Original Article

Efficacy Of Acupressure As A Pain Management Tool For Knee Osteoarthritis Among Geriatric Patients: A Meta Analysis

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Abstract

Background-Acupressure is a complementary treatment that uses fingers and other acupressure tools to stimulate acupoints and maintains the balance of energy. There are several trails have reported its effectiveness in relieving pain. Purpose-This systematic review is to critically assess the effect of acupressure on knee osteoarthritis and its symptoms. Methods-Databases of the Cochrane library, PubMed/MEDLINE, and google scholar were searched from their establishment until September 30, 2022. All the Randomized Controlled Trials [RCTs] that had compared the use of acupressure with either placebo or non-intervention for relieving the symptoms of knee osteoarthritis were included in the study. Results-The meta-analysis showed that acupressure has equivalent effects in reducing pain [p = 0.46] and physical function [p =0.005], as compared to control group. Conclusion- Acupressure could provide significant clinical benefits to osteoarthritis of knee for a short-term by pain reduction improvement in physical function and also reduction in stiffness as an added benefits on reduction in psychological illness such as anxiety, depression, and stress.

Keywords: Acupressure, Osteoarthritis, Pain, Review

Introduction

Osteoarthritis [OA] is a chronic, non- inflammatory, and degenerative disease. The most recurrently affected joints are the knees.[1] it is characterized by progressive cartilage destruction, subchondral sclerosis, and osteophyte formation in load-bearing joints. It has been reported that knee pain caused by OA is the most common cause of physical disability in the elderly. [2-4] Knee Osteoarthritis [KOA] is a heterogeneous pathology characterized by a complex and multifactorial aetiology contri0butes to the broad variation in symptoms and treatment response constitutes a challenge for the identification of personalized and effective interventions. The debilitating symptom of OA is the pain, stiffness in the joint, reduced range of movement, crepitation, locking, deformity, quadriceps atrophy, and loss of function. [1] Knee OA accounts for almost four fifths of the burden of OA worldwide and increases with obesity and age. It can be treated effectively with pain management. Global prevalence of knee OA was 16.0% in individuals aged 15 and over and was 22.9% in individuals aged 40 and over. Correspondingly, there are around 654.1 million individuals [>40 years] with knee OA in 2020 worldwide. Correspondingly, there are around annual 86.7 million individuals [>20 years] with incident knee OA in 2020 worldwide. According to the individual countries the prevalence and incidence varies substantially. The risk of prevalence and incidence in

females is higher than male. Indians have a higher prevalence due to frequently knee bending and squatting and genetic or environmental factors.[2,3] This can be treated with muscle-strengthening, aerobic exercise, education, weight loss, when these are ineffective, a choice of one or more options from a range of pharmacological paracetamol, topical NSAIDs which gives analgesic effects for pain control, although effective, simultaneously can cause liver and kidney damage, gastrointestinal reactions, cardiovascular reactions in the long term, but this is still reservation. Overuse of the joints increases joint damage and degeneration.[4] Non-pharmacological treatments such as acupuncture, transcutaneous electrical nerve stimulation [TENS], and thermal [heat/cooling] treatments, insoles, and braces are also recommended for managing the osteoarthritis of knee.[5] Acupressure is a non-pharmacological, self-administrative cost effective without any adverse effects. It can be taught to the patients or care takers to help achieve pain reduction in the affected areas for home-based therapy.[6] In acupressure, muscular tension is released by applying pressure with hand at specific acupoints/ trigger points which are positioned along the meridians to balance the flow of the physiological energy. The meridians are activated by the acupoints based on similar fundamental principal of acupressure and acupuncture. Each meridian is connected to various organs and tissues of human body pain reduces from local and remote sites by administering the pressure and activation of specific acupoints on meridian. Pleasurable impulses reach the brain four times faster than the pain stimuli when the specific acupressure point is activated. Continuous impulses shut the neural 'GATES' and slower messages of pain are blocked from reaching the brain and helps to improve or strengthen the pain perception threshold of body.[7] This systematic review aims to assess the effects of acupressure specifically on knee osteoarthritis.

Materials and Methods

1. Study search:

The protocol of this overview was registered with PROSPERO- CRD42022349825. This overview of SRs/MAs was performed in accordance with PRISMA guidelines. Electronic literature searches were conducted by an independent researcher in three international electronic databases [PubMed, Google scholar, and Cochrane Library] from inception to September 30, 2022. All study designs that looked at use of acupressure in pain management for osteoarthritis of knee among older adults were included in the review. [Fig 1] PICOT criteria: P: Elderly with Osteoarthritis of knee I: C: Either sham acupressure or usual care [other than acupressure] O: pain reduction and improved range of motion and reduced joint stiffness after acupressure T: Minimum of 8 weeks.

