

Effect of Acupressure Therapy and Conventional Physiotherapy Exercises vs Conventional Physiotherapy Exercises after 4 weeks on Pain, Stiffness and Physical Function in Patients of Knee Osteoarthritis between 50-65 years of Age

Kareena Kundnani¹, Apoorva Pavnaskar²

¹ Bachelor of Physiotherapy, ² Department of Musculoskeletal Physiotherapy,

¹ DES Brijlal Jindal College of Physiotherapy, MUHS, Pune, India.

² Assistant Professor, DES Brijlal Jindal College of Physiotherapy, MUHS, Pune, India.

Corresponding Author: Kareena Kundnani

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ABSTRACT

Purpose: Previous studies have shown physiotherapy exercises led to improvement in stiffness and physical function, while acupressure acted better on pain. The need of current study is to find out the additive effect of acupressure therapy when used with conventional physiotherapy.

Methodology: A Quasi-experimental study was conducted on 50 chronic knee pain patients in Pune. The subjects in experimental group received acupressure therapy and conventional physiotherapy exercises and subjects in control group received conventional physiotherapy exercises for 4 weeks (thrice a week supervised). Outcomes were assessed twice i.e., at baseline and at the end of 4 weeks. Means for outcomes were compared.

Results: Statistically significant improvement was observed in the values within experimental group (p value: <0.0001*-NPRS and <0.0001*-WOMAC) as well as within control group (p value: <0.0001-NPRS and <0.0001-WOMAC). The mean difference between the values between control and experimental group did not show statistical significance (p value: 0.560-NPRS and 0.442-WOMAC). Clinically significant improvement was observed in stiffness in experimental group.

Conclusion: The effect of acupressure therapy when used along with conventional physiotherapy exercises does not show any added effect on pain, stiffness and physical function.

Keywords: Magnet therapy, Strengthening exercise, WOMAC, Knee pain.

INTRODUCTION

One of the most prevalent degenerative, progressive, multifactorial diseases, osteoarthritis is typified by alterations in the overall structure and function of the joint. Osteoarthritis is now understood to affect

the entire joint, including the subchondral bone, periarticular muscles, menisci, ligaments, capsule, and synovium, as opposed to the conventional definition of the condition, which was a disease of articular cartilage. ^[1,2,3] Pain, stiffness,

decreased range of motion, swelling, and trouble performing different functional tasks are thought to be the most typical signs of osteoarthritis.^[4]

The main symptom of osteoarthritis is pain. Nociceptive neurons in the capsule, synovium, menisci, subchondral bone, etc., receive the pain sensation. It is then transmitted to the spinal cord via myelinated and unmyelinated fibers, which either stimulate the descending central neurons or the interneuron, which relays the information to higher sensory areas.^[5]

Osteoarthritis pain is caused by both central and peripheral neurophysiological processes.^[6] Osteoarthritis-specific pain might be caused by a number of factors rather than just the breakdown of cartilage. Soft tissue lesions, meniscal pathology, subchondral bone lesions, and synovitis are the causes of osteoarthritis pain. An extremely prevalent finding in arthritic joints is synovitis, which causes the capsule to expand.^[7,8] According to a study, inflammation in the joint lowers the nociceptive threshold of pain receptors inside and outside the joint, making these nociceptive neurons more responsive to stimuli. This, in turn, increases nociceptive sensitivity, which ultimately leads to peripheral sensitization. Patients with osteoarthritis have obvious pain sensations as a result of this peripheral sensitization, which allows excessive stimuli to enter the cerebral brain. Osteoarthritis causes an increase in sensory innervation of the capsule and synovium as well as peripheral sensitization.^[7,8,9,10] which further facilitates the increased sensory impulses to the pain perceiving brain, resulting in excruciating pain.

The knee is one of the most often impacted joints in osteoarthritis. There are two main approaches to treating knee OA: conservative measures and surgery. Conservative management is always the first line of treatment, and after it has been tried, surgery is the next step. Many conservative techniques are available to

treat osteoarthritis in the knee. The primary goals of managing OA are to improve function, minimize pain, encourage self-management, and alter the course of the illness and its consequences.^[11]

There are various non-pharmacological techniques available to treat knee pain and stiffness, and thereby improve physical function. Two of them are physiotherapy and acupressure therapy (Sujok therapy).

