

Community empowerment in implementing effleurage massage for women in labor at Pratama Deliana Clinic

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ABSTRACT

Effleurage massage is one of the massage methods to reduce pain during labor which is listed in the Summary of pain relief measures during labor, where during the first stage of the latent phase (0-3 cm opening) and the active phase (4-7 cm opening) the activity that can be carried out by labor mothers is effleurage. Effleurage is light massage using your fingers, usually on your stomach, in rhythm with your breathing during contractions. Effleurage can be done by the birthing mother herself or by the birth attendant during the contractions. The purpose of this community service is to increase the knowledge of birthing mothers and their families about Effleurage massage. The results of the community service carried out on 15 mothers who gave birth found that the majority of mothers were 80% able to overcome/manage the pain they felt. It is hoped that this service activity can be continued starting when the mother is pregnant so that the mother is not confused in carrying out effleurage massage during childbirth.

KEYWORDS

Effleurage massage;
Material women;
Pratama deliana clinic



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1. Introduction

Labor is the process of opening and thinning the cervix, and the fetus descends into the birth canal [1]. Birth is a process in which the fetus and amniotic fluid are pushed out through the birth canal [2]. Labor and normal birth are processes of expulsion of the fetus that occur in full-term pregnancy (37-42 weeks), spontaneous birth with a back of the head presentation that takes place within 18 hours, without complications for both the mother and the fetus [3].

Care for the first stage of labor is the care needed by the mother during the birth process [4]. The patient is said to be in the first stage of labor, if the cervix has opened and contractions are regular at least 2x in 10 minutes for 40 seconds which last between 0-10 cm opening (complete dilation) [5]. The process in stage I is divided into a latent phase and an active phase. Latent phase (8 hours) from 0 opening to 3 cm opening [6]. While the active phase (7 hours) from cervical opening 4 cm to 10 cm opening [7]. Duration for primigravida lasts 12-14 hours, in multigravida about 6-8 hours [8]. The first stage is the peak of the greatest pain, because labor pain is a subjective experience caused by ischemia of the uterine muscles, pulling and traction of the uterine ligaments, traction on the ovaries, fallopian tubes and distention of the lower part of the uterus, pelvic floor muscles and perineum [9]–[13]. Pain in labor is a manifestation of uterine muscle contractions. The level of labor pain is described by the pain intensity perceived by the mother during labor [14]. The intensity of pain depends on the sensation of the severity of the pain itself [15].

Pain in labor appears due to psychological responses and physical reflexes [16]–[20]. Pain will have an impact on increasing the activity of the sympathetic nervous system which can result in changes in blood pressure, pulse, respiration, and skin color, nausea, vomiting, and also excessive sweating [21]–[25]. Emotional tension due to anxiety and fear can exacerbate the mother's perception of pain during labor [22], [26]–[29]. So that labor pain will cause fear, anxiety will appear which ends with panic [24].

Labor pain can also cause hyperventilation resulting in increased oxygen demand, increased blood pressure, and reduced intestinal motility and urinary bladder [18], [20], [22], [24], [26]. This situation will

stimulate an increase in catecholamines which can cause interference with the strength of uterine contractions resulting in uterine inertia. If labor pain is not treated, it will cause prolonged parturition.

This will cause the birthing mother to have a bad birth experience, experience birth trauma which can cause postpartum blues, so it is very important for birth attendants to meet the mother's need for a sense of security and comfort. The Indonesian Hospital Association Data Center explained that 15% of mothers in Indonesia experienced childbirth complications and 21% stated that the labor they experienced was a painful delivery because they felt extreme pain, while 63% did not receive information about the preparations that must be made to reduce pain in labor.

Effleurage massage is one of the massage methods to reduce pain during labor which is listed in the Summary of pain relief measures during labor, where during the first stage of the latent phase (0-3 cm opening) and the active phase (4-7 cm opening) the activities that can be carried out by the delivery mother is effleurage [30][31]. Effleurage is a light massage using the fingers, usually on the stomach, in rhythm with breathing during contractions [32][33]. Effleurage can be done by the birthing mother herself or by the birth attendant during the contractions [34][35]. It is used to distract the mother from pain during contractions [36][37]. The main action of effleurage massage is the application of the Gate Control theory which can "close the gate" to inhibit the passage of pain stimuli to the higher centers of the central nervous system [38][39].

