The Influence of Slow Back Stroke Massage, Cold-compress and Warm-compress to the Level of Prostaglandin F2α (PGF2α) in Primary Dysmenorrhea

by Mukhoirotin, Kurniawati, Diah Ayu Fatmawati

Submission date: 18-Aug-2020 10:41AM (UTC+0700)
Submission ID: 1370865585
File name: Mukhoirotin_IJFMT.docx (38.59K)
Word count: 2996
Character count: 18293

The Influence of Slow Back Stroke Massage, Cold-compress and Warm-compress to the Level of Prostaglandin F2α (PGF2α) in Primary Dysmenorrhea

Mukhoirotin[1], Kurniawati[1], Diah Ayu Fatmawati[1]

[1]Nursing Science Program, Faculty of Health Science, Unipdu Jombang

Corrsponding author:
Mukhoirotin (mukhoirotin@fik.unipdu.ac.id)
Address: Campus UNIPDU, Peterongan, Jombang, Indonesia

ABSTRACT

The cause of primary dysmenorrhea is excessive release of the hormone prostaglandin F2-alpha (PGF2α). The aim of this study was to assess the influence of SBBM, cold-compresses and warm-compresses toward the level of PGF2α in primary dysmenorrhea, using Post Test Only with Control Group Design and Pretest-Postest Control Group Design. The subjects were 76 female-student, selected by purposive sampling. NRS used to measure the pain level and ELISA used to measure PGF2α levels. The data were analyzed by using Paired Sample T-Test, One-Way Anova and Kruskal-Wallis test. SSBM, cold-compresses and warm-compresses are effective to decreasing of pain level and PGF2α levels in primary dysmenorrhoea.
Keywords: Slow Stroke Back Massage, Cold-compresses, Warm-compresses, PGF2α, menstrual pain

INTRODUCTION

This incidence of dysmenorrhea is 20% to 90% among reproductive women and 15% occurred among young female[(1)] followed with pain level around 2%-29%[(2)]. Primary dysmenorrhoea commonly occurred among adolescents without any pathological problems at the pelvis[(3-4)]. The prevalence of primary dysmenorrhea among adolescent was 55.5-90.1%[(1, 5)]. In Mexico, dysmenorrhea affects 65% of students' daily activities[(6)].

The cause of primary dysmenorrhea is an increase in prostaglandin F2-alpha (PGF2α) production.[(7)] The treatment of dysmenorhea commonly used nonsteroidal anti-inflammatory drugs (NSAIDs). As we know medication consumption for long time will give some impact such as medication addictive [(8-9)], diarrhea, abdominal pain, nausea[(10)], kidney-complications, liver-complications, sleep-disorders[(11)], digestion-problems[(12)]. The pharmacological treatment for dysmenorrhea was successful, but about 20-25% of the failure process[(13)]. The one of the traditional treatment for dysmenorrhea is Slow Stroke Back Massage (SSBM), cold-compresses and warm-compresses. SSBM reduces pain and effectively increases endorphin levels[(14)]. Cold-compresses reduce prostaglandins, so it will make strengthens the sensitivity of pain and other subcutaneous at the injury site by inhibiting the inflammatory process and giving analgesic[(15)]. The skin stimulation causes endorphin loose so it will block blocking the transmission of pain stimulus. Skin stimulation activates the transmission of sensory A-Beta nerve fibers and decreases pain transmission C and delta-A fibers so the synaptic gate closes the transmission of pain impulse[(16)]. Cold-compresses and warm-compresses are stimulates to loosing the endorphin β levels and regulate uterine hypercontractility during menstrual pain[(17)].

The results of previous studies indicated that Moxibustion consumption can reduce the levels of PGF2α, OT, vWF and increase the levels of β-EP (β Endorphin)[(18)]. However, the influence of SSBM, Cold-compresses and Warm-compresses toward the intensity of pain and PGF2α levels in Primary Dysmenorrhea have not been clearly known. The aim of this study was to analysis the effect of SSBM, Cold-compresses and Warm-compresses toward Pain Intensity and Prostaglandin F2α (PGF2α) levels in Primary Dysmenorhea.

