

# Physiotherapeutic approach in women undergoing hysterectomy: A systematic review

Edgar Manoel Martins<sup>1</sup>, Carolina Girola<sup>2</sup>, Raquel Eleine Wolpe<sup>3</sup>, Thuane Huyer Da Roza<sup>4</sup>, Gesilani Júlia Da Silva Honório<sup>5</sup>.

Universidade do estado de Santa Catarina (UDESC), Florianópolis (SC), Brazil.

## ABSTRACT

**Background:** Hysterectomy is the second most frequently performed surgery on the female genital tract. Patients undergoing this procedure are susceptible to complications that can be prevented by preventive measures, including physiotherapy. **Objective:** To identify in the scientific literature the physiotherapeutic approaches in women undergoing hysterectomy. **Methods:** Systematic searches were performed for articles indexed in the databases: Pubmed, LILACS, MEDLINE, PEDro and SciELO, between the years 2009 to 2019. 9 articles met the inclusion and exclusion criteria determined to compose this systematic review. **Results:** The main topics of physical therapy activities found in the articles were: techniques for pelvic floor muscles strengthening, breathing exercises, aerobic exercises and core strengthening, upper and lower extremities, transcutaneous electrical stimulation, evaluation of physical performance, fatigue, pain and quality of life, in addition to the application of alternative techniques such as: acupuncture, electroacupuncture, auricular electrical stimulation, electrical acu-stimulation and acupressure. **Conclusion:** There is a great diversity of studies showing beneficial effects in the different interventions developed, serving as a basis for directing physiotherapeutic approaches in hysterectomy, aiming at complementary resources for the better care of the patient undergoing this procedure.

**Keywords:** Hysterectomy; Physiotherapy; Women's Health.

## BACKGROUND

Hysterectomy is the second most common surgical procedure performed on the female genital tract<sup>(1)</sup>. In developed countries it is the most common gynecological surgery<sup>(2)</sup>, and between 20% and 30% of women are likely to undergo this procedure at some point in their lives<sup>(3)</sup>. In Brazil, between January 2018 and March 2019, 127,624 hysterectomies were performed, of which 3,854 were performed in Santa Catarina<sup>(4)</sup>.

The main indications for this procedure are uterine leiomyomas<sup>(5-8)</sup>, abnormal uterine bleeding<sup>(5-9)</sup>, chronic pelvic pain<sup>(5,8,10,11)</sup>, genital prolapses<sup>(5,8,12)</sup> and malignant and premalignant disease involving the uterus<sup>(5,8)</sup>. Among the different surgical approaches, the one that brings the greatest complications is the abdomen route<sup>(13)</sup>, and the majority of total hysterectomies today are performed via the open abdomen route worldwide<sup>(1)</sup>. Patients undergoing hysterectomy are susceptible to complications that may present immediately or later<sup>(14)</sup>.

In view of this, physiotherapy plays an important role in this process, with measures such as early walking<sup>(15)</sup>, minimizing postoperative (PO) pain and discomfort, preventing the development of adhesions in the incisional region, vascular complications, antalgic posture, pelvic floor muscle dysfunctions, abdominal weakness<sup>(16)</sup> and, in addition, with intensive respiratory therapy through the use of respiratory physiotherapy techniques and exercises, preventing atelectasis<sup>(15)</sup> and pneumonia<sup>(17)</sup>.

Based on the importance of physiotherapy in this process, as well as in order to fill the existing gaps regarding the scientific basis and the knowledge of new physiotherapeutic approaches in this procedure, this review sought information on the possibilities of physiotherapeutic approaches, assisting in the direction of care and benefiting the recovery process. In view of the above, this review aimed to identify physiotherapeutic approaches in women undergoing hysterectomy in the scientific literature.

\*Corresponding author: [edgarmartins@live.com](mailto:edgarmartins@live.com)

Submission date 20 December 2019; Acceptance date 07 April 2020; Publication date 03 September 2020





## METHODS

This study is characterized as a systematic review (PROSPERO CRD42019135175). To formulate the problem question, it was used the strategy PICO<sup>(18)</sup>. Searches of published and indexed articles were carried out in the databases: LILACS, MEDLINE, PEDro, Pubmed and SciELO. The searches were performed in May 2019, using the descriptors DeCS: “Hysterectomy” and “Physical Therapy Modalities”, except in the PEDro database, which because it is a database exclusively related to physiotherapy, the search was performed only with the descriptor “Hysterectomy”.