The effect of effleurage massage on labor pain in the first active phase in the independent practice of midwife Nuriman Rafida and the independent practice of midwife Latifah in Jambi City [40]–[44] There is a significant effect between effleurage massage on reducing pain in the first active phase, with P (value) $0.000 < 0.05$ [45]–[49]. The effect of effleurage massage on primipara pain in the first stage of physiological labor at RSIA Bunda Arif Purwokerto proves that effleurage massage can reduce pain from a scale of 7.647 to 6.117 [50]–[54].

Most mothers complain of pain in the waist or back that spreads to the stomach, especially primi mothers [55]–[59]. There are no midwives who provide effective care using the effleurage technique to treat this pain. This is understandable because in primiparas it is their first experience in giving birth, giving rise to fear, anxiety and experience worse in normal delivery. Therefore the authors are interested in taking the case of this report to provide a safe and comfortable experience of the mother's normal delivery process by providing relaxation massage. Based on the background above and seeing how important it is to do community service for mothers in childbirth with the title "Implementation of Effluarege Massage for Mothers in Birth at the Pratama Deliana Clinic Pekanbaru".

2. Method

The activity plan in order to implement the solutions offered, in detail are:

- Visits and coordination of the servants to the Delina Pratama Clinic. Held in October 2020.
- Implementation of educational activities and demonstrations or practice of effleurage massage for mothers in labor. Held in October-December 2020 at the Deliana Clinic Pekanbaru for 15 mothers giving birth.

3. Results and Discussion

Servants who are students of Midwifery STIKes HangTuah Pekanbaru coordinate and visit the Pratama Delina clinic with the aim of conveying the aims and objectives for implementing this effleurage massage which will be carried out at the Pratama Delina Clinic. In Figure 1. The figure shows that the servants conduct counseling about education and demonstrations or the practice of implementing effleurage massage. The material provided in education and demonstrations or practice is about effleurage massage for mothers in labor. Demonstrations or practical implementations are carried out in accordance with the effleurage massage technique for mothers in labor. The effleurage massage was carried out at the PratamaDelina Clinic Pekanbaru for 15 mothers giving birth.



Fig. 1. Servant Coordination in the Implementation of Effleurage at the Delina Primary Clinic

A total of 15 mothers gave birth at the Pratama Deliana clinic in the first stage of labor who experienced labor pain. This can be overcome by carrying out effleurage massage which is useful so that the mother can manage the pain she feels as shown in Figure 2. The figure shows that it has been proven that with the implementation of effleurage massage the mother can be calmer in dealing with the labor pain she feels.



Fig. 2. Implementation of Effleurage Massage

Based on observations and assessments during the activity, this activity yielded the following results: Mothers in labor understood and understood about effleurage massage and its implementation to deal with the intensity of pain and Mothers in labor and their companions wanted to apply effleurage massage during labor and the pain experienced by mothers could be overcome.

4. Conclusion

Provide a statement that what is expected, as stated in the "Introduction" chapter can ultimately result in "Results and Discussion" chapter, so there is compatibility. Moreover, it can also be added the prospect of the development of research results and application prospects of further studies into the next (based on result and discussion).

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Author Contribution

The activity plan in implementation of effleurage massage for women in labor at pratama deliana clinic.

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Conflict of Interest

The authors declare no conflict of interest.

