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Expert Opinion Article

Empirical Insights Into Holistic Healing: Chronic Lower Back Pain Management Through Yoga And Auricular Acupressure

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Abstract

Background: Chronic lower back pain represents one of the most prevalent musculoskeletal disorders globally, significantly contributing to functional disability across diverse occupational groups. It is not limited to individuals engaged in physically demanding labour but is increasingly observed among those with sedentary lifestyles and desk-bound professions. This condition affects a substantial segment of the population, posing serious implications for public health and workforce productivity.

Aim: This study aims to evaluate the therapeutic efficacy of Auricular Acupressure and Yogic interventions in the management of chronic lower back pain among affected individuals.

Methods: A total of 120 participants were selected from the rural population of Mahender-Grah district, India, using purposive convenience sampling. These participants were randomly assigned into three groups (with the parameters: alpha = 0.05, power = 0.95 and effect size (ES) = 0.82) a Yoga intervention group (n = 40), an Acupressure intervention group (n = 40), and a control group (n = 40). The intervention period spanned six months. Participants in the Yoga group engaged in structured Yogic practices five days per week, allowing for two rest days. In the Acupressure group, auricular seeds were applied once every ten days for the duration of the intervention. Pre- and post-intervention assessments were conducted using the Oswestry Low Back Disability Questionnaire or Oswestry Disability Index (ODI) to evaluate lower back disability, while the Angle of Flexion (AOF) was measured using a standard manual goniometer. The research was conducted at the Department of Yoga, Central University of Haryana, under the supervision of the designated research supervisor.

Result: The findings of the study showed a significant improvement in pain conditions and disability of lower back, with auricular group showing slightly greater improvement (p=0.00426).

Conclusion: Both Yoga and Acupressure therapies showed their effectiveness in pain and disability of lower back. These interventions could serve as cost effective health care.

Keywords: Lower back pain, Disability, Yoga, Acupressure, Auricular Acupressure, Pain management.

Introduction: Spine is a complex vertical five segment structure composed of bones, nerves, discs, muscles, joints, ligaments. Each segment possesses a distinct curvature essential for maintaining balance and regulating the body's normal functions. Spinal pain refers to a condition characterized by moderate to severe discomfort resulting from injury or disruption in the intricate structural integrity of the spine (Cramer & Darby, 2005), (Oxland, 2016). According to the theoretical framework of acupressure, this type of pain is systematically classified into three distinct categories. Vata – Stretch and sprain, traumatic fracture. Pitta – Severe (off and on / Periodic) due to constipation, gas, inflammatory. Kapha – Osteophytes, POTT'S spine, osteopenia, osteoporosis, degenerative (Agarwal & Sharma, 2023, p. 7). When discussing lumbar pain, the common perception is that the discomfort stems from a disorder localized in the lumbar region itself. However, if treatment is sought under the assumption that the issue is confined solely to the lumbar area, the individual often experiences only temporary relief or continued relief only as long as the medication is administered. A fitting analogy can be drawn to a damp spot on the ceiling of a house. Repairing the visible damp area may result in short-term resolution, with the dampness appearing to vanish for a time. Yet, this superficial repair does not address the underlying cause. Eventually, the dampness reappears, as the true source of the issue—such as a leaky water tank or supply pipe located on the roof—has not been resolved. Similarly, lower back pain, often perceived as originating in the lumbar region, is frequently a consequence of dysfunctions in the upper and middle back (Li et al., 2021). The spinal column is a complex structure, with muscles, connective tissues, vertebrae and the spinal cord interconnected in a manner that distributes the body's weight across the spine (Miele et al., 2012). The lumbar region, being subject to the

greatest mechanical load, often becomes the focal point of pain. Yet, misalignment or tension in the upper and middle back can place undue stress on the lower spine, leading to lumbar discomfort (Izzo et al., 2013). It is estimated that approximately 10-15% of lower back pain cases can be attributed to misalignments or disturbances in the upper and middle back (Abbasi et al., 2024). In the event of any injury or issue in the upper back, the vertebrae, which are responsible for evenly distributing spinal weight, are affected. When these vertebrae are compromised, the lumbar spine, which is uniquely shaped with an outer concavity and an inner convexity, bears the brunt of the mechanical strain (Adams & Dolan, 2005). This is why it is essential not to view lower back pain in isolation, but rather to assess the entire spine to uncover the root cause of the discomfort. A deeper understanding and development of spinal anatomy and its interrelated functions can help individuals prevent or mitigate many potential spinal issues, particularly those affecting the lower back (McGill, 2015).