Professor Park Jae Woo of South Korea created sujok therapy, a supplemental alternative therapy, in 1987. Sujok might produce noticeable results quickly. The South Korean language is the source of the term sujok. Sujok serves as a panel of remedies to regulate health. The words su and jok imply hands and feet, respectively. Due to their many similarities to the human body, the sujok technique of therapy involves stimulating the hands and/or feet. Massage and applying color to the skin by placing seeds, magnets, needles, and other objects on particular points are two ways to stimulate the hands and feet. Sujok is thought to be a simpler, less expensive therapeutic approach than the majority of alternative therapies, with generally faster outcomes.^[12,13]

MATERIALS & METHODS

A Quasi experimental study was conducted on knee osteoarthritic patients. Institutional Ethics Committee (IEC 331A/2023-24) had approved the study protocol for the entire duration of the study. Board of Research Studies (BORS) committee had also approved the study protocol. Participants were screened for eligibility according to the inclusion and exclusion criteria. Participant in the interventional group received acupressure therapy and conventional physiotherapy for 4 weeks, 3 alternative days in a week. Participants in the control group received only conventional physiotherapy for 4 weeks, 3 alternative days in a week. Participants were asked to perform the same therapies on the

other days unsupervised. They were taught to apply magnets by themselves.

Conventional physiotherapy exercises included strengthening and mobility exercises for hip muscles and quadriceps and hamstrings while acupressure therapy included the use of small byol magnets applied on patient's middle finger and affected knee. The magnets were kept in place for a minimum of 8 hours and not more than 10 hours. Patients were taught the application of magnets for them to be able to apply on the alternate days.

The outcome measures in this study were Numerical pain rating scale (NPRS) and Western Ontario and McMaster University Osteoarthritis Index (WOMAC). Outcomes were recorded at two-time points. Time point 1 was at the time of recruitment after group allocation and time point 2 was on the last day of follow up i.e. after 4 weeks

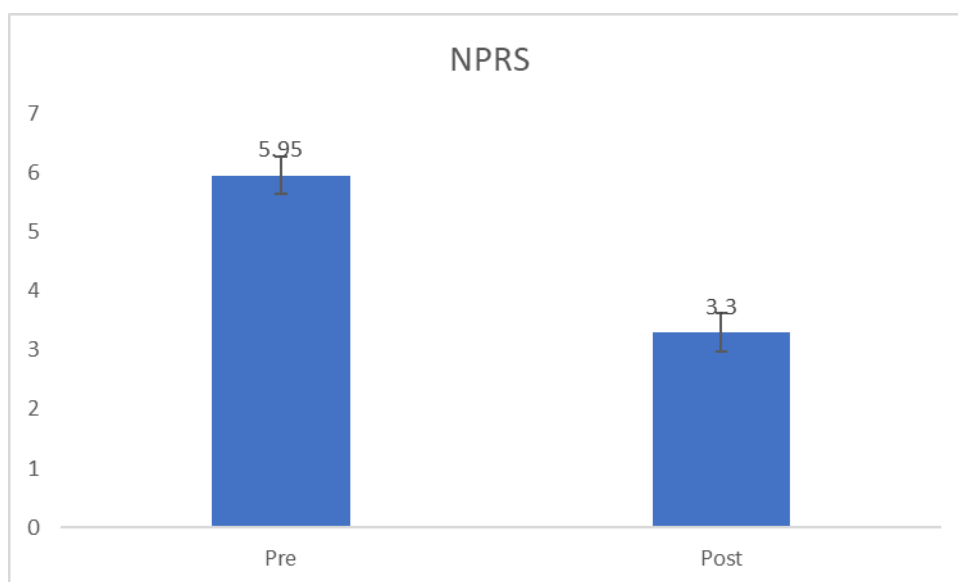
STATISTICAL ANALYSIS

Data was entered in Microsoft Excel and imported to Statistical Package for Social

