

A Practical and Analytical Study of Yoga Therapy Techniques for Back Pain

Research Article

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Abstract

Background: Yoga has garnered considerable public interest and attention across various countries worldwide, frequently being suggested as a means to enhance one's health. It encompasses more than mere physical exercises, incorporating a distinct philosophical outlook and psychological processes. This aspect is crucial when integrating exercises into today's unique cultural milieus. **Aim:** To determine the effect of selected yoga postures in treating backache. **Methods:** A quasi-experimental design was chosen to substantiate the objectives of this study. Seven different postures were considered; eight respondents recorded their responses after the yoga therapy. A purposive sampling technique has been followed to acquire the data. The data were screened and analysed using a one-sample t-test to signify the effectiveness of the yoga postures. Moreover, ANOVA is used to analyse posture comparison and compute whether all participants obtained the same relief. Furthermore, twelve cohorts participated in an awareness seminar and took part in thirteen different treatments; the effectiveness of such treatments was gauged via t-test. **Results:** Significant levels of relief were identified. However, the extent of relief among participants was different. **Conclusion:** This study adds to the literature related to the effect of yoga in reducing back pain. The study results can be used to create awareness of providing conventional treatment substitutions.

Keywords: Back pain, Yoga, Postures, Pakistan.

Introduction

Yoga has attracted a lot of public interest and attention in different countries of the world, and this practice is often recommended as an alternative to improve health conditions (1, 2). Yoga therapy is practicing yoga posture and exercises to heal health conditions under a yogi's guidance, teachings, and instructions. The therapy is intended to prevent, overcome, reduce or improve physical, cognitive, and spiritual stress (3). The streamlined and disciplined yoga practices uphold endurance, physical energy, and workability. It promotes the characteristics of friendliness and sympathy and alleviates the ability for self-control. It ushers a sense of calmness and well-being (4). This practice constitutes not just physical exercises since it includes a particular philosophical perspective and psychological mechanisms (5, 6), which is essential when introducing exercise in today's specific cultural environments.

Although traditional medicine is an important part of Pakistan's cultural heritage, yoga is not widely practised, as it is more of a tradition of neighbouring India, which is believed to be known as a part of Pakistani society thanks to social networks (7). The low popularity of yoga practice and the small number of studies can also be explained by the fact that yoga, both in its traditional and commercialised form, does not correspond to Islamic normative rules that violate Islamic positions from the perspective of monotheism and gender relations (8).

On the other hand, several research studies have confirmed that meditation asana, or a blend of both, can reduce pain in people with Carpel Tunnel Syndrome (CTS), arthritis, and back pain (9, 10, 11, 12). Back pain has been studied as the most significant public health issue and is being extended to epidemic magnitude. It lays a sizeable affliction on the workforce and the health care system (13). The issue of back pain has been proven to be very difficult to treat. The problem has been reported as one of the most frequent reasons for using complementary and alternate treatments (14). It is revealed through various research studies that several methods are being practised throughout the world, considering the type of ailments. Iyengar Yoga (15) has been studied to treat chronic lower back pain (14). Iyengar Yoga has also been applied as a therapeutic approach in medical settings (16, 17). Thus, yoga has

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been considered a Complementary and Alternative Method (CAM) to treat various physiological ailments and protect from diseases.

Other studies show that yoga can be beneficial in reducing physical pain, stress and anxiety (18, 19). However, the use of yoga raises several questions. For example, in the USA, yoga exercises were tested to see if they reduce stress and improve physical condition in nursing students. The research showed that the students experienced stress and continued perceiving their lives as stressful despite practicing yoga. Moreover, stress increased, and the physical quality of life and health satisfaction decreased during the study (20).

The results of the literature review conducted by Wieland et al. (2017) (21) showed evidence of low to moderate reliability that yoga, compared to control groups, slightly or moderately improved back-related functions after three and six months. According to the authors, the risk of adverse yoga-related phenomena also remains; it is unclear whether there is any difference between yoga and other exercises for improving back functions or reducing pain; therefore, more high-quality research is needed. Another study found that the difference in physical or mental quality of life for people with chronic lower back pain was insignificant compared to cases without exercise or physiotherapy (2). The most current meta-analysis study focusing on various physical ailments has identified that several asanas have diversified results in terms of long-term and short-term effects (22).

