force.

INTRODUCTION

Since the middle of the 2000s, the incidence of female breast cancer has been gradually rising by 0.5% annually, which can be at least partially linked to the continuous drop in fertility and the rise in obesity [1]. In other societies, the prevalence of chronic pain following breast cancer therapy ranges from 25% to 60%, according to the research. [2].About 80–90% of women with early-stage breast cancer survive for five years, compared to 24% of women with more advanced breast cancer in most developed nations. [3]. In addition to younger age, preoperative discomfort, intercostobrachial nerve damage during surgery, radiotherapy, as well as psychological morbidities, are among the most often reported factors linked with chronic pain after breast cancer treatment, according to a systematic analysis analysing risk factors for the occurrence of persistent pain after surgery. [4].

One of the cornerstones of first breast cancer treatment may be surgery. Although improvements in surgical technique have lessened normal tissue damage, discomfort and functional limitation still persist after therapy. [5]. According to **Assa** [6] persistent pain may also be caused by injury to the intercostobrachial nerve (ICBN), which originates from the lateral cutaneous branch of the second intercostal nerve and enters the axilla by puncturing the second intercostal space and the musculus serratus anterior in the midaxillary line.

After performing breast surgery, a chronic pain condition called post-mastectomy pain syndrome (PMPS), which is often neuropathic, may develop [7]. Surgery for breast cancer may frequently result in complications, including pain [8]

The first reports of persistent pain following mastectomy appeared in the 1970s and were described as a dull, burning, and throbbing pain in the anterior chest, arm, and axilla that was made worse by shoulder girdle movement. [9].

According to the International Association for the Study of Pain (IASP), chronic pain is any discomfort that lasts longer than the typical three-month recovery period. Three criteria were used to classify chronic pain as PMPS: the kind, location, and timing of the pain. To ensure comparability, the PMPS criteria were the same at both time points. The same side of surgery, the chest wall, the axilla, or the ipsilateral arm were listed as the pain location.[9].

Pain should often diminish as the lesion heals or as the hazard no longer exists. However, pain might be categorised as chronic if it continues following the normal tissue healing process.[10].

However, neuropathic pain (NP), which is described by the IASP as "pain arising as a direct consequence of a lesion or disease affecting the somatosensory system," will be a significant source of disability and distress in breast cancer patients who are already weakened by the medical and psychological stressors associated with diagnosis and treatment and has been regarded as the most significant cause of chronic breast pain. [11].

Radiating pain, numbness, pins and needles, burning or stabbing sensations, paresthesia, and hypersensitivity close to the surgical site are common symptoms of neuropathic pain after breast surgery. [12].

Lymphedema, neuropathy/pain, exhaustion, menopausal symptoms, weight gain, and other physical and psychological difficulties and sequelae are experienced by a significant part of breast cancer survivors (fear of recurrence, fear of death, change in body image, change in relationship, financial stress, etc.). These issues may develop while receiving treatment or linger for a long time after it has ended.[13].

The Task Force's objective was to provide physical therapists with a thorough set of outcome measures that will be used with a specific patient population. [14]

Task force cancer EDGE Rating Scale is described in Table 1.

Table 1: Cancer EDGE Rating Scale [14]

Rate	Recommendation	Description
4	Highly Recommend	Highly recommended; the outcome has excellent psychometric properties and clinical utility; the measure has been used in research on individuals with or post-breast cancer.
3	Recommend	Recommended; the outcome measure has good psychometric properties and good clinical utility; no published evidence that the measure has been applied to research on individuals with or post breast cancer.
2A	Unable to Recommend it at this time	Unable to recommend at this time; there is insufficient information to support a recommendation of this outcome measure; the measure has been used in research on individuals with or post-breast cancer.
2B	Unable to Recommend it at this time	Unable to recommend at this time; there is insufficient information to support a recommendation of this outcome measure; no published evidence that the measure has been applied to research on individuals with or post breast cancer.
1	Do not Recommend	Poor psychometrics &/or poor clinical utility (time, equipment, cost, etc.)

