



# Effects of Kinesio Taping® on range of motion and shoulder pain relief in mastectomy patients.

## Efeitos Do Kinesio Taping® na dor e amplitude de movimento de pacientes mastectomizadas.

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### ABSTRACT

**Introduction:** Owing to the surgery of breast cancer, post-surgery healing can evolve with functional alterations, such as pain, decreasing of movement breadth and other alterations that can occur on the homolateral shoulder of surgery. Within this prospect, one proposes the Kinesio Taping® method as a new resource in physiotherapy area that might be used as coadjuvant treatment of mastectomized patients. **Objective:** Analysis of the effect of Kinesio Taping® method in relation with pain relief and increase of the breadth of homolateral shoulder movement from mastectomized patients. **Method:** Bibliographic review was fulfilled from data bases such as LILACS, PubMed, SciELO, MEDLINE, academic Google, besides other sites and books. Researched period ranged from 2000 to 2014. **Results:** The results of the researched works indicate that Kinesio taping® method is effective in the treatment of algic complaints and of increase of movement breadth in pathologies like tendinitis at the rotator cuff and syndrome of shoulder impact. None of the cited studies were realized in mastectomized patients. **Conclusion:** The mechanisms wherein functional bandage could aid over shoulder performance of mactetomized patients are not clear because there are not any study that proves the effectiveness of Kinesio Taping® method over this type of treatment to the date.

**Keywords:** Physiotherapy; Bandage; Mastectomy; Range of motion; Pain.

### RESUMO

**Introdução:** Em decorrência da cirurgia de câncer de mama, as mulheres podem evoluir com alterações funcionais, como dor, diminuição da amplitude de movimento (ADM) e outras alterações que podem ocorrer no ombro homolateral da cirurgia. Nessa perspectiva, propõe-se o método Kinesio Taping® como um novo recurso na área da fisioterapia que poderia ser utilizado como tratamento coadjuvante de pacientes mastectomizadas. **Objetivo:** Analisar o efeito do método do Kinesio Taping® em relação ao alívio da dor e aumento da amplitude de movimento do ombro homolateral em pacientes mastectomizadas. **Método:** A revisão bibliográfica foi efetuada nas bases de dados como: LILACS, PubMed, SciELO, MEDLINE, Google acadêmico, além de sites e livros. O período pesquisado foi de 2000 até 2014. **Resultados:** Os resultados dos trabalhos pesquisados indicam que o método Kinesio Taping® é eficaz no tratamento da queixa algica e do aumento da amplitude de movimento em patologias como: tendinite no manguito rotador e síndrome do impacto do ombro. Nenhum dos estudos citados foram realizados em pacientes mastectomizadas. **Conclusão:** Os mecanismos pelos quais a bandagem funcional poderia auxiliar no desempenho do ombro de pacientes mastectomizadas não são claros porque não possuem nenhum estudo que comprove, até a presente data, o desempenho do método Kinesio Taping® nesse tipo de tratamento.

**Palavras – chave:** Fisioterapia; Bandagem; Mastectomia; Amplitude de Movimento; Dor.

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**Financial support:** There is no financial support.

**Submission date 13 August 2015; Acceptance date 15 November 2015; Online publication date 23 November 2015**





## INTRODUCTION

The Kinesio Taping® is a physical therapy resource initially developed in Japan and introduced in the US in the 1990s. It promotes the activation or inhibition of the neuromuscular system, being used for different therapeutic purposes, helping both treatment/prevention of injury and to improve functional performance.<sup>(1,2)</sup>

This method uses a functional and elastic bandage consisting of a thin elastic tape which can be stretched up to 50% of its original length. It is positioned on the skin following the direction of the muscle fibers having as effects the reduction of pain, as some researchers claim that this form of application, activates some cutaneous mechanoreceptors following the gate control theory of pain, there is also increasing joint stability, the performance improvement articulare one aumentodo interstitial space, promoting better blood and lymph flow.<sup>(3,4,5)</sup>