However, yoga has yet to be considered an alternative medication or healing system in Pakistan, so it is very rarely studied specifically to heal lower back pain. Therefore, this study aims to study various yoga techniques' practical and analytical approaches to treating back pain.

Materials and Methods

This study was intended to evaluate the effect of yoga practices in treating lower back pain. Therefore, a

Quasi-experimental design was chosen to substantiate the objectives of this study. The primary data collection method was used to collect the data. People suffering from back pain constituted the subjects of interest for this study. Therefore, a purposive sampling technique was used to target the respondents for the study.

The study has been conducted in the Pakistani context, specifically focusing on Karachi, Sindh. In this study, eight participants took part and recorded their evaluations. The Institutional data collection instrument (intake form) was used to collect the yoga specialists with each participant administered the individual yoga sessions participant. Seven different (postures) *asanas* (*Vakkar, Angsanichalan, Bhujang, Market, Marjari, Settuband, Pawanmukut*) recommended and administered by the yoga professionals were executed in the sessions.

A quantitative approach was used to answer the research questions, and the collected data were screened and analysed using SPSS.

In the first step, the significance of the average relief score was computed by applying a t-test. ANOVA is applied to gauge posture-wise and participant-wise comparison.

In the next step, an awareness seminar was also organized to motivate the thirty participants by demonstrating yoga therapy treatments. Eight participants recorded their feedback, with pre and post-conditions. In this study, all requirements of scientific ethics were followed, and informed consent was obtained from all participants. Again, a t-test was applied to compare pre-treatment and post-treatment relief scores.

Results

Most of the participants in the experiment were men between the ages of 30 and 77, engaged in different professional activities. Data on their physical condition and back pain relief methods used before the experiment are presented in Table 1.

Table 1: Pre-evaluation data

R	Age	Gender	Weight in Kg	Height in feet	Work type Sedentary, Standing or any other and time of pain	Any medical history	History of back pain since	Which condition is causing an increase in pain	Any associated problem with back pain	Whether pain is being relieved if yes, then with what technique
1	77	Male	83	6	Country head of an organization that is mostly sedentary	No	Lower back pain Since the last 5 months	While sitting or standing and especially in bending	No	In Sleeping
2	65	Male	74	5.9	Social work mixed	Numbness during sleep and discomfort in the left shoulder		Excessive walking, Pain the at hip joint and lower back during exercise	Heart surgery and high cholesterol level. Also, constipation problem	Controlled/relieved by medicine

3	36	Male	75	5.2 feet	Official work is mostly mixed	Nothing except numbness in the left leg	Sever back pain	Riding bicycle increases the level of back pain. Heavy work also increases a back pain	No recorded	15-minute back exercises
4	30	Male	80	5.9	Mostly standing Mainly at night and sometimes in the morning	No other medical history	Yes, having back pain for the last 2 years	Heavy work	No other medical issue is the patient having pain signals along with numbness in the legs	Relief of pain is due to painkillers and the use of a Lumbar belt
5	52	Male	75	5.8	Official work Travelling and sitting a long time	No other medical history	Back pain bulging at L4 and L5 For the last 3 years	Heavy work	Neck pain. Numbness in legs	Medication. Meditation and Yoga
6	54	Male	78	6.00	Official work. Mostly sedentary work	Knee pain. Cataract operated	Back pain usually occurs in the morning	Nothing	Knee pain	Massage and exercise
7	62	Female	50	5.6	Official work. Sedentary	Asthma	Back pain usually in the morning	Nothing	Asthma	Massage
8	70	Male	107	5.10	Own Business After Retirement	No	Backache due to an Accident	Winter Session	No	Medication