The inclusion criteria included articles: with a sample in the pre and/or postoperative (PO) hysterectomy process, regardless of the reason for surgical indication; that brought intervention from the physiotherapeutic area (evaluation and/or treatment); published in the last ten years (2009-2019), in Portuguese, Spanish and/or English; and published in the selected databases. The exclusion criteria determined were articles: that did not bring hysterectomy as a central surgical procedure; that bring in another professional to carry out the procedures associated with physiotherapy; that were not related to the physiotherapeutic approach; protocol articles; research not carried out on human beings; and articles not found in its full version.

The selection phases of the articles (Figure 1) were carried out by two researchers independently. In the selection phase by title and abstract, independent worksheets were sent to the researchers involved, containing a reason for inclusion or exclusion of each article, after this procedure both worksheets were joined for comparison and discussion of the articles that would go on to the next phase. In the following phase, readings of the full texts were carried out, following the same protocol as in the previous phase. A third researcher participated in all the steps to confirm the inconsistencies. Articles that, after the reading of the full text, met the inclusion and exclusion criteria were included in the review, regardless of their type and level of evidence.

The PEDro scale was used to classify the methodological quality of the studies<sup>(19)</sup>, created by the PEDro database, composed of 11 questions used for classification of randomized clinical trials (RCT), and 10 points are counted in the final score, and the closer to the total score (10/10), the more

methodological criteria are met in RCT, with consequent better methodological quality. For the classification of recommendation and evidence, it was used the *Oxford Centre for Evidence-Based Medicine* scale<sup>(20)</sup>, that is divided by degree of recommendation, which is subdivided into A, B, C and D, and A is the highest degree of recommendation and level of evidence, which is subdivided into 1A, 2A, 3A, 2A, 2B, 2C, 3A, 3B, 4 and 5, with 1A being the best level of evidence (table 1).

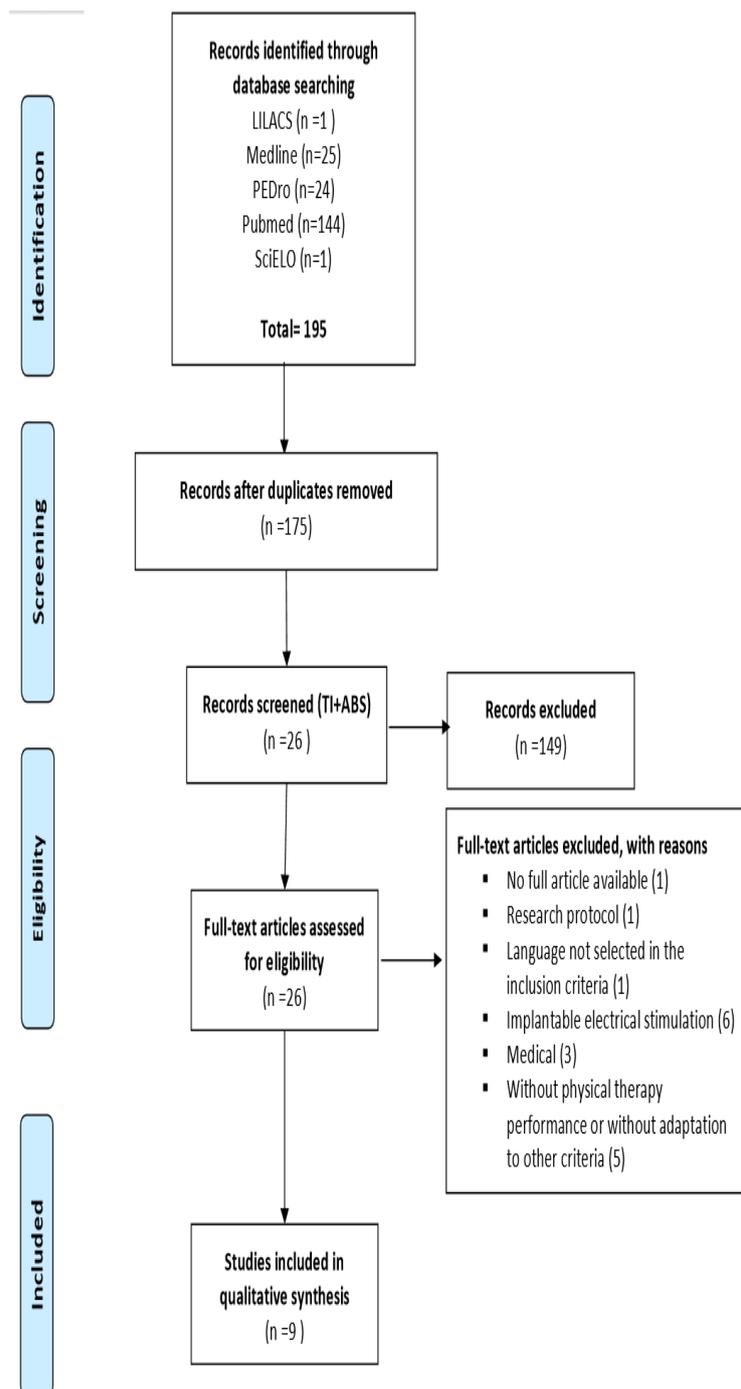


Figure 1 –Prisma Flowchart - Selection of studies.