Other researchers generate hypotheses to explain the possible basic mechanism of the increased muscle activity while applying the taping kinesio method, among them is neurofacilitação - tactile stimulation provided by the band that would activate the skin receptors, promoting stimulation of alpha motoneurons. However, these studies are still scarce and controversial.<sup>(6,7)</sup> These pesquisadores also noted that there is a direct relationship between cutaneous afferent stimulation provided by the band, and the shutter speed of the motor units.<sup>(7)</sup>

Breast cancer is the most frequent cancer among women in both developed countries and developing countries. According to the Ministry of Health, Brazil is among the countries with the highest incidence rate, so that the breast cancer is said to be the leading cause of death from malignant neoplasm in the female population. The surgery has been used for many years as the main therapeutic option, with aims to promote local control by removing malignant cells present in cancer, these surgeries can be classified as: radical mastectomy (Hasteld), modified radical mastectomy (Patey and Madden) and simple mastectomy (total mastectomy).<sup>(8,9)</sup>

Mastectomy patients have limited range of motion (ROM). This decrease can be caused by lymphedema, muscle weakness, infection, pain, paresthesia, sensitivity changes, leading to a decreased function, and the movements of abduction and flexion of the most affected shoulder. These changes in ROM put in risk the performance of activities of daily living (ADLs) in women with mastectomies, also occurring compensatory movements of the upper trapezius and levator scapulae in activities above his head, causing subacromial compression and resulting in pain shoulder.<sup>(8,9)</sup> In this way the Kinesio Taping® could be an adjunctive treatment in women undergoing mastectomy surgery.

## METHOD

It is a systematic literature review. The following electronic databases were searched: Literature Latin America and the Caribbean (LILACS), PubMed and SciELO, MEDLINE, Google

Scholar, as well as websites and books. As search strategies the following expressions were used in the English and Portuguese languages: Kinesio Taping®; mastectomy; physiotherapy; lymphedema; range of motion (ROM) and shoulder girdle.

The decisive inclusion criteria for the selection of the articles were: articles on experimental studies, quasi-experimental and clinical trials; The studied period was from 2000 to 2014 who analyzed the main objective of the effect of taping on increasing the range of motion and decreased pain.

Exclusion criteria: descriptive studies that did not offer precise information on the methodology used and / or results, as well as conference abstracts.

## RESULTS

The total of studies initially selected were 13 articles, but only nine articles were used for preparation of the study which 5 are related to application of Kinesio Taping® method in the shoulder joint and 4 are related to breast cancer and the importance of physical therapy. The summary of nine items in Table 1 below.

## DISCUSSION

### Application of the method kinesio Taping® in the shoulder joint

The shoulder joint is a common target of pain and decreased range of motion in the musculoskeletal system in mastectomy patients. Most of these women, after removal of points and drain, are advised to seek the physiotherapy care for rehabilitation of this joint.

Study in healthy patients observed no significant influence on the electromyographic activity in the shoulder girdle muscles, after application of Kinesio Taping® method.<sup>(10)</sup> However, some authors report that after applying Kinesio method taping® in players baseball had shoulder impingement syndrome, there was a significant increase in electromyographic activity of the lower trapezius muscle during the abduction movement of the shoulder 17 of these athletes.<sup>(11)</sup>

Research conducted assessed the effects of Kinesio Taping® method in the condition called shoulder impingement syndrome compared with conventional physiotherapy. Sample was 55 patients, but only 30 patients were treated with functional bracing. The intervention ranged from six days to two weeks with a job with follow-up after 6 weeks. Visual analogue scale (VAS) was used of pain, but other assessment tools were used primarily to analyze disability, functionality and range of motion (ROM) in patients with shoulder impingement syndrome. We obtained a good result in the first week of treatment in patients undergoing application of Kinesio Taping® method.<sup>(12)</sup>

