The effects of the Pilates method in individuals after stroke: a systematic review with meta-analysis

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ABSTRACT:

Background: Pilates has shown significant effects in post-cerebrovascular accident (CVA) patients. **Objective:** To carry out a systematic review with meta-analysis, investigating the effects of the Pilates method in post-stroke individuals. **Methods:** An electronic search was performed using an optimized strategy in the Medline, CINAHL, SPORTDiscus, Web of Science, LILACS and PEDro databases, plus a manual search. Clinical trials that used the Pilates method in post-stroke rehabilitation, in functionality outcomes, were included. Studies were reviewed by two independent reviewers. Methodological quality was assessed using the PEDro scale. **Results:** Seven studies were included. The results of the meta-analyses showed that Pilates was effective in improving mobility (-3 seconds; CI 95% -4 to -1; p=0.009), assessed by the Timed Up and Go, and quality of life (SMD 1.1; 95% CI 0.5 to 1.58; p<0.001) of individuals after stroke. Regarding the descriptive results, Pilates proved to be effective in improving lower limb motor function, cardiopulmonary function, step length, and gait ability. **Conclusion:** This systematic review showed, through meta-analysis, that the Pilates method is effective in improving the mobility and quality of life of post-stroke individuals. In addition, descriptive results were significant for lower limb motor function, cardiopulmonary function, step length, and gait ability. However, these latter results deserve caution, as they were all based on descriptive results from only one clinical trial each.

Keywords: Stroke; Pilates; functionality, review.

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BACKGROUND

Stroke is defined as an acute neurological dysfunction, of vascular origin, with a rapid onset of symptoms, which vary depending on the affected region of the brain. This dysfunction can cause impairment of the hemibody contralateral to the brain injury, called hemiplegia or hemiparesis[1]. Currently, stroke is considered a public health problem, with a high incidence, and one of the main causes of chronic disability in the world[2].

Among the various deficiencies presented by individuals after a stroke, one of the most prevalent is the motor, which is identified as one of the most disabling[3]. The main primary motor deficiency presented by these individuals is muscle weakness, which can occur due to loss and/or decreased activation of motor units, physiological changes in the plegic muscle, denervation, decreased physical activity, or disuse[4]. However, hemiparetic individuals may also develop other primary motor deficiencies, such as decreased coordination motor skills, in addition to reduced balance and mobility limitations, increasing the risk of falls[5].

Conventional post-stroke rehabilitation aims to restore individuals' functions, improving their performance in daily activities and social participation, with intense

interventions generating better results[5]. Although intensive rehabilitation is offered to many patients in the first three to six months after the stroke, also known as the period of spontaneous recovery, many of them, in the chronic phase, continue to present motor deficits, making them a group prone to greater functional decline and the presence of comorbidities[3]. Furthermore, many abandon treatment or are discharged, due to the stagnation of the condition (absence of improvement) and/or session routine[4]. Therefore, new treatment proposals are essential to potentially improve the quality of care for this population and increase patient adherence to the treatment.

Pilates, a method widely applied in clinical practice today, is based on eight principles: control, breathing, fluid movement, centralization, stability, range of motion, and resistance[6]. This method consists of a set of physical exercises that integrates the body and mind, providing postural control, strength, flexibility, balance, awareness, and perception of body movement[5]. Two previous meta-analyses investigated the effects of Pilates on individuals after a stroke[7, 8]. However, the first included only three studies, investigating the effects only on the balance variable[7], and the second included only four randomized clinical trials, investigating the effects on lower limb function[8]. The Pilates method, according to new clinical trials published, showed potential for improvement in other outcome measures, such as gait and quality of life in this population[5, 6].

Therefore, given all of the above, adding Pilates to the rehabilitation of stroke patients could not only help reduce disabilities but also increase the quality of life, allowing the individual the ability to gain some independence[5]. Therefore, The objective of the present study was to carry out a systematic review of the literature with meta-analysis, investigating the effects of the Pilates method on the functionality of individuals after a stroke.

MATERIALS AND METHODS

Procedures

To carry out this systematic review, a computerized search was carried out using an optimized strategy in the Medline, CINAHL, SPORTDiscus, Web of Science, LILACS, and PEDro databases (Appendix 1). A manual search was also carried out in all references of articles included in the database searches. Two authors carried out a systematic search for each database, using a combination of keywords, such as Pilates, stroke, stroke, stroke, hemiplegia, hemiparesis, hemiparetic, paresis, plegia, paretic, ischemic, and hemorrhagic, in addition to their respective terms in English. Both evaluators critically analyzed the title and summary of each article found and, subsequently, critically read the full text of the articles selected in the previous stage. A third independent evaluator was responsible for disagreements in the eligibility of articles made by the first two evaluators. The coverage period was any study published until June/2023. There were no restrictions regarding the language of the publication. The review was registered in the PROSPERO database (CRD42023438874).