**TABLE 1** – Analysis of methodological quality, degree of recommendation and level of evidence.

Studies	Oxford scale		PEDro scale
	Degree of recommendation	Level of evidence	Methodological Quality
<b>Frey <i>et al.</i></b> <sup>(21)</sup>	A	1B	07/out
<b>Frawley <i>et al.</i></b> <sup>(22)</sup>	A	1B	09/out
<b>Kim <i>et al.</i></b> <sup>(23)</sup>	A	1B	06/out
<b>Tsang <i>et al.</i></b> <sup>(24)</sup>	A	1B	05/out
<b>Wei-min <i>et al.</i></b> <sup>(25)</sup>	A	1B	04/out
<b>Carli; Brown; Kennepohl</b> <sup>(26)</sup>	C	4	-----
<b>Yang <i>et al.</i></b> <sup>(27)</sup>	A	1B	09/out
<b>El-Bandrawy; Emara; Ghareeb</b> <sup>(28)</sup>	A	1B	04/out
<b>Lauszus <i>et al.</i></b> <sup>(29)</sup>	B	2B	-----

## RESULT

Altogether, 195 articles were found in the researched databases, and 9 articles that met the inclusion and exclusion criteria remained for the composition of the review. These articles, regarding the type of study, are: 7 RCTs, 1 cohort study and 1 case report. The main topics found in the articles were: techniques for strengthening the pelvic floor musculature (PFM), breathing exercises, aerobic

exercises and strengthening the *core*, upper and lower extremities, transcutaneous electrical stimulation, assessment of physical performance, fatigue, pain and quality of life (QOL), in addition to the application of complementary techniques such as: acupuncture, electroacupuncture, auricular electrical stimulation, electrical acu-stimulation and acupressure. The main results found are described in TABLE 2.





**TABLE 2**– Information from the studies analyzed in the review (2009-2019).

Author	N	Objectives	Methods		Results
			Evaluation	Intervention	
Frey <i>et al.</i> , 2009 <sup>(21)</sup>	200 (HV)	Check the effects of point P6 on the incidence of nausea and vomiting PO	Nausea, craving, vomiting and pain at 2, 6 and 24h PI	GI: acu-stimulation bracelet ( <i>ReliefBand</i> ®) on P6 GP: inactive electrodes	The incidence of nausea and vomiting was significantly lower in GIs compared to GPs (6 and 24h PI)
Frawley <i>et al.</i> , 2010 <sup>(22)</sup>	51 (HV and HVL)	Compare GI and GC to see if there is significant improvement in symptoms of pelvic organ and bladder prolapse at 3, 6, 12 months PO	Preoperative and at 3, 6 and 12 months of PO, using the UDI, IIQ, 3-day diary (bladder), Pad-Test (48h), MWS, CSS, AQLS and vaginal palpation	GI: TMAP and counseling (lifestyle changes and bladder and bowel retraining) GC: Usual care	Significant differences in the quality of MAP contraction occurred in the GI and the participants in this group were more likely to memorize correct contraction.
Kim <i>et al.</i> , 2011 <sup>(23)</sup>	264 (HL)	Check which neuromuscular monitoring mode at point P6 is able to prevent nausea and vomiting in PO	Apfel score, 3-point scale (0 = no symptoms, 1 = nausea, 2 = vomiting) and EVA, performed 6 and 24h PO	GC: 2 electrodes in the ulnar nerve path (ST, 1Hz, 50mA) GI (ST, TOF, DBS or tetanic): 2 electrodes positioned on P6	In the tetanus group, at 6 h of PO, the need for opioids and the incidence of nausea and vomiting were significantly lower than in the GC.
Tsang <i>et al.</i> , 2011 <sup>(24)</sup>	48 (HAT)	To verify the effectiveness of auricular TENS in controlling PO and PFE pain in patients undergoing HAT	Preoperative: PFE PO: PFE and EVA	TENS: Each point was stimulated for 90s with f = 1Hz, intensity according to the patient's tolerance  TENS group (5 points), TENS placebo group (5 points), GC (no intervention)	EVA scores from the TENS group decreased significantly at all PI times. The GC showed a significant reduction in PFE over time.
Wei-min <i>et al.</i> , 2011 <sup>(25)</sup>	80 (HR)	Observe the effect of combined acupuncture modalities	Patients had urinary retention. Assessment: residual urine volume (<100ml and voluntary urination)	GI and GC (usual care + bladder exercises). From the 15 <sup>th</sup> PO day: acupuncture at specific points. If bladder function recovered, 1st TTO ended with removal of bladder probe. If not, it would continue the 2nd from the 22nd PO day.	Patients with residual urine volume greater than 200ml at the end of the 2 TTO were significantly different between groups, indicating that the rehabilitation of bladder function in the GI was better than in the GC.





