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# Effects Of Baduanjin On Shoulder Pain And Range Of Motion In Postoperative Breast Cancer Survivors

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## Abstract

Purpose: To evaluate the effect of Baduanjin on shoulder pain and range of motion in breast cancer survivors.

Methods: A randomized controlled trial was conducted between October 2021 and December 2021 in China. Patients with cancer invading unilateral breast and stable disease for at least 6 months after radical resection were recruited, and non-inclusive factors were excluded, including cancer recurrence, malignant transformation, deep vein thrombosis, heart failure, fracture, upper limb third-degree edema, etc. 61 people were included and randomly divided into experimental group and control group, with 31 people in the experimental group and 30 people in the control group. In this study, Simple joint goniometer, Visual Analogue Scale(VAS) and Chinese version of the Disabilities of the Arm, Shoulder and Hand (DASH) were used to evaluate the joint range of motion, pain and upper limb function of patients. The experimental group used traditional Chinese Health Qigong Baduanjin for rehabilitation intervention; the patients in the control group were requested to maintain their original physical activity. Both groups were observed for 12 weeks. All data were calculated and analyzed using SPSS 26.0.

Results: After 12 weeks of intervention, compared with the control group, the VAS score and DASH score of the experimental group were significantly decreased ($P < 0.01$), and the range of motion of flexion and external rotation of the affected shoulder joint was significantly improved ($P < 0.05$), and the range of adduction and internal rotation was significantly improved ($P < 0.01$).

Conclusion: Our findings indicate that Baduanjin can improve the range of motion of shoulder joints, improve upper limb function and relieve pain in patients after breast cancer surgery.

**Keywords:** Baduanjin; Breast cancer survivors; Randomized controlled trial; Qigong; Shoulder

## 1. Introduction

Breast cancer has the highest morbidity and mortality among female malignancies, with 24.2% and 15.0%, respectively (Bray et al., 2018). The development of surgery combined with radiotherapy and chemotherapy has greatly improved the survival rate of breast cancer patients, but it also brings a series of complications. More than half of women who have undergone treatment for invasive breast cancer will endure at least one injury to their upper extremities that last a long time. Lymphedema, pain, weakness, and limited shoulder range of motion (ROM) all contributed to a decline in upper limb function and quality of life (QOL) (Norman et al., 2009; Ridner, 2005; Smoot et al., 2010; Springer et al., 2010; Koca et al., 2020).

Rehabilitation exercises for patients with shoulder pain and limited mobility have been paid attention to earlier, and various attempts have been made. Aerobic exercise, resistance exercise, and strength training have all been shown to improve symptoms in patients(K. Johansson et al., 2014; Karin Johansson et al., 2013; Ramírez-Parada et al., 2022; Soriano-Maldonado et al., 2019; Wanchai & Armer, 2019). Among aerobic exercise, water sports, modified gymnastics, yoga and Pilates are all good choices, but each has its advantages and disadvantages. The research results of Johansson et al (2014)showed that water sports improved patients' flexion and external rotation by 36% and 57%, respectively, and the improvement effect was very significant. However, it is not suitable for all patients due to the limitations of temperature, sports venues, and personal exercise preferences. In a Japanese study(Arinaga et al., 2016), 23 patients who performed 10 minutes of modified gymnastics daily showed significant improvement in lymphedema-related symptoms and muscle strength after 6 months. But there are few similar studies, and reliability and validity remain to be further confirmed. After 8 weeks of yoga classes in 12 patients, both shoulder abductor strength and balance were enhanced(Loudon et al., 2016). Sener et al(2017) randomly divided 60 patients into Pilates training and routine groups. After 8 weeks, the severity of lymphedema in the intervention group was reduced, and the quality of life score and upper limb function score was higher than those in the control group, indicating that Pilates is more effective. However, yoga and Pilates training require higher flexibility of the patient's body and are not suitable for older patients.

Baduanjin is a kind of traditional qigong method created in ancient China. It integrates the knowledge of zang-fu meridians, yin-yang and five elements, rehabilitation medicine, biomechanics and other knowledge of traditional Chinese medicine (L. Zou et al., 2017). In traditional Chinese medicine theory, the Baduanjin exercise uses natural energies to balance the coordination of the body, breathing, energy and mind with eight simple movements (Koh et al., 1982). As far as movements are concerned, it belongs to moderateintensity aerobic exercise. The movements are derived from daily life and are easy to understand and accept.