Lower back pain is a widespread health concern affecting a substantial segment of the global population. According to Data Bridge Market Research, this issue is projected to impact an increasing number of individuals, with investments in its management expected to reach approximately 13,421.46 million USD by 2029. This growing financial commitment underscores the critical need for effective therapeutic interventions and preventive measures. When this issue persists for three months or longer, it is classified as chronic, posing substantial challenges to both patients and healthcare providers. Chronic lower back pain can severely impact an individual's quality of life, limiting physical functionality and often leading to psychological distress. In recent years, there has been growing interest in alternative therapies, including Yoga and Acupressure, for the management of chronic lower back pain. Yoga, an ancient practice that combines physical postures, breathing exercises, and meditation, has been shown to improve flexibility, strength, and mental well-being. It offers a holistic approach to pain management by addressing both the physical and psychological aspects of chronic pain. Acupressure, particularly Auricular Acupressure (AA), is another alternative therapy gaining attention. This technique involves applying pressure to specific points on the ear, which are believed to correspond to various body parts and functions. Auricular Acupressure is thought to promote pain relief and enhance overall health by stimulating the body's self-healing mechanisms.

Angle of Flexion: This term refers to the degree of movability and range of motion in the lumbar region of the spine, specifically illustrating the extent to which an individual can bend forward (flexion) and backward (extension) (Vaisy et al., 2015). It serves as an important indicator of spinal mobility, particularly in the assessment of lumbar spine health and is often utilized in evaluating both the functional capacity and flexibility of the lower back during various movements and postures.

Methodology:

The sample size was determined based on previous studies on chronic lower back pain, specifically. A 2012 study involving 80 participants divided into two groups on chronic lower back pain. (Tekur et al., 2012). A 2016 study involving 120 participants on chronic lower back pain. (Saper et al., 2016). To enhance the accuracy of the sample size determination, an additional method was employed utilizing G*Power software (version 3.1.9.4) with the following parameters: alpha = 0.05, power = 0.95 and effect size (ES) = 0.82. This calculation yielded a required sample size of 40 participants per group. The alpha level, power and effect size values were determined based on a review of previous studies, which indicated that a sample size of 40 participants per group was appropriate. After determining the effect size to be 0.82, with a statistical power of 0.95 and an alpha level of 0.05, the required sample size for each active group, Yoga and Acupressure, was calculated to be 40 participants. The G*Power software facilitates sample size calculation primarily for two-group comparisons; however, the present study was structured to include three groups. Accordingly, based on the calculated sample size for the two active intervention groups, an equivalent number of participants—specifically, 40—was also allocated to the control group to maintain methodological consistency and statistical balance. Consequently, the total number of participants in the study amounted to 120. The research was conducted at the Department of Yoga, Central University of Haryana, under the supervision of the designated research supervisor. Participants in the study included both male and female individuals, aged between 30 and 60 years.

Inclusion Criteria:

Subjects aged between 30–60 years and who had chronic lower back pain (> 3 months of duration) were enrolled in the study. And have disability of back at least 5% on the bases of Oswestry Disability Index questionnaire. Both gender (Male-Female), Participants recommended by physician, Participants from nearby villages who meet the study criteria.

Exclusion Criteria:

Those with the history of Any spinal surgery (Including lower back and cervical), Cervical trauma, Central nervous system disease, Cervical radiculopathy, Acute inflammation and malignancy,

Pregnant woman, Participants currently undergoing any form of Yogic practices regimen or therapeutic intervention for back pain were excluded from the study, Age below 30 years, not willing to give consent for regular intervention of the study, who addicted to any psychotropic drugs.