2. Study selection

Full text articles of potentially eligible studies assessed based on the inclusion criteria MeSH [Medical Subject Headings] terms and text words for 'Knee osteoarthritis', 'knee pain' and 'acupressure' were used to identify relevant studies. No restrictions were made on publication time. Reference lists of all included studies and review articles identified by the search were also checked to identify other relevant studies. All studies were assessed for methodological quality using a JADAD scale.

Inclusion criteria

Studies that looked at acupressure use for knee osteoarthritis without any other specific disease condition and rather required the management of knee pain were included. Inclusion criteria of all databases selected were free full text, randomised control trial, clinical trial of acupressure for knee osteoarthritis, geriatric age group [above 60 years], both male and female of any ethnicity or race, Adequate cognitive status [score >5 on the 6-item screener], Adequate functional ability to administer the acupressure protocol [e.g., able to use fingers or device to apply pressure to acupoints, able to easily reach feet to access acupoints]. Studies of English language, freely available full text articles were included.

Exclusion criteria

The criteria for excluded studies were disease specific comorbidities such as rheumatoid arthritis, gouty arthritis, cancer, and fractures, done knee replacement surgery, Ligament tear, other neurological diseases and not containing relevant information on pain scale assessment. And intervention other than acupressure such as acupoints injection, moxibustion therapy, aromatherapy and combined therapies. Trials using devices or plasters

on acupoints such as acupoints transcutaneous electrical nerve stimulation, acupoints embedding, and auricular seed were also excluded. Duplicate published literature and non-acupressure in the treatment group.

Intervention and control group

Sham acupressure and usual care without any form of pain relief were considered as the comparison groups. Sham acupressure is performed by applying a light touch without any pressure on the acupoints location or on the areas other than the actual acupoints' locations. In addition, usual care was specific to each trial and involved measures other than the intervention treatments such as isometric exercise, pharmacological treatment, and heat pack