METHODS

The design in this study was Post Test Only with Control Group Design and Pretest-Postest Control Group Design. The sample was 76 female students in faculty of health science of Unipdu Jombang who experienced dysmenorrhoea, selected by purposive sampling. The samples were divided into six groups: SSBM (n=13), cold-compress (n=12), warm-compress (n=13), SSBM+cold-compresses (n=13), SSBM+warm-compresses (n=13), control (n=12). The data were collected by two istruments: NRS (Numeric Rating Scale) to measured the pain level, ELISA to measured PGF2α. Data were analyzed by Paired Sample T-Test, One-Way Anova and Kruskal-Wallis test.

FINDINGS

Table 1. Intensity of menstrual pain before giving intervention

Group	Mean	p
SSBM	6.31	0.747
Cold-compress	6.75	
Warm-compress	6.31	
SSBM+cold-compress	6.15	
SSBM+warm-compress	6.77	
Control	6.17	

One-Way Anova, Post Hoc Tamhane's test

Table 2. The menstrual pain after giving intervention

Group	Mean	p
SSBM	3.54	0.000
Cold-compress	2.83	
Warm-compress	2.85	
SSBM+cold-compress	2.23	
SSBM+warm-compress	3.08	
Positive-control	6.00	

One-Way Anova test, Post Hoc Tamhane's test

16

Table 3. The differences of menstruation pain between before and after intervention group

Group	Before Mean±SD	After Mean±SD	p
SSBM	6.31±0.95	3.54±0.88	0.000
Cold-compress	6.75±1.29	2.83±1.19	0.000
Warm-compress	6.31±1.18	2.85±0.89	0.000
SSBM+cold-compress	6.15±1.28	2.23±0.09	0.000
SSBM+warm-compress	6.77±1.83	3.08±1.80	0.000
Control	6.17±1.40	6.00±1.21	0.166

Paired Sample T-Test

Table 4. The differences of PGF2α level between intervention group and control group

Group	Median-pg/ml	p
SSBM	132.967	0.017
Cold-compress	136.033	
Warm-compress	145.367	
SSBM+cold-compress	151.300	
SSBM+warm-compress	136.767	
Control group	156.544	

Kruskal-Wallis test, *Post Hoc* Mann-Whitney test.

DISCUSSION

The menstrual pain level before give the interventions were moderate to severe and after give treatments the average menstrual pain level in all treatment groups was mild and in control group was moderate level. The intensity of menstrual pain in this study was addressed with some previous studies which showed that the menstrual pain level among he respondents was moderate to severe level[19-20]. Some risk factors of dysmenorhea are include the early of age menarche, the longer of menstrual periods, the higher of menstrual volume, family history of dysmenorrhea, smokers, obesity, alcohol consumption[2,21-22], high caffeine diet[23], and high levels of stress[24].

The results of this study showed that the average of menstrual pain level in all intervention groups are significantly decrease between pre-test and post-test. This showed that SSBM, cold-compresses and warm-compresses, SSBM+cold-compresses, SSBM+warm-compresses are effective to reduce the menstrual pain level. These interventions are cutaneous stimulation techniques, where the mechanism of these interventions in reducing pain level was explained according to the gate control theory. Gate control theory explained that skin stimulation can activate the transmission of the fibers of A-Beta nerve sensory[25]. This process can reduce pain transmission through small diameter of C and delta-A fibers so the synaptic gate will closes the transmission of pain impulse. Generally, the cutaneous stimulation on the body is on the back and shoulders. Cutaneous stimulation are influenced peripheral fibers to send the impulses by using dorsal horn in the spinal cord, when the impulses carried by A-Beta fibers are dominate so the gate mechanism will close so the pain impulses are not delivered to the brain[26].