Inclusion and exclusion criteria

In this systematic review, clinical trials that used the Pilates method in the intervention and rehabilitation of hemiparetic individuals, of both sexes, without

restrictions on age or duration of injury were included. Studies should report intervention with the Pilates method, in terms of functionality outcomes. The exclusion criteria were review studies, studies with other hemiparesis, not due to the stroke, or studies that included another neurological condition in the population in addition to the stroke.

All data were extracted and arranged in a standard form, adapted from the Cochrane Collaboration. The information extracted from the studies was: type of study, characteristics of the participants included (such as gender, age, sample size, etc.), objective, intervention protocol (such as duration, intensity, frequency, description of activities, etc.), measures of outcome used, relationship investigated (groups) and results found. When necessary information was not found in the published version of the studies, additional details were requested from the corresponding author via email.

Methodological quality

The methodological quality of the included experimental studies was assessed according to the PEDro scale, described in the Physiotherapy Evidence Database (www.pedro.org.au). The scale, composed of 11 items, was developed to classify the methodological quality (internal validity and statistical information) of randomized clinical trials. Each item, except item 1, contributes one point to the total scale score, which ranges from 0 to 10 points. The study scores described in the database's electronic address will be used. The scoring of studies not included in the PEDro database or not scored will be carried out by the authors of this study[9].

Statistical analysis

All information about the studies was extracted by two evaluators and verified by a third. The fixed effects model was preferably used and, in the case of statistically significant heterogeneity (I2>40%), the effect size was analyzed using the random effects model. Pooled data for gait speed and mobility were reported as mean difference (MD), along with their respective 95% confidence intervals (95%CI), while for balance and quality of life, the result was reported as standardized mean difference (SMD) (variables assessed by different instruments, and reported in different measurement units). All analyses were performed using the Comprehensive Meta-Analysis program, Version 3.0. The critical value to reject H0 was set at a significance level of 5% (2-tailed). When data were not available to be included in the meta-analysis, the difference between the comparison groups was only described, according to the results reported by the authors.

RESULTS

The electronic search resulted in 347 articles. Of these, 314 articles were excluded after reading the titles and 23 excluded after reading the abstracts, leaving ten articles selected for full text reading. After reading, six articles were included in this review, according to the established inclusion criteria. The manual search returned one study that was also included after analysis. Thus, a total of seven articles were included and described in the present study[6, 10-15]. The main reasons for excluding studies were studies with healthy people, studies comparing Pilates with other interventions, articles

that addressed other diseases, trials non-randomized, and repeated studies. Figure 1 represents the study selection flowchart, with each step performed.

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┌─────────────────────────────────────────────────────────────────────────────────┐
│  ┌──────────────────────────────┐                                                 │
│  │ Database searched until      │         ┌──────────────────────────────┐       │
│  │ June 2023:                   │────────▶│   Title reading – excluded    │       │
│  │ MEDLINE (n=201)              │         │          (n=314)              │       │
│  │ LILACS (n=05)                │         └──────────────────────────────┘       │
│  │ PEDro (n=93)                 │                                                 │
│  │ CINAHL (n=10)                │         ┌──────────────────────────────┐       │
│  │ SportDiscus (n=13)           │◀────────│ Reading of abstracts -        │       │
│  │ Web of Science (n=25)        │         │ excluded (n=23)               │       │
│  └──────────────────────────────┘         └──────────────────────────────┘       │
│  ┌──────────────────────────────┐                                                 │
│  │ Potentially eligible studies │◀───                                             │
│  │ after title and abstract     │    ┌──────────────────────────────────────┐    │
│  │ evaluation (n=10)            │───▶│ Studies excluded after reading the    │    │
│  └──────────────────────────────┘    │ full text (n=4)                       │    │
│                                       │ • Magazine report                     │    │
│                                       │ • Case study                          │    │
│  ┌──────────────────────────────┐    │ • Study included other neurological   │    │
│  │  Included studies (n=6)       │ ✚  │   populations                         │    │
│  └──────────────────────────────┘    │ Studies included through manual       │    │
│                                       │ search (n=1)                          │    │
│          ┌──────────────────────────────────────┐                                │
│          │   Total studies included (n=7)       │                                │
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The seven studies were summarized in Table 1 and presented an average methodological quality of 5 (Table 2). The studies included nine to 60 participants, with an average age of 58 to 68 years. Six studies were carried out in chronic patients (> 6 months)[6, 10-13, 15], while 1 was carried out in acute patients (< 6 months)14. Regarding the intervention, four studies[10, 11, 13, 14] performed Pilates in the experimental group and conventional physiotherapy in both groups, and three studies[6, 12, 15] performed Pilates in the experimental group and no treatment in the control group. Regarding outcome measures, two studies evaluated gait speed (Gait speed test – 10 meters – TM10M)[10, 12], four studies evaluated balance (Berg balance scale – EBB, center of pressure oscillation, Functional Reach Test – TAF, and Tinetti Performance Oriented Mobility Assessment - POMA)[6,10,13,14], three studies evaluated mobility (Timed Up and Go – TUG, which in addition to walking includes other activities, such as turning and sitting /lift)[10, 11 ,14], two studies assessed quality of life (Stroke Specific Quality of Life Scale – SSQol - and Korean Stroke Specific Quality of Life Scale – KSSQoL)[14, 15], and only one study for each one of the following outcome measures: motor function of the lower limbs (Fugl-Meyer Scale – lower limbs – EFM-LL)[10], cardiopulmonary function (Submaximal treadmill test)[11], step length (System for analysis of 3D movement)[12], and gait ability , (Dynamic Gait Index – IMD, which evaluates the ability to walk, in different situations, such as shaking the head and moving around objects)[14].