The aim of the Breast Cancer EDGE Task Force is to offer physiotherapists with a comprehensive set of outcome measures that can be applied to a specific patient population, to evaluate post-mastectomy pain syndrome (PMPS) (a chronic neurological pain) in patients who have undergone mastectomy with a focus on pain, lymphedema, and tiredness. The question "Have you ever suffered pain owing to your present disease?" was used to screen patients in accordance with the Brief Pain Questionnaire. to determine whether the patient's belief is correct and to rule out other potential causes of pain (such as medicine, surgery, radiation, or a prosthetic device) in addition to the disease. [15].

SUBJECT AND METHODS

Subjects

The pain management protocol has been reviewed and approved by the Baheya Research Center, and therefore the Baheya research ethics committee (BEC) with IRB Protocol Number (202103030005) within which a complete of 10 female patients, whose age was ≤ 18, their characteristics (Marital status, Occupation, Job-status) are described in Table 2.

Table 2: Patient characteristics (Marital status, Occupation, Job-status).		
Studied variable	**N=10**	**No (%)**
Marital status:		
Married	9	(90.0)
single	1	(10.0)
Occupation:		
commercial	2	20.0
education	1	10.0
not comp	2	20.0
optical	1	10.0
physical	1	10.0
social w	1	10.0
teacher	2	20.0
Job-status:		
full time	3	30.0
home make	5	50.0
part-time	1	10.0
retired	1	10.0

The Baheya Centre for Early Detection and Treatment of Breast Cancer organization served as the provider for participants. Patients met the criteria for inclusion if they had acquired post-mastectomy pain syndrome (PMPS) in the past and had more than three months of postoperative pain. After being assessed using questionnaires and other pain assessment techniques, they underwent a six-session physiotherapy program designed specifically to relieve pain before being examined again. All of the women signed written consent papers in both Arabic and English.

Inclusion criteria

Chronic pain lasting longer than three months, confined to the axilla or chest wall Pain certainly begins following surgery or radiation treatment, Pain is constant, not varying, The patient has undergone radiation therapy for at least 6 weeks..

Exclusion criteria

Less than a year had passed since the patient's diagnosis, and the time after their operation was less than six months, history of ipsilateral breast cancer, pregnancy, nervous system disease, and psychiatric illness.

Questionnaires

For clinical and research application in people with a cancer diagnosis as listed in **Table 3**, seven of the 22 pain measures showed adequate psychometric characteristics and clinical value.

Table 3. Outcome Measures Sorted by Task Force Rating	
4 Highly Recommended:	
McGill Pain Questionnaire–Short Form	is comprised of 3 parts: 15-word descriptors that describe two dimensions of pain: (sensory and affective), Pain Intensity scale, VAS.[16]
Numeric Rating Scale	the most ordinarily used one is the 11-item version, the rating of pain from (0 – 10) where (0 = no pain) and (10 = the foremost severe pain). [17]
Visual Analog Scale	is a 10 cm-long horizontal line with the words “no pain” at one end and “pain as bad as it can be” at the other. [17]
3 Recommended:	
Brief Pain Inventory	There’s a complete of 32 items on the BPI, it describes pain interferes with 7 domains of function within the last 24 hours[18].
Brief Pain Inventory–Short Form (modified BPI)	is a tool developed specifically to be used in individuals with cancer [19].
McGill Pain Questionnaire (MPQ)	is a unique measure because it assesses pain using a multidimensional approach based on the gate control theoretical framework [19]. contains three major classes of word descriptors: sensory, affective, and evaluative[20].
Pain Disability Index (PDI)	is a multidimensional tool, that contains seven categories: family/home responsibility, recreation, social activity, occupation, sexual behavior, self-care, and life support activity. The disability level rating scale is from 0 = no disability to 10 = total disability[21].