Carli; Brown; Kennepohl, 2012 <sup>(26)</sup>	1 (HAT)	Report the case of an 88-year-old woman with endometrial cancer, submitted to an exercise protocol, pre- and post-HAT.	Preoperative: TC6, RBANS, SF36. Reassessment: 4 and 8 weeks of PO	Preoperative program: 3 weeks of strengthening of upper limbs and lower limbs, abdominal breathing exercises and walking. PO: resumed the exercises at home 1 week after surgery.	Improvement in the TC6, improvements in the SF36. Patient reported greater pleasure in his AVDs and better concentration.
Yang <i>et al.</i> , 2012 <sup>(27)</sup>	24 (HR)	To investigate the efficiency of a MAP rehabilitation program in the function of AP and QV in patients surviving gynecological cancer.	AP dysfunction questionnaire, AP muscle strength (perineometer + EMG), evoked motor potential of the sacral nerve and health-related QV (EORTC QLQ-C30 and QLQ-CX-24)	PFRP group (4 weeks): AP exercises ( <i>biofeedback</i> and <i>core</i> exercises) and counseling on the muscle of the AP No-PFRP group: booklet with AP exercises and lifestyle advice	Clinically significant difference pre and PI in the PFRP group in terms of physical function, pain, sexual concern, sexual activity and sexual / vaginal function. Significant improvement in MAP sexual function and strength.
El-Bandrawy; Emara; Ghareeb, 2013 <sup>(28)</sup>	150 (HA)	Assess whether transcutaneous electrical stimulation on point P6 is more effective than acupressure in reducing post-HA nausea and vomiting	Mc Gill (nausea and vomiting)	A group: TEAS 10Hz on P6 30min. + AE  B group: acupressure on P6+ AE  C group: AE	4 and 8 hours after TTO, A group presented improvement in both scales, significant in relation to groups B and C. B group showed significant improvement in relation to C group.
Lauszus; Kallfa; Madsen, 2016 <sup>(29)</sup>	108 (HA and HV)	Evaluate the perioperative modalities of physical performance, fatigue, pain and QV	Strength, functional capacity, body composition, fatigue and QOL, being assessed preoperatively and twice in PO period (2 and 4 weeks after surgery)		Women who underwent HA and HV reported a reduction in physical function analyzed by SF36 at 30 days of PO

**Note:** HAT = Total abdominal hysterectomy; HR = Radical hysterectomy; HV = Vaginal hysterectomy; HVL = Laparoscopic-assisted vaginal hysterectomy; HA = Abdominal hysterectomy; HL = Laparoscopic hysterectomy; TMAP = Pelvic floor musculature training; GI = Intervention group; GC = Control group; GP = Placebo group; ST = Single twitch; TOF = Train-of-four; DBS = Double-burst stimulation; TENS = Transcutaneous electrical nerve stimulation; PFE = Peak expiratory flow; TC6 = 6-minute walk test; RBANS = Repeatable Battery for the Assessment of Neuropsychological Status; SF36 = Short-Form 36; AVDs = Activities of daily living; PFRP = Pelvic floor rehabilitation program; EMG = Electromyography; EORTC = European Organization for Research and Treatment of Cancer; UDI = Urogenital Distress Inventory; MWS = Modified Wexner Score; IIQ = Incontinence Impact Questionnaire; CSS = Constipation Scoring System; AQLS = Assessment of Quality of Life score; CVS = Consecutive Vertical Scale; VAS = Visual analogue scale; MMSS = Upper limbs; MMII = Lower limbs; TEAS = Transcutaneous electrical acupoint stimulation; AE = Antiemetic; PO = Postoperative; PI = post intervention; QoL = Quality of life; TTO = Treatment.