Table 1. Summary of evaluated studies

| Study	Sample	Intervention	Assesment instruments
Liang et al., 2018[10]	n = 60 Age = 68 (±2) years Chronic	Experimental group = Conventional physiotherapy (40 minutes, 6x/week, 10 weeks) + Pilates (30 minutes, 6x/week, 10 weeks). Control group = Conventional physiotherapy (40 minutes, 6x/week, 10 weeks).	Balance (Berg Balance Scale), gait speed (10 Meter Gait Test), Mobility (Timed Up and Go), and motor function (Fugl-Meyer Scale – Lower Limbs).
Lim et al., 2016[6]	n = 19 Age = 64 (±6) years Chronics	Experimental group = Pilates (60 minutes, 3x/week, 8 weeks). Control group = No treatment.	Balance (oscillation of the center of pressure - FIT, Bertec Corp., USA).
Lim and Yoon, 2017[11]	n = 20 Age = 63 (±7) years Chronics	Experimental group = Conventional physiotherapy (30 minutes, 5x/week, 8 weeks) + Pilates (30 minutes, 5x/week, 8 weeks). Control group = Conventional physiotherapy (30 minutes, 5x/week, 8 weeks).	Cardiopulmonary function (submaximal treadmill test) and mobility (Timed Up and Go).
Roh et al., 2016[12]	n = 20 Age = 66 (±4) years Chronics	Experimental group = Pilates (60 minutes, 3x/week, 8 weeks). Control group = No treatment.	Step length and gait speed (3D motion analysis system - Instrumented Treadmill, Bertec, USA)
Sathe et al., 2018[13]	n = 9 Age = Not reported Chronics	Experimental group = Conventional physiotherapy (Time not reported, 3x/week, 6 weeks) + Pilates (Time not reported, 3x/week, 6 weeks). Control group = Conventional physiotherapy (Time not reported, 3x/week, 6 weeks).	*Balance (Tinetti Performance Oriented Mobility Assessment - POMA)*
Surbala et al., 2013[14]	n = 23 Age = 58 (±5) years Acute	Experimental group = Conventional physiotherapy (60 minutes, 6x/week, 8 weeks) + Pilates (45 minutes, 3x/week, 8 weeks). Control group = Conventional physiotherapy (60 minutes, 6x/week, 8 weeks).	*Balance (Functional Reach Test), mobility (Timed Up and Go), walking ability (Dynamic Gait Index) and quality of life (Stroke Specific Quality of Life Scale).*
Yun et al., 2017[15]	n = 40 Years= 65 (±4) age Chronics	Experimental group = Pilates (60 minutes, 2x/week, 12 weeks). Control group = No treatment.	Quality of life (*Korean Stroke Specific Quality of Life*).

Table 2. Details of studies on the PEDro scale

Articles	Randomization	Blinding of participant distribution	Initial similarity between groups	Blinding of participants	Blinding of therapists	Blinding of assessors	Measures of a primary outcome	" Intention to treat"	Intergroup comparison of the primary outcome	Measures of precision and variability for at least one outcome	Total
Liang et al., 2018[10]	Y	N	Y	N	N	N	Y	N	y	Y	5/10
Lim et al., 2016[6]	Y	N	Y	N	N	N	Y	N	Y	Y	5/10
Lim and Yoon, 2017[11]	Y	N	Y	N	N	N	Y	N	Y	Y	5/10
Roh et al., 2016[12]	Y	N	N	N	N	N	N	N	N	Y	2/10
Sathe et al., 2018[13]	Y	N	Y	N	N	N	y	N	Y	N	4/10
Surbala et al., 2013[14]	Y	Y	Y	N	N	Y	Y	N	y	Y	7/10
Yun et al., 2017[15]	Y	N	Y	N	N	N	Y	N	Y	y	5/10

*Note: Y = yes, N = No.

　　　　Regarding the results of the meta-analysis, analyses were generated for four outcome measures: gait speed, balance, mobility, and quality of life. For the four other outcome measures found (motor function of the lower limbs, cardiopulmonary function, step length, and walking ability), the results reported by the study authors were described.

