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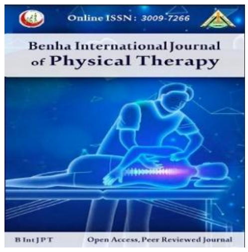

Original research

Effect of Kinetic Control Training on Postnatal Low Back Pain

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Abstract

Background: Due to musculoskeletal and biomechanical changes during pregnancy, postnatal low back pain (PLBP) is a frequent condition that affects women after giving birth. **Objective:** This study was conducted to investigate the effect of kinetic control on postnatal low back pain intensity and lumbar ROM. **Methods:** The Visual Analogue Scale (VAS) was used to assess the severity of pain, a pressure algometer was used to assess pain pressure threshold, and lumbar flexibility (lumbar flexion ROM) was assessed by using the modified Schober test for each woman in both groups (A, B) before and after treatment. **Results:** Results of this study found that there was no significant difference between groups in age, weight, height, and BMI. Within groups, there was a significant decrease in VAS and a significant increase in pain pressure threshold and lumbar flexibility (lumbar flexion ROM) post-treatment. Between groups, pre-treatment: there was no significant difference between the two groups, A and B, in VAS, PPT, and lumbar flexion ROM. Post treatment: there was a significant difference between the two groups, A and B, in VAS, PPT, and lumbar flexion ROM in favor of group B. **Conclusion:** It can be concluded that kinetic control training (KCT) is an effective modality in reducing postnatal low back pain through decreasing pain intensity and increasing pain pressure threshold and lumbar flexibility (lumbar flexion ROM).

Key words: Kinetic control training,Low back pain,Lumber ROM,Postnatal, Pressure Algometer,Visual Analog Scale (VAS).

Introduction

A common musculoskeletal problem that affects many women during the postpartum period is postnatal low back pain (LBP). After giving delivery, this pain typically appears weeks or months later. Research indicates that 50–70% of expectant mothers experience back pain and discomfort, highlighting the significant prevalence of postpartum LBP[1]

Low back pain and subsequent instability in postpartum women are a serious concern because of increased stress on the lumbar spine, surrounding ligaments, and muscles due to physiological and biomechanical changes, as well as hormonal effects like increased relaxin hormone during pregnancy, which can exacerbate or cause back pain caused by ligamentous laxity in the pelvic area, especially in cases of prolonged or difficult labor[2]

Moreover, stress, anxiety, and depression correlate with heightened pain intensity and length, while a higher body mass index, lack of physical activity, and a past occurrence of low back pain also elevate the chances of persistence following childbirth [3]These factors are further intensified by the physical requirements of early motherhood, including regular lifting, carrying the baby, and extended breastfeeding, all of which add extra load on the lower back and may lead to ongoing postnatal low back pain [4,5]

Due to the physical effort required to care for a newborn, managing LBP is necessary for postpartum recovery and general maternal health [6,7]

To promote optimal recovery and quality of life, effective management is important. Painkillers, physical therapy focused on strengthening the back and core muscles, and rest are the standard treatments for postnatal LBP. Electrotherapy methods that are efficient, inexpensive, and have few adverse effects include ultrasound, laser therapy, and interferential current. These techniques are expected to enhance patient functionality, reduce pain, lower morbidity, improve productivity, and lower overall healthcare costs [8].

Recently, there has been growing interest in rehabilitation approaches such as kinetic control exercises, which concentrate on enhancing posture, movement patterns, and core stability in order to lessen discomfort and stop additional injuries [9].

Kinetic control training typically involves a combination of manual therapy, exercises to improve flexibility and strength, and neuromuscular re-education to improve coordination and motor control. It was discovered to enhance individuals with persistent low back pain's functional lumbar mobility and their ability to resume everyday activities [10].

This approach is designed to reestablish normal movement patterns that safeguard the spine, decrease muscle imbalances, and enhance the body's overall ability for functional tasks[11.] Kinetic control involves the balanced display of movement options with optimal interaction among essential elements for sensorimotor neuromuscular regulation, driven by afferent sensory information, especially proprioceptive input, central nervous system (CNS) integration, effective motor coordination, and physiological demands to ensure functional dynamic stability and regulated mobility [12,13.]