## DISCUSSION

In this review, articles with different surgical approaches, assessments and treatments were included. However, all articles had hysterectomized women and physiotherapeutic domain procedures as their central character, whether exclusively or not, being performed pre and/or post-operatively. Two articles of this review<sup>(26,29)</sup> brought in their evaluation method the SF-36, a questionnaire translated and validated in Portuguese, which because it is generic<sup>(30)</sup>, it is able to evaluate different aspects, such as quality of life, fatigue and pain, through its domains, and this is a useful tool when it comes to a heterogeneous population, as in the case of hysterectomized women, because it is large, it can be applied regardless of age group, disease or treatment group<sup>(30)</sup>. Transcutaneous electrical stimulation and P6 acupressure proved to be beneficial, with a high degree of recommendation, in reducing postoperative nausea and vomiting<sup>(21,23,28)</sup> in this review. Molassiotis *et al.*<sup>(31)</sup> conducted a similar study using a commercial elastic acupressure bracelet (*Seaband*<sup>®</sup>) to reduce nausea and vomiting in women with breast cancer undergoing chemotherapy, this bracelet being an elastic band with a plastic button, to perform only acupressure, without the presence of electric current. The patients were instructed to press the button in contact with the point for 2 to 3 minutes every 2 hours, for five days and obtained better results in reducing nausea, vomiting and anxiety compared to the control group, which received antiemetics. Ortenzi<sup>(32)</sup> also indicated that relieving nausea and vomiting is one of the best studied effects of acupuncture and acupressure.

The application of auricular TENS<sup>(24)</sup> in points related to hysterectomy, showed minimization of postoperative pain, revealing itself as an effective non-medication alternative for this purpose. Although there was no difference in peak expiratory flow (PEF) between the intervention and placebo groups, there was a reduction in PEF in the control group, which only rested. Usichenko *et al.*<sup>(33)</sup> conducted a study with application of preoperative auricular acupuncture, with the objective of analgesia, in patients undergoing outpatient knee arthroscopy surgery, resulting in less need for the use of ibuprofen by the intervention group, however the pain intensity referred in EVA was similar in both groups. Interesting studies<sup>(22,27)</sup> brought in their main protocol the training of the AP muscles. Despite the study of Yang *et al.*<sup>(27)</sup> present

more significant benefits, both protocols demonstrated some level of improvement in the muscles of the AP (quality of contraction and strength). According to previous studies<sup>(34,35)</sup>, hysterectomy can lead to bladder changes and reduced quality of life. A recent article by Bykoviene *et al.*<sup>(36)</sup> verified the effects of AP muscle training and recommendations for lifestyle changes associated or not with tibial nerve stimulation in the overactive bladder, and only the group that performed AP training associated with recommendations for lifestyle changes had a significant decrease in urinary incontinence, according to assessments made through a 3-day diary and using the King's College Health Questionnaire. This demonstrates the need for prophylaxis and that PA training has been used in different aspects of the dysfunctions that cover the PA, with good reported effects.

However, the study of Frawley *et al.*<sup>(22)</sup> used as a physiotherapeutic intervention a well-designed muscle training protocol for the AP, but it did not present expressive results in comparison to the control group. This is probably due to the fact that the control group also obtained lifestyle advice and exercises for the AP muscles similar to those of the treatment group, performed without assistance and / or physical therapy supervision, which may have left the groups with approximate treatments. In another study<sup>(22)</sup>, also used the Urogenital Distress Inventory (UDI) and Incontinence Impact Questionnaire (IIQ) related to the evaluation of aspects of the urinary bladder, the Modified Wexner Score (MWS) questionnaire to assess fecal incontinence, the Constipation Scoring System (CSS) to assess constipation and the Assessment of Quality of Life Score (AQLS) to analyze quality of life, these specific questionnaires are very useful for the evaluation of patients who fit the symptoms evaluated in their domains, either for investigation or as an adjunct to confirm a diagnosis. Selcuk *et al.*<sup>(37)</sup> carried out a study including women who underwent hysterectomy and used the UDI, IIQ and MWS questionnaires to assess aspects of AP dysfunctions. The patients who underwent simple hysterectomy obtained, according to the UDI questionnaire, significantly higher obstructive and irritative scores compared to the control group, and patients who underwent radical hysterectomy showed greater impact on sexual life through the Pelvic Floor and Sexual Incontinence





Impact Questionnaire, reaching the conclusion that hysterectomy affects the quality of life in all aspects involving the functions of the AP, being considered urgent urinary dysfunctions, sexual dysfunctions and obstructions the most unpleasant and time-consuming symptoms to be overcome. Wei-min *et al.*<sup>(25)</sup> used in their study techniques of traditional Chinese medicine (acupuncture and moxibustion), which originally are not present in the curriculum of physiotherapy courses, however, although they are not exclusive to physiotherapy, they belong to one of the specializations of the profession. Thus, they can function as a resource in the urogynecological treatment of patients submitted to radical hysterectomy, and have been shown to be beneficial in reducing urinary retention in this population<sup>(25)</sup>. Zhang<sup>(38)</sup> conducted a similar study with 36 patients who had an episode of urinary retention during hospitalization for different reasons (spinal cord injury, cerebrovascular accident, gynecological and abdominal surgeries, childbirth, nephritis and meningitis), obtaining positive results: 30 patients were cured, four cases improved and only two failed, with an effectiveness rate of 94.44%. According to Ortenzi<sup>(32)</sup>, acupuncture can also be an auxiliary instrument in reducing pain and side effects from the use of postoperative opioids, despite this, there were no articles on this point in this review.

