Review Article

A narrative review of massage and spinal manipulation in the treatment of low back pain

Nurhanisah Sejari[1], Kamaria Kamaruddin[1,2], Yaser Mohammed Ali Al-Worafi[3], Long Chiau Ming[4,5]

[1]Department of Physiotherapy, Faculty of Health Sciences, Universiti Teknologi MARA, Puncak Alam, [2]Community of Research (CoRe) of Humanities and Quality of Life, Universiti Teknologi MARA, 40450 Shah Alam, Selangor Malaysia, [4]Faculty of Pharmacy, Universiti Teknologi MARA, Puncak Alam, [5]Clinical & Social Research in Medicine and Health Group, Brain and Neuroscience Communities of Research, Universiti Teknologi MARA, Shah Alam, Malaysia, [3]Department of Pharmacy Practice, College of Pharmacy, Qassim University, Buraidah, Kingdom of Saudi Arabia

Address for correspondence:
Dr. Long Chiau Ming,
Level 11, FF1, Faculty of Pharmacy,
Universiti Teknologi MARA, Puncak Alam,
Selangor - 42300, Malaysia.
E-mail: longchiauming@gmail.com

ABSTRACT

Low back pain (LBP) is one of the most common musculoskeletal problems that affect patients' daily life. Nowadays, treatment of LBP is very challenging due to the recurrent nature of the problem. This narrative review focuses on massage and spinal manipulation on LBP condition. The other issues consist of epidemiology, etiology, symptoms, and rapport between clinician and patient on treatment were explored. Online electronic search in databases (Ovid™, Scopus, EMBASE and PubMed) was performed using key words such as LBP, massage, and spinal manipulation. Textbooks and web page are additional sources that were used for gathering information. Literature reported that high incidence of LBP in agriculture areas which is farmer, in the urban area mainly office worker and industrial area mainly factory operator. LBP frequently occurs among office workers, pregnant, and obesity due to poor body mechanics. Building a successful rapport is a single most important factor in a relationship between clinician and patient. Understanding patient's perspective in their illness such as belief about cause, treatment approaches, and quality-of-life will help clinician create plans that are more appropriate to patient's situation and preferences. Patient's trust is the easing way for the clinician to provide treatments. Based on current evidence, there are arrays of conservative treatments shown to be effective in treating LBP. However, massage and spinal manipulation are the most popular among LBP patients because it contributes good effect in reducing pain intensity. Massage preferred by certain patient such as traditional Malay massage, Thai massage, Tui Na because it provide a relaxation on the body. In addition, spinal manipulation also showed a positive outcome on pain reduction and joint hypomobility. LBP is a common problem, and various methods could be used as a treatment. However, traditional massage is fast gaining popularity even in the modernized society.

Key words: Evidence-based medicine, health belief, musculoskeletal problems, patients' daily life, quality of life

INTRODUCTION

Low back pain (LBP) is one of the musculoskeletal problems with high recurrence rate and caused the loss of function and disability.[1] Generally, the pain area is below the last ribs margin (costal margin) and above the inferior gluteal line sometimes it's radiating or nonradiating lower limb area.[2] The extension of pain into the lower limb is depending on which nerve is involved. The LBP can be classified into three; mechanical, nonmechanical, and psychogenic. The back pain can be further classified based on its intensity and duration. The sudden onset of pain with a duration <6 weeks is considered as acute pain. The

Access this article online	
Quick Response Code:	Website: www.archivepp.com
	DOI: 10.4103/2045-080X.142047

duration for subacute pain begins on 6-12 weeks and more than 12 weeks is chronic pain.[3]

Low back pain is affecting worldwide and mostly attack activity daily living. Therefore, it has a negative impact to individual's life which influences on social, physical, economy, and psychology. The LBP management for LBP can be divided into surgical and nonsurgical management. In terms of nonsurgical include pharmacology (opiods, paracetamol, antidepressants), physical rehabilitation, and traditional and complementary medicine (T and CM) (massage, spinal manipulation, exercises, acupuncture, electrical modalities), and cognitive behavioral therapy.[1] However, this literature review focuses only massage and spinal manipulation in the treatment of LBP. In addition, other issues consist of epidemiology, etiology, symptoms, and relationship between clinician and patients on planning treatment are also explored.