　　　　Gait speed: Two studies[10, 12], including 80 participants, and with an average methodological quality of 4, investigated the effects of Pilates on gait speed. The results were not significant, showing that Pilates did not increase walking speed (0.04 m/s; 95% CI -0.05 to 0.14; $p=0.38$), assessed by TVM10 (Figure 2).
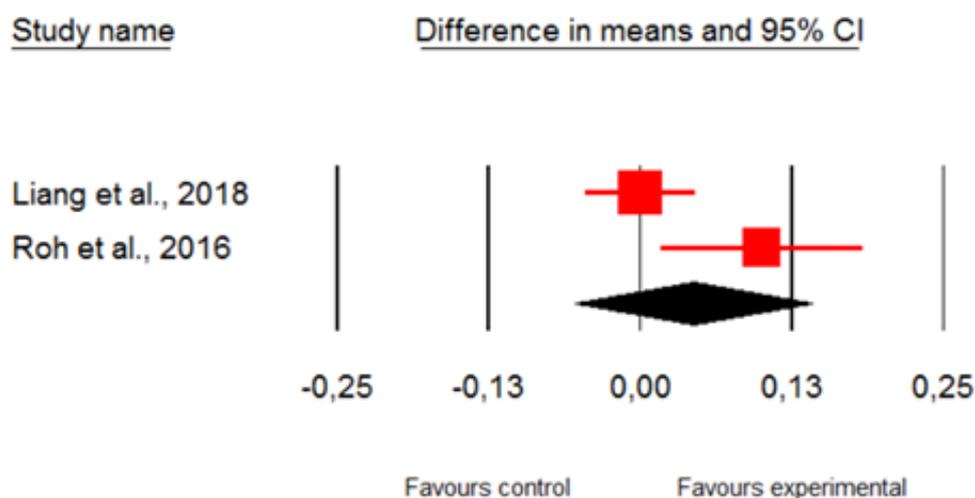

Figure 2. Forest-plot for the effect of Pilates on the gait speed of post-stroke individuals

Balance: Three studies[6, 10, 14], including 103 participants, and with an average methodological quality of 6, investigated the effects of Pilates on balance. The results were not significant, showing that Pilates did not improve balance (SMD 0.40; 95% CI -1.01 to 1.85; p=0.58), assessed by BSE, center of pressure oscillation, and TAF (Figure 3). One study[13], involving 9 participants, and with a methodological quality of 4, investigated the effects of Pilates on balance but did not report sufficient data for inclusion in the meta-analysis. The authors reported significant results (p<0.05), showing that Pilates improved balance, assessed by POMA.
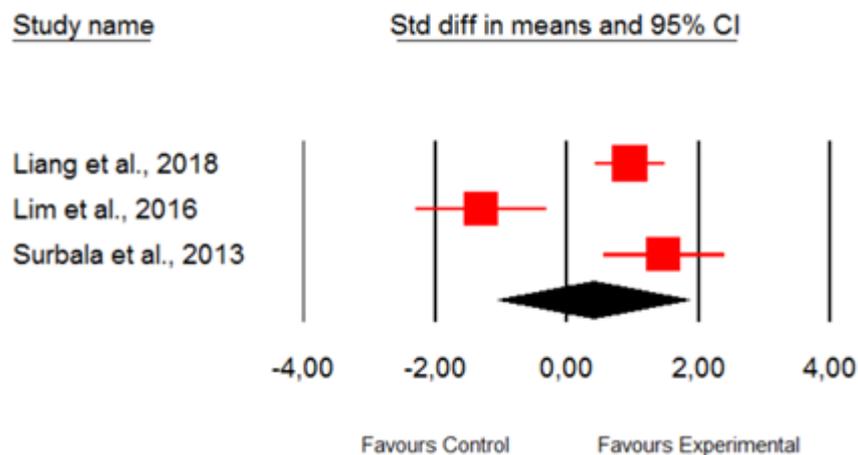
Figure 3. Forest-plot for the effect of Pilates on the balance of post-stroke individuals