References

- [1] E. H. M. Kopmeiners, M. H. Hollander, N. van Voorst, and C. A. I. Stramrood, "Effect of early postpartum EMDR on reducing psychological complaints in women with a traumatic childbirth experience," *J. Psychosom. Obstet. Gynecol.*, vol. 44, no. 1, Dec. 2023.
- [2] H. W. Kim and S. Y. Kim, "Gender differences in willingness for childbirth, fertility knowledge, and value of motherhood or fatherhood and their associations among college students in South Korea, 2021," *Arch. Public Heal.*, vol. 81, no. 1, p. 110, Jun. 2023.
- [3] L. Hoffmann, N. Hilger, E. Riolino, A. Lenz, and R. Banse, "Partner support and relationship quality as potential resources for childbirth and the transition to parenthood," *BMC Pregnancy Childbirth*, vol. 23, no. 1, p. 435, Jun. 2023.
- [4] Y. M. Adinew, J. Kelly, M. Smith, and A. Marshall, "Women's perspectives on disrespect and abuse during facility-based childbirth in Ethiopia: a qualitative study," *BMC Pregnancy Childbirth*, vol. 23, no. 1, p. 444, Jun. 2023.
- [5] K. S. Dickson, C. Ayebeng, A. B. Adu-Gyamfi, and J. Okyere, "Postnatal care service utilisation for babies within the first two months after childbirth: an analysis of rural-urban differences in eleven Sub-Saharan African countries," *BMC Pregnancy Childbirth*, vol. 23, no. 1, p. 423, Jun. 2023.
- [6] K. Reppen, L. Henriksen, B. Schei, E. B. Magnussen, and J. J. Infanti, "Experiences of childbirth care among immigrant and non-immigrant women: a cross-sectional questionnaire study from a hospital in Norway," *BMC Pregnancy Childbirth*, vol. 23, no. 1, p. 394, May 2023.
- [7] E. Reviriego-Rodrigo et al., "Experiences of water immersion during childbirth: a qualitative thematic synthesis," *BMC Pregnancy Childbirth*, vol. 23, no. 1, p. 395, May 2023.
- [8] M. Mirzania et al., "Mistreatment of women during childbirth and its influencing factors in public maternity hospitals in Tehran, Iran: a multi-stakeholder qualitative study," *Reprod. Health*, vol. 20, no. 1, p. 79, May 2023.
- [9] F. Vahidi, M. Mirghafourvand, E. Naseri, and S. Ghanbari-Homaie, "Birth-related posttraumatic stress disorder and negative childbirth experience related to maternal functioning among adolescent mothers: a cross-sectional study," *BMC Pregnancy Childbirth*, vol. 23, no. 1, p. 371, May 2023.
- [10] D. Makombe, E. Thombozi, W. Chilemba, A. Mboma, K. J. Banda, and E. Mwakilama, "Herbal medicine use during pregnancy and childbirth: perceptions of women living in Lilongwe rural, Malawi – a qualitative study," *BMC Womens. Health*, vol. 23, no. 1, p. 228, May 2023.
- [11] A. P. Rodrigues et al., "Women's voice on changes in childbirth care practices: a qualitative approach to women's experiences in Brazilian private hospitals participating in the Adequate Childbirth Project," *Reprod. Health*, vol. 20, no. S2, p. 19, Jan. 2023.
- [12] A. Keepanasseril, D. M. Balachandran, J. Sharma, D. K. Maurya, and S. S. Kar, "External validation of the Maternal Severity Index for predicting maternal death following potentially life-threatening complications during pregnancy and childbirth: a single-centre, prospective observational study," *BMJ Open*, vol. 12, no. 12, p. e067112, Dec. 2022.
- [13] S. P. A. do Souto, R. C. G. da Silva, A. P. Prata, M. J. Guerra, C. Couto, and R. S. de Albuquerque, "Midwives' interventions for reducing fear of childbirth in pregnant women: a scoping review," *JBI Evid. Synth.*, vol. 20, no. 12, pp. 2867–2935, Dec. 2022.
- [14] X. Mei et al., "Associations among fear of childbirth, resilience and psychological distress in pregnant women: A response surface analysis and moderated mediation model," *Front. Psychiatry*, vol. 13, Dec. 2022.
- [15] D. L. Mwakawanga, B. Mwilike, M. Kaneko, and Y. Shimpuku, "Local knowledge and derived practices of safety during pregnancy, childbirth and postpartum: a qualitative study among nurse-midwives in urban eastern Tanzania," *BMJ Open*, vol. 12, no. 12, p. e068216, Dec. 2022.