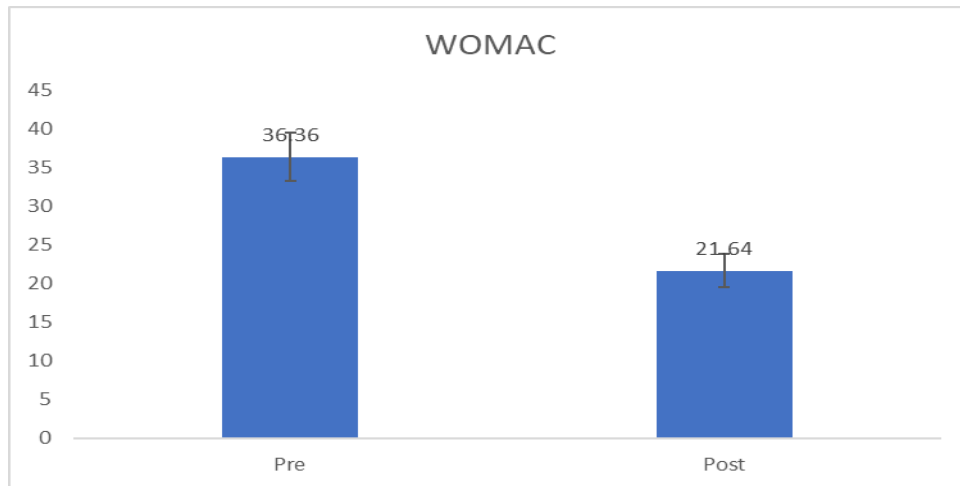
Sciences (SPSS) version 25 and analyzed using SPSS. Data were analyzed for descriptive and inferential statistics. Data were checked for normality using Histogram or QQ plot. Nonparametric tests were used. The mean and standard deviation for age of both the groups was calculated. For non-parametric data, Wilcoxon signed rank test was used to check within group differences and Mann Whitney test was used to compare the values between the groups.

RESULT

Fifty participants were screened and all of them fulfilled the inclusion criteria and were considered eligible for the study. Included participants(n=50) were randomly allotted into two groups i.e., experimental group(n=25) and control group(n=25). Two from the intervention group and two from the control group failed to complete the study.



[Graph-1]: Comparison of pre and post NPRS results of control group.

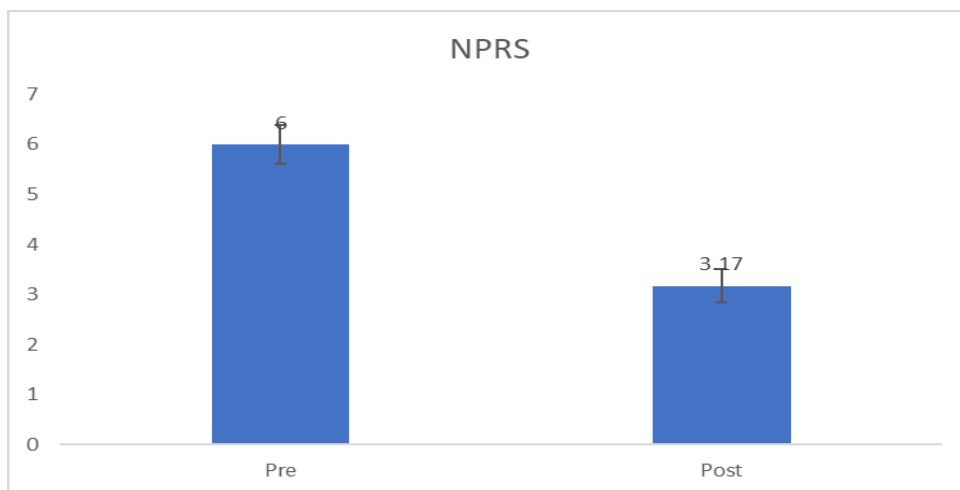


[Graph-2]: Comparison of pre and post WOMAC results of control group.