Concept of acupressure:

It is also known as non-invasive acupuncture, represents a non-pharmacological modality aimed at managing various bodily ailments and disorders. This therapeutic approach falls under the purview of the Ministry of AYUSH, specifically as a sub-discipline of Yoga and Naturopathy. The Acupressure system employs a diverse array of instruments tailored to specific therapeutic strategies to achieve relief or amelioration of bodily disorders. The term "Acupressure" derives from the fusion of "acus or acu," signifying needle and "pressure," denoting a subtle and targeted application of pressure akin to the tip of a needle (Agarwal & Agarwal, 2021). With in the frame work of Acupressure different tools and techniques are utilized depending on the treatment approach. For instance, seeds and colours are favoured in correspondence approaches, which align with specific points on the body. In the non-invasive acupuncture system, specifically within the framework of Acupressure, magnets are utilized to stimulate energy pathways, adhering to a variety of methodologies and theoretical frameworks. Among these are the Boyle Traditional Chinese Medicine (TCM) Hand Chart, the Ayurvedic Meridian Chart, the Dr. Wall Meridian Chart and the recently discovered YNM Meridian system by Indian scientist shri J.P. Agrwal at ASPEUS Prayagraj. These methods collectively emphasize the manipulation of the body's energy flow, or "qi," without puncturing the skin, aligning with the broader principles of Traditional Chinese Medicine. In contrast, the TCM model traditionally employs the use of sterilized acupuncture needles, which are inserted at specific root points to achieve precise therapeutic outcomes. This distinction highlights the difference between invasive (acupuncture) and non-invasive (Acupressure) therapeutic techniques. Auricular Acupressure, a specialized form of Acupressure targeting the ear, has been selected for this study due to its relevance in stimulating systemic responses through reflex points on the auricle (Gong & Liu, 2024).

Mechanisms of Acupressure:

An Energy-Based System: -Acupressure is a holistic and energy-based therapeutic system that coordinates between the body's inherent energies and cosmic energy (Luckman, 2009). It operates through the stimulation of specific points on the body, known as acu-points, which act as small energy stations. The activation of these points sends signals to the brain, thereby triggering the body's natural healing processes.

1. Acupressure-Points and Their Stimulation: Acupressure-points are strategically located energy stations on the body. When these points are stimulated, they send rapid signals to the brain to activate the body's healing energy. The process of pressing or stimulating these acu-points for therapeutic purposes is termed Acupressure. This stimulation can be achieved through various defined sources, including manual pressure, magnets, or seeds.

2. Comparison with Modern Medicine: In contemporary medical practices, alleviating physical ailments often involves the administration of medications containing specific chemicals. These chemicals dissolve in the bloodstream and send signals to the brain to release endorphins and enkephalins, which are natural pain-relieving chemicals produced by the brain. Similarly, Acupressure stimulates acu-points to send signals to the brain, prompting the release of endorphins and enkephalins. However, this process is natural and does not require the brain to become hyperactive. The stimulation of acu-points ensures a balanced and sustained release of these chemicals, contributing to pain relief and overall healing.

3. Magnet and Seed Therapy in Acupressure: Magnet and seed therapy are common methods used in Acupressure. Magnets or seeds are applied to specific points on the patient's hands, feet and ears. These are kept in place for a defined duration to ensure continuous stimulation of the acu-points. The sustained stimulation from magnets or seeds helps maintain a consistent flow of signals to the brain, ensuring a steady release of endorphins and enkephalins, thereby facilitating natural healing.

4. Energy Regulation and Auricular Acupressure: Acupressure also considers the energy levels of different organs, aiming to balance these energies for optimal health. Auricular Acupressure, which involves stimulating points on the ears, is particularly effective for pain relief. The proximity of the ears to the brain allows signals to reach the brain more quickly, expediting the release of problem-specific hormones. Acupressure is an energy-based therapeutic system that leverages the body's natural healing capabilities through the stimulation of acu-points. By sending signals to the brain to release natural pain-relieving chemicals, Acupressure provides a holistic and non-invasive approach to health and wellness. Methods such as magnet and seed therapy, along with Auricular Acupressure, enhance the efficacy of this practice, making it a valuable component of integrative medicine.