Table 2: Post-Evaluation data

One-Sample Statistics			
	N	Mean	Std. Deviation
Relief_Score	56	4.2857	0.81384
			Std. Error Mean
			0.10875

Table 3: One-Sample Test

	Test Value = 3					
	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Relief_Score	11.822	55	0.000	1.28571	1.0678	1.5037

Fifty-six observations were collected from eight respondents and seven postures to compute whether the cohorts got relief after exercising the prescribed postures. Since the data were obtained on a five-point Likert scale, the average score of the relief (mean=4.28) (Table 2) is compared with the test value of three to gauge overall significance. The test score (t=11.82) (Table 3) is greater than the benchmark of (t = >2), followed by the sig value (p=0.000), which is lesser than the benchmark of 0.01. Therefore, the result indicates that all the postures, on average, are helpful and relieve the participants' overall Relief Significance.

To gauge whether the average score before and after the different treatments are the same or whether the post-treatment average score is better, a paired sample t-test is applied to test the hypothesis.

Table 4: Paired samples test results

		Paired Differences					t	df	Sig
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Post_Yoga - Pre_Yoga	0.45561	0.66083	0.08831	0.27864	0.63258	5.159	55	0.000

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The paired sample t-test provides, on average, the overall significance of the seven postures. The result shows that the mean score difference (0.45561) is significant as $t = 5.159$, which is greater than its benchmark ($t > 2$), followed by the sig value = 0.000, which is less than its benchmark ($p < 0.01$). This result shows that under-considered yoga postures play a significant role in treating back pain.

Table 5: Posture-wise Comparison

ANOVA					
Relief_Score					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	10.679	6	1.780	3.387	0.007
Within Groups	25.750	49	0.526		
Total	36.429	55			

Seven different postures were exercised to provide relief to the cohorts. It is important to compare such postures to whether they provide the same level of relief. The results of the ANOVA (Table 5) test show that the average relief provided by these seven different postures has statistically significant differences as the F-Stat is 3.38, followed by a sig value of 0.007 ($p < 0.01$).

ANOVA has a limitation. It only informs whether all the postures have, on average, the same level of relief or not. It does not rank these postures; therefore, the Tukey test (Table 6) is applied to know the postures with different relief levels. The output indicates that Vakkar and Pawanmukut provide different levels of relief, whereby the Pawanmukut posture is more robust than the Vakkar posture. In contrast, the rest of the postures provide, on average, the same level of relief.

Table 6: Relief Score

Tukey HSD ^a	N	Subset for alpha = 0.05	
Postures		1	2
Vakkar	8	3.5625	
Angsanchalan	8	3.6875	3.6875
Bhujang	8	4.3125	4.3125
Markat	8	4.5000	4.5000
Marjari	8	4.5625	4.5625
Settuband	8	4.6250	4.6250
Pawanmukut	8		4.7500
Sig.		0.071	0.071

Means for groups in homogeneous subsets are displayed.
a. Uses Harmonic Mean Sample Size = 8.000.

To gauge whether the exercise participants receive the same level of relief, an ANOVA test is applied to compare the average score of relief obtained by all individuals. The result depicts that all individuals have the same level of relief as the F stat is 1.37, lesser than the benchmark, and the sig value is 0.239, which is greater than the benchmark ($p < 0.05$).

Table 7: Relief experienced by exercise participants

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.071	7	0.867	1.371	0.239
Within Groups	30.357	48	0.632		
Total	36.429	55			

The next step was to compare pre and post-seminar results. Twelve cohorts participated in the awareness seminar, where they were given thirteen treatments for backache. The data was obtained for thirteen different practices at pre-practice and post-practice. The descriptive statistics (Table8) show that the average values of seven treatments are getting better results, two are getting worse, and four are sustained.

