

Integrated Approach Of Interferential Therapy And Siddha Varmam Therapy (Non-Pharmacological Management) On Pain And Disability In Nonspecific Low Back Pain Patients

Vaishnavi A¹, Vishnupriya M¹, Yasmeen PAS¹, Sri Kumari V², Madhavi K³, Rajalakshmi Shanmugavelan⁴, Samraj Karunanidhi⁵

¹ Internship, College of Physiotherapy, Sri Venkateshwara Institute of Medical Science (SVIMS), Tirupati, Andhra Pradesh, India.

¹ Srikumari, Professor, College of Physiotherapy, Sri Venkateshwara Institute of Medical Science (SVIMS), Tirupati, Andhra Pradesh, India.

² Research Associate-III, Siddha Clinical Research Unit, Tirupati, Central Council for Research in Siddha, Under Ministry of Ayush, Govt. of India.

² Research Officer, In-Charge, Siddha Clinical Research Unit, Tirupati, Central Council for Research in Siddha, Under Ministry of Ayush, Govt. of India.

Corresponding Author

Dr. V. Sri Kumari, Associate Professor, College of Physiotherapy, SVIMS, Tirupati.

Mail ID: Vadlamudi_jyo@yahoo.com

Contact No.: 9490181120

Abstract

Background: Low back pain (LBP) is a musculoskeletal condition that affects many individuals. While Interferential therapy (IFT) and Siddha Varmam Therapy (SVT) are frequently used treatments, determining their specific contributions when used alongside integrated physiotherapy and Siddha Varmam Therapy (SVT) for relieving nonspecific LBP symptoms and enhancing quality of life. **Objectives:** This study aims to assess the effectiveness of SVT and IFT in managing pain and disability in patients with nonspecific LBP, using the Numerical Pain Rating Scale (NPRS) and the Roland Morris Questionnaire (RMQ), both individually and in combination. **Methodology:** An experimental study was conducted on 60 subjects with age group of 20 – 60 years on both males and females with nonspecific low back pain were included in this study. 60 subjects were divided into 3 groups with 20 subjects in each group. Group 1 - received SVT alone. While group 2 - received IFT alone. Group 3- received both IFT and SVT. **Results:** The results revealed significant differences in NPRS score, RMQ score and Range of motion (ROM) between the three groups ($p < 0.005$). A test for the equality of means and a Mann-Whitney test were used to compare the three groups; these tests revealed a significant difference in disability levels, range of motion and pain

severity. The group3 showed significant differences in the NPRS, RMQ, ROM scores compared to other 2 groups. **Conclusion:** The present study revealed integrated SVT and IFT may be considered an effective treatment strategy for non-specific low back pain.

Keywords: Low back pain, Interferential Therapy, Siddha Varmam Therapy, Roland Morris Questionnaire, Numerical pain rating scale, Range of Motion.

Introduction

Low back pain is defined as pain below the costal margin and above the inferior gluteal folds, with or without leg pain. LBP is very common around worldwide. It is the most prevalent and most disabling of the conditions that are considered to benefit from rehabilitation. LBP is classified as specific and nonspecific. Specific low back pain occurs as pain and other symptoms that are caused by specific pathophysiological mechanisms of nonspinal or spinal origin. Spinal causes include herniated disc, spinal stenosis, fracture, tumor, infection and axial spondyloarthritis. Nonspecific low back pain occurs with or without leg pain, without a clear nociceptive specific cause. It probably develops from the interaction of biologic, psychological and social factors accounting for approximately 80-90% of all cases of low back pain. [1- 5]

According to ICMR (Indian Council of Medical Research) reports nearly 8% of peoples in all states of India suffering from LBP. Among these people females are showing higher rates of Years Lived with Disability (YLD) than males. The current estimates of incidence, prevalence and disability-adjusted life years (DALYs) of LBPs are 245.9 million cases/year (3.2%; 15th worldwide cause), 577.0 million cases (7.6%; 15th worldwide cause) and 64.9 million DALYs (2.6% of all DALYs; 6th worldwide cause), respectively. All these measures displayed a considerable ~50% increase during the last 20 years. The burden of all LBP cases is marginally higher in women than in men, exhibits gradual increase from the birth age, reaching the peak between 40–50 years, and then progressively declining. An analysis within each age range shows that prevalence of LBP among all human diseases grows in parallel with ageing, with the most notable increase after 80 years. According to a linear fit based on data of the last 20 years, incidence, prevalence and DALYs of LBP may further increase by ~1.4 fold by the year 2050. [6]