For the survivors of breast cancer surgery, there is almost no burden on the difficulty, and basically, all the movements can be done easily. As far as the exercise load is concerned, the patient can complete the personalized exercise amount according to

his situation. As far as breathing is concerned, Health-Qigong Baduanjin focuses on natural breathing, which is conducive to regulating the emotional state of breast cancer survivors. As far as the coordination of music and action is concerned, exercising under the rhythm of soothing music is conducive to relaxing the body and mind, venting negative emotions, obtaining mental pleasure, and helping to improve sleep quality and sleep state (Liao et al., 2015). From a theoretical point of view, Health-Qigong Baduanjin contains rich theoretical knowledge of traditional Chinese medicine. It is not difficult to know from the name that each movement corresponds to an important body part, which can guide practitioners to exercise purposefully. From the perspective of practice conditions, the exercise process of Health-Qigong Baduanjin can be carried out within 1 square meter per capita and in a place with good ventilation, which saves the practitioners time and economic costs(Zou,2017).

The effect of Health-Qigong Baduanjin on strengthening the body has been proved by many relevant studies (M. Li et al., 2015), but Health-Qigong Baduanjin is used as an exercise intervention method for shoulder joint rehabilitation training in patients with breast cancer after surgery. Whether it is effective or not has yet to be confirmed by science. Therefore, the main purpose of this study was to evaluate the effect of Baduanjin on shoulder pain and range of motion in survivors of breast cancer surgery through a randomized controlled trial.

## 2. Methods

2.1 Design and sample

This was a randomized controlled trial. The convenience sampling method was used to recruit patients with upper extremity dysfunction after breast cancer surgery who visited the oncology departments of several hospitals in Datong City, Shanxi Province, China from January 2020 to July 2021.

Inclusion criteria for participants:

1) Patients with breast cancer after radical surgery who signed the informed consent and voluntarily participated in this experiment;
2) Women aged >30;
3) Patients with a stable condition for at least 6 months after radical operation;
4) Patients with stable disease for at least 3 months after receiving adjuvant therapy (chemotherapy, radiotherapy or immunotherapy);
5) Cancer invades unilateral breast.

Exclusion criteria for participants:

1) Cancer recurrence or malignant transformation, deep vein thrombosis, heart failure, hyperthyroidism, etc.;
2) The upper limb on the affected side has fractures, surgery, nerve damage or other diseases that affect exercise;
3) Patients with third-degree lymphedema of the upper limbs.

A total of 70 post-operative breast cancer patients were systematically investigated, and each patient was asked to fill out a questionnaire. After completing the above screening procedures and related tests, 64 people met the criteria and were randomly divided into the experimental group and the control group, with 32 in each. However, 2 patients were unable to complete the study due to travelling abroad, and 1 patient withdrew from the study due to a sudden skin allergy. Therefore, 61 breast cancer survivors participated in the study, 30 in the control group and 31 in the experimental group.

2.2 Intervention

The experimental group used "Health Qigong Baduanjin" promulgated by the General Administration of Sports of China in 2003 for exercise intervention, and practiced for 45 minutes every day, including ten minutes of warm-up, half an hour of Baduanjin practice and five minutes of cooling. The control group maintained daily exercise, and the duration of both experiments was twelve weeks.

2.3 Outcome assessments

2.3.1 Shoulder pain

A visual analogue scale (VAS) was used to evaluate patients' subjective pain perception. Draw a 10cm thick straight line on white paper, mark "no pain/no difficulty" on the left side of the line and "very painful, unbearable/very difficult, need help" on the right side. According to their subjective feelings, patients make a mark in the straight line to express their corresponding pain level. The length of the distance from the starting point to the mark is the measure of the degree of pain/disability, on a scale of 0-10, with higher scores indicating greater severity (Lund et al., 1991). In the pain self-assessment scale, VAS is a widely used method at present. Patients choose the corresponding options according to their conditions, which are considered to be more able to reflect the real situation of the patients (Safikhani et al., 2018)

2.3.2 Range of motion of the shoulder

Measure the range of motion of flexion, extension, abduction, adduction, internal rotation and external rotation of the affected side joint using a simple goniometer.