The average decreasion of menstrual pain level in SSBM-group. Touch and massage are the technique of sensory integration that affect the activity of nervous system. Individuals who perceived touch as a stimulation to relax, a relaxation response will appear. The use of appropriate cutaneous stimulation can reduce pain perception and muscle tension. Conversely muscle tension can increase pain perception[16]. Massage of connective tissue makes relaxes on body, reduces muscle spasms, connective tissue tenderness, increases the circulation and β-endorphin plasma[27]. This intervention can stimulate the autonomic nervous system to balance the sympathetic and parasympathetic nerves[28]. The SSBM was effectived to reducing menstrual pain level[14]. The connective tissue manipulation (CTM) can be used as an intervention to primary dysmenorrhoea and menstrual-related symptoms because this method didn't give the potential effects such as analgesic, noninvasive and easy to do[29].

The average of menstrual pain level in cold-compress group was ranged 6.75-2.83. The intervention of cold-compress in the abdomen for 20 minutes by using a bag filled ice. The intervention of cold-compress to respondents was helpful to reduce the pain level, this because of the blood flow was decreased in area which is compressed, and gave analgesic effect by slowing the speed of nerve delivery so the pain impulses will be decrease or less to the brain. Cold-compresses was gave the physiological effects to reduce the inflammatory response, reduce blood flow, reduce edema, and reduce local pain[30]. Cold therapy (ice compresses) intervention will be blocked and the impulses of pain will be reduce or loose for few times[26]. Previous research results showed that cold-compresses was effective reduced menstrual pain[31].

After given of warm-compresses the average of menstrual pain significantly decreased. Warm-compresses is an intervention that can help to reduce pain by using dilated method of blood vessels so this will increasing the blood supply to the body[32]. Some previous research said that warm-compresses was effected to reduce menstrual pain level[33-34].

In the control group after given management information about menstrual pain, a small proportion experienced a decreasing of menstrual pain level but was not significant. The information was included pharmacological and non-pharmacological menstrual pain treatment. Non-pharmacological treatment are regular exercise, adequate rest, warm-compresses on abdomen, yoga, warm water shower, massage, deep breath, acupunctur, acupressure, TENS, salt and sugar diet, cold-compresses and deuretics consumption (asparagus and watermelon). Pharmacological treatments are hormonal-drugs and NSAIDs[35].

The results of this study showed that there were no significant differences in PGF2α levels in all intervention groups, there were significant differences in PGF2α levels between intervention and control. Primary dysmenorrhoea caused by the increasing of prostaglandin production and the release of endometrial prostaglandins during menstruation so it will induce uterine hypercontractility, reduce

uterine blood flow, and hypersensitive of pain[36]. Menstrual cramps more worse because PGF2α was increased and PGE2 decreases, so primary dysmenorrhoea increased the ratio of PGF2α to PGE2[37-38].

Massage is a therapy to reduce the production of NF-κB, inflammatory cytokines and TNF-α[39]. Inflammatory cytokines (ex: IL1-β, TNF-α) is stimulates prostaglandin production in the first day of menstrual phase[40-41]. The results of previous studies indicated that the Swedish Massage Therapy reduced the level of Mitogen-Stimulation of IL-1ß, IL-2, IL-4, IL-5, IL-6, IL-10, IL-13, and IFN-g[42]. The decreasing of inflammatory cytokines impacted decreasing of prostaglandin stimulation production. Therefore, the SSBM intervention can reduce prostaglandin levels in primary dysmenorrhoea.

Cold-compresses are the intervention which give vasoconstriction effects, prevented the edema, reduce inflammation, local anesthetics effect, reduce cell metabolism and increase blood viscosity. Warm-compresses are the interventions which give a vasodilation effects to blood circulation to becomes smooth and muscles relax[32]. Hot stimulation can increase blood flow in blood vessels at uterus and consequently the prostaglandin vascular will be liquid, bradykinin, and histamine[25]. Heat interventions in local area is as effective as NSAIDs[43]. The NSAIDs mechanism to relieve primary dysmenorrhea depends on the inhibition of cyclooxygenase (COX), an enzyme which responsible for the prostaglandins production (and other prostanoids). The unbalanced amount of prostaglandins from the endometrium during menstruation are major cause of dysrhythmias contraction at the uterus, the reducing of local blood flow and the increasing of peripheral nerve sensitivity during Primary Dysmenorhea[44]. Therefore, cold-compresses and warm-compresses are same effectively to reducing prostaglandins.

