Chapter - V

REVIEW OF LITERATURE
Chapter – 5  REVIEW OF LITERATURE

Literature survey has been done to find out the impact of yoga therapy on backache. Similarly, an effort is done to see the existing assessments of different levels of backache.

Classical text of yoga says, the impurities being destroyed by the practice of the different limbs of yoga knowledge becomes effulgent up to discrimination. One can overcome dualities by practicing asanas. Asanas and other various techniques of yoga are applied in Yoga therapy. Yoga therapy is used by many people to treat backache. A prototype research work has shown, yoga therapy brings substantial benefit to low back ache in a short span of time comparison with other conventional therapies. Earlier researches have shown the potentiality of yogic practices to heal the patients suffering from various joint problems like low backache.

According to Tilbrook et al., offering a 12-week yoga programme to adults with chronic or recurrent low back pain lead to greater improvements in functioning of the back than the usual care. The study was conducted from April 2007 to March 2010. The outcomes were assessed by postal questionnaire. The total number of patients was 313 adults with chronic or recurrent low back pain. The yoga intervention was induced for 156 subjects and the other 157 subjects were given usual care. All the participants given a educative booklet on back pain. The intervention group was offered a course of 12-classes, gradually progressing yoga programme delivered by 12 teachers over 3 months. Scores on the Roland-Morris Disability Questionnaire (RMDQ) at 3 (primary outcome), 6, and 12 (secondary outcomes) months, pain, self-efficacy, and general health measures at 3, 6, and 12 months (secondary outcomes) was considered as the parameter. 93 (60%) patients offered yoga attended at least 3 of the first 6 sessions and at least 3 other sessions. The group which was given yoga therapy had better functioning of the back at 3, 6, and 12 months than the usual care group. The adjusted mean RMDQ score was 2.17 points lower in the yoga group at 3 months, 1.48 points lower at 6 months, and...
157 points lower at 12 months. The yoga and usual care groups had similar back pain and general health scores at 3, 6, and 12 months, and the yoga group had higher pain self-efficacy scores at 3 and 6 months but not at 12 months. Two of the 157 usual care participants and 12 of the 156 yoga participants reported adverse events, mostly increased pain.

The study conducted by Posadzki P et al., has shown that yoga has the potential to alleviate low back pain. It has been suggested that yoga has a positive effect on low back pain and function. The objective of this study was to assess the effectiveness of yoga as a treatment option for low back pain. The selection of studies, data extraction and validation were performed independently by two reviewers. Randomized clinical trials were considered when they investigated yoga in patients with low back pain and assessed pain as an outcome measure. Seven Randomized Controlled Clinical Trials (RCTs) were considered. Five RCTs suggested that yoga leads to a significantly greater reduction in low back pain than usual care, education or conventional therapeutic exercises. Two RCTs showed no differences between the groups.

Yogitha B et al. in their study on patients with Common Neck Pain (CNP) concluded that Yoga relaxation through mind sound resonance technique (MSRT) adds significant complimentary benefits to conventional physiotherapy for CNP by reducing pain, tenderness, disability and anxiety, providing improved flexibility. In this study of 10 days duration, 60 patients with CNP were assigned to two groups (yoga, n=30) and (control, n=30). The yoga group received yogic Mind Sound Resonance Technique (MSRT) for 20 minutes in supine position after the conventional physiotherapy program for 30 minutes using pre-recorded audio CD and the control group had non-guided supine rest for 20 minutes after physiotherapy, for 10 days. MSRT provides deep relaxation for both mind and body by introspective experience of the sound resonance in the whole body while repeating the syllables A, U, M and Om and a long chant of Mahamrityunjaya mantra several times in a meaningful sequence. The yoga group showed statistically significant higher
reduction in pain, tenderness, Neck Disability Score (NDS) and State and Trait Anxiety Inventory-Y1 (STAI-Y1) and improved neck movements than that in the control group.

Tekur et al in their study on chronic back pain (CLBP) patients found that, in CLBP, a negative correlation exists between stress and quality of life. Yoga increases quality of life and spinal flexibility better than physical therapy exercises. The aim was to study the efficacy of a residential short term intensive yoga program on quality of life in CLBP. 80 patients with CLBP were randomized into two groups of 40 each. The yoga group practiced a specific module for CLBP comprising of asanas, pranayama, meditation and lectures on the philosophy of yoga. The control group practiced physical therapy exercises for back pain. Perceived stress scale (PSS) was used to measure baseline stress levels. The outcome measures were WHOQOL Brief for quality of life and Straight Leg Raising test (SLR) using a Gomometer. There were significant negative correlations (Pearson’s, P<0.005, r>0.30) between baseline PSS with all four domains and the total score of WHOQOL Brief. All the four domains in WHOQOL Brief improved in the yoga group with significant group time interaction and differences between groups. The SLR test has shown improvement in both the groups and the improvement was better in yoga group than the control group which had significant group time interaction than the control group.