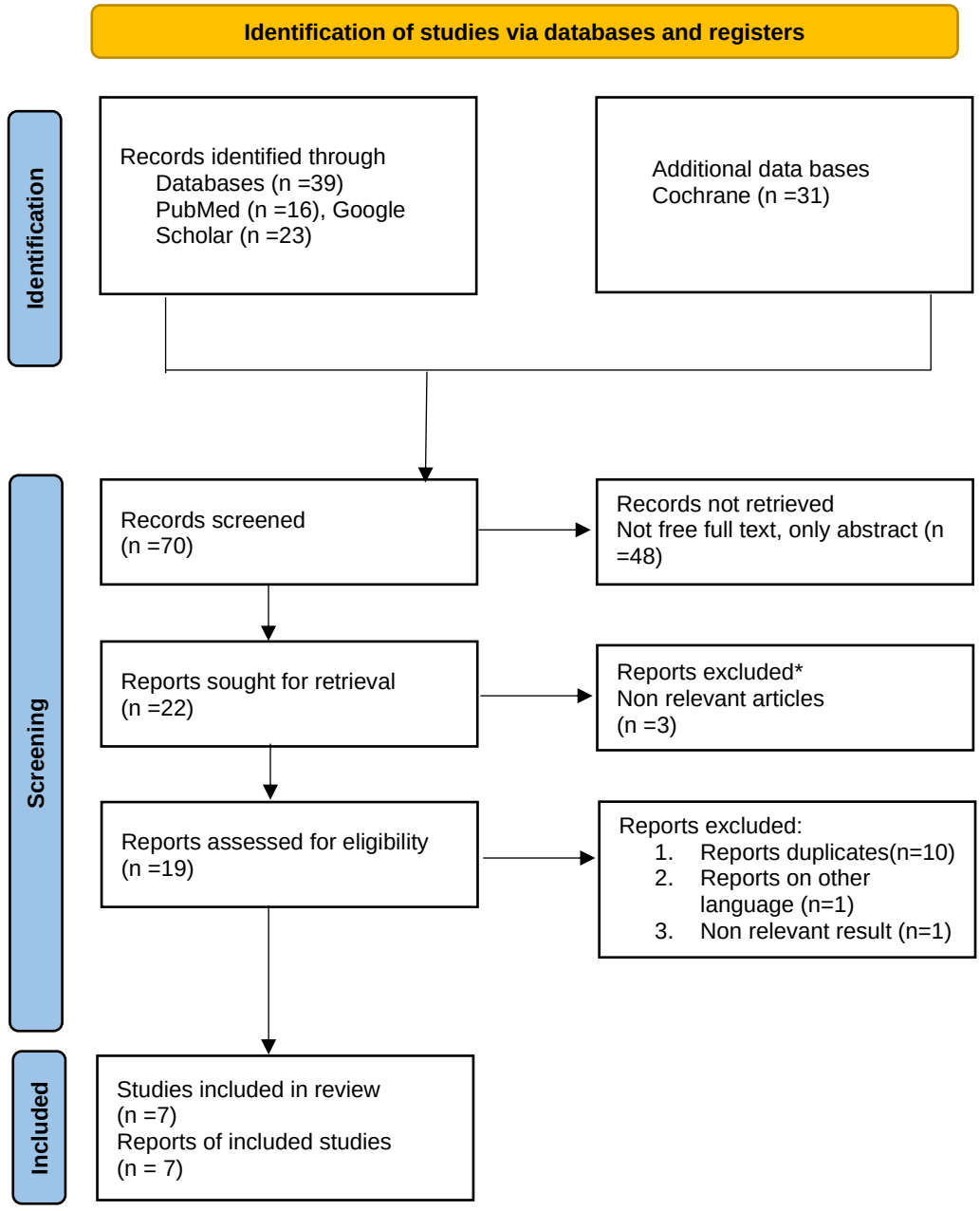
3. Data extraction and analysis

The Peer Review of Electronic Search Strategies [PRESS] checklist was employed to ensure standardization in the electronic search. All records were screened individually by author were assessed the studies for risk of bias using the JADAD scale. Data extraction and quality assessment Studies included were assessed for methodological qualities.

Results

1. Study selection:

Fig 1: PRISMA Flow chart of the literature



2. Characteristics of the included studies:

Seventy papers were identified based on the search and 22 articles were identified after applying free full text, and then 19 articles were identified after excluding non-relevant articles. Finally, 7 papers were selected to include in the study after excluded the duplicates reports, non-relevant result, reports on other language. The quality assessment of the selected studies is shown in tables 1, 2 and 4 describe the primary and secondary outcomes related to the data extraction from the 7 selected articles.

Table 1: Quality assessment of the studies included in the systematic review

Author and Year	Place	Study setting	Aim and Objectives clearly mentioned	Inclusion and exclusion criteria mentioned	Sample size estimation stated clearly	Sampling design stated clearly	Random sequence generation [selection bias]	Blinding of participants	Blinding of outcomes	Criteria Index tool mentioned clearly	Incomplete outcome data [attrition of data]	Selective reporting [reporting bias]	Generalizability
Zhang et al., 2012 [8]	USA	Clinic and community	Yes	Yes	No	No	Not mentioned	Not done	Not mentioned	Yes	Mentioned	Not mentioned	Yes
Sorour et al., 2014 [9]	Egypt	Hospital	Aim mentioned clearly and objectives are not mentioned clearly.	No	Yes	Yes	Not mentioned	Done	Not done	Yes	Not mentioned	Mentioned	Yes
Fadawy et al., 2018 [10]	Egypt	Hospital	Aim mentioned clearly and objectives are not mentioned clearly.	Yes	Yes	Yes	Not mentioned	Not done	Not done	No	Not mentioned	Not mentioned	Yes

Li et al., 2018 [11]	United states of America	Home	Yes	Yes	Yes	Yes	Not mentioned	Done	Not done	No	Mentioned	Not mentioned	Yes
Jaberi et al., 2019 [12]	Iran	Hospital	Yes	Yes	Yes	Yes	Not mentioned	Done	Not done	Yes	Not mentioned	Not mentioned	Yes
Rani et al., 2020 [13]	India	Not specified	Aim mentioned clearly and objectives are not mentioned clearly.	Yes	Yes	Yes	Not mentioned	Not done	Not done	Yes	Not mentioned	Not mentioned	Yes
Ho et al., 2021 [14]	China	Not specified	Yes	Yes	Yes	Yes	Not mentioned	Not done	Not done	Yes	Not mentioned	Not mentioned	Yes

Table 2: Characteristics and Categorization of the Included Reviews

Serial Number	Author and year	Place	Total sample	Intervention& sample			Major findings	Adverse effect	Primary Outcome	Secondary outcome
				Group1/ Study group/ verum acupressure group/acupressure group	Group 2/ sham acupressure	Group3/ Control group/ Usual group				