Mobility: Three studies[10, 11, 14], including 103 participants, and with an average methodological quality of 6, investigated the effects of Pilates on mobility. The results were significant, showing that Pilates improved mobility by -3 seconds (95% CI -4 to -1; p=0.009), assessed by TUG (Figure 4).
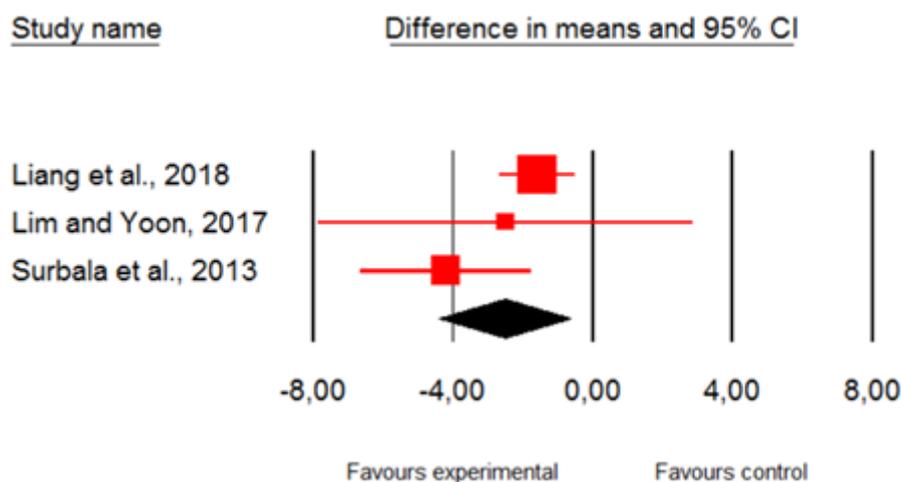

Figure 4. Forest-plot for the effect of Pilates on the mobility of post-stroke individuals

Quality of life: Two studies[14, 15], including 63 participants, and with an average methodological quality of 6, investigated the effects of Pilates on quality of life. The results were significant, showing that Pilates improved quality of life (SMD 1.1; 95% CI 0.5 to 1.58; p<0.001), assessed by SSQoL and KSSQoL (Figure 5).
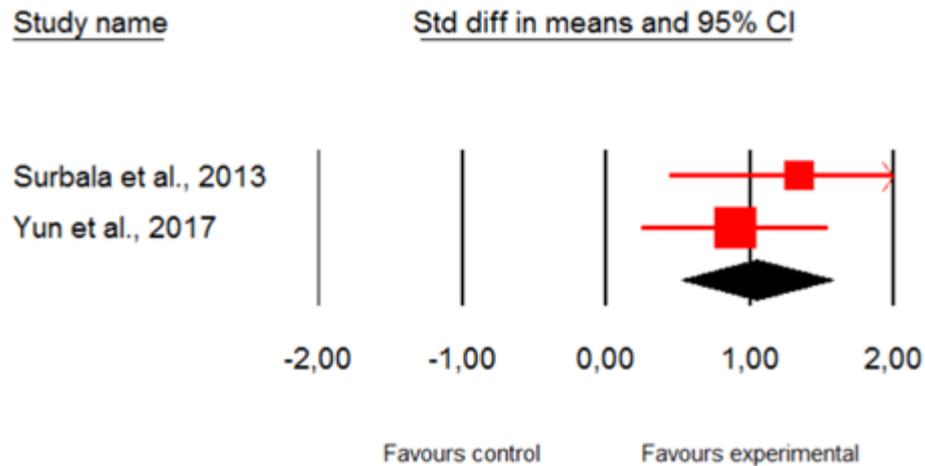
Figure 5. Forest-plot for the effect of Pilates on the quality of life of post-stroke individuals

Motor function of the lower limbs: A study[10], involving 60 participants, and with a methodological quality of 5, investigated the effects of Pilates on the motor function of the lower limbs. The authors reported significant results (p=0.005), showing that Pilates improved the motor function of the lower limbs, assessed by the EFM-LL.

Cardiopulmonary function: A study[11], involving 20 participants, and with a methodological quality of 5, investigated the effects of Pilates on cardiopulmonary function. The authors reported significant results (p<0.05), showing that Pilates improved resting heart rate, VO2max, and VO2max per kilogram, assessed by the submaximal treadmill test.

Step length: A study[12], involving 20 participants, and with a methodological quality of 2, investigated the effects of Pilates on step length. The authors reported significant results (p<0.05), showing that Pilates increased step length, assessed by the 3D movement analysis system.

Walking ability: A study[14], involving 23 participants, and with a methodological quality of 7, investigated the effects of Pilates on walking ability. The authors reported significant results (p=0.009), showing that Pilates increased walking ability, assessed by IMD.

All detailed forest plots can be found in Appendix 2.

DISCUSIONS

This review aimed to analyze the effects of the Pilates method in the rehabilitation of patients who have suffered a stroke. The results of the meta-analyses showed that Pilates was effective in improving the mobility and quality of life of individuals after a stroke. Regarding the descriptive results, Pilates proved to be effective in improving motor function of the lower limbs, cardiopulmonary function, step length and walking ability. However, these results deserve caution, as they are based on only one study for each outcome measure.

The meta-analysis showed that Pilates improved the mobility of individuals after a stroke, reducing the time to perform the TUG by 3 seconds. An argument that could explain this effect would be the strengthening of the stabilizing muscles of the trunk,

pelvis and lower limbs that Pilates provides[16, 17]. Since among the activities of daily life, mobility is an essential task for social participation of these individuals, with their limitation being considered the most disabling aspect after a stroke, restoring this ability in this population is essential during the motor rehabilitation program[18, 19]. Therefore, Pilates would be a great ally in the mobility rehabilitation of these patients.