2.3.3 Upper extremity dysfunction

The simplified Chinese (Mainland) version of the Disability of the Arm, Shoulder, and Hand questionnaire was used to assess participants' upper extremity dysfunction. This questionnaire is suitable for upper extremity dysfunction caused by any disease and has good reliability and validity (Chen et al., 2015). The questionnaire is divided into two parts, A and B. Part A focuses on the activities of the upper limbs, including 23 items, and divides the activity ability into 5 grades with a score of 1 to 5 points, which correspond to no difficulty, a little difficulty, obvious difficulty but can be done, very difficult, and impossible; Part B focuses on the upper limb pain and discomfort, including 5 items, and divides the pain and discomfort into 5 grades with a score of 1 to 5 points, which corresponding to none, mild, moderate, severe and extreme. The score is calculated according to the following formula: DASH=(A+B-30)/1.20, the higher the DASH value, the more severe the upper limb function limitation. A DASH of 100 indicates extremely limited upper extremity function.

2.4 Data analysis

The raw data were entered using Epidata and analyzed using IBM SPSS 26.0. Continuous variables are expressed as mean and standard deviation based on descriptive analysis. Demographic and cancer-related data were compared using the $\chi$ 2 test, Fisher's test, independent samples T-test, and Man-Whitney rank-sum test for between-group comparisons. When the shoulder range of motion, DASH score and VAS score of the participants conformed to the normal distribution, the independent sample t test was used, the Man-Whitney rank sum test was used for the non-normal distribution to compare between groups, and the Wilcoxon test or paired test was used for the intra-group comparison. Using a two-sided hypothesis test, $P<0.05$ was considered statistically

significant and P<0.01 was considered extremely significant.

2.5 Ethical approval

Written informed consent was obtained from the participants and their families on the first day of the intervention. Participation was voluntary, and participants were informed that they had the right to withdraw from the study at any time. Participant data is anonymized. The study was approved by the Medical Ethics Committee of Shanxi Datong University.

## 3. Results

3.1 Demographic characteristics and cancer-related factors of participants

The independent samples T-test showed that there was no difference between the experimental group and the control group in terms of demographics (age, education, marital status, employment, residence, per capita household income) and cancer-related factors (The affected side, cancer stage, preoperative menopause and adjuvant therapy) (P>0.05), indicating that the two groups are comparable and could be intervened and evaluated. See Table 1 for details.

**Table 1 Demographics and cancer-related factor of participants at baseline (N = 61) n (%)**

| Variable | Total | Control (n = 30) | Intervention (n = 31) | χ2 (P) |
|---|---|---|---|---|
| **Age(years)** | | | | 0.074(0.941) |
| **<40** | 3(4.92) | 2(6.67) | 1(3.23) | 3(4.92) |
| **40-60** | 45(73.8) | 21(70.0) | 24(80.0) | 3(4.92) |
| **>60** | 13(21.3) | 7(23.3) | 3(4.92) | 6(20.0) |
| **Education** | | | | 1.137(0.566) |
| **Below high school** | 26(42.62) | 16(53.33) | 10(32.26) | |
| **High school** | 19(31.14) | 8(26.77) | 11(35.48) | |
| **College and higher** | 16(26.23) | 6(20.00) | 10(32.26) | |
| **Marital status** | | | | 0.862(0.353) |
| **Not married** | 11(18.03) | 7(23.33) | 4(12.90) | |
| **Married** | 50(81.97) | 23(76.67) | 27(87.10) | |
| **Employment status** | | | | 1.048(0.306) |
| **Retired or unemployed** | 54(88.5) | 26(86.7) | 54(88.5) | |
| **Employed** | 7(11.5) | 4(13.3) | 3(9.68) | |
| **Residence** | | | | 1.069(0.208) |
| **City** | 26(42.62) | 14(46.67) | 12(38.71) | |
| **Countryside** | 35(57.38) | 16(53.33) | 19(61.29) | 、 |
| **Household income(RMB/month/person)** | | | | 0.480(0.787) |
| **< 3000** | 37(60.66) | 19(63.33) | 18(58.06) | |
| **3000–5000** | 20(32.79) | 9(30.00) | 11(35.48) | |
| **> 5000** | 4(6.56) | 2(6,67) | 2(6.45) | |
| **Affected side** | | | | 2.981(0.084) |
| **Left** | 14(45.16) | 15(50.00) | 14(45.16) | |