- [16] A. M. Adesanya et al., "Impact of the COVID-19 pandemic on expectant and new parents' experience of pregnancy, childbirth, breast feeding, parental responsiveness and sensitivity, and bonding and attunement in high-income countries: a systematic review of the evidence," *BMJ Open*, vol. 12, no. 12, p. e066963, Dec. 2022.
- [17] X. Li, X. Yang, L. Wang, J. Mao, and L. Xie, "The status quo and influencing factors of knowledge, attitude and practice of obstetric staff on the safe childbirth checklist," *Medicine (Baltimore)*, vol. 101, no. 48, p. e32040, Dec. 2022.
- [18] H. Van Uytzel et al., "Mental health after childbirth and the impact on postpartum weight retention and body composition. Data from the INTER-ACT randomized controlled trial," *Clin. Obes.*, vol. 12, no. 6, Dec. 2022.
- [19] R. Attard, J. Iles, F. Bristow, and R.-M. Satherley, "An interpretative phenomenological analysis of the experience of couples' recovery from the psychological symptoms of trauma following traumatic childbirth," *BMC Pregnancy Childbirth*, vol. 22, no. 1, p. 798, Oct. 2022.
- [20] E. Rondung, S. Magnusson, and E. Ternström, "Preconception fear of childbirth: experiences and needs of women fearing childbirth before first pregnancy," *Reprod. Health*, vol. 19, no. 1, p. 202, Oct. 2022.
- [21] N. Kapula, S. Shiboski, C. Dehlendorf, L. Ouma, and P. A. Afulani, "Examining socioeconomic status disparities in facility-based childbirth in Kenya: role of perceived need, accessibility, and quality of care," *BMC Pregnancy Childbirth*, vol. 22, no. 1, p. 804, Nov. 2022.
- [22] L. Straub, K. F. Huybrechts, H. Mogun, and B. T. Bateman, "Association of Neuraxial Labor Analgesia for Vaginal Childbirth With Risk of Autism Spectrum Disorder," *JAMA Netw. Open*, vol. 4, no. 12, p. e2140458, Dec. 2021.
- [23] Y. Zhu et al., "Effectiveness of acupoint hot compress on early puerperal rehabilitation of parturients after natural childbirth: study protocol for a prospective, multi-center, randomized controlled clinical trial," *Clin. Exp. Obstet. Gynecol.*, vol. 48, no. 6, p. 1350, 2021.
- [24] N. A. Scott et al., "If we build it, will they come? Results of a quasi-experimental study assessing the impact of maternity waiting homes on facility-based childbirth and maternity care in Zambia," *BMJ Glob. Heal.*, vol. 6, no. 12, p. e006385, Dec. 2021.
- [25] Y. B. Biru, G. A. Lemelem, and N. Solomon, "Length of stay in health facilities after childbirth and associated maternal and neonatal factors in Ethiopia: a cross-sectional study from a national survey," *BMJ Open*, vol. 11, no. 12, p. e055327, Dec. 2021.
- [26] I. M. F. de Souza, G. L. N. Vitral, M. V. Caliari, and Z. S. N. Reis, "Association between the chronology of gestation and the morphometrical skin characteristics at childbirth: a development of predictive model," *BMJ Heal. Care Informatics*, vol. 28, no. 1, p. e100476, Dec. 2021.
- [27] L. C. Kaplan et al., "Effects of the World Health Organization Safe Childbirth Checklist on Quality of Care and Birth Outcomes in Aceh, Indonesia," *JAMA Netw. Open*, vol. 4, no. 12, p. e2137168, Dec. 2021.
- [28] G. Baptie, E. M. Januário, and A. Norman, "Empowered or powerless? Contributing factors to women's appraisal of traumatic childbirth," *Br. J. Midwifery*, vol. 29, no. 12, pp. 674–682, Dec. 2021.
- [29] R. Prieto-Gómez, C. Schubert-Contreras, P. Muñoz-Montes, N. E. Ottone, and M. Deppe-A, "Terminología Embryologica, Parto y Anomalías de la reproducción: Propuesta de Términos Embriológicos en Español," *Int. J. Morphol.*, vol. 39, no. 6, pp. 1529–1534, Dec. 2021.
- [30] F. A. Carvalho, N. P. Batista, F. P. Diniz, A. F. Machado, J. K. Micheletti, and C. M. Pastre, "Repeated Massage Improves Swimmers' Perceptions during Training Sessions but Not Sprint and Functional Performance: A Randomized Controlled Trial," *Int. J. Environ. Res. Public Health*, vol. 20, no. 3, p. 1677, Jan. 2023.
- [31] M. Dufour, "Pourquoi dire qu'il faut commencer un massage par un effleurage est faux," *Kinésithérapie, la Rev.*, vol. 21, no. 235, p. 48, Jul. 2021.
- [32] W. Welis, D. Darni, and D. T. Mario, "Sports Massage: How does it Affect Reducing Lactic Acid Levels in Athletes?," *Int. J. Hum. Mov. Sport. Sci.*, vol. 11, no. 1, pp. 20–26, Feb. 2023.
- [33] L. A. Koelmeyer et al., "Personalizing Conservative Lymphedema Management Using Indocyanine Green-Guided Manual Lymphatic Drainage," *Lymphat. Res. Biol.*, vol. 19, no. 1, pp. 56–65, Feb. 2021.
- [34] F. Eskandari, P. Mousavi, M. Valiani, S. Ghanbari, and M. Irvani, "A comparison of the effect of Swedish massage with and without chamomile oil on labor outcomes and maternal satisfaction of the childbirth process: a randomized controlled trial," *Eur. J. Med. Res.*, vol. 27, no. 1, p. 266, Nov. 2022.