1	Zhang et al.,2012 [8]	USA	36	Sample - 15 The course lasted for 12 weeks along with usual care. Acupressure tool used to press down briskly then release with moderate pressure, repetitively for about 1 minute per point totally 30 minutes along with acupressure exercise. Participants were asked to perform this protocol at home five days a week. The eight knee acupoints are [i.e., ST34, ST35, ST36, SP9, SP10, GB34, EX-LE2, and EX-LE40]. The acupressure exercise is rubbing, lift the	Not mentioned	Sample - 21 Participants continued their current usual care and received no intervention during the same 12-week study period.	No statistical differences were found between the two groups among all WOMAC subscale and total scores at baseline.	Not mentioned	Physical function significantly changed from baseline to 12 weeks. The acupressure group [P = 0.03], shown greater improvement. However no significant differences were found in the subscales of pain and stiffness.	Not mentioned

				kneecap and gently move it in small circle.						
2	Sorour et al.,2014 [9]	Egypt	90	Sample -30 The intervention lasted for 3 months. The acupressure points were to be pressed 10 min, three times a day, 5 days/week. The eight knee acupoints are ST34, ST35, ST36, SP9, SP10, GB34, EX-LE2, and EX-LE4.	Sample -30 No intervention [usual care group].	Sample -30 Isometric exercise which includes stretching, strengthening, and resistive exercise for quadriceps, abductors, extensors, hamstrings, and calf muscles. TENS to relieve pain for 20 min and ultrasound continuous to accelerate tissue repair 1.5 w/cm2 for 3–5 min.	After the intervention, patients in the acupressure group had a considerable reduction in pain score.	Not mentioned.	acupressure acts better on pain. Also improvement in stiffness and physical function	Isometric exercise leads to more improvement of stiffness and physical function

3	Fadawy et al.,2018 [10]	Egypt	104	Sample - 52 Acupressure was given for about 6 months. Acupoints were not mentioned	Not mentioned	Sample - 52 The course lasted for six months. Intervention Not mentioned clearly.	Acupressure has a positive impact on the physical function of elderly patients with knee osteoarthritis and also improves the emotional disturbance and psychological wellbeing.	Not mentioned	Acupressure proved to be effective in the physical health status [WOMAC total mean score] has been reduced.	Psychological health status [Anxiety and depression total mean score] was improved.
4	Li et al.,2018 [11]	United states of America	150	Sample – 50. They were instructed to apply pressure on acupoints continuously for 3 minutes once daily, 5 days per week for 8 weeks in clockwise or counterclockwise circles. The acupoints are; Yintang, Anmian, heart 7, spleen 6, and liver 3 were stimulated	Sample – 50. Similar instruction as those assigned to verum acupressure, except that they were taught to apply pressure to 9 points that were not on acupuncture meridians.	Sample – 50. UC participants did not perform acupressure	Approximately 46%, 63%, and 36% of verum, sham and UC participants, respectively, met the MCID criterion for pain improvement at 4 weeks. At 8th week were 56%, 71%, and 50%. Group differences in the percentage of participants	only 5 of 85 [5.9%] missed the location of 1 or 2 acupoints. e broken skin and soreness in acupoints areas, which were likely caused by incorrect use of the handheld device for	Compared with the usual care [UC] group, both the verum group and the sham group had a greater reduction in WOMAC pain at 8 weeks, and the differences were statistically significant.	Not mentioned

				bilaterally except yintang.			achieving MCID improvement at both visits were mostly not statistically significant; only the sham group had a significantly higher percentage than the UC group at visit 2.	acupressure.		
5	Jaberi et al.,2019 [12]	Iran	96	Sample -32 Along with usual treatments the acupressure was given an alternate day for 10 consecutive sessions. The acupressure was applied bilaterally at points of LI4, SP10, SP9, GB34, ST36, ST34 for 2 minutes at intervals of 10 seconds of pressure and 2 seconds of	Sample -32 Intervention same as group 1 but acupressure was performed without the pressure and near to acupoints [2 to 3 cm around the acupressure points].	Sample -32 The control group did not receive any intervention.	In the acupressure group, the WOMAC and pain scores improved significantly in the short and long term and physical function improved along with pain relief in short term. Also pain score improved in short term without any improve	Not mentioned	The acupressure was able to reduce WOMAC and pain scores in long and short term and improve physical function in short term.	Not mentioned