| | | | | |
|---|---|---|---|---|
| **Right** | 32(52.46) | 15(50.00) | 17(54.84) | |
| **Cancer Staging** | | | | 5.252(0.151) |
| **Phase I** | 5(8.20) | 4(13.33) | 1(3.23) | |
| **Phase II** | 34(55.73) | 14(46.67) | 20(64.52) | |
| **Phase III** | 22(36.07) | 12(40.00) | 10(32.26) | |
| **Menopause before surgery** | | | | 3.014(0.0832) |
| **Yes** | 38(62.30) | 20(66.67) | 18(58.06) | |
| **No** | 23(37.70) | 10(33.33) | 13(41.94) | |
| **Adjuvant therapy** | | | | |
| **Neoadjuvant chemotherapy** | 19(31.15) | 9(30.00) | 10(32.26) | 0.074(0.786) |
| **Postoperative chemotherapy** | 52(85.25) | 24(80.00) | 28(90.32) | 1.451(0.228) |
| **Postoperative radiotherapy** | 48(78.69) | 22(73.33) | 26(83.87) | 2.523(0.112) |
| **Endocrine therapy** | 28(45.90) | 11(36.67) | 17(54.84) | 2.233(0.135) |

3.2 Comparison of outcomes between experimental and control groups at baseline

At baseline, there was no significant difference in VAS score and DASH score between the experimental group and the control group (P>0.05). And there was also no significant difference in the range of motion of flexion, extension, abduction, addition, internal rotation and external rotation of the affected joint between the two groups. (P > 0.05) (Table 2).

**Table 2 The outcome indicators at baseline（N=61）($\bar{x} \pm s$)**

| Outcome | Control (n = 30) | Experiment (n = 31) | P |
|---|---|---|---|
| **VAS score** | 3.50±2.25 | 3.54±1.99 | 0.073 |
| **DASH score** | 25.25±14.83 | 25.93±14.82 | 0.092 |
| **Shoulder range of motion** | | | |
| **Flexion** | 162.68±23.31 | 164.96±21.04 | 0.566 |
| **Extension** | 45.57±7.12 | 46.96±8.57 | 0.130 |
| **Abduction** | 168.21±15.71 | 170.71±14.64 | 0.267 |
| **Adduction** | 40.36±8.04 | 40.64±6.36 | 0.062 |
| **Internal rotation** | 63.82±26.42 | 56.96±27.37 | 0.053 |
| **External rotation** | 81.61±13.72 | 80.07±13.56 | 0.877 |

3.3 Comparison of the outcomes after 12 weeks

After 12 weeks of intervention, compared with the control group, participants in the experimental group showed better results in all outcome measures (Table 3). However, there was no statistically significant difference in the impact of the intervention on the range of

motion of shoulder extension and abduction between the two groups (P > 0.05), but there was a significant difference in the impact on shoulder flexion and external rotation (P < 0.05). There were extremely significant statistical differences (PP<0.01) in the influence on the abduction and internal rotation of the shoulder joint. In addition, there were also significant differences in the reductions in VAS scores and DASH scores between the two groups (both P = 0.000).

**Table 3 The outcome indicators after 12 weeks（N=61）($\bar{x} \pm s$)**

| Outcome | Control (n = 30) | Experiment (n = 31) | P |
|---|---|---|---|
| **VAS score** | 3.29±2.02 | 2.57±1.13 | 0.000** |
| **DASH score** | 25.18±14.01 | 21.54±11.44 | 0.000** |
| **Shoulder range of motion** | | | |
| **Flexion** | 153.57±19.43 | 170.50±13.37 | 0.049* |
| **Extension** | 48.82±6.58 | 50.89±6.53 | 0.070 |
| **Abduction** | 165.89±20.10 | 172.86±11.09 | 0.130 |
| **Adduction** | 36.29±8.30 | 47.68±6.31 | 0.000** |
| **Internal rotation** | 70.54±16.52 | 66.32±22.84 | 0.001** |
| **External rotation** | 81.25±13.72 | 83.29±11.49 | 0.026* |

Note: * means P<0.05, showing significant difference; ** means P<0.01, showing extremely significant difference.

## 4. Discussion

During radical mastectomy for breast cancer, the pectoralis major or pectoralis minor muscle was excised, and its innervating nerves and nutrient blood vessels were overstretched or accidentally cut off, resulting in a decrease in the functional activity of the upper extremity. Adhesions, fibrous adhesions of the tissues around the shoulder joint and contractures of the joint capsule, muscles, ligaments, and tendons, resulting in limited shoulder joint mobility and one or more upper extremity dysfunctions: limited joint mobility in the shoulder and arm, upper extremity muscles Weakened strength, neck and shoulder pain, and upper extremity lymphedema (Bates, 2010; DiSipio et al., 2013). Studies have shown that the incidence of upper limb pain on the affected side one year after breast cancer surgery is 12%-82%(De Groef et al., 2018), and neck and shoulder pain and limited shoulder mobility are reported in 86 percent of patients who undergo axillary lymph node dissection (Leidenius et al., 2003). A systematic evaluation of upper extremity function in patients undergoing breast cancer surgery and radiation therapy reported a 9% - 68% incidence of neck and shoulder pain (Lee et al., 2008).