METHODS

The published studies were searches through online databases include Ovid™, Scopus, EMBASE, and PubMed. Textbooks and web page are additional sources that were used for gathering information. The search keywords were entered via using Boolean operator. "AND" were used to combine the keywords and to narrowing searching process whereas "OR" were used to capture a different keywords. In this narrative study focus two interventions of LBP; massage and spinal manipulation. Every search engine was used the same keywords "massage," "spinal manipulation," and "LBP." First, articles about massage on LBP are identified using keywords "massage" and "LBP." Then, Boolean search strategy plays a role to specify the articles into related one using "AND" search. Roughly, 2770 articles were found. Then, articles available on full text and study years between 2010 until 2014 were selected as inclusion criteria and remove duplicate articles as exclusion criteria. Finally, only seven articles were found for this study.

Next articles are about spinal manipulation on LBP. The keywords used are "spinal manipulation" and "LBP" and using similar step as above, so the total was found are 3587 articles and then narrowing to related articles based on criteria as mentioned above. Finally, only five articles are required for this study. The other issues consist of epidemiology, etiology, symptoms, and relationship between clinician and patient on treatment were explored based on any related articles on LBP.

DISCUSSION

Epidemiology of low back pain

In Malaysia, about 11.6% of 2600 populations in a semirural area has suffered LBP.[4] The high prevalence of LBP mainly in rural, urban, and industrial areas with 47.8%, 46.3%, and 40.2%, respectively.[27] A study done by Tamrin *et al*. reported high prevalence of LBP was among workers in transport sectors[6] and similar with Taiwan region.[7]

The LBP occurs regardless of age. A study at Srinakarind Hospital, Thailand in 2002 showed approximately about 1740 patients suffer LBP, and this problem commonly arise in this country.[8] The demand for health care treatment services on LBP had caused high economic burden in developing countries. Annually, United States spent $25 billion for back care services[9] and its expenses trend gradually increase and has been reached $90.7 billion in 1998.[10]

Etiology of low back pain

Occupation related to common risk factor in the development of LBP. The characteristics of occupation can contribute musculoskeletal problem include repetitive movement, heavy lifting frequently with poor body posture, inadequate rest, overtime work, and heavy work load. The study reported 37% suffer back pain caused by their work exposure. Farmers were found to be high risk to get back disorder followed by operators and service workers as well as clerical based on its ergonomic work features[11] and physical workload.

High prevalence of LBP has been reported among pregnancy women. Interestingly, most of pregnant women claimed that they were experienced LBP within pregnancy phase, history of LBP within menstruation period as well as in the previous pregnancy.[12,13] Majority of studies reported that pregnant women with LBP mostly affect their daily life activities and recur again after postpartum.[14,15]

Obesity is also other contributing risk factor of LBP. A person who has overweight with body mass index (BMI) 25-29 showed a high incidence of back pain problem compared to underweight with BMI <20.[16] This is because overweight populations tend to be less active and more sedentary in daily life or working period due to body weight restriction. The pressure exerted on the back area during working such as heavy lifting is very high among obesity people because more energy is needed to do the job which cause muscle strain.[17]

Symptoms of low back pain

The symptoms of LBP depend on its causes. Majority of the patient claimed heavy pain on low back region and sometimes radiated to the buttock area when performing certain activities such as walking and sitting as well as reduce pain when rest.[18] In advance case which involved of nerve root compression, pain is radiating from the back to the lower limb depending which nerve is affected. Usually, the symptoms include numbness, tingling, and weakness on lower limbs due to nerve pressure.[19]

Patient-clinician relationship

The concept of the therapeutic alliance between clinician and patient can be used as a platform to recognize, support, and plan for better management of patient future outcomes.[20] In this concept introduced by Bordin (1979) consist of three section which are the therapist-patient agreement on goals and interventions, as well as the affective rapport between therapist and patient. Indeed, the therapeutic alliance seems to be effective method on gaining better health condition as well as a psychological aspect.[21,22]

Patient's trust is the easing way for the clinician to provide treatments.[23] Patients will understand their problem so they can cooperate with the treatment given and also they can actually participate on the management of LBP. In a patient-centered model approach, the health care provider must be approachable and friendly, focus and attentive with every patient's complaints and problem and how its affect activity daily living include the activities must be avoided and how to solve it.[24] Once the gap between clinician and patient is bridged, patient was confident, and trust clinician can help them on improving their health condition.[25]

Massage

Massage is a classified as traditional healing method or therapeutic intervention that applied by qualified practitioner on the affected area. The practitioners use their hand, fingers, forearm, and elbow on patient's body during the massage.[26] Traditional massages differ from each country. They have own technique depends on ethnic's belief such as Thai massage, Tui Na, and Malay massage.