Pilates was also effective in improving the quality of life of individuals after a stroke. Among the arguments that can justify this finding, we can also highlight the improvement in the mobility of individuals, since TUG is a predictor of quality of life in this population[20]. Furthermore, Surbala et al., in 2013 also attributed this improvements the positive impact of group exercise, stating that the encouragement of teachers and other students for the individual after a stroke contributes to the results found[14].

Furthermore, although there are no studies investigating the effect of Pilates on psychological factors, such as anxiety and depression, which may be directly related to individuals' perception of quality of life, a recent systematic review in elderly people showed significant effects of the method on depression, anxiety, quality of sleep, fear of falling, pain and perception of health, and consequently quality of life[21].

Finally, the descriptive results indicate improvement in the variable motor function of the lower limbs, cardiopulmonary function, step length and walking ability. Although these results are expected, since these functions and activities are worked on in the Pilates method, and are similar to previous results found in systematic reviews with other populations[22, 23], such results deserve caution, since they are all based on just one study.

One of the limitations of this review is the inclusion of seven studies, with an average methodological quality of 5, a value that can be considered low. Although it is difficult to blind participants and therapists in this type of intervention, no study blinded the distribution of participants into groups, or blinded the evaluators, which could compromise the methodological quality of each one. Furthermore, the sample size in the studies was also low, with the use of varied outcome measures, and for the nine variables found, only gait speed and mobility coincided as measures between the studies, evaluated and reported in the same unit. Finally, the heterogeneity for the other characteristics of the studies was also great, with intervention protocols and duration varying. Therefore, more randomized clinical trials, of high methodological quality, are still necessary in order to affirm, with a high level of evidence, the effectiveness of Pilates in measures of functionality in individuals after a stroke, when compared to no treatment or when compared to other treatments. interventions.

CONCLUSION

This systematic review showed, through meta-analysis, that the Pilates method is effective in improving the mobility and quality of life of individuals after a stroke. Furthermore, the descriptive results were significant for lower limb motor function, cardiopulmonary function, step length and walking ability. However, these latest results deserve caution, as they were all based on just one clinical trial.

Authors' contribution: KKPM, PRA and LCGS contributed to the study design; KKPM, PRA and LCGS performed data collection in the studies;. KKPM, and AAS contributed to the design and tabulation of the data. KKPM, AAS, LCGS, PRA and CDCMF contributed to the critical review, corrections and approved the final version.

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Conflict of interest: No.

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APPENDIX 1

MEDLINE

1. pilates.mp.

2. Exercise Movement Techniques/

3. or/1-2

4. cerebrovascular disorders/ or exp basal ganglia cerebrovascular disease/ or exp brain ischemia/ or exp carotid artery diseases/ or exp intracranial arterial diseases/ or exp "intracranial embolism and thrombosis"/ or exp intracranial hemorrhages/ or stroke/ or exp brain infarction/ or vertebral artery dissection/

5. (stroke or poststroke or post-stroke or cerebrovasc$ or brain vasc$ or cerebral vasc$ or cva$ or apoplex$ or SAH).tw.

6. ((brain$ or cerebr$ or cerebell$ or intracran$ or intracerebral) adj5 (isch?emi$ or infarct$ or thrombo$ or emboli$ or occlus$)).tw.

7. ((brain$ or cerebr$ or cerebell$ or intracerebral or intracranial or subarachnoid) adj5 (haemorrhage$ or hemorrhage$ or haematoma$ or hematoma$ or bleed$)).tw.

8. hemiplegia/ or exp paresis/

9. (hemipleg$ or hemipar$ or paresis or paretic).tw.

10. or/4-9

11. 3 and 10

CINAHL / SPORTDiscus

1. (MH "Cerebrovascular Disorders+") or (MH "stroke patients") or (MH "stroke units")

2. TI (stroke or poststroke or post-stroke or cerebrovasc* or brain vasc* or cerebral vasc or cva or apoplex or SAH) or AB (stroke or poststroke or post-stroke or cerebrovasc* or brain vasc* or cerebral vasc or cva or apoplex or SAH)

3. TI (brain* or cerebr* or cerebell* or intracran* or intracerebral) or AB (brain* or cerebr* or cerebell* or intracran* or intracerebral)

4. TI (ischemi* or ischaemi* or infarct* or thrombo* or emboli* or occlus*) or AB (ischemi* or ischaemi* or infarct* or thrombo* or emboli* or occlus*)

5. S3 and S4

6. TI (brain* or cerebr* or cerebell* or intracerebral or intracranial or subarachnoid) or AB (brain* or cerebr* or cerebell* or intracerebral or intracranial or subarachnoid)

7. TI (haemorrhage* or hemorrhage* or haematoma* or hematoma* or bleed*) or AB (haemorrhage* or hemorrhage* or haematoma* or hematoma* or bleed*)