A modified yoga-based intervention benefited individuals with Chronic Low Back Pain (CLBP). The data revealed, yoga fostered relaxation and new awareness/learning. Also, the researchers Galantino et al., have suggested more research investigating the effect of yoga. The study was conducted for 6 weeks. Twenty-two participants, 5 males and 17 females, between the age of 30 and 65 years, with chronic low back pain (CLBP) were randomized to either an immediate yoga based intervention, or to a control group with no treatment during the observation period. A specific CLBP yoga protocol was administered for one hour, twice a week for 6 weeks.
functional outcome measures included the forward reach (FR) and sit and reach (SR) tests. All participants completed Oswestry Disability Index (ODI) and Beck Depression Inventory (BDI) questionnaires. At the end of the study, potentially important trends in the functional measurement scores showed improved balance and flexibility and decreased disability and depression for the yoga group.

According to the study done by Sherman KJ et al.¹¹, yoga was more effective than a self-care book for improving function and reducing chronic low back pain, and the benefits persisted for at least several months. 101 adults with chronic low back pain were studied for 12 weeks in this study. The subjects were divided into 3 groups viz., yoga, book, and exercise. The primary outcomes were back-related functional status (modified 24-point Roland Disability Scale) and "bothersomeness" of pain (11-point numerical scale). The primary time point was 12 weeks. Clinically significant change was considered to be 2.5 points on the functional status scale and 1.5 points on the bothersomeness scale. The secondary outcomes were days of restricted activity, general health status and use of medication. Back-related function in the yoga group was superior to the book and exercise groups at 12 weeks. No significant differences in symptom bothersomeness were found between any 2 groups at 12 weeks. At 26 weeks, the yoga group was superior to the book group with respect to bothersomeness symptom. At 26 weeks, back-related function in the yoga group was superior to the book group.

In the study conducted by Tekur P et al.¹², seven (7) days of a residential intensive yoga-based lifestyle programme reduced pain-related disability and improved spinal flexibility in patients with Chronic Low Back Pain (CLBP) better than a physical exercise regimen. Eighty subjects, females 37, with CLBP, were randomly assigned to receive yoga or physical exercise. The intervention consisted of a 1-week intensive residential yoga programme comprised of asanas designed for back pain, pranayamas, meditation and didactic and interactive sessions on philosophical concepts of yoga. The control
group practiced physical exercises under a trained physiatrist and also had didactic and interactive sessions on the needful changes in their lifestyle. Both the groups were matched for time on intervention and attention. Pain-related outcomes were assessed by the Oswestry Disability Index (ODI) and by spinal flexibility, which was assessed using goniometer at pre and post intervention. There was a significant reduction in ODI scores in the yoga group compared to the control group. The spinal flexibility was improved significantly in both the groups but the yoga group had greater improvement as compared to control group on spinal flexion, spinal extension, right lateral flexion and left lateral flexion.

Yoga intervention for Veterans Administration (VA) patients with chronic back pain improves the health of veterans. The study is conducted by Groessl EJ et al. The purpose of the study was to examine the benefits of a yoga intervention for Veterans Administration (VA) patients. There were 33 participants. They were VA patients with a mean age of 55 years. They were 21% female, 70% white, 52% married, 68% college graduates, and 44% of them were retired personnel. The study consisted of completing questionnaires in the beginning and again 10 weeks later. Questionnaires included measures of pain, depression, energy/fatigue, health-related quality of life, and program satisfaction. Paired t-tests were used to compare baseline scores to those at the 10-week follow-up for the single group, pre-post design. Significant improvements were found for pain, depression, energy/fatigue, and the Short Form-12 Mental Health Scale. The number of yoga sessions attended and the frequency of home practice were associated with improved outcomes.