- [35] Z. Abbasi et al., "The Effect of Effleurage Massage Therapy on Symptoms of Osteoarthritis in Elderly Women with Osteoarthritis: A Cross-Clinical Trial," *Open Access Maced. J. Med. Sci.*, vol. 9, no. G, pp. 244–250, Nov. 2021.
- [36] A. Amrollahi, A. Rafiei, A. Bahri, and K. Nasiriani, "Effects of aromatherapy massage on the severity of restless legs syndrome in hemodialysis patients: A randomized clinical trial," *Ther. Apher. Dial.*, vol. 26, no. 6, pp. 1131–1136, Dec. 2022.
- [37] N. W. Sridani, S. Russeng, R. Nur, Fauzan, and R. Devi, "The effect of back massage EPRO method on blood pressure in hypertension patients," *Enfermería Clínica*, vol. 30, pp. 31–34, Jun. 2020.
- [38] M. Maghalian, M. Mirghafourvand, F. Ghaderi, S. Abbasalizadeh, S. Pak, and M. Kamalifard, "Comparison the effect of Swedish massage and interferential electrical stimulation on labor pain and childbirth experience in primiparous women: a randomized controlled clinical trial," *Arch. Gynecol. Obstet.*, vol. 306, no. 1, pp. 37–47, Jul. 2022.
- [39] Yanuar Eka Pujiastutik, Paramita Ratna Gayatri, and Ely Isnaeni, "COMPARISON OF ENDORPHINE MASSAGE AND EFFLEURAGE MASSAGE ON PRIMIGRAVIDA 1ST STAGE LATENT PHASE PAIN IN INDONESIA," *Malaysian J. Public Heal. Med.*, vol. 21, no. 2, pp. 45–51, Aug. 2021.
- [40] A. H. Heald et al., "Reducing fatigue-related symptoms in Long COVID-19: a preliminary report of a lymphatic drainage intervention," *Cardiovasc. Endocrinol. Metab.*, vol. 11, no. 2, Apr. 2022.
- [41] T. Farnham, "Reviewing pain management options for patients in active labor," *Nursing (Lond.)*, vol. 50, no. 6, pp. 24–30, Jun. 2020.
- [42] L. Monteiro Rodrigues, C. Rocha, H. T. Ferreira, and H. N. Silva, "Lower limb massage in humans increases local perfusion and impacts systemic hemodynamics," *J. Appl. Physiol.*, vol. 128, no. 5, pp. 1217–1226, May 2020.
- [43] K. M. Galamaga and A. Cristian, "Oncology Massage Therapy in Breast and Gynecologic Cancers," in *Breast Cancer and Gynecologic Cancer Rehabilitation*, Elsevier, 2021, pp. 297–301.
- [44] O. Bukhari, G. Phillips, and K. Sweeney, "Non-Allergic Rhinitis with Osteopathic Treatment Techniques," *Osteopath. Fam. Physician*, pp. 16–20, Mar. 2020.
- [45] A. Afrasiabifar, S. Hamzhiakia, A. Mosavi, and S. Mohammad Hossini, "The effect of warm water footbath versus Swedish massages on hemodialysis patients' sleep quality and insomnia," *J. Nurs. Midwifery Sci.*, vol. 9, no. 2, p. 81, 2022.
- [46] B. Inkaya and H. Tuzer, "Effect of Reflexology on the Constipation Status of Elderly People," *Yonago Acta Med.*, vol. 63, no. 2, pp. 115–121, 2020.
- [47] N. Mirbagher Ajorpaz, Z. Rahemi, M. Aghajani, and S. H. Hashemi, "Effects of glycerin oil and lavender oil massages on hemodialysis patients' restless legs syndrome," *J. Bodyw. Mov. Ther.*, vol. 24, no. 1, pp. 88–92, Jan. 2020.
- [48] A. Haseli, A. Ghiasi, and M. Hashemzadeh, "Do Breathing Techniques Enhance the Effect of Massage Therapy in Reducing the Length of Labor or not? a Randomized Clinical Trial," *J. Caring Sci.*, vol. 8, no. 4, pp. 257–263, Dec. 2019.
- [49] "Studying the Effect of Effleurage Massage on Sleep Quality and Self-Efficacy of Patients with Multiple Sclerosis Referred to the Fars MS Society," *Int. J. Pharm. Res.*, vol. 11, no. 1, Mar. 2019.
- [50] P.-C. Sung and Y.-P. Liu, "Assessments of forearm muscular demands and perceived exertions for different massage techniques of the Swedish-type massage," *Int. J. Appl. Sci. Eng.*, vol. 19, no. 1, pp. 1–11, 2022.
- [51] A. Maziyah, D. Fatmasari, D. M. Wenten Parwati, and R. S. E. Pujiastuti, "THE IMPACT OF COMBINATION OF BREASTFEEDING AND EFFLEURAGE MASSAGE IN REDUCING PAIN RESPONSE IN INFANTS INDUCED BY BLOOD SAMPLING IN C-REACTIVE PROTEIN TEST: AN OBSERVATIONAL CROSS-SECTIONAL STUDY," *Belitung Nurs. J.*, vol. 4, no. 2, pp. 242–248, May 2018.
- [52] S. Lotfipour-Rafsanjani, A. Ravari, Z. Ghorashi, S. Haji-Maghsoudi, J. Akbarinasab, and R. Bekhradi, "Effects of geranium aromatherapy massage on premenstrual syndrome: A clinical trial," *Int. J. Prev. Med.*, vol. 9, no. 1, p. 98, 2018.
- [53] A. Zargham-Boroujeni, A. Elsagh, and M. Mohammadzadeh, "The effects of massage and breastfeeding on response to venipuncture pain among hospitalized neonates," *Iran. J. Nurs. Midwifery Res.*, vol. 22, no. 4, p. 308, 2017.