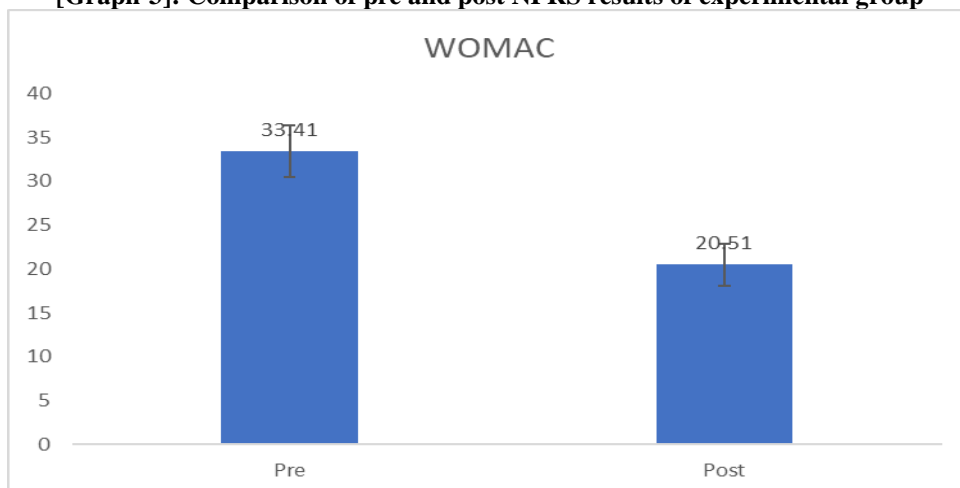
Wilcoxon signed rank test was used for comparison within control group between pre and post values of NPRS and WOMAC scores.

*p value<0.05 significant

Statistical significance difference was seen within the control group between the pre and post values (p value- <0.0001 NPRS and <0.0001 WOMAC).



[Graph-3]: Comparison of pre and post NPRS results of experimental group

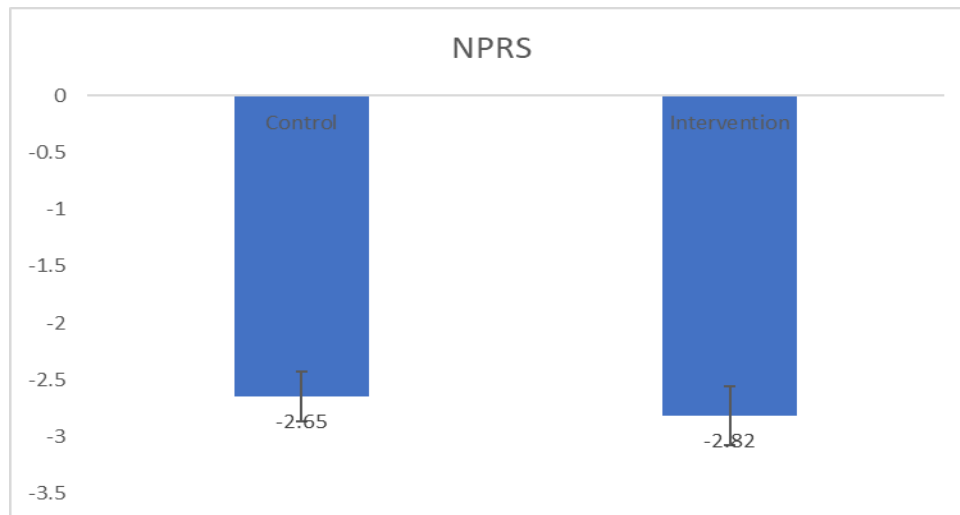


[Graph-4]: Comparison of pre and post WOMAC results of experimental group

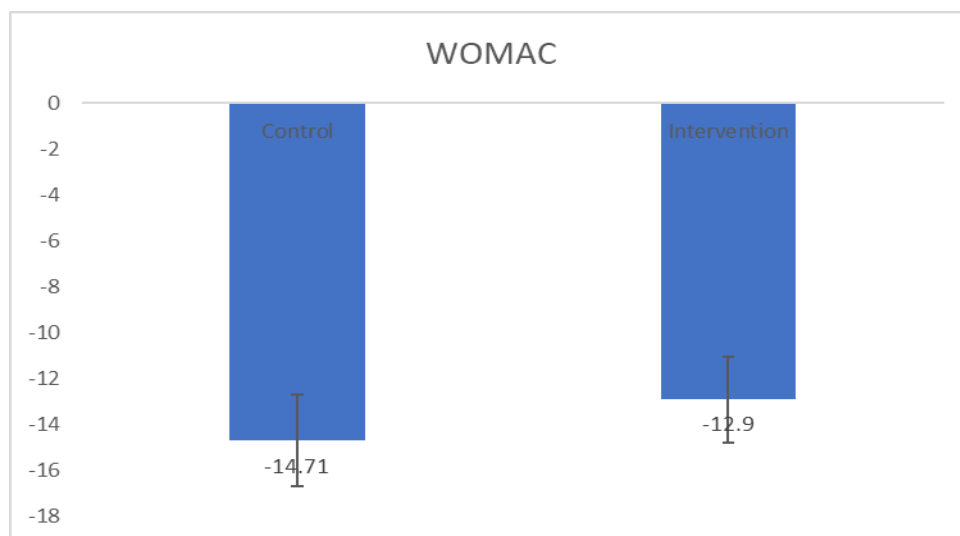
Wilcoxon signed rank test was used for comparison within the experimental group between pre and post values of NPRS and WOMAC scores.