Table 8: Group statistics before and after practice

	Dummy	N	Mean	Std. Deviation	Std. Error Mean
Side_Bending_SamanMudra	Before Practice	12	4.2500	0.86603	0.25000
	After Practice	12	4.2500	0.75378	0.21760
Bhunaman_Asana	Before Practice	12	4.3333	0.88763	0.25624
	After Practice	12	4.2500	0.45227	0.13056

Vajra_asana_forward_bending	Before Practice	12	3.7500	1.13818	0.32856
	After Practice	12	3.8333	1.11464	0.32177
Makar_Asana	Before Practice	12	4.1667	1.02986	0.29729
	After Practice	12	4.3333	0.98473	0.28427
Bhujan_Asana	Before Practice	12	4.1667	0.83485	0.24100
	After Practice	12	4.2500	0.75378	0.21760
Shalab_Asana	Before Practice	12	4.0000	0.95346	0.27524
	After Practice	12	4.0000	0.73855	0.21320
Yogic_Cycling	Before Practice	12	4.2500	0.75378	0.21760
	After Practice	12	4.2500	0.62158	0.17944
Rocking_on_Sides	Before Practice	12	4.4167	0.66856	0.19300
	After Practice	12	4.5000	0.52223	0.15076
Twisting_in_pawanmukut	Before Practice	12	4.3333	0.49237	0.14213
	After Practice	12	4.4167	0.51493	0.14865
Kapal_Bhati_in_SP	Before Practice	12	4.4167	0.66856	0.19300
	After Practice	12	4.5833	0.51493	0.14865
Agni_Sara_in_SP	Before Practice	12	4.5833	0.66856	0.19300
	After Practice	12	4.5000	0.67420	0.19462
Saitu_Band_Asana	Before Practice	12	4.4167	0.66856	0.19300
	After Practice	12	4.4167	0.66856	0.19300
Meditation	Before Practice	12	4.0000	1.47710	0.42640
	After Practice	12	4.1667	1.46680	0.42343

To gauge whether the average score before and after the different treatments is the same or the post-treatment average score is better, an independent sample t-test was applied (Table 9). Gauging equal variance is a prerequisite for computing equality of mean. Levene's test for equality of variance shows all treatments have an equal variance for pre and post-exercise data sets. Moreover, the difference in average scores for pre and post-treatment has no significant difference as all the p-values are not lesser than 0.05.

Table 9: Treatment-wise comparison

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Side_Bending_SamanMudra	Equal variances assumed	0.673	0.421	0.000	22	1.000	0.00000	0.33143	-0.68735	0.68735
	Equal variances not assumed			0.000	21.589	1.000	0.00000	0.33143	-0.68811	0.68811
Bhunaman_Asana	Equal variances assumed	2.882	0.104	0.290	22	0.775	0.08333	0.28758	-0.51307	0.67974
	Equal variances not assumed			0.290	16.351	0.776	0.08333	0.28758	-0.52525	0.69191
Vajra_asana_forward_bending	Equal variances assumed	0.071	0.792	-0.18	22	0.858	-0.08333	0.45988	-1.03707	0.87040
	Equal variances not assumed			-0.18	21.990	0.858	-0.08333	0.45988	-1.03709	0.87042
Makar_Asana	Equal variances assumed	0.060	0.808	-0.40	22	0.689	-0.16667	0.41133	-1.01971	0.68638
	Equal variances not assumed			-0.40	21.956	0.689	-0.16667	0.41133	-1.01981	0.68648
Bhujan_Asana	Equal variances assumed	0.185	0.671	-0.25	22	0.800	-0.08333	0.32470	-0.75672	0.59005
	Equal variances not assumed			-0.25	21.774	0.800	-0.08333	0.32470	-0.75712	0.59046
Shalab_Asana	Equal variances assumed	0.478	0.496	0.000	22	1.000	0.00000	0.34816	-0.72203	0.72203
	Equal variances not assumed			0.000	20.706	1.000	0.00000	0.34816	-0.72466	0.72466
Yogic_Cycling	Equal variances assumed	0.733	0.401	0.000	22	1.000	0.00000	0.28204	-0.58491	0.58491
	Equal variances not assumed			0.000	21.230	1.000	0.00000	0.28204	-0.58614	0.58614
Rocking_on_Sides	Equal variances assumed	1.100	0.306	-0.34	22	0.737	-0.08333	0.24490	-0.59122	0.42455
	Equal variances not assumed			-0.34	20.782	0.737	-0.08333	0.24490	-0.59295	0.42628
Twisting_in_pawanmukut	Equal variances assumed	0.607	0.444	-0.40	22	0.689	-0.08333	0.20566	-0.50986	0.34319
	Equal variances not assumed			-0.40	21.956	0.689	-0.08333	0.20566	-0.50991	0.34324
Kapal_Bhati_in_SP	Equal variances assumed	1.365	0.255	-0.68	22	0.501	-0.16667	0.24361	-0.67187	0.33854
	Equal variances not assumed			-0.68	20.654	0.501	-0.16667	0.24361	-0.67379	0.34046