Patients and Methods

Subjects:

Sixty-six women afflicted by postnatal lower back pain were chosen randomly from Om El Masreen General Hospital in Giza. The study was conducted from January 2024 to August 2024. Their postnatal LBP lasted for 6 months. They were between the ages of 25 and 35. Their body mass index (BMI) ranged from 20 to 25 kg/m2. They are medically stable and consented to participate in the study. Women with gynecological diseases may experience back pain, such as endometriosis, ovarian cysts, uterine fibroids, and congenital malformation. Excluded from the study were conditions such as cancer, osteoporosis, spinal stenosis, degenerative disc disease, radiculopathy, nerve root compression, and disc herniation.

Ethical approval:

Each woman signed a written informed consent form after being educated about the study's goals, the advantages of kinetic control, and its effectiveness in lowering postpartum low back pain. The Research Ethics Committee of Cairo University's Faculty of Physical Therapy accepted this study under the approved number P.T.REC/012/005122. The present study's clinical trial registration number is NCT07105683.

The design of the study:

A randomized controlled trial design was employed in the investigation. They split up into A and B, two equal groups: Group A (Control group): thirty-three women with postpartum LBP were treated with a hot pack for twenty minutes twice a day for six weeks. Group B (Study group): Thirty-three women who complained of postpartum LBP were treated with kinetic control (three sessions per week for six weeks) and hot packs (twenty minutes twice daily).

Randomization:

They were split up into two equal groups, A and B:

Group A (Control group):

It was composed of thirty-three women complaining of postnatal LBP and treated by a hot pack (twenty minutes twice daily for six weeks**).**

Group B (Study group):

It was composed of thirty-three women complaining of postnatal LBP and treated by hot pack (twenty minutes twice daily for six weeks**)** and kinetic control (three sessions per week for six weeks)**.**

Procedures:

Evaluative procedures: A-

BMI assessment: -1

Before beginning treatment, each postpartum patient in both groups had their height and weight measured using a weight-height scale. The following formula was then used To calculate the BMI: Weight (kg) divided by height (m2) yields BMI.

VAS:

To gauge each woman's degree of pain in group (A, B), the VAS was administered to each patient both before and after therapy.

Pressure Algometer: -2

Each woman in groups A and B received pressure both prior to and following therapy.

Fig. (1): PPT Measurement using a Pressure Algometer

3-Modified Schober Test (MST):

It was applied to each patient in group (A & B) prior to and following treatment to assess lumbar flexibility during forward flexion.

Fig. (2): Modified Schober Test

Treatment procedures:

1- Heat application:

The treatment was applied to each woman in group (A&B) at clinic under supervision. The electric hot pack was applied for 20 minutes, twice daily, over a period of 6 weeks.

2-Kinetic Control Training:

It was applied to each patient in the study group (Group B). They all received the extension control-based training three times per week for six weeks.

Extension Movement Control:

These exercises were used because of iliacus or anterior capsule shortening (anterior pelvic tilt); postures or activities that involve extension, like standing for extended periods of time, walking, or carrying a baby, exacerbate symptoms.

Application:

Repetition(frequency): For six weeks, three workouts a week, every day. Every activity that was done during the session was repeated twice a day at home.

Hold: 20-30 seconds for 3-5 times.

Duration of the session: 45-60 mins.

Number of sessions: 18 sessions.

Progression: when the patient can do every exercise, keep her hip in neutral position, and can hold this position without substitutions 30 seconds 5 times [14]**.**

Every exercise can progress by instructing patients to hold this position (neutral hip position without anterior tilting) and try to throw a ball with their hand.

Extension control movement includes the following exercises:

Back flattening on wall - standing. **.i**

): Back Flattening on the Wall-Standing.**3Fig. (**

Hip extension with Knee extended - Standing.**.ii**

Fig. (4): Retraining for Hip Extension with Knee Extended.

iii-Thoracic Extension (Sway) - Standing.

Fig. (5): Thoracic Extension (Sway) – Standing.

iv-Double knee bend (knee flexion with hip extension) - Prone.