**Table 1.** Population characteristics of the different studies, methods used and results obtained.

Author/ Year	Methodology	Results
(Bregagnolet et al. 2010)	Sample consisted of 28 women who underwent lymphadenectomy Axillary Total (LAT), which were measured: range of motion (ROM) of the joint of the shoulder circumference of the upper limbs, pulmonary function test (PF) and respiratory muscle strength (RMS) in the preoperative, immediate and late postoperative period. Postural analysis was performed in the periods pre and post-late. There was a decrease of shoulder ROM for flexion and abduction of the operated side.	This research evaluated the existing changes in women undergoing breast surgery with LAT and who did not receive physical therapy care during the study period. In assessing the ROM, we found a significant difference in flexion and shoulder abduction ipsilateral to surgery when compared to the Pre period with the immediate post and late post.
(Cools et al. 2002)	Sample was comprised of 20 healthy individuals. Through electromyographic activity, analyzed the strength of the trapezius and serratus anterior, with and without Kinesio Taping®.	There was no significant influence on the electromyographic activity of the muscles of the shoulder girdle in healthy subjects, with the application of Kinesio Taping®.
(Godoy et al. 2003)	Sample of 30 patients with lymphedema to analyze banding low elasticity in town with high temperature.	27 patients in the low-elasticity bandages were well tolerated in cities with high temperatures for the treatment of lymphedema in mastectomy patients in upper limbs.
(Hsu et al. 2009) (Kaya et al. 2011) (Miller e Osmotherly, 2009) (Silva et al. 2013) (Sousa et al. 2013) (Thelen et al. 2008)	Sample of 17 baseball players with shoulder impingement syndrome. All subjects received both elastic recording (kinesioTex TM) and placebo recording (micropore) of the lower trapezius muscle. Assessment was by electromyography (EMG) in the upper and lower trapezius activities, and serratus anterior muscles when lifting the arm. Sample of 55 patients in order to determine and compare the efficacy of Kinesio tape Taping® and conventional physical therapy in patients with shoulder impingement syndrome. Treatment response was assessed with the arm deficiency, shoulder and hand. Sample consisted of 22 individuals with symptoms of the impact of unilateral shoulder. Half of the patients continued the therapy routine and the other half used the kinesio Taping® with conventional therapy. Sample involved 36 women. The range of motion (ROM) was assessed by goniometry of the ipsilateral shoulder and contralateral (control). Quality of life was assessed by questionnaires European Organization for Research and Treatment of Cancer Quality of Life Questionnaire. Included were 105 women with a mean age of 55.82 years and body mass index of 27.80. It evaluated the functionality of the upper limb of women undergoing surgery for breast cancer, followed by physiotherapy service in a public institution of reference of the SUS / RJ. Sample consisted of 42 patients diagnosed with rotator cuff tendinitis. Respondents used the Kinesio Taping® and false tape with two consecutive intervals of 3 days.	The results of the repeated measures analysis showed that significantly increased recording elastic posterior slope of the scapula 30 and 60 during the lifting arm and increased muscle activity in the lower trapezoid 60-30° compared to placebo. In the first week, it obtained an improvement in the group using the Kinesio Taping®. However, there was no significant difference in these parameters between two groups in the second week. The kinesio Taping® may be an alternative treatment option for the treatment of the impact shoulder syndrome, especially when an immediate effect is required. In two weeks, the treated group showed a reduction in pain in both self-reported activity and pain during abduction. However, the statistical analysis was limited by the small sample size. The physical therapy approach improved range of motion and quality of life of women after surgery for breast cancer, but longer follow-ups can bring additional benefits. This result was positive and should, possibly, the role of physiotherapy in the early treatment of these patients, proving the real need of physical therapy intervention. The group using the method of Kinesio Taping® showed immediate improvement in the reduction of the group using the method of Kinesio Taping® showed immediate improvement in the reduction of shoulder pain.