The specific etiologies of neck-shoulder pain induced by breast cancer treatment are complex(Caro-Morán et al., 2016). First, neck-shoulder pain after breast cancer surgery is associated with inflammation-stimulated angiogenesis (Mafu et al., 2018). Angiogenesisrelated signalling factors, such as serum interleukin-1β (IL-1β), serum interleukin-6 (IL-6), tumour necrosis factor-α (TNF-α), and cyclooxygenase-2, play a role in causing hyperalgesia. Among them, IL-1β, IL-6 and tumor necrosis factor α may also aggravate lymphedema, some

angiogenesis-related factors are involved in extracellular matrix remodeling, and abnormal production of collagen and matrix leads to stiffness of shoulder joint capsule, which leads to reduced joint range of motion and neck and shoulder pain(Bajrovic et al., 2004; S. Johansson et al., 2000). Second, after breast cancer surgery, the pectoralis major and minor muscles have been removed, and they can only rely on the remaining small muscles in the chest and neck and shoulder muscles for compensatory exercise. The membrane continues to be stretched or shortened, and a little exercise will cause muscle soreness in the neck and shoulder. Long-term postural fixation can cause local blood circulation disorders, accumulation of metabolites, and inflammatory reactions, which in turn lead to limited shoulder movement, persistent pain, adhesions, and contractures. (Cheville & Tchou, 2007). Third, neck-shoulder pain is also related to myogenic factors(Andersen et al., 2003). The accumulation of hydrogen ions in muscle cells causes the conduction velocity of muscle fibers to decrease, and the sEMG power spectrum shifts to the left, causing muscle fatigue and aggravating neck and shoulder pain(Caro-Morán et al., 2016). The accumulation of muscle fatigue leads to a decrease in muscle metabolism, which eventually changes the composition of muscle fibers and reduces the proportion of type II muscle fibers, which in turn leads to a decrease in muscle strength (Larsson et al., 1995).

Studies have shown that traditional Chinese medicine techniques can improve the range of motion of the shoulder joint after breast cancer surgery. For example, a systematic review and meta-analysis (Jin et al., 2020) provided evidence that AcupunctureMoxibustion Therapy is useful and safe in the treatment of Breast Cancer-Related Lymphedema. Acupuncture on the acupoints on the shoulder joint meridian of patients after breast cancer surgery can dredge the meridian, promote blood circulation and remove blood stasis, nourish the local skin, promote wound healing, soften scars, reduce swelling and relieve pain, and improve joint mobility. Some clinical trial reports also claim that Tai Chi improves upper extremity function and balance during rehabilitation after breast cancer surgery(Luo et al., 2020). Baduanjin is also the essence of traditional Chinese medicine culture and is a kind of aerobic exercise, a scientific exercise method that scientifically integrates rehabilitation, biomechanics, and TCM meridian science(Lu et al., 2019). Baduanjin has the effect of softening tendons and strengthening bones, the biggest feature of Baduanjin is that the arm is required to rotate during practice. The internal and external rotation of the two arms increases the torque on the arm, thereby increasing the pressure on the arm(Qin et al., 2020).

Baduanjin consists of eight movements. The first four poses use the arms to rotate and stretch in different directions, pulling and stretching in opposite directions, to achieve the overall exercise effect on the trunk and upper limbs. In the first movement, the postures of holding up, pushing the clouds, and hugging with both hands can stretch the body and stretch the muscles, ligaments and soft tissues around the joints of the upper limbs. If the upper limbs and shoulder joints on the affected side can be stretched after breast cancer surgery, adhesions can be reduced. In the second movement, the guidance of the upper limbs focuses on the thorax and the shoulders, and the arms are in a forward flexion and abduction posture. This action requires "sinking the shoulders

and dropping the elbows",which helps to improve the range of motion of the shoulder joint and the muscle strength of the upper limbs, which can stretch the adherent tissue. The key to the third type of movement is the driving of the shoulders. With the shoulders as the force root, the upper and lower pressing can fully drive the function of forwarding flexion of the shoulder joint. The fourth movement reflects the function of extending the shoulder joint, improving the contractility of the shoulder joint and the surrounding motor muscles, which can gradually increase the range of motion of the shoulder joint on the affected side.