The effectiveness and efficacy of Iyengar yoga for chronic low back pain (CLBP) were assessed with intention-to-treat and per-protocol analysis. Ninety subjects, receiving standard medical care, were randomized to a yoga (n = 43) or control group (n = 47). Yoga subjects participated in 24 weeks of biweekly yoga classes designed for CLBP. The outcome was assessed at 12 (midway), 24 (immediately after), and 48 weeks (6-month follow-up) after the
start of the intervention using the Oswestry Disability Questionnaire, a Visual Analog Scale, the Beck Depression Inventory, and a pain medication-usage questionnaire. Significantly greater reductions in functional disability and pain intensity were observed in the yoga group when compared to the control group at 24 weeks. A significantly greater proportion of yoga subjects also reported clinical improvements at both 12 and 24 weeks. In addition, depression was significantly lower in yoga subjects. Improvements were observed for all outcomes in the yoga group which exhibited a greater trend for lesser usage of pain relieving medication. Although slightly less than at 24 weeks, the yoga group had statistically significant reductions in functional disability, pain intensity, and depression compared to standard medical care 6-months post-intervention. The researchers, Williams K, et al., concluded that, yoga improves functional disability, pain intensity, and depression in adults with CLBP. There was also a clinically important trend for the yoga group to reduce their pain medication usage compared to the control group.

It has been found that, Digital Infrared Thermal Imaging (DITI) is a valuable adjunct to mammography and ultrasound, especially in women with dense breast parenchyma. The study was conducted by Nimmi Arora et al. In this study which was aimed at evaluation of the role of DITI in the detection of breast cancer, 92 patients for whom a breast biopsy was recommended based on prior mammogram or ultrasound underwent DITI were involved. Three scores were generated: an overall risk score in the screening mode, a clinical score based on patient information and a third assessment by artificial neural network. Sixty of 94 biopsies were malignant and 34 were benign. DITI identified 58 of 60 malignancies, with 97% sensitivity, 44% specificity, and 82% negative predictive value depending on the mode used. Compared to an overall risk score of 0, a score of 3 or greater was significantly more likely to be associated with malignancy (30% vs 90%, P < 03). The researchers concluded that, DITI is a valuable adjunct to mammography and ultrasound, especially in women with dense breast parenchyma.
In the research\textsuperscript{16}, aimed to study the skin temperature disorders in low back pain (LBP) patients compared with reference persons without LBP and to evaluate the relationship between pain intensity and other clinical signs and temperature abnormalities, it has been found that, temperature changes of the plantar surface seem to be connected with LBP intensity. Sixty-five patients (29 men and 36 women of age group 30-51 years) with unilateral chronic LBP with or without referred nonradicular leg pain and 20 reference persons (7 men and 13 women of age group range, 30-49 years) without LBP, participated in this study. The pain level was recorded by the use of a visual analog scale (0-100). Questionnaires and a series of spinal mobility tests (the modified Schober, straight leg-raising test, finger-floor distance, side bending) were used. Thermographic images of the low back area and legs (anterior, lateral, and posterior surfaces and the plantar surfaces of feet) were taken with an infrared video camera. The temperature changes in the plantar surface correlated with LBP intensity. The pain levels differed in the groups with the different types of temperature changes. There were significant lower extremity regional skin temperature alterations (at least 1 regional inter side difference more than 0.3°C) in most of the cases, both in LBP patients and in reference persons, but plantar inter side temperature difference was significantly higher in LBP patients. The results show that, temperature changes of the plantar surface seem to be connected with LBP intensity. Temperature measurements may be useful as an adjunctive physiological test in the evaluation and documentation of autonomic dysfunction in LBP patients.

The study\textsuperscript{17} conducted under the guidance of Dr. K Krishna Bhat, Syndicate Member, Dean-Faculty of Science and Technology, Professor and Chairman, Department of Human Consciousness and Yogic Sciences, Mangalore University, Mangalagangothri – 574199, has shown that the effect of yoga therapy on sinusitis can be assessed by using Infra Red Thermal Imaging System.
Eventhough yoga therapy relieves pain in patients of chronic back ache, the commonly used medical parameters do not show the benefits of yoga, according to the finding of Dave et.al. The thermal imaging system can be used for early diagnosis of the abnormality and visualization of the response of the patient to the treatment. "A thermogram reveals malfunctions long before the minor faults grow in to the major problems based on variations in temperature. Total non-invasiveness is its major benefit." Therefore it is proposed to use Infra Red Thermal Imaging System (IRTIS) to assess the effect of yoga therapy on back ache. "The thermal imaging system can detect very minute changes in temperature. Psychogenic or functional low back pains are difficult to differentiate from structural disease. But the thermogram showed positive when other diagnostic tests fail, including Electromyography."

Use of thermography is new in the research of yoga therapy. Therefore the present effort on the research work entitled 'Assessment of the Effect of Yoga therapy on Back ache using Infra Red Thermal Imaging System' is a unique scientific approach to assess and standardize the effect of yoga therapy. It is hypothesized that the effect of Yoga therapy on back ache can be assessed by using IRTIS and it can be used as a parameter to the study the effect of yoga therapy.

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