				rest [in total ten times at each point per session].			ment in the physical function. But stiffness score increased significantly in long term. In the control group, the physical function worsened in long term.			
6	Rani et al.,2020 [13]	India	212	Sample - 106 Pharmacologic al treatment along with Pressure on selected acupoints manually on [ST34, ST35, ST36, SP9, SP10, and GB34]. The total duration was 15 minutes, consisting of 3 minutes of initial message around acupoints and 12 minutes of pressure applied on	Not mentioned	Sample - 106 Only pharmacological treatment	Acupressure combined with pharmacological treatment improves psychological and general health and pain reduction.	Not mentioned.	The VAS pain score reduced by 24.4% after 2nd months, 34.6% after 4th months, 42.9% after 6th months, and 53.4% after 8th months when compared from baseline. It may be noted that improvement in the pain score was also	Baseline scores of depressions, anxiety, and stress were found to be [p > 0.05]. A total of 30.5% reduction in the DASS-21 score was reported among intervention group patients, which is higher than that among control

				acupoints [2 minutes for each acupoints]. Frequency of acupressure application was two times a day for five days in a week, lasted for 8 months.					observed for the control group but comparatively less than for the intervention group [p > 0.05].	group patients [p = 0.08]. Mean scores of depressions, anxiety, and stress scored better for intervention group patients [p < 0.05].
7	Ho et al.,2021 [14]	China	76	Sample – 38. Participants assigned to topical heat pack at acupressure point's temperature around 43°C. The pressure given for 5 min in a point, and the total of 30 min, for about 4 weeks on SP10, ST 34, ST35 and EX-LE4.	Not mentioned	Sample – 38. Similar instruction was given as group 1. But instead of heat pack, thermal gun given on specific acupoints.	VAS scores after heat pack treatment were consistently better [lower] than thermal gun treatment.	No patient reported any physical discomfort or adverse effect during the study period in both groups	In the Thermal gun group, WOMAC function limitation and total scores were significantly improved after 8 sessions of interventions [p = 0.02]. Pain and stiffness scores were also improved although statistic	Flexion was significantly improved after 8 sessions of heat pack treatment [p = 0.02]. Quadriceps strength was significantly improved after the 8-week thermal gun treatment [increased from 4.42 to 4.63; p = 0.02]

									al significances had not been reached. No significance was found in the Heat pack group.	

WOMAC pain scale [8] [9] [10] [11] [12] [14] and VAS [13] [14] were the preferred pain measurement tools (Table 3). Outcome measures analysed initially before, during the study and finally after the treatment and also included baseline data together with variance estimates [e.g., standard deviations and mean values] were also reported. Primary outcome included, reduction in pain scales such as WOMAC pain scale, VAS and numeric rating scale [NRS], Secondary outcomes: range of motion, muscle strength, stiffness and physical function and psychological health status [Anxiety and depression total mean score] (Table 3).

Table 3: Assessment tool for outcomes.

Pain	Western Ontario and McMasters Universities Osteoarthritis Index [WOMAC], Mean visual analogue scale [VAS].
FUNCTION	WOMAC, comfortable gait speed [CGS], Timed up-and-go [TUG], Short Form-12 version 2 [SF-12v2].
KNEE ROM	Goniometer.
Muscle strength	Oxford Scale of Muscle Strength.
Psychological health status: Depression, anxiety, stress	Depression Anxiety Stress Scale-21[DASS-21], Hospital Anxiety and Depression Scale [HADS].

Table 4: Outcomes assessment included in the systematic review

Serial Number	Author and Year		Assessment tools	Outcome					
				Verum acupressure/Group 1/Study group		Sham acupressure/Group 2 / Isometric exercise		Usual care/Group 3/ Control group	
				Baseline& sample size	Final result &Sample size	Baseline& sample size	Final result &sample size	Baseline &sample size	Final result& sample size
1	Zhang et al.,2	Pain	WOMAC	13.53 ± 2.61 [15]	13.93 ± 3.39 [8]	Not mentioned		14.95 ± 3.71 [21]	13.85 ± 4.05 [16]