2 Recommended as reasonable to use	**1 Not recommended:**
• Faces Pain Scale • Neuropathic Pain Scale • Leeds Assessment of Neuropathic Signs & Symptoms • Pain-Detect Questionnaire • Pain Global Rating of Improvement • Pain Thermometer • Neuropathic Pain Scale for Chemotherapy-induced Neuropathy • Patient Pain Questionnaire	• American Pain Society Patient Outcome Questionnaire • Pain Quality Assessment Scale • West Haven Yale Multidimensional Pain Inventory

Participants underwent physical therapy, which is essential to maintain flexibility, strength, range of motion, and regular neuromuscular recruitment. When mobility, ADL performance, or vocational capacity are impacted, patients' attempts to lessen their pain through avoidance behaviours can seriously compromise function. Transcutaneous electrical nerve stimulation (TENS), topical cold, and desensitization procedures are a few analgesic modalities that are helpful during physical therapy session.

Exercises prescribed by a physical therapist can reduce pain and stiffness, restore movement to the arm and shoulder to keep it flexible (especially after radiation therapy), lessen the effects of surgery and encourage return to normal activities, reduce the risk of lymphedema or swelling in the affected arm, increase aerobic (heart-lung) capacity, improve breathing, and encourage use of the affected arm as normally as possible (combing hair, bathing, getting dressed, and eating). Lifting heavy objects requires caution.

Open and close your hand 15–25 times while performing the hand squeeze exercise with the affected arm lifted. Repeatedly bend and straighten the elbow. Twice contact the shoulder on the same side with the bent elbow before touching the opposing shoulder with the bent elbow. Raise your arms as high as you can without yanking on drains, then drop them and raise them again many times. (Repeat this three to four times daily)

Take a slow, deep inhale at least six times daily while lying on your back. Then, let it out slowly. Small hand weights are initially used to enhance strength, and these weights are gradually raised over time [22].

After six sessions of physiotherapy aimed at pain management and evaluated by EDGE task force outcome assessments, participants got follow-up for re-evaluation.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study was formally approved and supported by Baheya-Research Ethics Committee, Giza – Egypt. The study has been registered at www.clinicaltrials.gov with the identifier NCT05458154. The anonymized data that do not contain any personally identifiable information from any sources implies that the informed consent is not applicable.

CONSENT FOR PUBLICATION

The study was formally approved by the ethical committee of Baheya foundation for Early Detection and Treatment of Breast Cancer with the following number: 202103030005.

RESULTS

Brief Pain Inventory questionnaire (Long-form and short form) (BPI-L. F, S.F)

There was no significant difference between pre-and post-applying pain relief sessions in pain rating at worst, least, average, and at the same time of session.

There was no significant difference between pre-and post-applying pain relief sessions in pain interference during ADLs as described in Table 4.

Table 4. Outcomes Measures at evaluation and re-evaluation of Brief Pain Inventory questionnaire (Long-form and short form) (LF-SF).

	Pre		post
Marital status	No	(%)	---
Married	9	90.0%	
single	1	10.0%	
Occupation	No	(%)	
Commercial field	2	20.0	
Educational field	1	10.0	
not complete education	2	20.0	
optical field	1	10.0	
physical education	1	10.0	
social worker	1	10.0	
teacher	2	20.0	
Job-status	No	(%)	
full time	3	30.0	
homemaker	5	50.0	
part-time	1	10.0	
retired	1	10.0	
Have you ever had pain due to your present disease?	No	(%)	
Yes	1	10.0	
When you first received your diagnosis, was pain one of your symptoms	No	(%)	
Yes	1	10.0	