Breathing exercises were part of the protocol of two studies<sup>(26,27)</sup> of this review, and another study<sup>(22)</sup> focused on guidelines for performing correct breathing during exercises to strengthen the AP. According to De Cleve *et al.*<sup>(39)</sup>, lower abdominal surgery is associated with a 10 to 15% decrease in functional residual capacity. Recent study<sup>(40)</sup> demonstrated that respiratory physiotherapy plays an important role in improving vital capacity (VC) in patients undergoing abdominal surgery, being performed breathing exercises associated with upper limb exercises and assisted coughing, in addition to lower limb exercises, ending with the use of intermittent positive pressure or incentive spirometer, depending on the group, and both groups obtained positive results. Dias *et al.*<sup>(41)</sup> conducted a study analyzing breath stacking and incentive spirometry techniques on the inspiratory capacity of subjects undergoing abdominal surgery and observed that the breath stacking technique was able to mobilize a greater inspiratory volume in relation to incentive spirometry. Lunardi *et al.*<sup>(42)</sup> report that the

peak of reduction in the activation of inspiratory muscles and forced VC, after abdominal surgery, occurs around the third postoperative day, and hypoventilation is related to an increased risk of pulmonary complications. According to Rodrigues *et al.*<sup>(43)</sup>, in a study with 18 patients undergoing abdominoplasty, spirometric values changed between the 2nd and 7th postoperative days, returning to normal values from the 15th day after the surgical procedure. Thus, there is a need for the inclusion of breathing exercises in the physiotherapy treatment protocol in patients undergoing hysterectomy, since most procedures are still performed through the open abdominal route, worldwide<sup>(1)</sup>. Additionally, according to Silva *et al.*<sup>(44)</sup>, in the postoperative period of abdominal surgeries, respiratory physiotherapy is efficient in reversing atelectasis and in increasing oxygen saturation, and in its study a respiratory exercise protocol was developed, resulting in the improvement of minute-volume and tidal volume, as well as increments in maximum inspiratory and expiratory pressures, however there was an increase in pain after physical therapy. This shows that, although necessary, the intervention of the physiotherapist should be done sparingly, analyzing which exercises are most suitable for each patient or adapting them to the postoperative context, depending on the surgical approach.

## CONCLUSION

From the articles analyzed in this review, it could be concluded that the interventions performed in the studies with the objective of minimizing the possible complications associated with the hysterectomy procedure were positive. This great diversity of studies showing beneficial effects in the different interventions serves as a basis for directing physiotherapeutic approaches in hysterectomy, aiming at complementary resources for the better care of the patient undergoing this procedure. Through this review it was possible to observe the need for further studies in the area of physiotherapy, especially urogynecological, with good methodological quality that will ratify the findings addressed in this systematic review, thus contributing to the better treatment of hysterectomized women.

**AUTHORS' CONTRIBUTION:** EMM and CG contributed to the elaboration of the design, development of the study and data





acquisition. REW contributed to article design and data tabulation. THR contributed to the critical review, correction and approval of the final version. GJSH contributed to the elaboration of the study design and development and data analysis, and approval of the final version.