CONCLUSION

SSBM, cold-compresses and warm-compresses are effectively reduced pain level and PGF2α levels to dysmenorhea.

Ethical Clearance-obtained from the ethics commission of Nursing Faculty of Airlangga University, Surabaya.
Conflict of Interest-no
Source of Funding-Directorate of Research and Community Service, Directorate General of Research and Development Strengthening, Ministry of Research, Technology and Higher Education.

REFERENCES

1. Marjoribanks J, Proctor ML, Farquhar C, Derks RS. Nonsteroidal Anti-Inflammatory Drugs for Dysmenorrhoea. Cochrane Database Syst. 2010;20(1):CD001751.
2. Iacovides S, Avidon I, Baker FC. What We Know about Primary Dysmenorrhea Today: A Critical Review. *Hum Reprod Update*. 2015;21(6): 762–778.
3. Wallace S, Keightley A, & Gie C. Dysmenorrhoea. *The Obstetrician & Gynaecologist*. 2010;12:149–154.
4. Osayande AS, Mehulic S. Diagnosis and Initial Management of Dysmenorrhea. *Am Fam Physician*. 2014;89(5):341–346.
5. Abu Helwa HA, Mitaeb AA, Al-Hamshri S, & Sweileh WM. Prevalence of Dysmenorrhea and Predictors of its Pain Intensity among Palestinian Female University Students. *BMC Women's Health*. 2018;*18:18*.
6. Ortiz MI. Primary Dysmenorrhea among Mexican University Students: Prevalence, Impact and Treatment. *Eur J Obstet Gynecol Reprod Biol*. 2010;152(1):73–77
7. Lowdermilk, Perry & Cashion. *Keperawatan Maternitas (Maternity Nursing)*. Edisi 8. Buku 1. Elseiver. Singapore. 2013.
8. Gharloghi S, Torkzahrani S, Akbarzadeh AR, Heshmat R. The Effects of Acupressure on Severity of Primary Dysmenorrhea. *Patient Prefer Adherence*. 2012;6:137–42.

