

Are massage parameters well reported in clinical trials? A systematic review

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ABSTRACT | INTRODUCTION: Lumbar and cervical spine pains are one of the biggest health problems in modern society. Among the physical resources aimed at reducing the perception of pain in the spine, the therapeutic massage stands out. Following the principles of good clinical practice, it is expected that the techniques performed can be reproducible. **OBJECTIVES:** To investigate, through an initial exploration of the question, how appropriate is the description of the physiotherapy technique in randomized controlled trials of spinal massage. **METHODS:** An electronic search strategy was carried out on Medline through Pubmed. The search was restricted to the literature in English and Portuguese. We included Randomized Clinical Trials whose therapeutic massage was the main intervention performed in the spine. The parameters evaluated were: 1) pressure of manipulation, 2) direction of movements, 3) velocity of movements, 4) rhythm of movements, 5) frequency of movements and 6) duration of sessions. Twelve studies were included in this critical review of the evidence. Most of the studies did not report or report in a dubious manner, the pressure of manipulation, velocity of movements and rhythm of movements. Only 66% (n = 8) of the studies adequately reported the direction of movement. **CONCLUSION:** Physiotherapy techniques for spinal massage are not usually adequately described in randomized controlled trials. We suggest the improvement of reports of randomized clinical trials in the field of manual therapy.

KEYWORDS: Evidence-based practice. Guideline adherence. Massage

Introduction

Lumbar and cervical pains are one of the major health problems in modern society, with many studies showing a high prevalence of pain in these body segments. In the lumbar and cervical spines the global point prevalence can reach 12%¹ and 5.9%² respectively.

In this situation, physical rehabilitation is one of the pillars for the improvement of the painful situation and consequently the return of patients to the activities of daily living. There are several modalities of spine rehabilitation and some of the possible treatment options are massage therapy and myofascial release³. Therapeutic massage can be defined as a set of systematic manipulations of body tissues with hands⁴, with the purpose of influencing the nervous and muscular systems and the general circulation. Myofascial release is a variation of therapeutic massage, which involves the tensioning of the myofascial complex, with the intent to restore optimal length of the fascial tissue, decrease pain, and improve functionality⁵. It is believed that for a correct application of the techniques, a standard is required in the execution

The parameters that can influence the final result are: pressure of manipulation, direction of movement, speed of movement and rhythm of movements, besides the frequency and total duration of the

technique. However, due to the subjectivity inherent in the manipulation of body tissues, there are doubts about the standardization of massage techniques in randomized clinical trials (RCTs).

The aim of the present systematic review are to investigate how appropriate is the description of physiotherapy technique in randomized controlled trials of spinal massage. The current systematic review is an initial exploration of the question, in order to generate a first impression.

Methods

Research strategy

An electronic search strategy was performed in Medline. The search was limited to the literature in English and Portuguese and date of publication in April 2018. We included RCTs whose therapeutic massage was the main intervention performed in the vertebral column. The research strategy incorporated the recommendations of high sensitivity (approximately 99%) and moderate specificity (approximately 70%) for the recovery of clinical trials⁶. Only studies published in the health literature in the last 12 months were included. Chart 1 shows the adopted search filter:

Chart 1. Research methodology filter

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Search (((message) OR myofascial release) OR acupressure)
AND (((clinical[Title/Abstract] AND trial[Title/Abstract]) OR
clinical trials as topic[MeSH Terms] OR clinical trial[Publication
Type] OR random*[Title/Abstract] OR random allocation[MeSH
Terms] OR therapeutic use[MeSH Subheading])) AND
(("2017/04/25"[PDat] : "2018/04/25"[PDat]))
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Study selection criteria

Were analyzed studies with people of any age and both gender. We did not consider the controlled variable in the search strategy. We included studies that had any rated outcome, except for interventions in which the parameters adopted for risk assessment of bias were not considered relevant or involved other equally relevant variables (aromatherapy and molecular markers). The Therapeutic massage was defined as set of systematic manipulations of the body tissues with the hands, with the purpose of influencing the nervous and muscular systems and the general circulation.