8. S6 and S7

9. (MH "Hemiplegia")

10. TI (hemipleg* or hemipar* or paresis or paretic) or AB (hemipleg* or hemipar* or paresis or paretic)

11. S1 or S2 or S5 or S8 or S9 or S10

12. "pilates"

13. (MH "Pilates")

14. S12 or S13

15. S11 and S14

WEB OF SCIENCE /

1.   TS=(cerebrovascular disorders)

2.   TS=(stroke)

3.   TS=(hemiplegia)

4.   TS=(hemiparesis)

5.   TS=(hemiplegic)

6.   TS=(hemiparetic)

7.   1 or 2 or 3 or 4

8.   TS=(pilates)

9.   5 and 6

LILACS/Scielo

1.   AVC OR "acidente vascular" OR AVE OR derrame OR hemiparesia OR hemiparéticos OR hemiparético OR paresia OR parético OR paréticos OR hemiplegia OR hemiplégico OR hemiplégicos OR isquêmico OR hemorrágico

2.   pilates

3.   1 and 2

PEDro

Abstract and title: pilates

APPENDIX 2

Study name	Difference in means	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value
Liang et al., 2018	0,000	0,023	0,001	-0,046	0,046	0,000	1,000
Roh et al., 2016	0,100	0,042	0,002	0,017	0,183	2,370	0,018
	0,044	0,050	0,002	-0,053	0,141	0,883	0,377

Difference in means and 95% CI

-0,25 -0,13 0,00 0,13 0,25

Favours control   Favours experimental
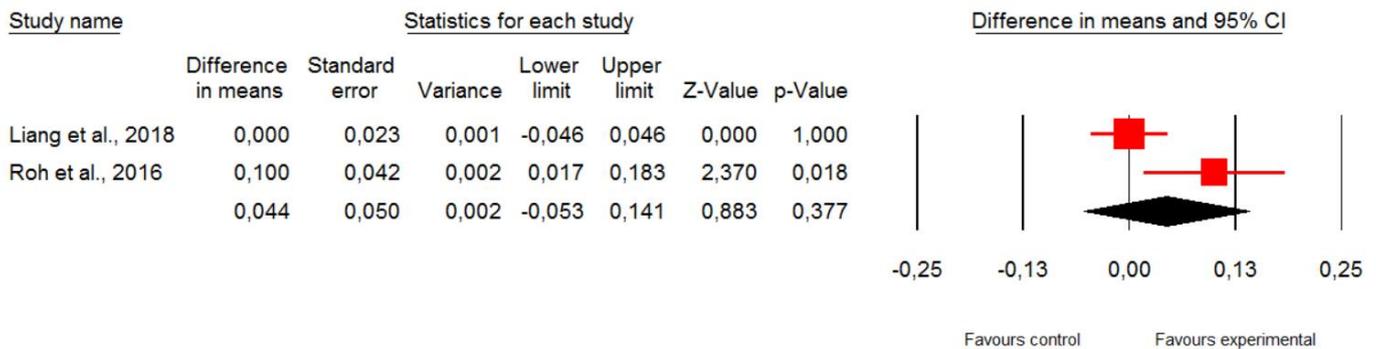
- Forest-plot detalhado para o efeito do Pilates na velocidade de marcha de indivíduos pós-AVE.

Study name	Std diff in means	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value
Liang et al., 2018	0,959	0,273	0,074	0,425	1,494	3,518	0,000
Lim et al., 2016	-1,308	0,506	0,256	-2,299	-0,316	-2,584	0,010
Surbala et al., 2013	1,470	0,470	0,221	0,548	2,391	3,125	0,002
	0,403	0,736	0,541	-1,038	1,845	0,548	0,583

Std diff in means and 95% CI

-4,00 -2,00 0,00 2,00 4,00

Favours Control   Favours Experimental
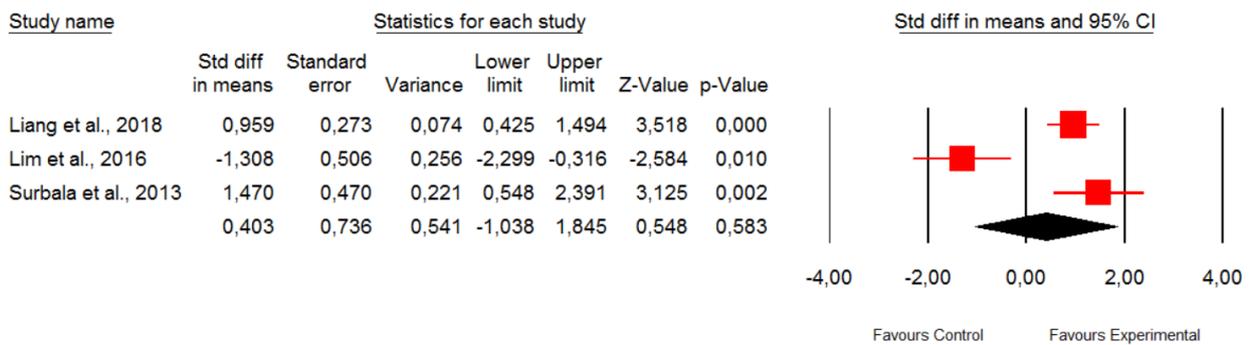
- Forest-plot detalhado para o efeito do Pilates no equilíbrio de indivíduos pós-AVE.