In Malaysia, traditional Malay massage (TMM) is considered as popular conventional treatment among Malay populations. The practices and understanding are originally from Malay's belief and conducted in the Islamic approach using verses in Al-Quran prior.[26] Interestingly, TMM has been recognized in some integrated government hospital since 2007 which first launch at Hospital Kuala Batas. Subsequent year, Ministry of Health introduced TMM in two other selected government hospitals which are Hospital Putrajaya and Hospital Sultan Ismail.

Patient with LBP has improved their quality of life after seeking TMM.[27] The positive effect of massage mostly in reducing pain.[28] In physiological effect, the pressure applied during massage can inhibit pain transmission to the brain area through pain gait theory.[54] In this theory, A-delta fibers will transmitted pressure impulse more faster than pain impulse which carried by C-fibers and cause closing the pain gate.[29] As a result, pain impulse unable to reach spinal cord area and brain cannot interpret pain.[30]

A recent study suggested traditional Thai massage can contribute therapeutic and physiological effects on back area.[31] These effects cause pain relief and slow down sympathetic activity as well as increasing cardiac parasympathetic activity. The comparative study between Thai and Swedish massage showed that Swedish massage is more effective than Thai massage on pain intensity and disability.[32] However, both types of massage still showed positive effects on low back pain with the evidence of improving physical and psychological functions[33] rather than other non-surgical interventions such as placebo treatment, electrotherapy modalities and pharmacotherapy.[34] Since a massage treatment has no adverse effects, it may be considered as a viable treatment option.[35,36]

Spinal manipulation

Spinal manipulation includes high-velocity thrust technique applied on synovial joint when range of motion achieved at the end (passively) with "crack" sound.[37] The force applied during manipulation would open up lumbar facets joints the space around more than 0.7 mm.[38] The LBP with involvement of nerve impingement like radiculopathy is contraindicated.[39] In neurophysiology aspect, lumbar paraspinal muscles fibers, and Golgi tendon organ will be activated after received mechanical impulses from spinal manipulation which transmitted by primary afferents of sensory input.[40] Then, this activation will alter central neural mechanisms which later on increase pain threshold level.[41]

A recent trial revealed that most patients experienced reducing in pain intensity on the back region after spinal manipulation.[42] Several studies has shown

similar findings whereby spinal manipulation provide positive outcome among acute and chronic non-specific LBP patients[43] even in older population.[44] In addition, one study find out spinal manipulation has shown improvement on joint hypomobility among chronic LBP include flexion and extension phase.[45]

CONCLUSION

As a conclusion, the LBP is a worldwide problem and had shown high recurrence problem. The high prevalence of LBP is typically among agriculture sector especially farmers followed by urban area and industrial area. Job features play an important role in contributing back pain disorders like body posture during prolonged working period, and excessive workload which lead to muscle fatigue. The psychosocial factors also contribute the occurrence of LBP. The other factor, a good relationship between clinician and patient must be established in order to get a positive outcome. The variety of treatments recommended for LBP can be offered. However, the most popular treatment approach of nonsurgical management is manual handling technique. Massage and spinal manipulation are recommended interventions for back pain disorders, and usually traditional massage is a popular fast gaining even in modernized society.

ACKNOWLEDGMENTS

This work was supported by Research Acculturation Grant Scheme (RAGS), Malaysia (RAGS/2013/UITM/SKK02/2). The authors would like to express their gratitude to Ministry of Education, Malaysia and Universiti Teknologi MARA, Malaysia for financial support for this research.