**FINANCIAL SUPPORT:** nothing to declare.

**CONFLICT OF INTEREST:** the authors declare that they have no conflict of interest.

## REFERENCES

- Uccella S, Morosi C, Marconi N, et al. Laparoscopic Versus Open Hysterectomy for Benign Disease in Uteri Weighing >1 kg: A Retrospective Analysis on 258 Patients. *J Minim Invasive Gynecol.* 2018;25(1):62–69.
- Nogueira-Silva C, Santos-Ribeiro S, Barata S, Alho C, Osorio F, Calhaz-Jorge C. Histerectomia totalmente laparoscopica: Análise retrospectiva de 262 casos. *Acta Med Port.* 2014;27(1):73–81.
- Sória HLZ, Fagundes DJ, Sória-Vieira S, Cavalli N, dos Santos CRC. Histerectomia e as doenças ginecológicas benignas: o que está sendo praticado na Residência Médica no Brasil? *Rev bras ginecol Obs.* 2007;29(2):67–73.
- Ministério da Saúde. BRASIL. DATASUS. 2019.
- De Sousa LP, Gonçalves MJ, Valle F, Geber S. Histerectomia total e subtotal: Há diferença quanto ao impacto na sexualidade? *Reprod e Clim.* 2013;28(3):117–21.
- Cohen S, Sewell C. Leiomiomas Uterinos. In: *Manual de Ginecologia e Obstetrícia do Johns Hopkins.* 4ª. Porto Alegre: Artmed; 2012. p. 497–503.
- Corleta H von E, Chaves EBM, Capp E. Miomas Uterinos. In: *Rotinas em Ginecologia.* 6ª. Porto Alegre: Artmed; 2011. p. 135–43.
- Marques JP, Mota F. Cirurgia Uterina por via abdominal. In: *Manual de Ginecologia - Volume II.* Permanyer Portugal; 2010. p. 447–79.
- Freitas F, Wender MCO, Valiati B, Rodini GP. Sangramento Uterino Anormal. In: *Rotinas em Ginecologia.* 6ª. Porto Alegre: Artmed; 2011. p. 121–34.
- Hurt KJ, Marvel RP. Dor Pélvica Crônica. In: *Manual de Ginecologia e Obstetrícia do Johns Hopkins.* 4ª. Porto Alegre: Artmed; 2012. p. 390–405.
- Oppermann MLR, de Souza CAB, Genro VK, Caran JZ, Filho JSLC. Dor Pélvica Crônica. In: *Rotinas em Ginecologia.* 6ª. Porto Alegre: Artmed; 2011. p. 96–112.
- Ramos JGL, Oderich CL, Schmidt AP, Martins-Costa SH. Anormalidades da Estática Pélvica. In: *Rotinas em Ginecologia.* 6ª. Porto Alegre: Artmed; 2011. p. 204–20.
- Antunes MLFC. Sexualidade da mulher submetida a histerectomia: dilemas no pós-operatório. *Dissertação: Escola Superior de Enfermagem de Coimbra.* 2014;187.
- Mônego HI, Niederauer N, Bilibio JP, dos Reis R, Rivoire WA. Pré e Pós-Operatório em Cirurgia Ginecológica. In: *Rotinas em Ginecologia.* 6ª. Porto Alegre: Artmed; 2011. p. 34–51.
- Russell JB, Green IC. Cuidados Perioperatórios e Complicações da Cirurgia Ginecológica. In: *Manual de Ginecologia e Obstetrícia do Johns Hopkins.* 4ª. Porto Alegre: Artmed; 2012. p. 346–61.
- Bim CR, Perego AL, Pires-Jr H. Fisioterapia Aplicada À Ginecologia E Obstetrícia. *Cesumar.* 2002;04(01):57–61.
- Lawrence VA, Cornell JE, Smetana GW. Strategies To Reduce Postoperative Pulmonary Complications after Noncardiothoracic Surgery: Systematic Review for the American College of Physicians. 2006;144(8).
- Pedrolo E, Danski MTR, Mingorance P, De Lazzari LSM, Méier MJ, Crozeta K. a Prática Baseada Em Evidências Como Ferramenta Para Prática Profissional Do Enfermeiro. *Cogitare Enferm.* 2009;14(4).
- PEDro. Escala de PEDro – Português. 2009;1–7.
- Oxford. Níveis de Evidência Científica segundo a Classificação de Oxford Centre for Evidence-Based Medicine. 2001.
- Frey UH, Scharmann P, Löhlein C, Peters J. P6 acustimulation effectively decreases postoperative nausea and vomiting in high-risk patients. *Br J Anaesth.* 2009;102(5):620–5.
- Frawley HC, Phillips BA, Bo K, Galea MP. Physiotherapy as an Adjunct to Prolapse Surgery: An Assessor-Blinded Randomized Controlled Trial. *Neurourol Urodyn.* 2010;29(5):719–25.
- Kim YH, Kim KS, Lee HJ, Shim JC, Yoon SW. The efficacy of several neuromuscular monitoring modes at the P6 acupuncture point in