Siddha Varmam Therapy (SVT) specifies the therapeutic manipulation of certain points in which the life energy is found concerted. Handling on these points with a particular force for the definite time will release the life energy from these points and fetch relief to the affected individual by regulating the flow of life energy which is blocked due to attack on particular

Varmam points or due to other causes. [7]. Interferential Therapy (IFT) is a medium frequency current and these currents are classified into three types – low frequency, medium frequency and high frequency. Direct and low frequency currents encounter a high electrical resistance in the outer layers of the skin. High frequency currents encounter a little resistance so they can penetrate deep structures easily, although such currents generally oscillate too rapidly to stimulate the tissues directly. These difficulties were overcome in the early 1950's with the development of interferential current therapy. This equipment produces two alternating currents of slightly differing medium frequency around (4000Hz) and is used widely to induce analgesia, elicit muscle contraction, modify the activity of the autonomic system, promote healing, reduces edema. [8 - 10] This study, focused on evaluating and comparing the influence of SVT or IFT in combination and in isolation on reducing LBP symptoms and enhancing quality of life. By investigating the effectiveness of these combined interventions, we seek to provide valuable insights into the optimal management of non-specific LBP.

Materials And Methods

Study design

There were equal numbers of subjects (20 each) in Group 1 (siddha Varmam therapy), Group 2 (interferential therapy) and Group 3 (both IFT and SVT). The data were measured at baseline (1st day), 7th day and 15th day. The study duration was 3 months.

Study settings

The study population was chosen from out patient facility of Siddha clinical research unit (SCRU) Tirupati, A.P, India and from Sri venkateswara institute of medical sciences SVIMS (physiotherapy department) Tirupati.

Participants

The present study involved 60 adults aged between 20 and 60 years who met the diagnostic criteria for low back pain localized between the 12th rib and gluteus fold. In this study both males and females of ODI score between 5 - 24 were included. The exclusion criteria included the presence of significant pathology, such as malignancy of spine, Congenital anomalies of spine, Osteomyelitis of spine, Potts spine, bone fractures and Pregnancy and lactating mother. The potential participants were provided with both verbal and written details regarding the study. Those who chose to participate formally endorsed the informed consent documents.

Intervention

The participants included in the study were randomly allocated to Group 1 (SVT), Group 2 (IFT) and Group 3 (SVT & IFT). Group 1 received single session of siddha varmam therapy for a duration of 10 minutes for 15 days.

While Group 2 received a single session of IFT for a duration of 15 minutes for 15 days and Group 3 received a session of IFT for 15 minutes along with session of SVT for duration about 10 minutes for 15 days.

Group 1

There are 11 varmam points. The treatment duration of the session was 10 minutes for 15 days.

Table-1 Location Of Varmam Points [11]

Sl.no	Varmam points	Location of application method
1	Nankana pattu varmam	Place the middle part of the thumb at the point described; Provide 3 rounds of external rotation at the sacral groove. Glide laterally to reach anterior superior iliac spine. Finally give clockwise rotation using 3 fingers on anterior superior iliac spine.
2	Puvatankal	Press with the center portion (pulp) of the thumb over the point on both sides. Sustain the pressure on the point for 10 seconds.
3	Muttu varmam	Place the tip of the three fingers over the point; press and move upwards
4	Kutiral noni nakku varmam	Place the thumb over the varmam point and then press (simultaneously the patient is asked to flex and extend the neck)
5	Komperikalam	Place the tip of the middle three finger over the point. Press three times (in a pumping motion) towards medical border of tibia.
6	Kutikal varmam	Place the tip of the middle three fingers over the point; press three times
7	Kan pukaiccal varmam	Place the tip of the three finger of the hand above the malleolus and glide downwards around the malleolus pressing the exact point.
8	Kal kulacu varmam	Place the central part (pulp) of the thumb at the point described; press and release three times.
9	Pulimuttu atanka	Place the central portion (pulp) of the thumb and apply deep pressure.
10	Virutti kalam	Press with the centre portion (pulp) of the thumb over the point on both sides. Sustain the pressure on the point for 10 seconds.
11	Ullankal vellai Varmam	Place the central part (pulp) of the thumb over the Varmam point and then press and release.

Group 2

The group 2 patients received interferential therapy for duration of 15 minutes for 15 days.