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Agni_Sara_in_SP	Equal variances assumed	0.048	0.829	0.304	22	0.764	0.08333	0.27409	-0.48510	0.65176
	Equal variances not assumed			0.304	21.998	0.764	0.08333	0.27409	-0.48510	0.65177
Saitu_Band_Asana	Equal variances assumed	0.000	1.000	0.000	22	1.000	0.00000	0.27294	-0.56604	0.56604
	Equal variances not assumed			0.000	22.000	1.000	0.00000	0.27294	-0.56604	0.56604
Meditation	Equal variances assumed	0.004	0.949	-0.27	22	0.784	-0.16667	0.60093	-1.41291	1.07958
	Equal variances not assumed			-0.27	21.999	0.784	-0.16667	0.60093	-1.41291	1.07958

Discussion

Although there is ample set of evidence related to the treatment of low back pain, little empirical evidence has so far been documented in the Pakistani context. In addition to this, very rare studies have been documented comparing the seven most crucial postures and their effectiveness, specifically in treating lower back pain. The suggested postures showed a significant impact in treating backache. However, the results of this study show that the pawanmukt posture was more robust than the vakkar posture, while the remaining five ones were almost indistinguishable from each other. This confirms the findings of Chetry and Das (2022) (23), which state that Pawanmuktasana is one of the most effective practices because it strengthens the abdomen, back, and increases flexibility. In addition, this pose improves blood circulation in the pelvic area (24).

This study also shows that yoga is associated with a psychological effect. Since the results before and after the seminar differed. The difference in health conditions is explained by the fact that yoga offers a holistic approach to people with various physical disorders, as it includes body awareness, breathing activity, physical posture, and meditation, which have additional biopsychosocial benefits (25). For example, a positive effect after meditation was observed, which supports the results of other studies that used different meditation techniques. A reduction in lower back pain was previously found by Carson et al. (2005) (26), who tested the effects of Buddhist loving-kindness meditation. The research literature review performed by Soares et al. (2022) (27) also demonstrated that meditation was slightly better than conventional long-term lower back pain relief, and most studies have shown no serious adverse phenomena. However, in another study, mindfulness-based cognitive therapy outperformed mindfulness meditation results (28).

On the other hand, the psychological effect is not absolute. Excluding meditation, only the six yoga techniques after the seminar resulted in a slightly greater improvement in the health condition. This suggests the need for further research into the effects of different meditation techniques and yoga postures on lower back pain in the future. As comorbidities were not considered in this study, additional studies are needed. In addition, the majority of participants in this experiment were male; therefore, more women and participants of different ages should be included in the future. It would also make sense to evaluate yoga's effect on participants' different religiosity.

Conclusion

This study provides evidence that some yoga-based interventions could reduce lower back pain and improve quality of life without medication. Yoga-based interventions have been a great source of healing various physiological and psychological ailments. However, in the Pakistani context, yoga as an alternative to conventional medication has yet to take its plight. This study evaluated pre and post-difference by suggesting some identified postures. It was revealed that significant levels of relief were observed. However, the extent of relief among participants was different; therefore, the results of this study show that it is worth investigating the efficacy of some yoga techniques in the future to improve the health condition of people suffering from lower back pain.

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