Have you had surgery in the past month?	No	(%)	
Yes	2	20.0	
Have you had pain other than these everyday kinds of pain during the last week?	No	(%)	
Yes	8	80.0	
Did you take pain medications in the last 7 days?	No	(%)	
Yes	5	50.0	
I feel I have some form of pain now that requires medication every day.	No	(%)	
Yes	5	50.0	
Rate your pain by circling the one number that best describes your pain at its worst in the last week.			
Median	6.0		6.00
Min-max	0.00- 10.00		0.0-10.00
Rate your pain by circling the one number that best describes your pain at its least in the last week.			
Median	1.5		1.5
Min-max	0.0-6.00		0.0-6.00
Rate your pain by circling the one number that best describes your pain on the average			
Median	4.0		4.0
Min-max	0.00-7.00		0.00-7.00
Rate your pain by circling the one number that tells how much pain you have right now			
Median	3.0		3.0
Min-max	0.00-8.00		0.00- 7.00
What kinds of things make your pain feel better (for example, heat, medicine, rest)?	No	(%)	
hot show	1	10.0	
massage/	1	10.0	
pain med	1	10.0	
Rest /sleep	3	30.0	
Rest in the supine position	1	10.0	
rest/pain	1	10.0	
sleep /rest	2	20.0	
What kinds of things make your pain worse (for example, walking, standing, lifting)?	No	(%)	
during exercises	1	10.0	
home working	2	20.0	
lifting	1	10.0	
standing	1	10.0	
walking	2	20.0	
working	1	10.0	
wrong movement	2	20.0	
What treatments or medications are you receiving for pain?	No	(%)	
cetal	1	10.0	
Nebadol	1	10.0	
NO	4	40.0	
panadol	4	40.0	
In the last week, how much relief have pain treatments or medications provided? Please circle the one percentage that most shows how much relief you have received	Median (min-max) 95.0(40-100)		
if you take pain medication, how many hours does it take before the pain returns	No	(%)	
I don't	4	40.0	
1 hour	6	60.0	
I believe my pain is due to:	No	(%)	
The effects of treatment	7	70.0	
My primary disease	0	0.0	
A medical condition unrelated to my primary disease	4	40.0	
during the past week, the pain has interfered with your:	Median (min-max)		Median (min-max)
General Activity	9.0(2.0-10.0)		8.0(1.0-10.0)
Mood			7.0(3.0-10.0)
Walking ability	9.0(5.0-10.0)		6.0(0.0-9.0)
Normal work			9.0(0.0-10.0)
Relation to people			0.0(0.0-8.0)

Sleep **Enjoyment of life**	8.0(0.0-10.0) 9.0(0.0-10.0) 0.0(0.0-9.0) 8.0(0.0-10.0) 7.0(0.0-10.0)		6.0(0.0-9.0) 5.0(0.0-10.0)
I prefer to take my pain medicine: **Median (min-max)**	2.0(1.0-3.0)		
I take my pain medicine (in 24 hours): **Median (min-max)**	1.0(1.0-3.0)		
Do you feel you need a stronger type of pain medication? **Yes**	No 2	(%) 20.0	
Do you feel you need to take more of the pain medication than your doctor has prescribed? Yes	No 2	(%) 20.0	
Are you concerned that you use too much pain medication? **Yes**	No 1	(%) 10.0	
Are you having problems with the side effects from your pain medication? **Yes**	No 1	(%) 10.0	
Do you feel you need to receive further information about your pain medication? **Yes**	No 1	(%) 10.0	
Other methods I use to relieve my pain include: (Please check all that apply) **cold /Relax** **Relax** **Relax/caffeine** **warm/cold** **warm/Relax**	No 1 3 1 1 4	(%) 10.0 30.0 10.0 10.0 40.0	
Medications not prescribed by my doctor that I take for pain are: **NO** **catafast** **Cetal** **ketofan** **melga** **panadol** **adol**	No 5 1 1 1 1 1 0	(%) 50.0 10.0 10.0 10.0 10.0 10.0 0.0	5 50.0 0 0.0 0 0.0 0 0.0 1 10.0 3 30.0 10.0

MC-GILL PAIN QUESTIONNAIRE (S.F)

There was a significant difference between pre- and post-applying pain relief sessions in heaviness sensation only (p-value = 0.02) as described in Table 5.