Group 3

The third group received both siddha varmam therapy with duration of 10 min for 15 days and interferential therapy with durations of 15 minutes for 15 days.

Assessments

In the present study, data were collected using three outcome variables. The assessment was performed using rating scales such as Numerical pain rating scale (NPRS) for the severity of pain, Ronald Morris low back pain and disability questionnaire (RMQ) for disability index, Lumbar range of motion (ROM) measured by inch tape.

Outcome variables

Numerical pain rating scale (NPRS)

The NPRS is a unidimensional measure of pain intensity in adults. It is a segmented numeric version of visual analog scale (VAS) in which a respondent selects a whole number (0-10 integers) that best reflects the intensity of his/her pain. The common format is a horizontal bar or line, the NPRS is anchored by terms describing pain severity extremes. The 11-point numeric scale ranges from '0' representing one pain extreme (e.g. "no pain") to '10' representing the other pain extreme (e.g. "pain as bad as you can imagine" or "worst pain imaginable").it can be done verbally or graphically for self-completion. The respondent asked to indicate the numeric value that best describes their pain intensity.

The Roland-Morris Disability Questionnaire (RMQ)

RMQ is a tool used to assess the level of disability caused by lower back pain. It consists of 24 statements related to everyday activities and how they are affected by back pain. Each statement is answered with either "yes" or "no" to indicate whether the symptom is experienced. Scoring involves counting the number of "yes" responses, with a higher score indicating greater disability. It doesn't provide descriptions of the varying degrees of disability (eg, 40%-60% is severe disability).

Statistical Analysis

The collected data were systematized using Microsoft Excel Sheets (version 2010). The normality of the data was assessed with the Kolmogorov-Smirnov test and Shapiro-Wilk test. Within each group differences were assessed using Wilcoxon Signed Ranks test and Spearman's rho test. The overall comparison between the three groups was carried out using Kruskal-Wallis test and the Mann-Whitney test.

Table 2: Demographic Age Statistics

Group	Age (Mean \pm SD)	Male n(%)	Female n(%)
Group-1	21-59 (46.35 \pm 9.593)	7(35)	13(65)
Group-2	21-64(45.25 \pm 13.688)	8(40)	12(60)
Group-3	16-64 (45 \pm 14.011)	3(15)	17(85)

Table 3 Group-1– Statistical outcome measures

S.no	Outcome variables	Mean \pm standard deviation		P value
		Pre	Post	
1	NPRS	7.15 \pm 1.309	3.25 \pm 1.02	0.000
2	RMQ	13.2 \pm 3.205	15.4 \pm 5.567	0.056
3	ROM Flexion	3.4 \pm 1.046	4.6 \pm 1.046	0.000
4	ROM Extension	3 \pm 1.046	4. \pm 1.165	0.000
5	ROM Right L.F	20.55 \pm 1.669	4.6 \pm 1.046	0.000
6	ROM Left L.F	20.4 \pm 2. 01	21.5 \pm 2.013	0.000

Table 4 Gropu-2- Statistical outcome measures

S.no		Mean \pm standard deviation		P value
		Pre	Post	
1	NPRS	7.15 \pm 1.309	3.25 \pm 1.02	0.000
2	RMQ	15.25 \pm 2.573	4.9 \pm 1.804	0.000
3	ROM Flexion	3.45 \pm 1.234	5.3 \pm 0.801	0.000
4	ROM Extension	2.9 \pm 1.21	4.0 \pm 0.725	0.000
5	ROM Right L.F	20.45 \pm 1.605	25.25 \pm 2.552	0.000
6	ROM Left L.F	20.5 \pm 2.115	25 \pm 3.479	0.000

Table 5- Group-3-Statistical outcome measures

Sl.no		Mean±Standard deviation		P value
		Pre	Post	
1	NPRS	7.95 ± 0.686	4 ± 0.973	0.000
2	RMQ	15.1 ± 2.594	4.75 ± 2.149	0.000
3	ROM Flexion	3.65 ± 1.137	5.15 ± 0.671	0.000
4	ROM Extension	2.55 ± 0.759	3.4 ± 0.598	0.000
5	ROM Right L.F	21.15±2.277	25.7 ± 2.003	0.000
6	ROM Left L.F	21.9 ± 2.269	25.75± 2.124	0.000