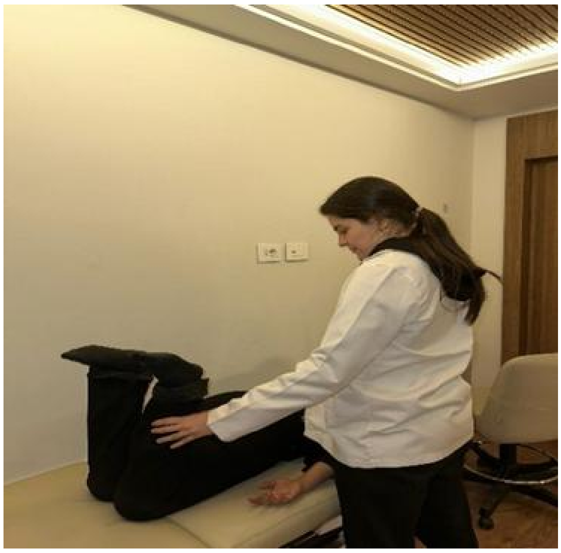

Fig. (6): Double knee bend.

Statistical analysis:

An unpaired t-test was employed to examine the differences in traits across groups. A two-way (2x2) mixed design Multivariate

Analysis of Variance (MANOVA) was used to investigate within-group and between-group impacts on dependent variables. Each statistical analysis was carried out using PSS version 28 for Windows. P < 0.05 will be the significance threshold for all statistical tests.

Results

I. General characteristics of patients:

Age, weight, height, and BMI did not significantly differ between groups A and B (P = 0.482, 0.311, 0.453, and 0.210, respectively).

Table 1: Comparison between the two studied groups regarding age, weight, height, and BMI.

	Group A	Group B	MD	t-value	P value	Sig
Age (years)	29.1±2.8	28.9±2.7	0.2	0.68	0.482	NS
Weight (Kg)	67.9±3.3	67.5±3.4	0.4	0.965	0.311	NS
Hight (cm)	166.6±3.0	166.7±3.2	-0.1	0.698	0.453	NS
BMI (Kg/M²)	24.5±0.9	24.3±0.9	0.2	1.03	0.210	NS

$\overline{X}$±SD = Mean ± S.D. MD: Mean difference t-test = Student test
p was significant if ≤ 0.05 S = Significant at level 0.05 N.S. = Not significant

II. VAS

Within groups: Following therapy, VAS was considerably lower in groups A and B than before treatment (t = 3.01, p < 0.001) .Between groups: Before treatment, There was no significant difference in the VAS between groups A and B (p = 0.155). After treatment, groups A and B's VAS differed significantly, favoring group B. (p = 0.001) **(Table 2).**

Table 2. Comparison between the two studied groups regarding the values of VAS pre and post treatment.

VAS	Pre-treatment	Post-treatment	MD	%of charge	t-value	p-value	Sig
	$\overline{X}$ ±SD	$\overline{X}$ ±SD					
Group A	3.2±0.7	2.5±0.8	0.7	-21.8	3.01	0.001	S
Group B	3.4±0.7	0.5±0.7	2.9	-85.0	12.32	0.001	S
MD	-0.2	2.0					
t-value	1.06	5.98					
p-value	0.155	0.001*					
Sig	NS	S					

$\overline{X}$±SD = Mean ± S.D. MD: Mean difference t-test = Student test
p was significant if ≤ 0.05 S = Significant at level 0.05 NS = Not significant

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III. Pressure algometer (Pain Pressure Threshold PPT):

Following treatment, the pressure pain threshold for both groups A and B was considerably higher than it was prior to therapy (t = 6.01, p = 0.001). Between groups: Prior to treatment: There was no significant difference between the pressure algometers of Groups A and B (p = 0.077). Following treatment, there was a significant difference between the two groups' pressure algometers, favoring group B (p = 0.017) (Table 3).

Table 3. Comparison between the two studied groups regarding the values of Pressure algometer pre- and post-treatment.