	012 [8]	Stiffness		6.53 ± 1.64 [15]	5.73 ± 2.01 [8]			6.77 ± 1.26 [21]	6.67 ± 2.08 [16]
		Function		48.33 ± 15.25 [15]	43.07 ± 13.13 [8]			48.85 ± 13.49 [21]	44.95 ± 13.13 [16]
2	Sorour et al.,2014 [9]	Pain	WOMAC [mean]	68.0 [30]	32.0 Not mentioned	64.0 [30]	76.0 Not mentioned	68.0 [30]	80.0 Not mentioned
		Stiffness		70.0 [30]	60.0 Not mentioned	60.0 [30]	40.0 Not mentioned	60. 0 [30]	60.0 Not mentioned
		Function		61.2 [30]	50.6 Not mentioned	60.0 [30]	45.9 Not mentioned	63.5 [30]	57.6 Not mentioned
3	Fadawy et al.,2018 [10]	Pain	WOMAC [mean total score]	75.48 [52]	64.9 [52]	Not mentioned		77.4 [52]	82.98 [52]
		Stiffness		70.91 [52]	60.1 [52]			68.03 [52]	69.95 [52]
		Function		73.51 [52]	68.89 [52]			73.73 [52]	74.21 [52]
		Anxiety	HADS	8.96±1.47 [52]	7.71±1.30 [52]			8.86±1.47 [52]	8.81±1.47 [52]
		Depression		10.10±2.03 [52]	8.96±1.66 [52]			9.44±1.92 [52]	9.04±2.60 [52]
4	Li et al.,2018 [11]	Pain	WOMAC	6.5 ± 2.6 [50]	4.8 ± 2.9 [41]	6.8 ± 3.2 [50]	5.5 ± 2.8 [41]	6.9 ± 2.9 [50]	6.3 ± 3.3 [42]
		Function	WOMAC	20.5 ± 8.3 [50]	14.4 ±7.8 [41]	23.9 ±10.5 [50]	18.3 ± 10.5 [41]	22.2 ± 9.5 [50]	19.9 ± 10.9 [42]
			TUG	10.55 ±2.66 [50]	9.38 ±1.86 [41]	11.20 ± 3.16 [50]	10.45 ± 2.83 [41]	10.37 ±2.23 [50]	9.83 ± 2.03 [42]
			CGS, meters/second	1.09 ±0.23 [50]	1.18 ± 0.17 [41]	1.05 ±0.25 [50]	1.11 ± 0.23 [41]	1.11 ± 0.21 [50]	1.12 ± 0.19 [42]
5	Jaberi et al.,2019 [12]	Pain	WOMAC	12.00±3.100 [32]	9.00±2.82 [32]	10.65±3.46 [32]	9.59±3.35 [32]	10.68±2.86 [32]	10.75±2.81 [32]
		Stiffness		4.81±1.46 [32]	4.59±1.38 [32]	4.03±1.55 [32]	3.90±1.61 [32]	3.56±1.47 [32]	3.78±1.23 [32]
		Function		39.03±7.69	35.91±7.42	36.97±8.40	36.41±6.95	36.97±9.39	37.31±7.52

					[32]	[32]	[32]	[32]	[32]	[32]
6	Rani et al.,2020 [13]	Pain	VAS		8.97 ± 5.27 [106]	4.18 ± 2.11 [98]	Not mentioned		8.12 ± 4.67 [106]	7.31 ± 2.45 [103]
		Psychological health	DASS-21[Total]		40.85 ± 22.32 [106]	28.36 ± 18.76 [98]			42.95 ± 22.47 [106]	37.98 ± 17.25 [103]
7	Ho et al.,2021 [14]	Pain	WOMAC		11.11 ± 3.62 [38]	9.52 ± 3.50 [35]	Not mentioned		10.05 ± 3.34 [38]	9.75 ± 2.97 [36]
			VAS		4.51 ± 2.39 [38]	4.12 ± 2.05 [35]			4.27 ± 2.15 [38]	3.85 ± 1.80 [36]
		Function	SF-12v2		29.07 ± 6.36 [38]	32.27 ± 5.28 [35]			30.20 ± 8.65 [38]	30.38 ± 4.76 [36]
		Knee ROM	Goniometer	Extension	14.61 ± 5.82 [38]	11.27 ± 4.85 [35]			11.03 ± 2.80 [38]	110.05 ± 14.58 [36]
					111.72 ± 14.62 [38]	113.50 ± 12.52 [35]			9.90 ± 1.75 [38]	119.50 ± 11.01 [36]
				Flexion						
		Muscle strength	Oxford Scale of Muscle Strength	Quadriceps	4.42 ± 0.36 [38]	4.63 ± 0.39 [35]			4.67 ± 0.37 0 [38]	4.68 ± 0.41 [36]
				Hamstring	4.66 ± 0.40 [38]	4.81 ± 0.31 [35]			4.88 ± 0.22 [38]	4.88 ± 0.28 [36]

[Favors intervention i.e. acupressure is effective]