- preventing postoperative nausea and vomiting. *Anesth Analg.* 2011;112(4):819–23.
24. Tsang HC, Lam CS, Chu PW, Yap J, Fung TY, Cheing GLY. A randomized controlled trial of auricular transcutaneous electrical nerve stimulation for managing posthysterectomy pain. *Evidence-based complementary and alternative medicine.* 2011;276769:1-9
  25. Wei-Min Y, Ai-Zhen P, Jian-Jun L, Dan-Feng L, Qi-Hui H. Clinical observation on the acupuncture treatment in patients with urinary retention after radical hysterectomy. *Chin J Integr Med.* 2011;17(11):860–3.
  26. Carli F, Brown R, Kennepohl S. Prehabilitation to enhance postoperative recovery for an octogenarian following robotic-assisted hysterectomy with endometrial cancer. *Can J Anesth.* 2012;59(8):779–84.
  27. Yang EJ, Lim JY, Rah UW, Kim YB. Effect of a pelvic floor muscle training program on gynecologic cancer survivors with pelvic floor dysfunction: A randomized controlled trial. *Gynecol Oncol.* 2012;125(3):705–11.
  28. El-bandrawy AM, Emara HM, Ghareeb HO. Transcutaneous Electrical Acupoint Stimulation versus Acupressure on Postoperative Nausea and Vomiting after Abdominal Hysterectomy. *British Journal of Medicine & Medical Research.* 2013;3(4):2247–55.
  29. Lauszus FF, Kallfa E, Madsen MR. Fatigue and physical function after hysterectomy measured by SF-36, ergometer, and dynamometer. *Arch Gynecol Obstet.* 2016;294(1):95–101.
  30. Ciconelli RM. Tradução para o português e validação do questionário genérico de avaliação de qualidade de vida "Medical outcomes study 36 - Item Short-Form Health Survey (SF-36)". Universidade Federal de São Paulo; 1997.
  31. Molassiotis A, Helin AM, Dabbour R, Hummerston S. The effects of P6 acupressure in the prophylaxis of chemotherapy-related nausea and vomiting in breast cancer patients. *Complement Ther Med.* 2007;15(1):3–12.
  32. Ortenzi A. Acupuntura na Dor Pós-Operatória. *Medicina perioperatória.*
  33. Usichenko TI, Kuchling S, Witstruck T, et al. Auricular acupuncture for pain relief after ambulatory knee surgery: a randomized trial Taras. *Can Med Assoc J.* 2007;176(2):179–83.
  34. Herzog TJ, Wright JD. The impact of cervical cancer on quality of life-The components and means for management. *Gynecol Oncol.* 2007;107(3):572–7.
  35. Skjeldestad FE, Rannestad T. Urinary incontinence and quality of life in long-term gynecological cancer survivors: A population-based cross-sectional study. *Acta Obstet Gynecol Scand.* 2009;88(2):192–9.
  36. Bykoviene L, Kubilius R, Aniuliene R, Bartuseviciene E, Bartusevicius A. Pelvic floor muscle training with or without tibial nerve stimulation and lifestyle changes have comparable effects on the overactive bladder. A randomized clinical trial. *Female Urol.* 2018;15(4):186-192.
  37. Selcuk S, Cam C, Asoglu MR, et al. Effect of simple and radical hysterectomy on quality of life - Analysis of all aspects of pelvic floor dysfunction. *Eur J Obstet Gynecol Reprod Biol.* 2016;198:84–8.
  38. Zhang D. Thirty-six cases of urinary retention treated by acupuncture. *J Tradit Chinese Med.* 2008;28(2):83–5.
  39. de Cleve R, Assumpcao M, Sasaya F, et al. Correlation between intra-abdominal pressure and pulmonary volumes after superior and inferior abdominal surgery. *Clinics.* 2014;69(7):483–6.
  40. Fernandes SCS, dos Santos RS, Giovanetti EA, et al. Impact of respiratory therapy in vital capacity and functionality of patients undergoing abdominal surgery. *Einstein.* 2016;14(2):202–7.
  41. Dias C, Plácido T, Ferreira M, Guimarães F, Menezes S. Espirometria de incentivo e breath stacking: repercussões sobre a capacidade inspiratória em indivíduos submetidos à cirurgia abdominal. *Rev Bras Fisioter.* 2008;12(2):94–9.
  42. Lunardi AC, Paisani DM, Silva CCBM da, Cano DP, Tanaka C, Carvalho CRF. Comparison of lung expansion techniques on thoracoabdominal mechanics and incidence of pulmonary complications after upper abdominal surgery: a randomized and controlled trial. *CHEST J.* 2015;148(4):1003–1010.





43. Rodrigues MA, Nahas FX, Gomes HC, Ferreira LM. Ventilatory function and intra-abdominal pressure in patients Who underwent abdominoplasty with plication of the external oblique aponeurosis. *Aesthetic Plast Surg.* 2013;37(5):993–9.
44. da Silva FA, Lopes TM, Duarte J, Medeiros RF. Tratamento fisioterapêutico no pós-operatório de laparotomia. *J Heal Sci Inst.* 2010;28(4):341–4.