Source: Research Data

Such benefits of the method were also observed in the shoulder girdle, when they were used as a treatment adjunct to traditional forms of therapy for patients with shoulder impingement syndrome. The study was randomized controlled twenty-two patients: one group used Kinesio Taping® and the other group that underwent conventional physiotherapy. Good results were obtained in the group treated with kinesio Taping® with decreasing pain and improving motion in abduction.<sup>(13)</sup>

Randomized, double-blind trial conducted in forty-two patients with clinical diagnosis of rotator cuff tendonitis, which were randomly divided into two groups: one group was treated with Kinesio taping® and the placebo group used

a fake tape. The self-reported pain and disability in the active range of motion (ROM) were measured at various intervals to assess differences between the groups. The group treated with Kinesio taping® method showed immediate improvement in reducing shoulder pain. Consequently it proved to be a possible effectiveness of Kinesio Taping® method as an alternative treatment option for the syndrome shoulder impingement and rotator cuff tendonitis, especially when it is needed an immediate effect in reducing pain and increasing range of motion.<sup>(4)</sup> None of the cited studies were performed in mastectomy patients.



## Physical therapy intervention in the arm and the use of Kinesio Taping® method in the treatment of lymphedema in mastectomy patients.

Research evaluated the existing changes in women undergoing breast surgery with lymphadenectomy axillary total (LAT), and who did not receive physical therapy care during the study period. It evaluated the range of motion (ROM) and found a significant difference in flexion and abduction of the shoulder ipsilateral to the surgery, compared the pre - operative period, with the immediate postoperative and late postoperative period. The authors reported that this research, it was observed that ADM flexion and abduction of the shoulder on the operated side is impaired after surgery, remaining 30 days after the LAT performed surgery.<sup>(14)</sup>

The functional wraps are widely used in the treatment of lymphedema for mastectomy patients because assist in the removal of accumulated fluids and maintaining shrinkage.<sup>(15)</sup>

Women who underwent mastectomy or axillary lymphadenectomy quadrantectomy associated (LA) were included in a survey where the initial assessment it was found that all movements except evaluated medial rotation, were significantly lower when compared to the other shoulder (control). After the 10th session of physiotherapy, found a significant improvement in flexion, extension, abduction, adduction, medial rotation and lateral rotation. When compared to the control member, such movement were similar except abduction, that although the next functional value was still lower than the control member.<sup>(16)</sup>

Cross-sectional study in a hospital cohort of women undergoing surgical treatment for papaya cancer where the physical therapy protocol starts immediately after surgery at the bedside, and aims to maintain shoulder movement and care of the member through flexion exercise guidelines, abduction, external rotation two to three times a day and activities that do not exceed the range of 90° to the removal points and drain. The research result was positive because the role of physiotherapy was early in the treatment of mastectomy patients, proving the real need of physiotherapy intervention.<sup>(17)</sup> The conclusion of the authors cited above confirms the effectiveness of physical therapy intervention in the treatment of the affected upper limb, noting also that the Kinesio Taping® associated with such interventions can help both in relieving pain as increasing the range of motion.

## CONCLUSION

After the literature review, it was concluded that the findings regarding the application of Kinesio Taping® method in reducing pain and increased range of motion are still quite conflicting. The mechanisms by which the taping could help shoulder the performance of mastectomy patients are unclear because they have no study that proves, to date, the performance of Kinesio Taping® method in this type of treatment. Certainly, more research is needed to evaluate the

immediate and late effects of the application of this technique in the shoulder muscle activity both increased range of motion and decreased pain complaint in these patients.

The Kinesio Taping® method is being used to treat lymphedema with lymph drainage order to reduce the edema lines as a new alternative proposal on improving the range of motion in flexion and abduction, which are reduced movements after surgical mastectomy procedure.

## AUTHOR'S CONTRIBUTION

LMFR, MMPR and FBB: search for articles and writing of the manuscript; RMVS and CAAL: guidance, review and correction of the manuscript.

## COMPETING INTERESTS

There is no conflict of interest in this research.

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