Data collection

Study selection was carried out by two independent researchers (RRBTM and KS) using a standardized spreadsheet. The inconsistencies were arbitrated through consensus involving a third party evaluator (BCF). The parameters evaluated were: 1) pressure of manipulation, 2) Direction of movements, 3) velocity of movements, 4) rhythm of movements, 5) frequency of movements and 6) duration of sessions. The risk of bias related to the intervention protocol was determined as follows: 1) Low risk of bias: when the authors reported clearly the parameters of the massage, allowing the procedure to be reproduced; 2) uncertain risk, was present when the authors reporting the parameters, but did not detail such data, to the point of allowing the procedure to be reproduced, or when the description of the

parameter and procedure adopted could be improperly described and 3) High risk of bias, when the authors did not report any mention of the procedure. The kappa agreement coefficient was applied to describe the interrater agreement and were interpreted according to the following aspects: poor, 0.00; slight, 0.01 to 0.20; fair, 0.21 to 0.40; moderate, 0.41 to 0.60; substantial, 0.61 to 0.80; and almost perfect, 0.81 to 1.00. All data extracted from RCTs were transformed into percentages. Kappa agreement was assessed using the vassarstats online tool (<http://vassarstats.net/kappa.html>). The graphic presentation of the biases of the therapeutic massage parameters of the included studies was performed using Review Manager Analysis software (RevMan 5.3) from Cochrane Collaboration.

Results

The electronic search provided a total of 270 RCTs who performed therapeutic massage and were published in the Medline database between April 2017 and April 2018. Of these, 19 studies involved experimental animals, 18 studies were published in Chinese. The other studies involved other study designs, including literature reviews. Twelve studies had as their intervention the therapeutic massage performed in any segment of the spine and were included in the final review (Figure 1). All twelve included studies (n = 876) presented pain as one of the evaluated outcomes (see Table 1):