Pressure algometer	Pre-treatment $\bar{X}$ ±SD	Post-treatment $\bar{X}$ ±SD	MD	%of charge	t-value	p-value	Sig
Group A	4.4±1.5	8.5±8.0	-4.1	93.2	6.01	0.003	S
Group B	3.7±1.2	10.7±3.7	-7	189.2	5.26	0.001	S
MD	-0.7	2.2					
t-value	1.48	2.11					
p-value	0.077	0.017					
Sig	NS	S					

MD: Mean difference t-test = Student test Mean±SD. = $\bar{X}$±SD

S = Significant at level 0.05 NS = Not significant p was significant if ≤ 0.05

IV. Modified Schober Test MST (Lumbar Flexion):

Within groups: Groups A and B both displayed a substantial improvement in lumbar flexion range of motion after treatment as compared to pretreatment (t = 5.62, p = 0.001). In between groups: Pre-treatment: Lumbar flexion range of motion did not differ significantly between groups A and B (p = 0.082). Following treatment, there was a highly significant difference (p = 0.001) in lumbar flexion range of motion between groups A and B in favor of the study group (Table 4).

. Comparison between the two studied groups regarding the values of the Modified Schober test **4Table** pre- and post-treatment.

MST	Pre-treatment	Post-treatment	MD	%of charge	t-value	p-value	Sig
	$\bar{X}$ ±SD	$\bar{X}$ ±SD					
Group A	2.8±0.8	4.5±0.6	-1.7	60.7	5.62	0.001	S
Group B	3.1±0.8	6.5±1.1	-3.4	109.6	6.12	0.001	S
MD	-0.3	-2.0					
t-value	1.67	4.12					
p-value	0.082	0.001*					
Sig	NS	S					

MD: Mean difference t-test = Student test Mean±S.D. = $\bar{X}$±SD

S = Significant at level 0.05 NS = Not significant p was significant if ≤ 0.05

Discussion

A frequent musculoskeletal ailment that affects women after giving birth, postnatal low back pain (PNLBP) has a major negative influence on everyday tasks, mobility, and life quality. Increased pelvic instability and weakness of the deep core muscles (transversus abdominis, multifidus) due to ligamentous laxity [15].

Postpartum low back pain (LBP) can lead to several issues if it is not managed. Chronic discomfort following the acute postpartum period can reduce spinal mobility, hinder mothers' ability to carry out their responsibilities, and result in compensatory movement patterns that further strain other musculoskeletal components [16].

Structural issues can occur in some cases; for example, sacral stress fractures are rare but serious causes of postpartum lower back pain that need to be diagnosed using magnetic resonance imaging (MRI). Furthermore, psychological effects like increased worry, depression, and a lower quality of life might result from postpartum LBP [17].

This study's goal was to investigate the effects of kinetic control on postnatal low back pain intensity and lumbar ROM. Sixty-six women suffering from postnatal low back pain were selected randomly from Om El Masreen General Hospital in Giza. The study was conducted from January 2024 to August 2024. Their postnatal LBP lasted for 6 months. They were between the ages of 25 and 35. Their body mass index (BMI) ranged from (20-25 kg/m2). They are medically stable and consented to participate in the study.

Before signing a written informed consent form, each woman was informed about the objectives of the trial, the advantages of kinetic control, and its effectiveness in lowering postnatal low back pain. The Research Ethics Committee of Cairo University's Faculty of Physical Therapy accepted this study under the approved number P.T.REC/012/005122. The present study's clinical trial registration number is NCT07105683.

The study used a randomized controlled trial design. They split up into A and B, two equal groups. Group A (Control group): It consisted of thirty-three women complaining of postnatal LBP and treated by a hot pack (twenty minutes twice daily for six weeks). Group B (Study group): It consisted of thirty-three women complaining of postnatal LBP and treated by hot pack (twenty minutes twice daily for six weeks) and kinetic control (three sessions per week for six weeks). Each woman in group (A & B) had her body weight and height measured using a standard weight and height scale. Visual Analogue Scale (VAS) employed to evaluate the degree of pain,

pressure algometer was used to assess pain pressure threshold, and lumbar flexibility (lumbar flexion ROM) was assessed by using the modified Schober test for each woman in both groups (A, B) before and after treatment.

The study's findings revealed that: within groups, there was a significant decrease in VAS and significant increase in pain pressure threshold and lumbar flexibility (lumbar flexion ROM) post treatment. Between groups, pre-treatment: there was no significant difference between the two groups A and B in VAS, PPT and lumbar flexion ROM. Post treatment: there was a significant difference between the two groups A and B in VAS, PPT, and lumbar flexion ROM in favor of group B.