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- [54] J. Rodríguez-Mansilla, B. González-Sánchez, S. Torres-Piles, J. G. Martín, M. Jiménez-Palomares, and M. N. Bellino, "Effects of the application of therapeutic massage in children with cancer: a systematic review," *Rev. Lat. Am. Enfermagem*, vol. 25, 2017.
- [55] J. Park et al., "Application of massage for ankle joint flexibility and balance," *J. Phys. Ther. Sci.*, vol. 29, no. 5, pp. 789–792, 2017.
- [56] Y. Kapoor and R. Orr, "Effect of therapeutic massage on pain in patients with dementia," *Dementia*, vol. 16, no. 1, pp. 119–125, Jan. 2017.
- [57] K. Kito and K. Suzuki, "Research on the Effect of the Foot Bath and Foot Massage on Residual Schizophrenia Patients," *Arch. Psychiatr. Nurs.*, vol. 30, no. 3, pp. 375–381, Jun. 2016.
- [58] S. Azima, H. R. Bakhshayesh, M. Kaviani, K. Abbasnia, and M. Sayadi, "Comparison of the Effect of Massage Therapy and Isometric Exercises on Primary Dysmenorrhea: A Randomized Controlled Clinical Trial," *J. Pediatr. Adolesc. Gynecol.*, vol. 28, no. 6, pp. 486–491, Dec. 2015.
- [59] K. Takamoto et al., "Effects of compression at myofascial trigger points in patients with acute low back pain: A randomized controlled trial," *Eur. J. Pain*, vol. 19, no. 8, pp. 1186–1196, Sep. 2015.