Table 5. Outcomes Measures at evaluation and re-evaluation of McGill pain Questionnaire (S.F)

Studied variable	Pre	post	*p*-value
Throbbing **median** **min-max**	2.0 0.0-2.00	1.0 0.0-3.00	0.70
Shooting **median** **min-max**	1.0 0.0-3.00	0.0 0.0-3.0	0.18
Stabbing **median** **min-max**	1.0 0.0-3.0	1.0 0.0-3.00	0.56
Sharp **median** **min-max**	2.0 0.0-3.00	2.0 0.0-3.00	0.31
Crambing **median** **min-max**	2.0 0.0-3.00	2.0 0.0-3.00	0.18

Gnawing **median** **min-max**	2.0 0.0-3.00	2.0 0.0-3.00	1.0
Hot-burning **median** **min-max**	2.0 0.0-3.00	1.0 0.0-3.00	0.41
Aching **median** **min-max**	2.0 1.0-3.00	2.0 0.0-3.00	0.56
Heavy **median** **min-max**	3.0 0.0-3.00	2.0 0.0-3.00	0.02
Tender **median** **min-max**	2.0 0.0-3.00	1.0 0.0-3.00	0.25
Splitting **median** **min-max**	2.0 0.0-3.00	1.0 0.0-3.00	0.15
Tiring-exhausting **median** **min-max**	2.0 0.0-3.00	2.0 0.0-3.00	0.31
Sickening **median** **min-max**	2.0 0.0-3.00	2.0 0.0-3.00	0.08
Fearful **median** **min-max**	1.0 0.0-3.00	1.0 0.0-3.00	0.56
Punishing-cruel **median** **min-max**	1.0 0.0-3.00	1.0 0.0-3.00	0.65
Visual analog (VAS) **median** **min-max**	5.0 0.0-7.0	5.0 0.0- 9.0	0.71
Present Pain Intensity (PPI) **median** **min-max**	3.0 0.0-5.0	2.5 0.0-5.0	0.34

PAIN DISABILITY INDEX (PDI)

There was a significant difference between pre- and post-applying pain relief sessions in recreation only (p-value = 0.02) as described in Table 6.

Table 6. Outcomes Measures at evaluation and re-evaluation of Pain disability index (PDI)

Studied variable	Pre	post	p-value
family and home responsibilities **median** **min-max**	9.0 2.00-10.00	8.0 1.0-10.0	0.21
Recreation **median** **min-max**	9.5 0-10.00	6.5 0.0-10.0	0.02
social activity **median** **min-max**	0.0 0.0-9.0	0.0 0.0-8.0	0.65
Occupation **median** **min-max**	9.5 0.0-10.00	9.0 0.0-10.0	0.85
sexual behavior **median** **min-max**	0.0 0.0-0.0	0.0 0.0-0.0	1.0
self-care **median** **min-max**	5.0 0.00-10.00	5.0 0.0-10.00	0.65
life-support activity **median** **min-max**	7.5 0.0-10.0	7.0 0.0-10.00	0.25
Total score **median** **min-max**	37.0 25.0-53.0	32.5 18.0-54.0	0.33

NEUROPATHIC PAIN SCALE (NPS)

There was a significant difference between pre- and post-applying pain relief sessions in tingling pain and the Total discriminant function score (p-value = 0.02) as described in Table 7

Table 7. Outcomes Measures at evaluation and re-evaluation of Neuropathic pain scale (NPS)			
Studied variable	Pre	post	*p*-value
1sf. Numbness: median min-max	70.0 0.0-100.0	55.0 0.0- 70.0	0.29
2sf. Tingling pain median min-max	80.0 0.0-100.0	60.0 0.0- 100.00	0.02
3sf. Increased pain due to touch median min-max	30.0 0.0- 100.0	20.0 0.0- 80.0	0.27
Total discriminant function score median min-max	1.53 -1.30 - 2.90	0.89 -1.30 - 1.65	0.02
	No %	No %	
Burning Yes	6 60.0	5 50.0	1.0
Painful cold Yes	2 20.0	1 0.0	0.5
Electric shocks Yes	6 60.0	4 40.0	0.5
Tingling Yes	9 90.0	6 60.0	0.5
Pins and needles Yes	7 70.0	6 60.0	0.37
Numbness Yes	8 80.0	6 60.0	1.0
Itching Yes	8 80.0	6 60.0	0.62
Hypesthesia to touch Yes	8 80.0	6 60.0	0.5
Hypesthesia to prick Yes	7 70.0	5 50.0	0.5
Brushing Yes	6 60.0	5 50.0	0.5
Pre total score10/10 median min-max	7.5 1.0 - 10.00	5.5 1.0 - 9.0	1.0

FACT GOG-NTX

There was a significant difference between pre- and post-applying pain relief sessions in a feeling of nausea (p-value =0.03).