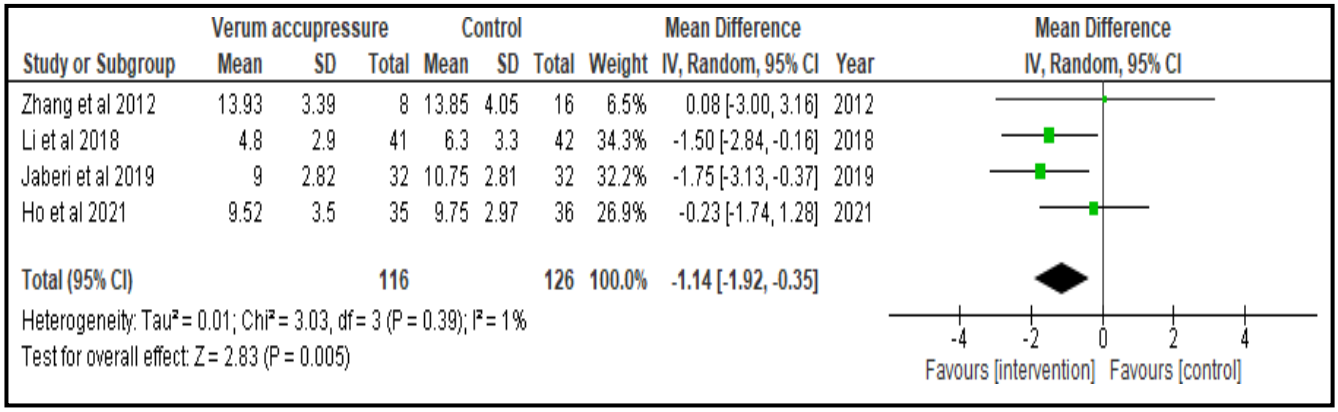


Figure 02: Forest plot of Verum acupressure versus control for mean change in pain scores using the WOMAC scale:

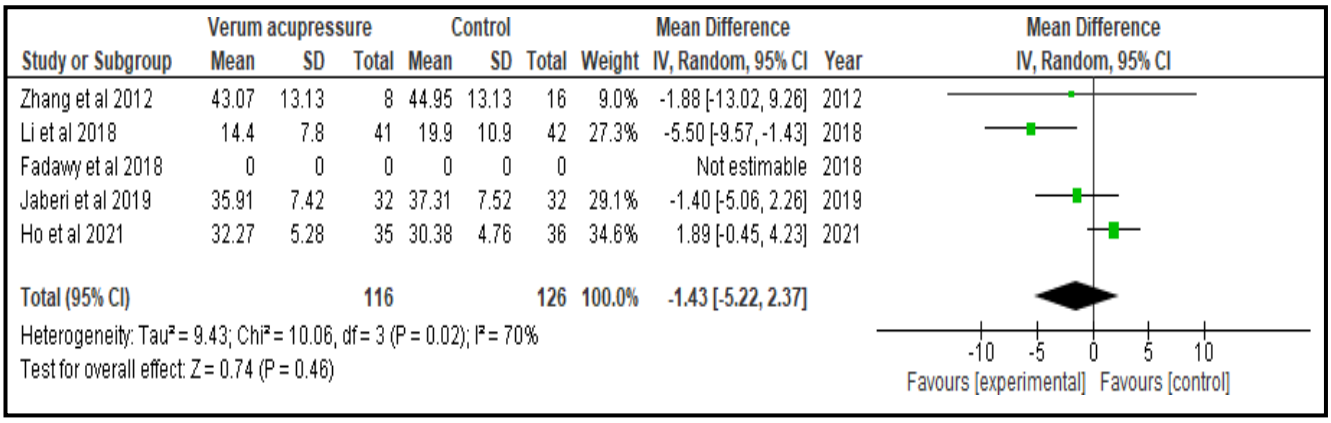


Figure 03: Forest plot of Verum acupressure versus control for mean change in function scores using the WOMAC scale:
[Favors intervention i.e. acupressure is effective]

The meta-analysis showed that acupressure has equivalent effects in reducing pain [p = 0.46] compared to control group, improving physical function [p =0.005], as compared to control group. Pooled results also showed similar results where acupressure has an equivalent effect in reducing pain, and showed a favourable effect in improving physical function of joints, as compared to no intervention (Figures 2 and 3).