Figure 1. flow chart of inclusion of studies

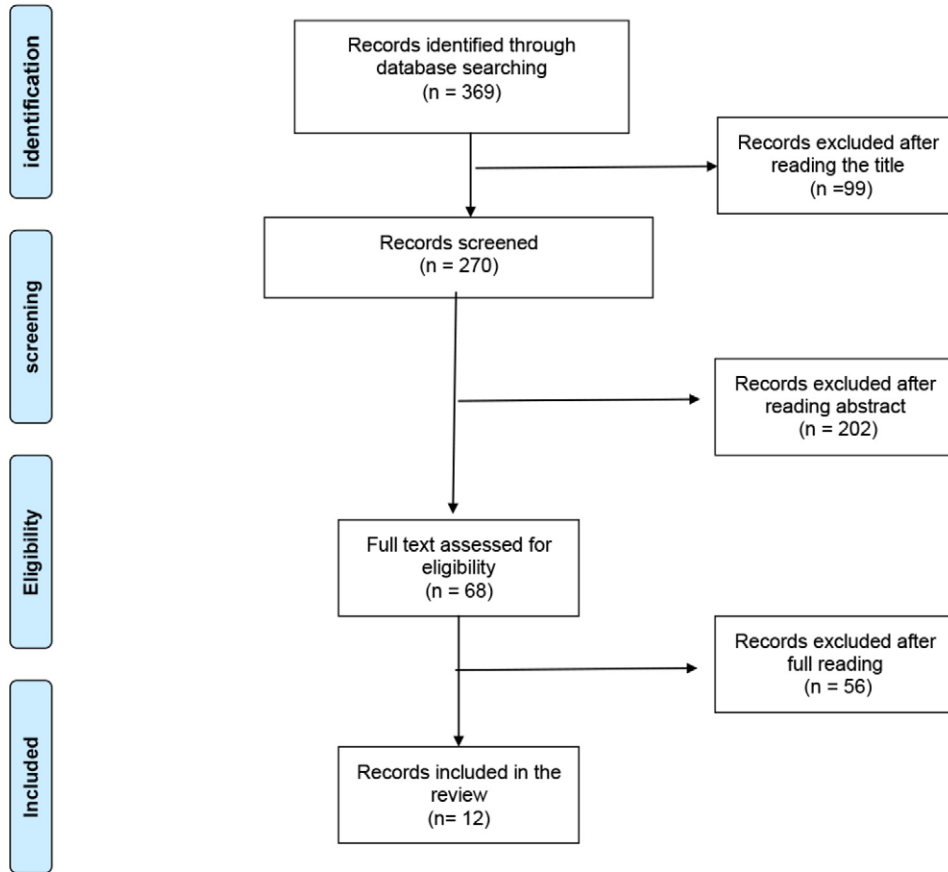


Table 1. Characteristics of included studies

First Author / (Year)	Patients	Follow-up	Outcomes measures
Arguisuelas,M (2017)	N = 54 (nonspecific chronic low back pain)	12 weeks	- Pain - Disability
Cambron (2017)	N = 225 (low back pain of >3 months)	12 months.	-Pain -Disability
Castro-Martin (2017)	N=21 (diagnosis of stage I-IIIa breast cancer)	4 weeks	-Pain -Range Of Movement
Krekousias (2017)	N=75 (low back pain >3 months)	5 weeks	- Pain - Disability
Movahedi (2017)	N=50 (nurses)	4 weeks	-Pain -Fatigue
Ojoawo (2017)	N=62 (mechanical low back pain)	8 weeks	- Pain - Disability
Oliveira (2017)	N=20 (chronic nonradicular low back pain).	5 weeks	- Pain - Disability -Heart rate variability -Postural balance
Pach (2018)	N=92 (chronic neck pain)	12 weeks	- Pain - Disability -Quality of life -Cost-effectiveness
Rodríguez-Huguet (2017)	N=41 (neck pain)	1 month	-Pain
Xia (2017)	N=29 (Neck Pain After Anterior Cervical Discectomy and Fusion)	1 month	- Pain
Xiang (2017)	N=57 (Cervical Spondylosis)	12 weeks	- Pain - Blood perfusion
Yazdanpanahi (2017)	N=150	2 weeks	-Pain

Regarding the report of the therapeutic massage parameters, only the frequency of movements and durations of sessions were clearly described. The omission of information related to the most prevalent massage parameters of included studies was related to rhythm of movements (figure 2). Figure 3 reports the biases of the therapeutic massage parameters of the individual studies. The agreement among the investigators was nearly perfect (Kappa: 0.8714, standard error: 0.0404, 95% CI: 0.7921-0.9507).

Figure 2. Relative frequency of the description of the massage parameters of RCTs included in the study

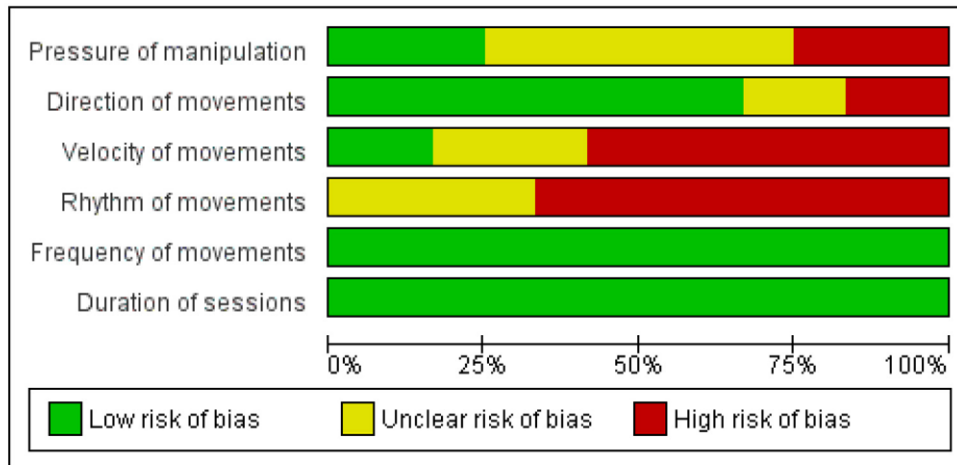


Figure 3. Classification of bias risk in individual studies

	Pressure of manipulation	Direction of movements	Velocity of movements	Rhythm of movements	Frequency of movements	Duration of sessions
Arguisuelas,2017	+	+	+	?	+	+
Cambron,2017	?	+	?	-	+	+
Castro-Martin,2017	?	?	-	-	+	+
Krekoukias,2017	?	+	-	-	+	+
Movahedi ,2017	+	+	-	-	+	+
Ojoawo,2017	-	+	?	?	+	+
Oliveira,2017	-	-	-	-	+	+
Pach,2018	?	+	?	?	+	+
Rodríguez-Huguet,2018	+	+	+	?	+	+
Xia,2018	?	+	-	-	+	+
Xiang-wen, 2017	?	?	-	-	+	+
Yazdanpanahi,2017	-	-	-	-	+	+