Table-6-Between 3 Groups

Measure	Comparison	Mann-Whitney U	Z	Asymp. sig.	Interpretation	Better in
RMQ Pre-Post	Group 1 vs. Group 2	4	-50315	0	Significant difference	Group 2
	Group 1 vs. Group 3	198	-0.055	0.956	No significant difference	None
	Group 2 vs. Group 3	412	-0.685	0.493	No significant difference	None
RIGHTL.F POST-PRE	Group 1 vs. Group 2	7.5	-5.354	0	Significant difference	Group 2
	Group 1 vs. Group 3	185.5	-0.398	0.691	No significant difference	None
	Group 2 vs. Group 3	424.5	-0.398	0.691	No significant difference	None
LEFT L.F POST-PRE	Group 1 vs. Group 2	46.5	-4.281	0	Significant difference	Group 2

	Group 1 vs. Group 3	175	-0.685	0.493	No significant difference	None
	Group 2 vs. Group 3	435	-0.685	0.493	No significant difference	None

Results

A total of 60 subjects were selected who met the inclusion criteria of the study. The means \pm standard deviations of age in groups 1,2 and 3 were 46.3 ± 9.5 , 45.2 ± 13.6 and 45.0 ± 14.0 respectively. This study aimed to assess the short-term impact of combining IFT with SVT on pain severity, disability index and range of motion in patients with non-specific low back pain. The results were evaluated by comparing data within each group and between three groups: group 1(SVT), group 2(IFT) and group 3(SVT&IFT) with information collected at baseline, 7th day and after the intervention 15th day.

Group 1, which received SVT: showed substantial reductions in NPRS pre (7.15 ± 1.309) to post (3.25 ± 1.02) and RMQ scores pre (13.2 ± 3.205) to post (15.4 ± 5.567). ROM also improved flexion pre (3.4 ± 1.046) to post (4.6 ± 1.046), extension pre (3 ± 1.046) to post (4.1 ± 1.165), lateral flexion right pre (20.55 ± 1.669) to post (4.6 ± 1.046) and lateral flexion left pre (20.4 ± 2.01) to post (21.5 ± 2.013). The p value of 0.000 indicates that the differences in scores across the three time points for NPRS, and ROM in all movement directions (flexion, extension, lateral flexion right and left) are statistically significant. But RMQ result (P- 0.056) is close to significance but not statistically significant at the 0.05 level after Siddha Varmam Therapy. Siddha Varmam Therapy has led to a statistically significant reduction in both pain and disability among the participants, with the most pronounced effects seen in pain reduction.

Group 2 (IFT) demonstrated significant decreases in NPRS pre (7.15 ± 1.309) to post (3.25 ± 1.02) and RMQ scores pre (15.25 ± 2.573) to post (4.9 ± 1.804). ROM also improved such as flexion pre (3.45 ± 1.234) to post (5.3 ± 0.801), extension pre (2.9 ± 1.21) to post (4.0 ± 0.725), lateral flexion right pre (20.45 ± 1.605) to post (25.25 ± 2.552) and lateral flexion left pre (20.5 ± 2.115) to post (25 ± 3.479). The p value 0.000 indicates that the differences in RMQ, NPRS and ROM in all directions (flexion, extension, lateral flexion right and left) across the three time points are statistically significant. Interferential Therapy (IFT) has led to statistically significant improvements in both pain and disability among the participants. The decreasing mean ranks for RMQ and NPRS suggest that participants experienced reduced disability and pain over the course of the therapy.

Group 3 both exhibited the most significant improvements. NPRS scores dropped from pre (7.95 ± 0.686) to post (4.00 ± 0.973), while RMQ scores decreased from pre (15.1 ± 2.594) to post (4.75 ± 2.149). ROM in this group also achieved the most notable improvements in flexion pre (3.65 ± 1.137) to post (5.15 ± 0.671), extension pre (2.55 ± 0.759) to post (3.4 ± 0.598), lateral flexion right pre (21.15 ± 2.277) to post (25.7 ± 2.003) and lateral flexion left pre (21.9 ± 2.269) to post (25.75 ± 2.124). The p value 0.000 indicates that the differences in RMQ, NPRS and ROM in all directions (flexion, extension, lateral flexion right and left) across the three time points are statistically significant.

The combination of Siddha Varmam Therapy and Interferential Therapy has led to statistically significant improvements in both pain and disability among the participants. The decreasing mean ranks for RMQ and NPRS suggest that participants experienced reduced disability and pain over the course of the combined therapy. It also showed statistical improvements in all aspects of range of motion (flexion, extension, right and left lateral flexion). The combined therapy group showed the highest mean ranks for NPRS and RMQ, with p-values indicating statistically significant differences compared to the other two groups.