Discussion

This systematic review included 7 RCTs assessing the effectiveness of acupressure for OA knee treatment. Six out of seven articles shows the reduction in the pain on the affected knee. [9,14] Four out of seven articles show improvement in physical health and its function. [8, 10, 12, 14] Two out of seven articles showed improvement in stiffness of muscles and joints. [9] [14] Also, two out of seven articles showed improvement in the psychological health.[10] [13] Zhang et al. 2012 [8] has not reported any significant changes in the pain and stiffness. Only two out of seven articles shown long term effect on the pain. [12] [13] Six out of seven articles used WOMAC Scale for asses the pain. [8-12, 14] There were sparse and mild adverse events were reported in the. [11] Blinding of participants was done in the 3 out of seven papers [9] [11] [12]. Sorour et al., 2014 [9] has not stated the inclusion and exclusion criteria clearly. Zhang et al [8]2012 has not mentioned the study design and sample size estimation. our obtained results could be fairly generalizable due to the included randomised control trails in this study were done in several

different countries. Rani et al., 2020 [13] is the only Randomized control trail done in India with the sample size of 212. However, due to inadequate sample size and a limited number of investigations, conclusions cannot be formed regarding the efficacy of acupressure in treating knee OA. Although the intervention duration, frequency, and acupoints selection varied among the studies, most studies in this review used acupoints ST34, ST36, SP9, SP10, and GB34 for knee OA at least three times a week. Moreover, two RCTs [8] [13] did not register their trials where pre-specified analysis intentions for the trial cannot be acquired. Scale for pain assessment were mentioned in all the studies but each study has used different scales such as Western Ontario and McMasters Universities Osteoarthritis Index [WOMAC], numeric rating scale [NRS], Mean visual analogue scale [VAS]. Two out of seven papers [11,12] mentioned sham acupressure along with the control group and compared the efficacy between acupressure and sham acupressure. "Sham acupressure" is physical pressure on wrong points or non-points, which deliberately violate traditional acupuncture theories of point locations, and this is incapable of achieving the outcomes intended by true acupressure. Li et al., 2018 [11] study shows sham acupressure has greater MCID criterion comparing with Verum acupressure but there was no significant improvement based on WOMAC score. Jaberi et al., 2019 [12] reported no significant difference between the two groups. Thus, it is unclear whether sham acupuncture with insertion is an appropriate control providing a contrasting exposure.[15]

Acupressure may have an analgesic effect through gate control theory, and endogenous release of opioids [endorphin-release theory]. The gate control theory explains that stimulation of the thick myelinated nerve fibres causes a neural inhibition at the spinal level blocking the transport of the pain stimuli to the brain via the nonmyelinated nerve fibres and the neuromatrix theory of pain, introduces the notion that pain is multidimensional, and that pain intensity is influenced by many factors, including sensations, emotions**,** and cognitive processes, such as experience and memory. According to the endorphin-release theory, the acupressure-related pain relief may be explained by the release of a group of substances called the endorphins, which are the natural opiate-like substances thereby causing the pain suppression, and reduce the overproduction of cortisol, resulting in a systematic relaxation response, which can relax stiffness of muscles. Acupressure may have modulated sympathetic nervous system activity and stimulates the release of catecholamine from the adrenal gland, acting on peripheral dopamine D1 receptors to produce systemic anti-inflammatory effects by hypothalamic–pituitary–adrenocortical axis to lower cyclooxygenase-2 [COX-2] and prostaglandin E2 [PGE2] levels. Acupressure mediates nitric oxide [NO] signal, known to improve local microcirculation via cyclic guanosine monophosphate [cGMP]. [3][8] It helps in enhancing the physical performance by suppressing fatigue-inducing molecules in the blood. [7, 16-19] This is involved in the recovery from disease by controlling the energy flow, so-called Qi, in the meridians. Acupressure relieves local muscle tensions and also recover the proper functions of tendons and bones. Acupressure is inexpensive, safe, and non-invasive treatment, but also a treatment that can be shared among caregivers, nurses, and doctors. Moreover, acupressure is a simple treatment that can be performed by patient themselves. In terms of public health, this potentially reduces medical costs, and patients can improve their confidence in own health [6].

Conclusion

We conclude that acupressure could provide significant clinical benefits to osteoarthritis of knee for a short-term. Acupressure work efficiently in the symptom management for osteoarthritis when compare with pharmacological treatments without much adverse effects. Most outcome measures in the included studies were dependent on patient-reported scales which are vulnerable to the subjective conditions of the patient and assessor. Although positive results suggesting acupressure as a standalone or as a combinative treatment for osteoarthritis of knee, high-quality evidence was insufficient. Further studies are needed for Physiological outcome indicators, including the range of motion, pain threshold, and muscle tone are encouraged to emphasis the long-term effects of acupressure in the role of pain management in the future planned research.

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None

Conflict of Interest:

None

Author contributions:

NK- conceptualization and data extraction, writing; SK, DS, SM- Data curation, Writing-Original draft preparation, Writing-Reviewing and Editing

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