*p value<0.05 significant

Statistical significance difference was seen within the experimental group between the pre and post values (p value- <0.0001 NPRS and <0.0001 WOMAC).



[Graph-5]: Comparison of NPRS scores of both groups.



[Graph-6]: Comparison of WOMAC scores of both groups.

Mann Whitney test was used for comparison of mean difference between values between control and experimental group.

*p value<0.05 significant

Results for comparison of mean difference between the values between control and experimental group did not show statistical significance (p value- 0.560 NPRS and 0.442 WOMAC).

DISCUSSION

The present study finding revealed significant reduction in NPRS scores and total WOMAC scores in both the groups. The control group findings revealed a significant reduction in pain and other symptoms after 1 month of treatment. On the same way, study done by Jansen et al. entitled “Strength training alone, exercise therapy alone, and exercise therapy with passive manual mobilization each reduce

pain and disability in people with knee osteoarthritis: a systematic review” revealed that all three intervention types were effective at relieving pain and perfecting physical function. The effect size of exercise with additional manual mobilization on pain (0.69) could be considered of moderate size, while the effect sizes of strength training (0.38) and exercise remedy alone (0.34) could be considered small. The effects on physical function tended to be lower than those on pain and would be considered moderate or small.^[14]

The experimental group findings revealed a significant reduction in stiffness, pain and other symptoms after 1 month of treatment. On the same way, study conducted by the University in 3 Maryland School of Medicine, 570 cases entered either acupuncture or sham acupuncture treatments for knee osteoarthritis. Those entering real acupuncture reported enhancement in function and pain relief in comparison with the sham treatments. On the same way, cases with osteoarthritis of the knee who entered acupuncture had significantly lower pain and better function after 8 weeks than did cases who entered minimum acupuncture or no acupuncture.^[15]

Yet there's no significant difference between the enhancement seen in both the groups. Both the groups showed nearly equal enhancement.

Clinically the experimental group showed reduction in morning stiffness after application of magnets overnight which was a temporary result as compared to the control group. On the same way, a study done by Yip YB et al. entitled “An experimental study on the effectiveness of acupressure with aromatic lavender essential oil for sub-acute, non-specific neck pain in Hong Kong” revealed that the manual acupressure group had 23% reduced pain intensity (P = 0.02), 23% reduced neck stiffness (P = 0.001), 39% reduced stress level (P = 0.0001), improved neck flexion

(P = 0.02), neck lateral flexion (P = 0.02), and neck extension (P = 0.01).^[16]

Incidental finding: 3 participants of the acupressure group reported increased pain in the affected knee after 8 hours of application of magnets. Two participants willingly continued to apply magnets but instead of keeping the magnets for 8-10 hours, they kept it for 4 hours and their symptoms showed improvement in the consequent sessions. While one participant discontinued to be a part of the study due to pain.

CONCLUSION

Acupressure therapy did not provide added beneficial effect on pain, and physical function in OA knee patients when used with conventional physiotherapy exercises. Whereas it exerted beneficial effect on morning stiffness in OA knee patients

Declaration by Authors

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Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

1. Hunter, David J, David T Felson. Osteoarthritis. BMJ (Clinical research ed.) 2006, 332: 639- 42.
2. Chen DI, Shen J, Zhao W, et al. Osteoarthritis: toward a comprehensive understanding of pathological mechanism. Bone research. 2017 Jan 17;5(1):1-3.
3. Cui A, Li H, Wang D, et al. Global, regional prevalence, incidence and risk factors of knee osteoarthritis in population-based studies. E Clinical Medicine. 2020 Dec 1;29.
4. Lespasio MJ, Piuze NS, Husni ME, et al. Knee osteoarthritis: a primer. The Permanente Journal. 2017;21.
5. Felson DT. The sources of pain in knee osteoarthritis. Current opinion in rheumatology. 2005 Sep 1;17(5):624-8.
6. Fingleton C, Smart K, Moloney N, et al. Pain sensitization in people with knee osteoarthritis: a systematic review and meta-