Discussion

This study aimed to evaluate the clarity in reporting massage therapy information. Regarding the speed of movement, only two authors^{5,7} report having considered this parameter within the massage protocol. The speed of massage can provide different physiological and biomechanical effects. The low speed of the massage is related to the inhibitory effects and the high speed is related to the excitatory effects of the autonomic nervous system⁸. The chiropractic manipulation is a technique of vertebral manipulation that must be performed, necessarily at high speed⁹. The RCT conducted by Cambron¹⁰, made by 7 different licensed chiropractic physicians with at least 3 years of clinical experience, does not make clear how was the control of the velocity of applied chiropractic manipulation, which can significantly influence the evaluated outcomes.

Only 3^{5,7,11} studies refer to the pressure applied during the approach. Arguisuelas⁵, explains that in his study, a light pressure was exerted, on the other hand, recognizes the difficulty in standardizing the applied pressure. Arguisuelas⁵, explains that in his study, a light pressure was exerted, on the other hand, recognizes the difficulty in standardizing the applied pressure. This is assumed as a limitation for the study involving myofascial therapies. Movahedi¹¹, in an attempt to standardize the therapy pressure applied in their study (equivalent to 3 - 4 kg), reported that participants should feel a feeling of weight, numbness and heat in the area. However, we understand that there was clarity of information, allowing the reproduction of the procedure applied. We did not find any study that associated participants' signs and symptoms with the applied pressure of manipulation. Furthermore, in patients with cognitive alterations or changes in sensitivity, the relationship between pressure and sensation reported may be substantially underestimated or overestimated.

The rhythm movement is related to the number of pause between movements. In our understanding, no RCTs evaluated in this study presented this information clearly and convincingly. In our understanding, this is the first study that systematically investigates the parameters of the various therapeutic massage

techniques in RCTs in patients with spinal pain perception. According to the data obtained in this research, we can see the great difficulty in establishing reliable and reproducible massage parameters. Only the frequency (that is, the number of times the technique is applied for some period) and the duration of application of the technique, were properly reported, allowing reproduction in clinical practice^{5,7,10-19}. The studies selected in this review report that each session had a mean frequency of 1 to 2 times a week, and duration ranging from ten minutes to forty minutes.

We did not intend to evaluate the bias related to the randomization process, data collection and analysis. Accordingly, no analysis was performed regarding random sequence generation, concealment of allocation, blinding of participants and professionals, blinding of outcome assessors, incomplete outcomes, and reporting of selective outcome and other sources of bias proposed by the Cochrane Handbook. We believe that systematic reviews of the literature, with no year restriction and with well-defined outcomes, can contribute to answer these questions.

Conclusions

The findings of our study indicate that physiotherapy techniques for massage is not usually appropriately described in clinical trials. The lack of a detailed description of the intervention can be an important source of bias related to the independent variable. Therefore, the use of objective parameters and the development of new technologies for the calibration of interventions in the field of manual therapy may be considered.

Author contributions

Maciel RRBT conceived the original idea and directed the project. Study concept and design: Maciel RRBT, Ferreira BC and Lima K. Acquisition of data: Maciel RRBT, Ferreira BC and Lima K. Analysis and interpretation of data: Maciel RRBT, Ferreira BC and Lima K. Maciel RRBT wrote the manuscript in consultation with Ferreira BC and Lima K. Final approval of the version to be published: Maciel RRBT, Ferreira BC and Lima K.

Competing interests

No financial, legal or political competing interests with third parties (government, commercial, private foundation, etc.) were disclosed for any aspect of the submitted work (including but not limited to grants, data monitoring board, study design, manuscript preparation, statistical analysis, etc.).

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