Study name	Difference in means	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value
Liang et al., 2018	-1,580	0,556	0,309	-2,669	-0,491	-2,843	0,004
Lim and Yoon, 2017	-2,500	2,731	7,460	-7,853	2,853	-0,915	0,360
Surbala et al., 2013	-4,200	1,248	1,558	-6,647	-1,753	-3,365	0,001
	-2,524	0,964	0,929	-4,413	-0,634	-2,618	0,009

Difference in means and 95% CI

-8,00 -4,00 0,00 4,00 8,00

Favours experimental   Favours control
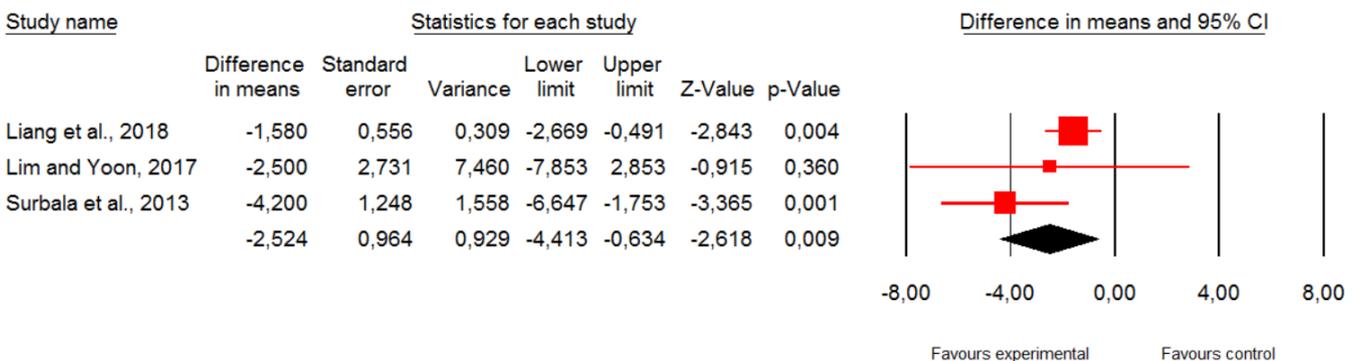
- Forest-plot detalhado para o efeito do Pilates na mobilidade de indivíduos pós-AVE.

Study name	Std diff in means	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value
Surbala et al., 2013	1,344	0,462	0,213	0,438	2,249	2,908	0,004
Yun et al., 2017	0,899	0,332	0,110	0,248	1,549	2,708	0,007
	1,050	0,270	0,073	0,522	1,578	3,896	0,000

Std diff in means and 95% CI

-2,00 -1,00 0,00 1,00 2,00

Favours control   Favours experimental
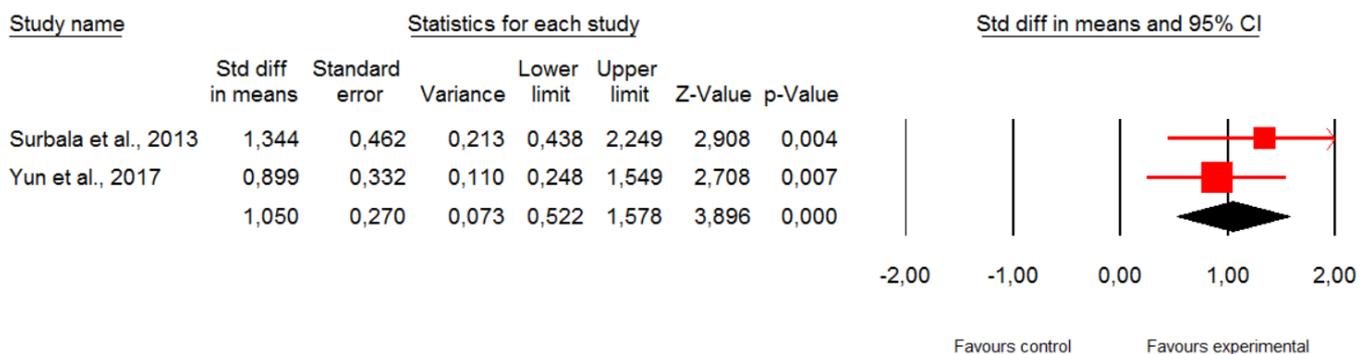
- Forest-plot detalhado para o efeito do Pilates na qualidade de vida de indivíduos pós-AVE.