9. Chen MN, Chien LW, Liu CF. Acupuncture or Acupressure at the Sanyinjiao (SP6) Acupoint for theTreatment of Primary Dysmenorrhea: A meta-analysis. *Evid Based Complement Alternat Med*. 2013;493038.
10. Kashefi F, Ziyadlou S, Khajehei M, Ashraf AR, Fadaee AR, Jafari P. Effect of Acupressure at the Sanyinjiao Point on Primary Dysmenorrhea: A Randomized Controlled Trial. *Complement Ther Clin Pract*. 2010;16:198–202
11. Wang YJ, Hsu CC, Yeh ML, Lin JG. Auricular Acupressure to Improve Menstrual Pain and Menstrual Distress and Heart Rate Variability for Primary Dysmenorrhea in Youth with Stress. *Evid Based Complement Alternat Med*. 2013;138537.
12. Nasehi M, Sehhatie F, Zamanzadeh V, Delazar A, Javadzadeh Y, Chongheralu BM. Comparison of the Effectiveness of Combination of Fennel Extract/Vitamin E with Ibuprofen on the Pain Intensity in Students with Primary Dysmenorrhea. *Iran J Nurs Midwifery Res*. 2013;18: 355–9
13. Navvabi Rigi et al. Comparing The Analgesic Effect of Heat Patch Containing Iron Chip and Ibuprofen for Primary Dysmenorrhea: A Randomized Controlled Trial. *Biomed Central*. 2012.
14. Mukhoirotin dan Diah Ayu Fatmawati. Pengaruh Akupresur pada Titik Sanyinjiao dan Slow Stroke Back Massage terhadap Penurunan Intensitas Nyeri Haid (Dismenorrhea) (The influence of accupressure at Pengaruh Sanyinjiao point and Slow Stroke Back Massage to decreasing of menstrual pain level. (Dismenorrhea). https://ppnijateng.org/wp-content/uploads/2016/11/PROSIDING-MUSWIL-II-IPEMI-JATENG_MAGELANG-17-SEPTEMBER-2016.33-39.pdf.
15. Price, A. Sylvia., & Wilson, M. L. *Patofisiologi : Konsep Klinis Proses-Proses Poenyakit (Pathophysiology: clinical concept and disease process)*. Edisi 6, Volume II. Jakarta : EGC. 2005.
16. Potter & Perry. Buku Ajar Fundamental Keperawatan (Textbook of Fundamental of Nursing). Jakarta: EGC. 2010
17. Mukhoirotin, Kurniawati and Fatmawati DA. The Effects of Cold-compress and Warm-compress on β-Endorphin Levels, IL-6 and TNFα among Adolescent with Dysmenorrhea. *Indian Journal of Public Health Research & Development*. 2018;Volume 9. Number 12: 474-479.
18. Yang M, Chen X, Bo L, Lao L, Chen J, Yu S, Yu Z, Tang H, Yi L, Wu X, Yang J & Liang F. Moxibustion for Pain Relief in Patients With Primary Dysmenorrhea: A Randomized Controlled Trial. *PLOS ONE*. 2017;
19. Potur DC, Bilgin NC, Komurcu N. Prevalence of Dysmenorrhea in University Students in Turkey: Effect on Daily Activities and Evaluation of Different Pain Management Methods. *Pain Manag Nurs. American Society for Pain Management Nursing;* 2014; 15: 768–777.
20. Kazama M, Maruyama K & Nakamura K. Prevalence of Dysmenorrhea and Its Correlating Lifestyle Factors in Japanese Female Junior High School Students. Tohoku. *J. Exp. Med*., 2015, *236*, 107-113.
21. Farahmand M, Ramezani Tehrani F, Khalili D, Amin G, Negarandeh R. Factors associated with the Severity of Premenstrual Syndrome among Iranian College Students. *J Obstet Gynaecol Res*. 2017; 43: 1726–1731.
22. Gebeyehu MB, Mekuria AB, Tefera YG, Andarge DA, Debay YB, Bejiga GS, et al. Prevalence, Impact, and Management Practice of Dysmenorrhea among University of Gondar Students, Northwestern Ethiopia: A Cross-Sectional Study. *Int J Reprod Med*. 2017; 2017: 1–8.
23. Faramarzi M, Salmalian H. Association of Psychologic and Nonpsychologic Factors with Primary Dysmenorrhea. *Iran Red Crescent Med J*. August 2014; 16(8): e16307.
24. Sahin N, Kasap B, Kirli U, Yeniceri N & Topal Y. Assessment of Anxiety-Depression Levels and Perceptions of Quality of Life in Adolescents with Dysmenorrhea. *Reproductive Health*. 2018;15:13: 1-7.
25. Sherwood, L. Fisiologi Manusia : dari Sel ke Sistem (Physiology of Human : Cell to System). Ed. 6. Jakarta : ECG. 2011
26. Prasetyo. *Konsep dan Keperawatn Nyeri (concept and pain nursing)*. Graha Ilmu. Yogyakarta. 2010.
27. Holey E, Cook E. Evidence-Based Therapeutic Massage: *A Practical Guide for Therapists, 3rd ed. Edinburgh: Churchill Livingstone*. Elsevier. 2011