Discussion

Interferential current therapy has gained attraction as a non-invasive electrotherapy technique that modulates pain perception and promotes neuromuscular activation through medium-frequency currents. A review focusing on IFT application demonstrated that the use of a 4 kHz carrier frequency combined with a 100 Hz pulse rate yielded the most favorable short-term outcomes, including pain relief, improved body posture, better balance, and enhanced functional mobility in Chronic Low Back Pain patients (13). Furthermore, both 1 kHz and 4 kHz frequencies were associated with decreased reliance on pain medications, suggesting IFT's role in supporting drug-free pain management.

A randomized controlled trial comparing IFT to placebo found significant improvements in pain during trunk flexion ($p = 0.029$), disability (measured by the Oswestry Disability Index, $p = 0.039$), and postural sway ($p = 0.010$) in the IFT group (14). These results highlight IFT's dual impact on both pain modulation and balance, potentially through enhanced somatosensory feedback and neuromuscular control.

Additionally, when combined with exercise therapy, IFT has shown enhanced efficacy. One study observed a significant reduction in pain intensity from 6.29 ± 2.16 to 2.54 ± 1.86 ($p < 0.001$), alongside increased spinal flexion and extension over an eight-week period (15). These outcomes indicate that the combination of passive IFT and active exercise therapies may

provide synergistic benefits by addressing both neurophysiological and biomechanical components of LBP.

In parallel, traditional medicine systems such as Siddha have developed unique manual therapies for pain relief, with Varmam therapy being one of the most prominent. Varmam involves the application of pressure to specific energy points, believed to regulate the flow of vital life force and restore physiological balance. Recent studies have begun to explore the empirical effects of Varmam in clinical settings. A study conducted in Chennai involving 10 middle-aged patients demonstrated significant improvements in pain (VAS scores) and disability (ODI scores) following a course of Varmam therapy, assessed using the Wilcoxon Signed Rank Test, affirming its potential clinical utility (17). Beyond numerical pain scores, qualitative improvements in functional abilities were also noted.

Further evidence from a larger Varmam study revealed that this manual intervention significantly alleviated multiple forms of pain—such as aching, radiating, dull, and sharp sensations—after 28 days of treatment, with statistically significant findings ($p < 0.001$) (18). The study suggests that Varmam may be particularly effective in addressing complex sensory pain profiles, potentially due to its influence on the autonomic and somatosensory systems.

In addition, case-based observations support the practical efficacy of Varmam. In one report, a 55-year-old male with radiating lumbar pain showed marked symptomatic relief after a 21-day regimen of Agathiyar kuzhambu and Varmam therapy, without the use of any conventional pharmacological interventions (19).

The present study combined approach demonstrates superior outcomes in terms of pain relief and functional improvement compared to either therapy used alone. Patients in the group receiving both therapies exhibited the most significant reduction in pain, measured using the Numerical Pain Rating Scale (NPRS), and in disability, assessed through the Roland Morris Questionnaire (RMQ). The study's inclusion of spinal range of motion (ROM) assessments provides objective evidence of improved flexibility and mobility in patients undergoing combined therapy.

Limitations

Small sample size, short duration of study, lack of randomization, absence of a placebo group.

Future recommendations

Future recommendations of the study involving SVT and IFT for nonspecific low back pain (LBP) should focus on expanding the sample size and diversity of participants. Since this

study was limited to a sample size of 60 participants divided into three groups, future research should involve a more substantial and more diverse sample, including different age groups, occupations, and individuals with varying degrees of pain and disability. Further exploration of the long-term effects of this combined treatment is essential. It is also advised to explore the cost-effectiveness of this combined approach. Future research should assess the overall costs associated with combining Siddha Varmam Therapy and IFT compared to conventional treatment methods, such as medication or surgery.

Conclusion

In conclusion, this study highlights the promising potential of integrating SVT with IFT for patients suffering from nonspecific low back pain (LBP). The combined approach leverages the ancient healing principles of Siddha Varmam, which focuses on energy flow and pressure points, with the modern, targeted benefits of electrotherapy provided by IFT. Both therapies demonstrated effectiveness in reducing pain and improving disability individually, but the most significant results were observed when the therapies were combined, providing superior outcomes in terms of pain reduction, muscle relaxation, and mobility improvement. The results of this clinical trial showed statistically significant improvements across all groups, with the combination therapy group showing the greatest enhancement in flexibility and functional abilities.