There was a significant difference between pre- and post-applying pain relief sessions in spending time in bed (p-value =0.04).

There was a significant difference between pre-and post-applying pain relief sessions in a feeling of numbness or tingling and discomfort in hands (p-value =0.03).

There was a significant difference between pre- and post-applying pain relief sessions in a feeling of numbness or tingling and discomfort in the feet (p-value =0.05) as described in Table 8.

Table 8. Outcomes Measures at evaluation and re-evaluation of Fact GOG-NTX			
Studied variable	**Pre**	**post**	***p*-value**
Physical well being			
GP1: **median** **min-max**	 4.0 2.0-4.0	 3.0 1.0-4.0	0.10
GP2: **median** **min-max**	 3.0 0.0-4.0	 2.0 0.0-3.0	0.03
GP3: **median** **min-max**	 4.0 1.0-4.0	 4.0 1.0-4.0	0.18
GP4: **median** **min-max**	 3.0 1.0-4.0	 3.0 1.0-4.0	0.08
GP5: **median** **min-max**	 0.0 0.0-3.0	 0.0 0.0-3.0	1.0
GP6: **median** **min-max**	 3.0 1.0-4.0	 2.0 1.0-3.0	0.10
GP7: **median** **min-max**	 3.0 2.0-4.0	 3.0 1.0-4.0	0.04
Social- Family well being			
GS1: **median** **min-max**	 3.0 1.0-4.0	 3.0 1.0-4.0	0.31
GS2: **median** **min-max**	 4.0 1.0-4.0	 4.0 1.0-4.0	0.31
GS3: **median** **min-max**	 4.0 1.0-4.0	 4.0 1.0-4.0	1.0
GS4: **median** **min-max**	 4.0 2.0-4.0	 4.0 2.0-4.0	1.0
GS5: **median** **min-max**	 4.0 3.0-4.0	 4.0 3.0-4.0	1.0
EMOTIONAL WELL-BEING			
GE1: **median** **min-max**	 2.0 1.0- 4.0	 2.0 1.0- 4.0	1.0
GE2: **median** **min-max**	 4.0 2.0- 4.0	 4.0 2.0- 4.0	1.0
GE3: **median** **min-max**	 0.0 1.0- 4.0	 0.0 0.0- 4.0	1.0
GE4: **median** **min-max**	 4.0 2.0- 4.0	 4.0 1.0- 4.0	0.19
GE5: **median** **min-max**	 0.0 0.0- 1.0	 0.0 0.0- 1.0	1.0
GE6: **median** **min-max**	 0.0 0.0- 2.0	 0.0 0.0- 2.0	1.0
FUNCTIONAL WELL-BEING			
GF1: **median** **min-max**	 0.0 0.0- 3.0	 1.0 0.0- 4.0	0.10
GF2: **median**	 0.0	 0.0	0.31