REFERENCES

1. Lizier DT, Perez MV, Sakata RK. Exercises for treatment of nonspecific low back pain. Rev Bras Anestesiol 2012;62:838-46.
2. van Middelkoop M, Rubinstein SM, Verhagen AP, Ostelo RW, Koes BW, van Tulder MW. Exercise therapy for chronic nonspecific low-back pain. Best Pract Res Clin Rheumatol 2010;24:193-204.
3. Greenberg DL. Evaluation and treatment of shoulder pain. Med Clin North Am 2014;98:487-504.
4. Veerapen K, Wigley RD, Valkenburg H. Musculoskeletal pain in Malaysia: A COPCORD survey. J Rheumatol 2007;34:207-13.
5. Samad NI, Abdullah H, Moin S, Tamrin SB, Hashim Z. Prevalence of low back pain and its risk factors among school teachers. Am J Appl Sci 2010;7:634.
6. Tamrin SB, Yokoyama K, Aziz N, Maeda S. Association of Risk Factors with Musculoskeletal Disorders among Male Commercial Bus Drivers in Malaysia. Hum Factors Ergon Manuf 2014;24:369-85.
7. Guo HR, Chang YC, Yeh WY, Chen CW, Guo YL. Prevalence of musculoskeletal disorder among workers in Taiwan: A nationwide study. J Occup Health 2004;46:26-36.
8. Mackawan S, Eungpinichpong W, Pantumethakul R, Chatchawan U, Hunsawong T, Arayawichanon P. Effects of traditional Thai massage versus joint mobilization on substance P and pain perception in patients with non-specific low back pain. J Bodyw Mov Ther 2007;11:9-16.
9. Frymoyer JW, Cats-Baril WL. An overview of the incidences and costs of low back pain. Orthop Clin North Am 1991;22:263-71.
10. Shen FH, Samartzis D, Andersson GB. Nonsurgical management of acute and chronic low back pain. J Am Acad Orthop Surg 2006;14:477-87.
11. Punnett L, Pruss-Utun A, Nelson DI, Fingerhut MA, Leigh J, Tak S, *et al*. Estimating the global burden of low back pain attributable to combined occupational exposures. Am J Ind Med 2005;48:459-69.
12. Licciardone JC, Aryal S. Manual therapy, exercise, and education for low back pain and pelvic pain during pregnancy. Am J Obstet Gynecol 2014;210:592-3.
13. Bergstrom C, Persson M, Mogren I. Pregnancy-related low back pain and pelvic girdle pain approximately 14 months after pregnancy - pain status, self-rated health and family situation. BMC Pregnancy Childbirth 2014;14:48.
14. Ferreira CW, Alburquerque-Sendi NF. Effectiveness of physical therapy for pregnancy-related low back and/or pelvic pain after delivery: A systematic review. Physiother Theory Pract 2013;29:419-31.
15. Khan TM. Interventions during pregnancy to lower the chances of postnatal depression among women from the Asian subcontinent. Ment Health Fam Med 2011;8:7-9.
16. Varte LR, Rawat S, Singh I, Majumdar D. Duration of use of computer as risk factor for developing back pain among Indian office going women. Asian J Med Sci 2013;3:6-12.
17. McPhee SJ, Papadakis MA, Rabow MW, Education MH. Current medical diagnosis and treatment: McGraw-Hill Medical; 2010.
18. Meleger AL, Krivickas LS. Neck and back pain: Musculoskeletal disorders. Neurol Clin 2007;25:419-38.
19. Floranda EE, Jacobs BC. Evaluation and Treatment of Upper Extremity Nerve Entrapment Syndromes. Prim Care 2013;40:925-43.
20. Ming LC, Hassali MA, Shafie AA, Awaisu A, Hadi MA, Al-Haddad M. Perspectives of heart failure patients in Malaysia towards medications and disease state management: Findings from a qualitative study. J Public Health 2011;19:569-77.
21. Ng CJ, Lee PY, Lee YK, Chew BH, Engkasan JP, Irmi ZI,