References:

1. Koes BW, van Tulder MW, Thomas S. Diagnosis and treatment of low back pain. *BMJ* 2006; 332: 1430-4.
2. Cieza A, Causey K, Kamenov K, HanSon SW, Chatterji S, Vos T. Global estimates of the need for rehabilitation based On the Global Burden of Disease study 2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet* 2021; 396: 2006-17.
3. Hoy D, Bain C, Williams G, Lyn March, Peter Brooks, Fiona Blyth, et al. A Systematic review of the global prevalence of low back pain. *Arthritis Rheum* 2012; 64: 2028-37.
4. Hartvigsen J, Hancock MJ, Kongsted A, Quinette Louw, Ferreira ML, Genevay S, et al. What low back pain is and why we need to pay attention. *Lancet* 2018; 391: 2356-67.
5. Deyo RA, Mirza SK. Herniated lumbar intervertebral disk. *N Engl J Med* 2016; 374: 1763-72
6. Camilla Mattiuzzi, Giuseppe Lippi, Chiara Bovo Current epidemiology of low back pain, Service of Clinical Governance, Provincial Agency for Social and Sanitary Services, Trento, Italy; Section of Clinical Biochemistry, University of Verona, Verona, Italy; *JHMHP Vol4* 2020
7. Natarajan S, Anbarasi C, Meena R, Muralidass SD, Sathiyarajeswaran P. *Journal of Ayurveda and Integrative Medicine* Treatment of acute avulsion of posterior cruciate ligament of left knee with bony

- fragment by Siddha Varmam therapy and traditional bone setting method. *J Ayurveda Integr Med.* 2019;10(2):135-38.
8. Kloth, L. Interference current. In: *Clinical Electrotherapy* Nelson, R.M., Currier, D.P. (Ed.) Ch9, 183-207, Appleton and Lange, 1987. Norwalk, Connecticut, USA
 9. Ward, A.R. *Electricity Fields and Waves in Therapy* Science Press, 1980. Marrickville, NSW, Australia.
 10. De Domenico, G. *Basic Guidelines for Interferential Therapy.* Theramed Books, 1981. Ryde, NSW, Australia.
 11. *Guidelines for Practice of Siddha Varmam Therapy*, Central Council for Research in Siddha, Chennai; 2017.
 12. Albornoz-Cabello M, Maya-Martín J, Domínguez-Maldonado G, Espejo-Antúnez L, Heredia-Rizo AM. Effect of interferential current therapy on pain perception and disability level in subjects with chronic low back pain: A randomized controlled trial. *Clin Rehabil.* 2017 Feb 1;31(2):242–9.
 13. Theologou S, Trevlaki E, Trevlakis E. Effectiveness of Interferential Current for the Treatment of Chronic Low Back Pain. *European Journal of Medical and Health Sciences.* 2022 Dec 25;4(6):113–8.
 14. Jung KS, In TS. Effects of Interferential Current Treatment on Pain, Disability, and Balance in Patients with Chronic Low Back Pain: A Randomized Controlled Study. *Journal of The Korean Society of Physical Medicine.* 2020 Aug 31;15(3):21–7.
 15. Olawale O, Agudzeamegah C. The efficacy of interferential therapy and exercise therapy in the treatment of low back pain. *Nigerian Journal of Experimental and Clinical Biosciences.* 2014;2(1):10
 16. Sugasini *, Nj M, Mv M. Sugasini et al. *JOURNAL OF TRADITIONAL AND INTEGRATIVE MEDICINE* [Internet]. 2020;(3):411–4. Available from: <http://www.jtim.biosci.in>.
 17. Fathima SA, Ali SR, Musthafa MM. Evaluation of Effectiveness of Varmam in the Symptomatic Management of Thandagavadam Introduction. Vol. 5, Issue 1 *Journal of Siddha.*
 18. Kannaiyan N, Shanmugavelan R, Krishna A, Soundariya R, Karunanithi S, Purushothaman VN. Effectiveness of Varmam integration on the quality of pain management. *Journal of Research in Siddha Medicine.* 2023 Jan;6(1):41–6.
 19. Priya BK, Aishwarya A. Effectiveness of siddha purgative therapy and varmam in the management of thandaga vatham (lumbar spondylosis) [Internet]. Available from: www.mutagens.co.in