The current study findings concurred with a meta-analysis review by Luomajoki and his colleagues in KC, which showed that, in comparison to other interventions, addressing movement impairments has an immediate and long-lasting improvement in discomfort. Considering other aspects, such as the length of the discomfort, it resulted in more immediate pain relief. The current study's results corroborated this claim, since the study group that was treated by KCT in addition to hot packs demonstrated a higher degree of pain alleviation [18,19].

The current study results findings were consistent with those of Shamsi and his colleagues, who looked at how KC affected the stability index and pain in postnatal low back pain subjects. This is especially true when laboring for a long time or is complicated, as low back pain and the instability it causes are major concerns for postpartum women. After completing the KC training program, Shamsi reported a notable improvement in her handicap, symptom severity, and stability index, which was attributed to improved back muscle performance and coordination.

The evidence that restoring movement retraining (KC) choices has a great clinical effect on improving pain and function, targeting a special focus for improving the functional control of the movement system [9].

Comerford and Mottram had similar evidence that kinetic control retraining combines physical retraining and mental retraining through patient education, feedback during the training, and home exercising, which contribute to improving the patient's outcomes in disability, pain, ROM, and returning to the functional activities of daily living [13].

Sahrmann claims that people who suffer from low back pain frequently exhibit unique, uncontrollable movement patterns that exacerbate their suffering [21]. While movement synergy exercises are essential for lowering symptoms, functional disability, and the chance of recurrence in postnatal low back pain, kinetic control retraining focuses on these modified tactics. Additionally, combining feedback and patient education results in notable short- and long-term gains [22].

It is challenging to make firm judgments regarding the efficacy and long-term consequences of kinetic control training in this population due to the lack of thorough, high-quality investigations. Given these initial results, more randomized controlled trials with bigger sample sizes and longer follow-up times are required [23].

Additionally, the individualized nature of kinetic control exercises makes it difficult to standardize protocols, which may explain the inconsistent results reported across different trials. Therefore, while kinetic control training may provide short-term symptom relief, there is insufficient proof of its superiority over conventional exercise programs in improving long-term outcomes in women with postnatal low back pain [24].

Limitations

The physical and psychological status of the participants. Personal and individual differences between women affect assessment and treatment outcomes. Severity of pain related to daily activities.

Conclusion

By lowering pain intensity and raising the pain pressure threshold and lumbar flexibility (lumbar flexion range of motion), kinetic control training (KCT) has been shown to be a successful treatment for postnatal low back pain.

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References

1-Bergström H, Karlsson M, Löfgren M. The prevalence of low back pain during and after pregnancy: A systematic review. European Spine Journal, 2018;27(7): 1354-1360.

2-Lee JH, Kim YS, Lim JS. Postnatal low back pain management and its relationship with maternal posture. Journal of Physical Therapy Science,2019;31(5): 389-395.

3-Tariq F, Shah SM. Exploring the impact of kinetic control exercises in reducing postnatal low back pain: A clinical trial. Journal of Musculoskeletal Research, 2020; 22(6): 529-535. https://doi.org/10.3233/MSR-190047.

4-Chavan V, Anand S. Indian Journal of Forensic Medicine and Toxicology 2020;10.37506/ijfmt. v14i3.10457.

5-Dittmer DS, Gibbons L, Parsons M. Psychological factors influencing low back pain in the postpartum period: A systematic review. Journal of Clinical Psychology in Medical Settings, 2021; 28(3): 244-253. https://doi.org/10.1007/s10880-021-09811-6.

6-Clayson H, Grieve S, Rogers K. Impact of postnatal low back pain on daily activities in new mothers. Journal of Obstetric, Gynecologic & Neonatal Nursing, 2020; 49(2): 125-133. https://doi.org/10.1016/j.jogn.2019.10.005.

7-Aguirre I, Trowbridge E, McHugh R. The impact of body mass index and physical activity on postnatal low back pain: A cohort study. Journal of Women's Health, 2020; 31(4): 322-329. https://doi.org/10.1016/j.jwh.2022.02.005.

8-Harrison AB, Scott CD, Taylor EF. Postnatal low back pain: Review of prevention strategies and treatment options. Journal of Clinical Rehabilitation, 2020; 34(3): 234-243. https://doi.org/10.1177/0269215520900131.