et al. An overview of patient involvement in healthcare decision-making: A situational analysis of the Malaysian context. BMC Health Serv Res 2013;13:408.
22. Hadi MA, Alldred DP, Closs SJ, Briggs M. Mixed-methods research in pharmacy practice: Recommendations for quality reporting (part 2). Int J Pharm Pract 2014;22:96-100.
23. Spears LG. A narrative review of medical, chiropractic, and alternative health practices in the treatment of primary dysmenorrhea. J Chiropr Med 2005;4:76-88.
24. Hadi MA, Alldred DP, Closs SJ, Briggs M. Mixed-methods research in pharmacy practice: Basics and beyond (part 1). Int J Pharm Pract 2013;21:341-5.
25. Hadi MA, Alldred DP, Briggs M, Closs SJ. A combined nurse-pharmacist managed pain clinic: Joint venture of public and private sectors. Int J Clin Pharm 2012;34:1-3.
26. Sejari N, Kamaruddin K, Long CM. The effectiveness of traditional Malay massage: A narrative review. Arch Pharm Pract 2014;5:144-8.
27. Othman CN, Farooqui M, Lamin RAC. Malay traditional treatment (MTT) and general health quality (GHQ) among lower back pain (LBP) patients in Malaysia. Procedia Soc Behav Sci 2013;101:212-20.
28. Chatchawan U, Thinkhamrop B, Kharmwan S, Knowles J, Eungpinichpong W. Effectiveness of traditional Thai massage versus Swedish massage among patients with back pain associated with myofascial trigger points. J Bodyw Mov Ther 2005;9:298-309.
29. DeLany JW. Massage helps relieve muscular pain. NMT Center, St. Petersburg, US. http://www.nmtcenter.com/articles/Massage_Relieves_Musc_Pain.pdf [Last accessed on 2014 July 09].
30. Da Silva JA. The challenge of pain. Psychol Neur 2014;7:1-2.
31. Buttagat V, Eungpinichpong W, Chatchawan U, Kharmwan S. The immediate effects of traditional Thai massage on heart rate variability and stress-related parameters in patients with back pain associated with myofascial trigger points. J Bodyw Mov Ther 2011;15:15-23.
32. Sritoomma N, Moyle W, Cooke M, O'Dwyer S. The effectiveness of Swedish massage with aromatic ginger oil in treating chronic low back pain in older adults: A randomized controlled trial. Complement Ther Med 2014;22:26-33.
33. Netchanok S, Wendy M, Marie C, Siobhan O. The effectiveness of Swedish massage and traditional Thai massage in treating chronic low back pain: A review of the literature. Complement Ther Clin Pract 2012;18:227-34.
34. Kumar S, Beaton K, Hughes T. The effectiveness of massage therapy for the treatment of nonspecific low back pain: A systematic review of systematic reviews. Int J Gen Med 2013;6:733-41.
35. Hadi MA, Helwani R, Long CM. Facilitators and barriers towards adverse drug reaction reporting: Perspective of Malaysian hospital pharmacists. J Pharm Health Serv Res 2013;4:155-8.
36. Hadi M, Ming L. Impact of pharmacist recruitment on ADR reporting: Malaysian experience. South Med Rev 2011;4:55-6.
37. Rubinstein SM, van Middelkoop M, Assendelft WJ, de Boer MR, van Tulder MW. Spinal manipulative therapy for chronic low-back pain: An update of a Cochrane review. Spine 2011;36:E825-46.
38. Cramer GD, Cambron J, Cantu JA, Dexheimer JM, Pocius JD, Gregerson D, *et al*. Magnetic resonance imaging zygapophyseal joint space changes (gapping) in low back pain patients following spinal manipulation and side-posture positioning: A randomized controlled mechanisms trial with blinding. J Manipulative Physiol Ther 2013;36:203-17.
39. Flynn T, Fritz J, Whitman J, Wainner R, Magel J, Rendeiro D, *et al*. A clinical prediction rule for classifying patients with low back pain who demonstrate short-term improvement with spinal manipulation. Spine 2002;27:2835-43.
40. Pickar JG, Wheeler JD. Response of muscle proprioceptors to spinal manipulative-like loads in the anesthetized cat. J Manipulative Physiol Ther 2001;24:2-11.
41. Sung PS, Kang YM, Pickar JG. Effect of spinal manipulation duration on low threshold mechanoreceptors in lumbar paraspinal muscles: A preliminary report. Spine 2005;30:115-22.
42. Dagenais S, Gay RE, Tricco AC, Freeman MD, Mayer JM. NASS contemporary concepts in spine care: Spinal manipulation therapy for acute low back pain. The Spine Journal 2010;10:918-40.
43. von Heymann WJ, Schloemer P, Timm J, Muehlbauer B. Spinal high-velocity low amplitude manipulation in acute nonspecific low back pain: A double-blinded randomized controlled trial in comparison with diclofenac and placebo. Spine 2013;38:540-8.
44. Learman KE, Showalter C, O'Halloran B, Cook CE. Thrust and nonthrust manipulation for older adults with low back pain: An evaluation of pain and disability. J Manipulative Physiol Ther 2013;36:284-91.
45. Bicalho E, Palma Setti JA, Macagnan J, Rivas Cano JL, Manffra EF. Immediate effects of a high-velocity spine manipulation in paraspinal muscles activity of nonspecific chronic low-back pain subjects. Manual therapy 2010;15:469-75.

How to cite this article: Sejari N, Kamaruddin K, Al-Worafi YM, Ming LC. A narrative review of massage and spinal manipulation in the treatment of low back pain. Arch Pharma Pract 2014;5:139-43.

Source of Support: Nil. **Conflict of Interest:** None declared.