28. Holey LA, Dixon J, Selfe J. An Exploratory Thermo-Graphic Investigation of the Effects of Connective Tissue Massage on Autonomic Function. *J Manipulative Physiol Ther*. 2011;34: 457–462
29. Demirturk F, Erkek ZY, Alparslan O, Demirturk F, Demir O and Inanir A. Comparison of Reflexology and Connective Tissue Manipulation in Participants with Primary Dysmenorrhea. *The Journal of Alternative and Complementary Medicine*. Volume 22, Number 1, 2016, pp. 38–44
30. Tamsuri. *Konsep dan Penatalaksanaan Nyeri (Concept and treatment for pain)*. Jakarta: EGC; 2004.
31. Fransisca S, Eka Sudiwati NLP, & Novita Dewi. Pengaruh Kompres Dingin terhadap Penurunan Intensitas Nyeri pada Wanita yang Mengalami Dismenore di Rayon Ikabe Tlogomas (The Influence of Cold-compress to Decreasing of Menstrual Pain (Dismenorrhea) Level Among Women Who Got Dismenorrhea in Rayon Ikabe Tlogomas).. *Nursing News*. 2018;Vol. 3, No. 1; 153-163.
32. Kozier & Erb's. *Buku Ajar Praktik Keperawatan Klinis edisi ke-5 (Teaching Book of Clinical Nursing Practice 5th edition)*. Jakarta: EGC. 2009.
33. Mahua H, Mudayatiningsih S, and Perwiraningtyas P. Pengaruh Pemberian Kompres Air hangat terhadap Dismenorea pada Remaja Putri di SMK Penerbangan Angkasa Singosari Malang (The influence of warm-compress to Disminorhea among Teenanger in SMK Penerbangan Angkasa Singosari Malang). *Nursing News*. 2018;Volume 3, Nomor 1. Hal: 259-268.
34. Maidartati, Hayati S, Hasanah AP. Efektivitas Terapi Kompres Hangat Terhadap Penurunan Nyeri Dismenore Pada Remaja Di Bandung. *Jurnal Keperawatan BSI*. 2018;Vol. VI No. 2. Hal: 156-164.
35. Proverawati. *Menarche: Menstruasi Pertama Penuh Makna*. Nuha Medika. Yogyakarta. 2009.
36. Ma YX, Ma LX, Liu Xl, Ma YX, Lv K, Wang D, et al. A Comparative Study on the Immediate Effects of Electroacupuncture at Sanyinjiao (SP6), Xuanzhong (GB39) and a Non-Meridian Point, on Menstrual Pain and Uterine Arterial Blood Flow, in Primary Dysmenorrhea Patients. *Pain Medicine*. 2010; 11 (10):1564–75.
37. Wang M-C, Hsu M-C, Chien L-W, Kao C-H, Liu C-F. Effects of Auricular Acupressure on Menstrual Symptoms and Nitric Oxide for Women with Primary Dysmenorrhea. *The Journal of Alternative and Complementary Medicine*. 2009; 15(3):235–42.
38. Shi G-X, Liu C-Z, Zhu J, Guan L-P, Wang D-J, Wu M-M. Effects of Acupuncture at Sanyinjiao (SP6) on Prostaglandin Levels in Primary Dysmenorrhea Patients. *The Clinical Journal of Pain*. 2011; 27(3):258–61.
39. Crane JD, Ogborn DI, Cupido C, Melov S, Hubbard A, Bourgeois JM, Tarnopolsky MA. *Massage Therapy Attenuates Inflammatory Signaling after Exercise-Induced Muscle Damage. Sci Transl Med. 2012; 4: 119ra13*.
40. Thompson M, Barata da Silva H, Zielinska W, White TA, Bailey JP, et al. TNF-*a*-mediated augmentation of agonist-induced Ca2+ transients in myometrial cells. Am *J Physiol Endocrinol Metab*. 2004;287: E1142–1148.
41. Friebe-Hoffmann U, Chiao JP, Rauk PN. Effect of IL-1beta and IL-6 on Oxytocin Secretion in Human Uterine Smooth Muscle Cells. *Am J Reprod Immunol*. 2001;46: 226–231.
42. Rapaport MH, Scherrler P, and Bresee C. A Preliminary Study of the Effects of a Single Session of Swedish Massage on Hypothalamic–Pituitary–Adrenal and Immune Function in Normal Individuals. *The Journal of Alternative and Complementary Medicine*. Volume 16, Number 10, 2010, pp. 1079–1088
43. Akin MD, Weingand KW, Hengehold DA, Goodale MB, Hinkle RT, Smith RP: *Continuous Low Level Topical Heat in the Treatment of Dysmenorrhea*. *Obstet Gynecol*. 2001, *97*:343–349.
44. Dawood MY. Primary Dysmenorrhea: Advances in Pathogenesis and Management. *Obstetrics & Gynecology*. 2006; 108(2):428–41.