- analysis. Osteoarthritis and cartilage. 2015 Jul 1;23(7):1043-56.
7. Mathiessen A, Conaghan PG. Synovitis in osteoarthritis: current understanding with therapeutic implications. *Arthritis research & therapy*. 2017 Dec; 19:1-9.
 8. Zhang L, Li M, Li X, et al. Characteristics of sensory innervation in synovium of rats within different knee osteoarthritis models and the correlation between synovial fibrosis and hyperalgesia. *Journal of advanced research*. 2022 Jan 1; 35:141-51.
 9. Hochman JR, French MR, Bermingham SL, et al. The nerve of osteoarthritis pain. *Arthritis care & research*. 2010 Jul;62(7):1019-23.
 10. Arendt-Nielsen L, Nie H, Laursen MB, et al. Sensitization in patients with painful knee osteoarthritis. *Pain*. 2010 Jun 1;149(3):573-81.
 11. Osteoarthritis [Internet]. Atlanta, GA. Cited 2024 Available from <https://www.arthritis.org/diseases/osteoarthritis>
 12. Nurjannah I, Hariyadi K. Su Jok as a complementary therapy for reducing level of pain: A retrospective study. *Complementary Therapies in Clinical Practice*. 2021 May 1; 43:101337.
 13. M. P Khemka. *A Treatise on Advance Acupressure/ Acupuncture Part 22 Aches and pain. Acupressure Shodh Prashikshan Evam Upchar Sansthan*; 2024
 14. Jansen MJ, Viechtbauer W, Lenssen AF, et al. Strength training alone, exercise therapy alone, and exercise therapy with passive manual mobilisation each reduce pain and disability in people with knee osteoarthritis: a systematic review. *Journal of physiotherapy*. 2011 Jan 1;57(1):11-20.
 15. Lee B, Kwon CY, Lee HW, et al. The effect of sham acupuncture can differ depending on the points needled in knee osteoarthritis: A systematic review and network meta-analysis. *Heliyon*. 2024 Feb 7.
 16. Yip YB, Tse SH. An experimental study on the effectiveness of acupressure with aromatic lavender essential oil for sub-acute, non-specific neck pain in Hong Kong. *Complementary Therapies in Clinical Practice*. 2006 Feb 1;12(1):18-26.
 17. Ebrahimzadeh MH, Makhmalbaf H, Birjandinejad A, et al. The Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) in persian speaking patients with knee osteoarthritis. *Archives of bone and joint surgery*. 2014 Mar;2(1):57.
 18. Pollard H, Ward G, Hoskins W, et al. The effect of a manual therapy knee protocol on osteoarthritic knee pain: a randomised controlled trial. *The Journal of the Canadian Chiropractic Association*. 2008 Dec;52(4):229.
 19. Cheung DS, Yeung WF, Suen LK, et al. Self-administered acupressure for knee osteoarthritis in middle-aged and older adults: a pilot randomized controlled trial. *Acupuncture in Medicine*. 2020 Apr;38(2):75-85.
 20. Li LW, Harris RE, Tsodikov A, et al. Self-acupressure for older adults with symptomatic knee osteoarthritis: a randomized controlled trial. *Arthritis Care & Research*. 2018 Feb;70(2):221-9.
 21. Atalay, S. G., Durmus, A., Gezginaslan, Ö. The Effect of Acupuncture and Physiotherapy on Patients with Knee Osteoarthritis: A Randomized Controlled Study. *Pain physician*. 2021; 24(3): E269–E278.
 22. Pérez IT, González MG, González LG, et al. Pain treatment by means of Su Jok system for knee complaints in major adults. *Mediciego*. 2014;20(S1).
 23. Sorour AS, Ayoub AS, Abd El Aziz EM. Effectiveness of acupressure versus isometric exercise on pain, stiffness, and physical function in knee osteoarthritis female patients. *Journal of Advanced Research*. 2014 Mar 1;5(2):193-200.

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