9-Mottram S, Blandford L. Assessment of movement coordination strategies to inform health of movement and guide retraining interventions. Musculoskeletal Science and Practice. 2020; Feb 1; 45:102100.

10-Miranda, Iã Ferreira, Catiane Souza, Alexandre Tavares Schneider, Leandro Campos Chagas, Jefferson Fagundes Loss Comparison of Low Back Mobility and Stability Exercises from Pilates in Non-Specific Low Back Pain: A Study Protocol of a Randomized Controlled Trial. Complementary Therapies in Clinical Practice 2018; 31: 360-68, n.d.

11-Richards SH, Green CA , Easton M. Kinetic control and its role in low back pain rehabilitation: An evidence-based perspective. Musculoskeletal Science and Practice, 2020; 46: 102-108. https://doi.org/10.1016/j.msksp.102208.

12-Chang WD, Lin HY, Lai PT. Core strength training for patients with low back pain. Journal of Physical Therapy Science, 2015;27(3): 619-622.

13-Comerford M, Mottram S. Motor Control Exercise and management of uncontrolled movement 2014; 16(2): 587.

14-Abo Alfa M, Elsayed E, Shendy W, Elawady M, Elkafrawy N. Kinetic Control versus Mulligan Mobilization effect on functional outcomes in patients with lumbar radiculopathy: randomized comparative study. Egypt J Chem. 2021; Oct; 64(10): 5597-606.

15-Malmqvist S, Kjaermann I, Andersen K, Økland I , Brønnick K. Prevalence of low back and pelvic pain during pregnancy in a Norwegian

population. J Manipulative Physiotherapy 2022; 35: 272-278.
16-Wu WH, Meijer OG, Uegaki K, Mens JMA, van Dieën JH, Wuisman P IJM, Östgaard HC. Pregnancy-related pelvic girdle pain (PPP), I: Terminology, clinical presentation, and prevalence. European Spine Journal,2018; 13(7): 575-589. doi:10.1007/s00586-003-0615-y.
17-Gutke A, Lundberg M, Östgaard HC, Öberg B. Impact of postpartum lumbopelvic pain on disability, pain intensity, health-related quality of life, activity level, kinesiophobia, and depressive symptoms. Eur Spine J.2014; 20(1): 440-448.
18-Berthelot JM, le Goff B, Maugars Y , Laredo JD Sacroiliac joint edema by MRI: far more mechanical than inflammatory, Joint Bone Spine. 2016; 83: 3-5.
19-Saragiotto, Bruno T, Ã Christopher G Maher, Ã Tie. Motor Control Exercise for Non-Specific Low Back Pain. Spine Journal 2016; vol.41 (16): 1284-95
20-Luomajoki H, Macedo LG, Espejo, Tillier MA , Luque-Sanchis L. The effect of sensory-motor training and core stabilization in women with pregnancy- and postpartum-related lumbopelvic pain: A randomized controlled trial. Physical Therapy, 2018; 98(10): 775-785. doi:10.1093/ptj/pzy061.
21-Shamsi M, Sarrafzadeh J, Jamshidi A, Arjmand N , Ghezelbash F. Comparison of spinal stability following motor control and general exercises in nonspecific chronic low back pain patients. Clinical Biomechanics. 2017; Oct 1; 48: 42-8
22-Gehan Mousa Ahmed, Gehan Mahmoud Ramzy, Nada Gamal Mahmoud Mohamed Abdelaziz, Marwa Mahmoud Mahfouz Mahmoud, Mohamed M. Essa, Bishoy S. Lobbos, Mahmoud Yassin ElZanaty Rezk. Effect of Kinetic Control Retraining on Chronic Low Back Pain with Radiculopathy. International Journal of Applied Exercise Physiology: 2020; https://www.researchgate.net/publication/348443132
23-Sahrmann, Shirley. Diagnosis and Treatment of Movement Impairment Syndromes. Second Edition, Elsevier Inc.2015.
24-O'Sullivan, Synnott, A, O'Keeffe M, Bunzli S, Dankaerts W, O'Sullivan P, Robinson KK. Physiotherapists report improved understanding of and attitude toward the cognitive, psychological and social dimensions of chronic low back pain after Cognitive Functional Therapy training: a qualitative study. Journal of Physiotherapy, 2016; 62(4): 215-221.

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