The Influence of Slow Back Stroke Massage, Cold-compress and Warm-compress to the Level of Prostaglandin F2α (PGF2α) in Primary Dysmenorrhea

ORIGINALITY REPORT

16%	10%	12%	11%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Ema Wahyu Ningrum, Dwi Novitasari, Murniati Murniati. "Cutaneous stimulation of slow stroke back massage to reduce the pain of sectio caesarea", MEDISAINS, 2019 Publication	2%
2	journals.plos.org Internet Source	2%
3	Submitted to Vignan's Foundation for Science, Technology and Research University Student Paper	2%
4	Deswani Kasim, Sri Maryani Syahlan. "Gymnastic and Warm Compression Effect on Dysmenohrea Adolescence Overcoming Behavior", Asian Journal of Applied Sciences, 2018 Publication	1%
5	arbitrer.fib.unand.ac.id Internet Source	1%

6	Submitted to Universitas Sebelas Maret Student Paper	1%
7	www.lcrcientifica.com Internet Source	1%
8	Yu-Chu Chung, Hsing-Hsia Chen, Mei-Ling Yeh. "Acupoint stimulation intervention for people with primary dysmenorrhea: Systematic review and meta-analysis of randomized trials", Complementary Therapies in Medicine, 2012 Publication	1%
9	Demirtürk, Funda, Zümrüt Yilar Erkek, Özgür Alparslan, Fazlı Demirtürk, Osman Demir, and Ahmet Inanir. "Comparison of Reflexology and Connective Tissue Manipulation in Participants with Primary Dysmenorrhea", The Journal of Alternative and Complementary Medicine, 2015. Publication	1%
10	Mingxiao Yang, Xiangzhu Chen, Linna Bo, Lixing Lao et al. "Moxibustion for pain relief in patients with primary dysmenorrhea: A randomized controlled trial", PLOS ONE, 2017 Publication	1%
11	link.springer.com Internet Source	1%
12	www.omicsonline.org Internet Source	1%

13	www.hindawi.com Internet Source	1%
14	mafiadoc.com Internet Source	1%
15	www.reflexology-research.com Internet Source	1%
16	bmcnurs.biomedcentral.com Internet Source	<1%
17	Hajar Adib Rad, Zahra Basirat, Fatemeh Bakouei, Ali Akbar Moghadamnia et al. "Effect of Ginger and Novafen on menstrual pain: A cross-over trial", Taiwanese Journal of Obstetrics and Gynecology, 2018 Publication	<1%
18	Yu-Xia Ma, Liang-Xiao Ma, Xue-lian Liu, Yu-Xiang Ma et al. "A Comparative Study on the Immediate Effects of Electroacupuncture at Sanyinjiao (SP6), Xuanzhong (GB39) and a Non-Meridian Point, on Menstrual Pain and Uterine Arterial Blood Flow, in Primary Dysmenorrhea Patients", Pain Medicine, 2010 Publication	<1%
19	jurnalnasional.ump.ac.id Internet Source	<1%

Exclude quotes	Off	Exclude matches	< 3 words
Exclude bibliography	On		

The Influence of Slow Back Stroke Massage, Cold-compress and Warm-compress to the Level of Prostaglandin F2α (PGF2α) in Primary Dysmenorrhea

GRADEMARK REPORT

FINAL GRADE

/20

GENERAL COMMENTS

Instructor

PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6