min-max	0.0- 4.0	0.0- 4.0	
GF3: **median** **min-max**	1.0 0.0- 4.0	0.0 0.0- 4.0	0.31
GF4: **median** **min-max**	4.0 3.0- 4.0	4.0 3.0- 4.0	1.0
GF5: **median** **min-max**	0.0 0.0- 4.0	0.0 0.0- 4.0	0.78
GF6: **median** **min-max**	0.0 0.0- 1.0	0.0 0.0- 1.0	1.0
GF7: **median** **min-max**	0.0 0.0- 3.0	0.0 0.0- 3.0	1.0
ADDITIONAL CONCERNS			
NTX1: **median** **min-max**	3.0 0.0- 4.0	2.0 0.0- 3.0	0.03
NTX 2: **median** **min-max**	3.0 0.0- 4.0	2.0 0.0- 3.0	0.05
NTX 3: **median** **min-max**	3.0 0.0- 3.0	2.0 0.0- 3.0	0.03
NTX 4: **median** **min-max**	3.0 0.0- 4.0	2.0 0.0- 3.0	0.05
NTX 5: **median** **min-max**	3.0 0.0- 4.0	2.0 0.0- 3.0	0.06
HI12: **median** **min-max**	2.0 1.0- 4.0	2.0 1.0- 4.0	0.31
NTX 6: **median** **min-max**	0.0 0.0- 3.0	0.0 0.0- 2.0	0.15
NTX7: **median** **min-max**	0.0 0.0- 3.0	0.0 0.0- 2.0	0.15
NTX 8: **median** **min-max**	2.0 0.0- 4.0	0.0 0.0- 4.0	0.06
NTX 9: **median** **min-max**	3.0 0.0- 4.0	1.0 0.0- 4.0	0.06
AN6 **median** **min-max**	3.0 0.0- 4.0	3.0 0.0- 4.0	0.15

WONG-BAKER FACES A PAIN SCALE

There was a significant difference between pre- and post-applying pain relief sessions on the face expressions scale (p-value =0.01) as described in Table 9.

Table 9. Outcomes Measures at evaluation and re-evaluation of Wong-baker faces a pain scale

	Pre	**Post**	**p-value**
median **min-max**	4.0 0.00- 8.00	2.0 0.00- 4.00	0.01

DISCUSSION

Several different clinical measures of pain are available to be used within the cancer population. As concluded by **April** (**2015**),it was identified that the VAS, NRS, Pressure Pain Threshold, MPQ, MPQ – SF, PDI, BPI, and BPI – SF are highly recommended to be used within the breast cancer population[23]. According to (**Borland et al. 2007**), the VAS,

NRS, and Pressure Pain Threshold are examples of unidimensional techniques that simply quantify suffering intensity without examining the nature or effects of that pain [24]

In accordance with **(Levangie et al.2013)** the NRS measure has been validated in populations suffering from chronic low back pain, musculoskeletal discomfort, cancer, and particularly breast cancer. The EDGE criteria for the oncology section rate a measure as "highly recommend"[25].

PAIN QUALITY MEASURES

The MPQ has been validated in the diagnosis of breast cancer among other diseases. About ten research projects including people with breast cancer have employed the MPQ.A variety of pain disorders, including pain from metastatic cancer, have been assessed for pain using the MPQ-SF, which has been validated [26]. Over ten research looking at breast cancer-stricken women employed the MPQ-SF.

COMBINED PAIN INTENSITY AND INTERFERENCE MEASURE

The BPI- is a multimodal scale that asks questions about pain severity and function-related pain interference. The BPI consists of a total of 32 elements. People rank the worst, least, average, and present degree of their discomfort (including the last 24 hours). The BPI-SF assesses the degree of pain as well as how it affects daily functioning. [27].

LIMITATIONS

The main limitation of this study consists of the relatively small sample of patients we enrolled. The small sample size, for instance, prevents us to analyze the axillary surgery clearance influence on the outcome of neuropathy and limits the external validity of our findings. However, we also believe that this small and homogeneous group of patients probably improved the quality of the data.

CONCLUSION

This study demonstrates initial improvements in the patient's heaviness sensation based on the McGill Pain Questionnaire (S.F), in ADLs recreation based on the Pain Disability Index, in tingling sensation based on the Neuropathic Pain Scale (NPS), in the patient's sense of nausea and time spent in bed, and in an extremely numb or tingly and uncomfortable feeling in hands and feet after 6 pain relief sessions.

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No author has any financial interest or received any financial benefit from this research.

CONFLICT OF INTEREST:

Authors state no conflict of interest.

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