In this study, after 12 weeks of intervention, the improvement in the range of motion of the affected shoulder joint flexion and external rotation of the experimental group was significantly better than that of the control group ($P<0.05$). And the improvement of adduction and internal rotation was extremely significantly better than that of the control group ($P<0.01$). It suggests that practicing Baduanjin can improve the range of motion of shoulder joints in patients after breast cancer surgery. This is consistent with the conclusion of a previous similar study (Ying et al., 2019), which found that after six months of Baduanjin training, compared with the control group, the shoulder joint on the affected side of the experimental group had a very significant improvement.

Studies have shown that breast cancer patients will inevitably experience varying degrees of upper extremity dysfunction and will persist regardless of the treatment they take(Yuan et al., 2021). In breast cancer patients, scarring occurs when the surgical site heals, and certain nerves and muscles are damaged during surgery. Because of its weakened mechanical strength, it hinders the exchange of oxygen and nutrients and causes dysfunction in the dominant area. The scar tissue is hard in texture and has poor mobility, causing deformity and dysfunction of local damaged tissue(O'Brien et al., 2020).

In traditional Chinese medicine theory, the Baduanjin exercise uses natural energies to balance the coordination of the body, breathing, energy and mind with eight simple movements. Baduanjin helps to remove the congestion and blood consumption caused by surgical trauma, delay the speed of scar tissue hyperplasia, and even reduce the hyperplasia of scar tissue(R. Li et al., 2014), which helps to improve the upper limb function on the affected side after breast cancer surgery.

The simplified Chinese version of the Disabilities of the Arm, Shoulder and Hand (DASH) is divided into three parts: social function, physical activity, and upper extremity symptoms. It has good reliability and validity in evaluating upper extremity function in breast cancer patients(Chan et al., 2019). Interviews with the subjects before the experiment showed that their basic daily activities such as writing, twisting bottle caps, and opening doors were not affected, but they were significantly hindered in physical activities such as carrying heavy objects, changing the light bulb above their heads, scrubbing their backs, wearing sweaters, and so on. The level ranges from somewhat difficult, clearly difficult but doable, very difficult, to impossible. These are all upper extremity dysfunctions caused by the limited movement of the subjects' upper limbs and insufficient muscle strength. Symptoms such as upper limb pain, numbness, and stiffness are present in most subjects. After 12 weeks of the experiment, the upper limb dysfunction in both the experimental group

and the control group tended to decrease, and there was an extremely significant statistical difference in the DASH score between the two groups (PP<0.01). This indicates that Baduanjin can better improve the upper limb function of patients after breast cancer surgery.

Traditional Chinese medicine believes that "all pain is the cause of the stagnation of blood"(Wang et al., 2020). When practicing Baduanjin, the movements are gradual, and the flexion and extension of the upper limbs can stimulate the meridians and the distributed acupoints. Moreover, during the exercise, the patient is required to focus on the forceproducing area, the skin temperature will increase, the meridians will be dredged, the qi and blood of the whole body will be smooth, and the blood stasis will be eliminated. The blood stasis is reduced, and the pain is also reduced. In modern research, Zhang Baojuan (2012) used the Baduanjin exercise to treat low back pain. He pointed out that Baduanjin exercise can well stretch the spine, upper and lower limbs and other joints, exercise-related muscles, fascia and tendons, and relieve soft tissue adhesion. In addition, these exercises not only help to regulate blood stasis, regulate qi, relax meridians, regulate qi and blood, but also improve blood circulation in the lower back exercise the muscles of the lower back, and prevent lumbar muscle strain and lower back pain. In this study, after 12 weeks of intervention, the VAS scores of both the experimental group and the control group decreased, but there was a statistically significant difference between the two. It is not difficult to see from the data that the improvement of the experimental group was extremely significantly better than that of the control group. control group (p=0.000), which means that Baduanjin effectively relieved the participants' shoulder pain.

## 5. Conclusion

Baduanjin can improve the range of motion of shoulder joints, improve upper limb function and relieve pain in patients after breast cancer surgery. Baduanjin can be used as a more economical and effective rehabilitation exercise method for patients after modified radical mastectomy.

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