Auricular therapy is a specialized treatment approach that targets disorders and diseases in various organs of the body by stimulating specific

points on the outer ear, without the use of medication or surgery. Unlike traditional Acupressure in the framework of Traditional Chinese Medicine (TCM), which operates on the principles of Yin and Yang and the flow of energy (Qi) along specific meridians, Auricular therapy does not adhere to these energetic pathways (Xue & O'Brien, 2003). In TCM, each organ has a designated energy flow path with certain points along the meridian identified as acupuncture points—locations where energy exchange is most intense. However, Auricular therapy functions differently. Instead of energy meridians, the outer ear contains specific points corresponding to each organ, named accordingly. These points are stimulated in combination, based on the patient's condition, to create a tailored protocol for treating the disorder of a specific organ. Historically, Auricular therapy has deep roots, with evidence suggesting its origins in ancient Indian practices, such as the ritual of ear piercing. This tradition was introduced to China by Bodhidharma in the 5th or 6th century, where it gained further recognition (Greene, 2008). Over time, Auricular therapy spread globally due to its immediate therapeutic benefits. In the 20th century, Dr. Paul Nogier, a French neuro-physician, advanced the practice by introducing the modern theory of somatotopic inversion (Ernst, 2024). This theory conceptualizes the ear as a microcosm of the human body, depicting an inverted foetus within the contours of the ear. According to this theory, different regions of the ear are believed to correspond to specific areas of the body, according to the principles of Auricular therapy. These correspondences form the basis for therapeutic interventions in which various Acupressure points on the ear are stimulated to address systemic health conditions. Each of these Auricular zones houses multiple Acupressure points, which are used to modulate the flow of energy, or "qi," within the body. For the purposes of this study, only the nomenclature and designated areas of ear Acupressure are provided in figure, offering a detailed reference for the corresponding zones without delving into individual point functions. For instance, the antihelix represents the back. In the treatment of lower back pain, Auricular therapy targets this specific region, using a defined protocol that organizes the relevant ear points, providing a non-invasive and effective solution for back-related issues. In the image presented below, three distinct colours have been used to demarcate and represent the different anatomical sections of the spinal column, as outlined subsequently. The yellow-marked region corresponds to the lower segments of the spinal column, encompassing the coccygeal, sacral and lumbar regions. The green-marked region denotes the thoracic section of the spine, while the black-marked region represents the cervical portion of the vertebral column.

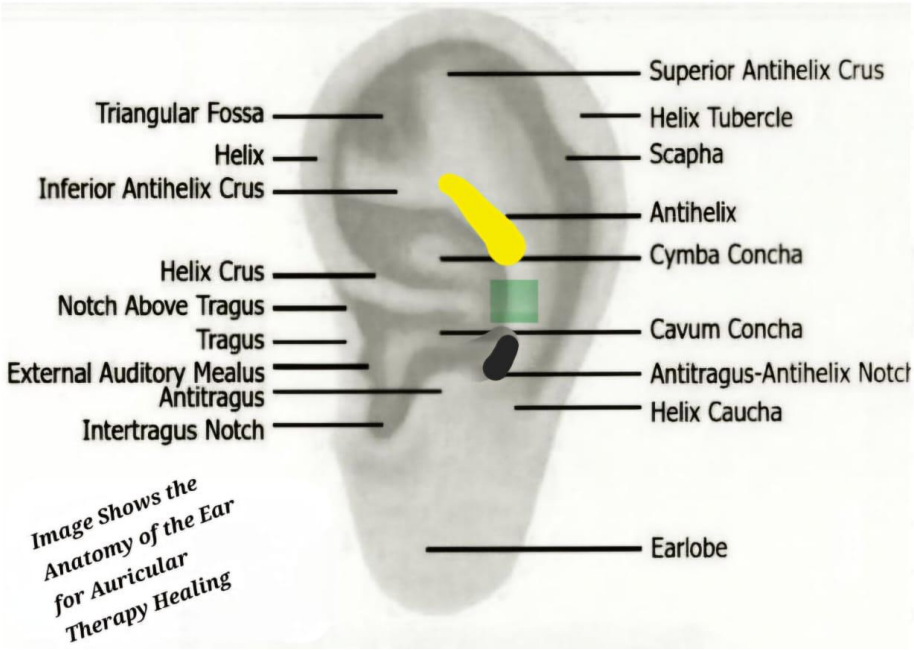


Figure 1

Auricular Acupressure Protocol for lower back pain:

Area of auricular seed application	Location of seed on ear	Total numbers of seeds	Time duration for application
Both Ear Antihelix, Intratragus notch, Chymba conchae,	Sacral, Lumber, Endocrine, Kidneys, liver Stomach, Spleen	10 seeds for each ear 10 +10 =20 (for both ear)	Once applied kept for 10 days

Table 1

Auricular Acupressure Group (AAG) ODI Variable values:

Variable	Group	Pre-Mean	Post-Mean	Subject	p-value
ODI	AA	20.4146	4.4390	40	0.00950

Table 2

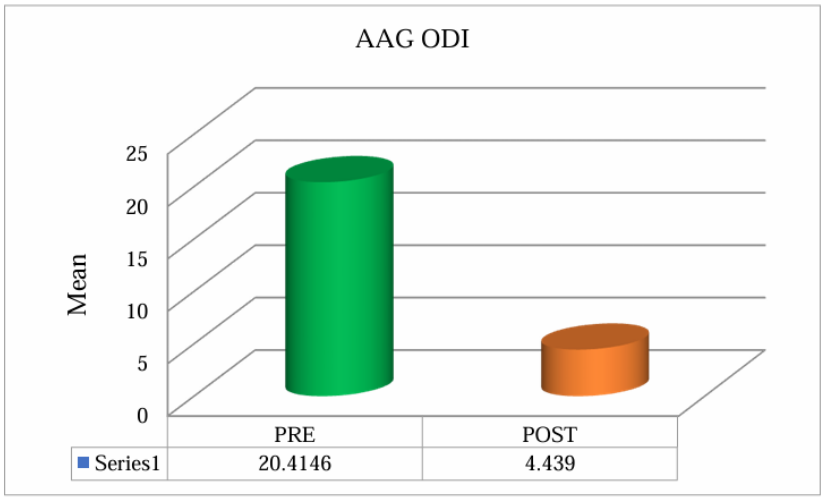


Figure 2

Auricular Acupressure Group (AAG) AOF Variable values:

Variable	Group	Pre-Mean	Post-Mean	Subject	p-value
AOF	AA	91.2439	73.0975	40	0.00132

Table 3

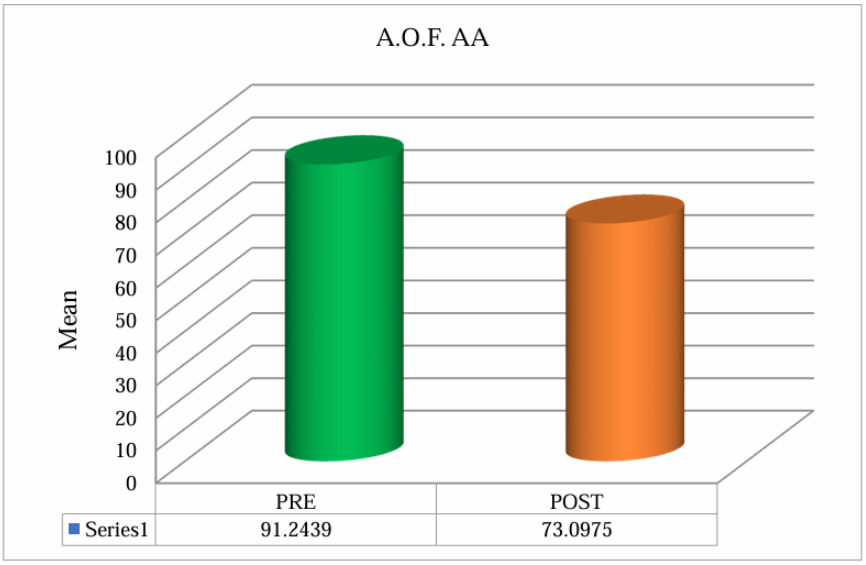


Figure 3

Yoga protocol:
Yoga Module Duration of Intervention:

Sr.	Yoga Practice	Frequency	Time in second/ minutes
1.	Prayer (Gayatri Mantra)	3	2 minutes
2.	Shat karma (Kapalbhati)	Set of 30 strokes In one round (5 round in toal)	5 minutes
3.	Bhujangasana(Cobra Pose)	5 rounds	30 second *5= 2.5 minutes
4.	Supta Udarakarshanasana (Sleeping abdominal Stretch Pose)	5	30seconds*5=150 seconds 2.5 minutes
5.	Savasana	1	3 minutes
6.	Sava Udarakarshanasana (Uiversal Spinal twist)	5	30seconds*5=150 Seconds (2.5M)
7.	Marjari-asana (cat stretch pose)	10	30seconds*10=300sec 5 minutes
8.	Vyagrasana(tiger pose)	10	30seconds*10=300sec 5 minutes
9.	Savasana	1	3minutes
10.	Salabhasana(locust Pose)	5	30seconds*5=150seconds 2.5 minutes
11.	Ustrasana (camel pose)	3	3*30seconds=90 seconds 1.5 minutes
12.	Supt Pawan muktasana (Leg lock pose)	3	3*30seconds=90seconds 1.5 minutes
13.	Savasana	1	3minutes
14.	Nadi suddhi	1	5 minutes
15.	Bhramari (Humming bee breath)	5	5*30seconds=150seconds 1.5 minutes
16.	Nadanusandhan (A, U, M, AUM)	5	5*30seconds=150seconds 1.5minutes

Table 4

Yoga Group (YG) ODI Variable values:

Variable	Group	Pre-Mean	Post-Mean	Subject	p-value
ODI	Yoga	22.5122	5.0975	40	0.00157

Table 5

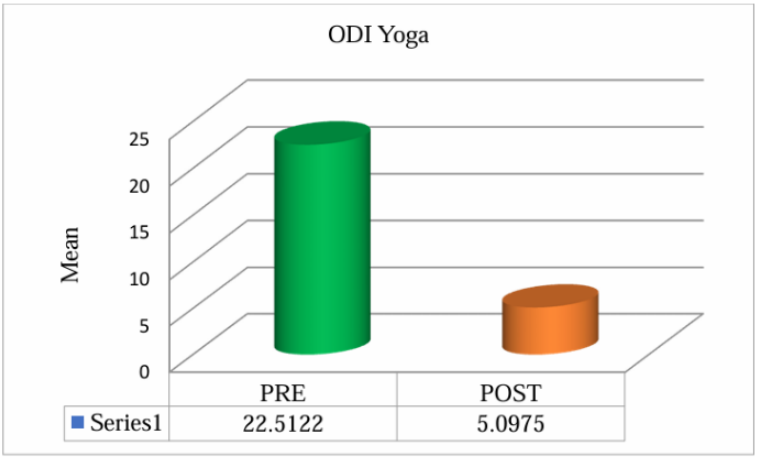


Figure 4

Yoga Group (YG) AOF Variable values:

Variable	Group	Pre-Mean	Post-Mean	Subject	p-value
AOF	Yoga	86.1707	74.8048	40	0.00151

Table 6

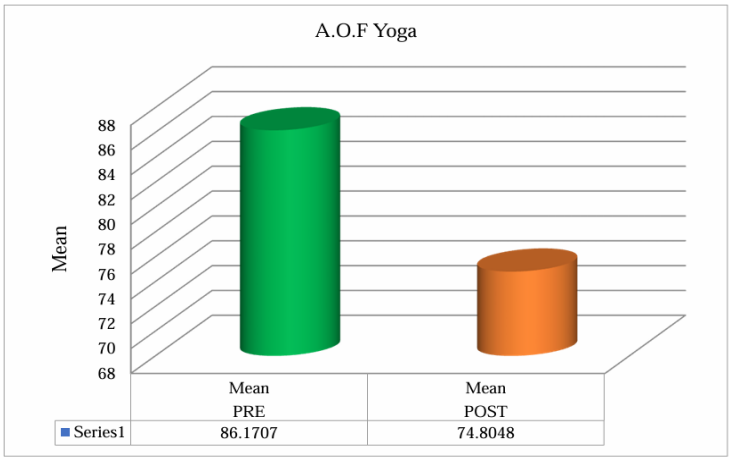


Figure 5

Control Group (CG) ODI Variable values:

Variable	Group	Pre-Mean	Post-Mean	Subject	p-value
ODI	Control	16.0975	18.0731	40	0.32310

Table 7

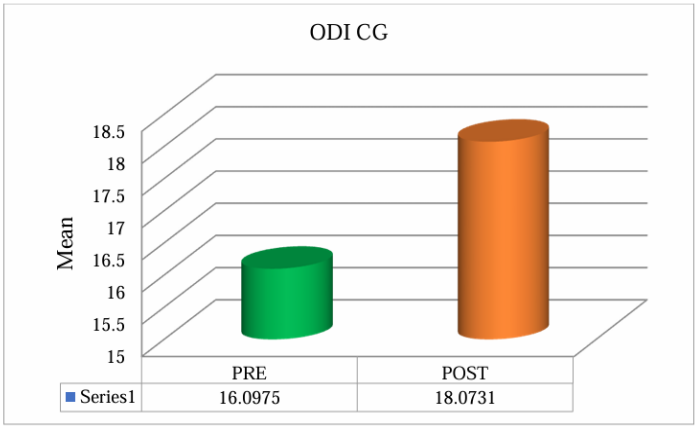


Figure 6

Control Group (CG) AOF Variable values:

Variable	Group	Pre-Mean	Post-Mean	Subject	p-value
AOF	Control	83.1707	84.939	40	0.31712

Table 8

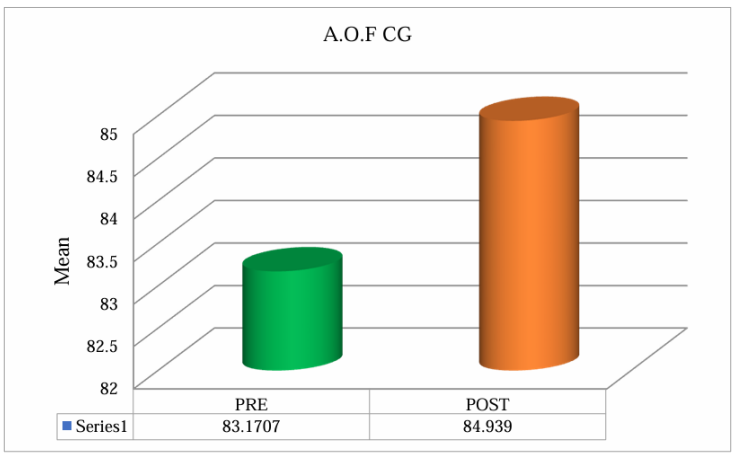


Figure 7

Discussion:

In today's fast-paced lifestyle, the prevalence of sedentary jobs is increasing, necessitating greater attention to healthcare to maintain optimal work performance. A healthy back is particularly essential for managing both physical and sedentary duties effectively. Recognizing this critical need, the present study was conceptualized. Currently, the chronicity of back-related problems is rising steadily. According to Data Bridge Market Research, expenditures on managing lower back problems are projected to reach 13,421.46 million USD by 2029. This growing financial burden highlights the pressing need for effective therapeutic interventions and preventive strategies. With these considerations in mind, this study aimed to evaluate the comparative efficacy of Yoga and Auricular Acupressure therapy on variables including lower back disability, body weight, fear avoidance, emotional regulation, spinal flexibility (angle of flexion) and quality of life. The findings revealed that the tailored Yogic therapy intervention demonstrated significant positive effects on lower back disability and AOF, Auricular Acupressure therapy also yielded positive outcomes on the same designated variables. This underscores the potential of both interventions as effective approaches for addressing lower back issues and enhancing overall well-being with compared match of control group. The pre-post comparative analysis of the Auricular Acupressure for the Oswestry Low Back Disability Questionnaire Index (ODI) variable demonstrated a significant positive change in lower back disability levels, as reflected by the mean ± SD values (20.4146±6.2489 to 4.4390±2.7753), (p-value = 0.00950) (Table 6.7). These findings align closely with the study conducted by Suen & Wong's work on Low Back Disability (Suen & Wong 2008), which suggests that the practice of a structured Auricular Acupressure protocol for lower back pain significantly enhances flexibility and reduces pain levels. (Suen & Wong 2008). The pre-post comparative analysis of the Auricular Acupressure for the Angle of Flexion variable demonstrated a significant positive change at individual angle of flexion of the participants, as reflected by the mean ± SD values (91.2439±19.1347 to 73.0975 ±10.9631), (p-value=0.00132) Table (6.12). These findings are in close alignment with the research conducted by Suen & Wong, which explored the impact of acupuncture on back flexibility. Their study underscores the efficacy of implementing a structured Auricular Acupuncture protocol as a means of enhancing overall back flexibility quality. In comparison, the present study demonstrates that the non-invasive approach of Auricular Acupressure is equally effective in improving back flexibility-related quality, offering a viable alternative for back flexibility management (Suen & Wong, 2008). The pre-post comparative analysis of the Yoga group for the Oswestry Low Back Disability Questionnaire Index (ODI) variable demonstrated a significant positive change in lower back disability levels, as reflected by the mean ± SD values (22.5122± 7.7817 to 5.0975± 4.1511) (p-value = 0.00157) (Table 6.1). These findings align closely with the study conducted by Singphow et al., which suggests that the regular practice of a structured Yoga protocol for lower back pain significantly enhances flexibility and reduces pain levels. (Singphow et al., 2022). The study also conducted pre-post comparative analyses of the Yoga group using the manual Goniometer for Angle of Flexion, which revealed a significant positive change in the participants' movability or angle of flexion. This improvement was evidenced by the mean ± SD values (86.1707±15.9967 to 74.8048 ±11.5243), (p-value=0.00151) Table (6.6). These findings exhibit alignment with the research conducted by Rathore's findings on back flexibility and mobility, the notable changes observed in the A.O.F outcomes in the present study indicate superior results. The findings suggest that consistent adherence to a structured Yoga protocol not only alleviates lower back pain but also improve movability or flexibility (Rathore et al., 2024). The mean ± SD values for these variables were observed as follows: Oswestry Low Back Disability (16.0975±8.9101 to 18.0731±8.6758), (p-value = 0.32310) (Table 6.13). Angle of flexion (83.1707±17.2320 to 84.9390±16.8857), (p value=0.31712) Table(6.18). These findings align with previous research, such as the work of Yu on low back disability and associated physiological and psychological parameters (Yu, 2024), as well as the study by Starkweather and colleagues on low back pain (Starkweather et al., 2024).

Result:

The findings of the study indicated a statistically significant improvement in pain levels, functional disability, and the angle of lumbar flexion, with the auricular acupressure group exhibiting a marginally greater improvement (p = 0.00426). The comparatively superior outcomes observed in the auricular acupressure group—particularly in terms of lumbar mobility and disability—may be attributed to the inherently therapeutic orientation of this modality. Unlike yoga, which is a holistic discipline encompassing physical, mental, and spiritual dimensions, auricular acupressure is explicitly directed toward clinical treatment. Yoga, in its classical conception, is not a therapeutic intervention per se, but rather a comprehensive philosophy and discipline aimed at self-realization, beginning with human limitations (bandhanas) and culminating in liberation (moksha). Within this broader spiritual trajectory, health emerges as a secondary, albeit significant, byproduct rather than the primary objective. Consequently, the healing

effects of yogic practices may manifest more gradually compared to targeted therapeutic modalities such as acupressure.

Conclusion:

The findings of this study conclusively demonstrate the significant positive impact of Yoga therapy and Acupressure therapy, specifically utilizing Auricular Acupressure, in promoting overall well-being for individuals with lower back pain and AOF issues. This study further validates the effectiveness of indigenous therapeutic techniques, highlighting the transformative potential of alternative therapies, particularly Yoga and Auricular Acupressure, in fostering a healthy lower back and balanced angle of flexion state.

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