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## **Association of Yoga and Meditation on Musculoskeletal Disorders Among Sadhus Attending Nashik Mahakumbha 2015-16 : A Cross Sectional Study**

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### **Abstract**

*Yoga and meditation is a well-established prevalent practice in masses to maintain health. Indian sadhus are known to be doing yoga and meditation for maintaining their health, however not much literature exists regarding the effect of yoga and cross legged meditation among Indian sadhus. The present cross-sectional study was conducted among 181 Indian sadhus to know their lifestyle with special reference to their orthopedic ailments and also explore if yoga and cross legged meditation had any effects on their musculoskeletal disorders. All Indian sadhus were asked regarding their basic demographic details, their life style pertaining to orthopedic ailments like low backache, pain in knee joints, use of special foot wear followed by their detailed examination by orthopedic experts. No radiological investigation was included in the study. Majority ( 54.7%) of sadhus did not include yoga as a way of life and there was no statistical significance between history of doing yoga and low back ache but there was positive significant association with knee joint pain. Similarly majority ( 75.69 % ) of the sadhus were doing cross legged meditation for long hours and there was significant association between cross legged meditation and knee joint pain. Hence it is advisable to do meditation and yoga in chair position to prevent articular cartilage denudation of the knee, especially in the elderly.*

**Key Words:** *Sadhus, Yoga, Meditation, Low Backache, Knee Pain, Nashik Mahakumbha.*

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**Introduction:** Yoga and meditation is a well-established prevalent practice in masses to maintain health. Yoga has been proven to improve low backache<sup>(1)</sup>. Meditation helps to distress the mind but meditation in cross legged position over a period of time is known to increase osteoarthritis of knee<sup>(2)</sup>. Nashik Mahakumbha is a 12 yearly religious mass gathering of the hindus<sup>(3,4)</sup>. It is attended by not only pilgrims, but also by individuals who lead a spiritual life in isolation at the base of the Himalayan ranges. Not much literature exists regarding the effect of yoga and cross legged meditation in Indian sadhus. We wanted to know more about their lifestyle, pertaining to their orthopedic ailments and also explore if yoga has any effects on their musculoskeletal disorders.

Hence a cross sectional study was conducted in July 2015, in Nashik, where these sadhus had gathered to attend this holy gathering.

**Objectives:**

- 1) To study the practices of sadhus visiting Nashik Mahakumbh in terms of yoga practices , meditation practices and footwear habits .
- 2) To study the association between history of doing yoga / cross legged meditation and low backache.
- 3) To study the association between history of doing yoga / cross legged meditation and pain in knee joint .

**Materials and Methods:** Present study was a cross sectional study in which 181 Indian sadhus were included by universal sampling method . Present study was approved by institutional ethic committee. All sadhus were approached through their akhada's (temporary townships) head. After taking due permission and written informed consent basic demographic data of sadhus was recorded. They were also asked questions regarding musculoskeletal disorders like backache , knee pain and flatfeet according to annexure 1. They were also asked about frequency of meditation and yoga and various significant lifestyles like use of footwear and its type . This was followed by clinical examination of spine, knee and feet.

The sadhus were examined by a group of orthopedic postgraduate trainee doctors who visited their akhadas in the sadhus' leisure time.

The spine examination concentrated on assessment of spinal tenderness from 1<sup>st</sup> to 5<sup>th</sup> lumbar vertebra, presence of paraspinal spasm, and pain during terminal flexion and extension of spine . Knee examination included medial joint line palpation, crepitus and pain during flexion and extension of knee. Foot examination mainly assessed the arches of the feet.

After taking detailed history with lifestyle habits and clinical examination , appropriate diagnosis was made according to the following operational definitions for the study.

### **Operational definitions:**

- **Low back ache** was defined clinically if any individual had persistent backache for more than 3 months with any lumbar vertebral spinous process being tender with or without paralumbar spasm, with pain in terminal flexion or extension.
- **Knee pain** was defined clinically if any individual had persistent pain for more than 3 months with crepitus with medial joint line tenderness with or without pain during flexion and extension of knee.
- **Flat foot** was defined clinically by absence of medial longitudinal arch on standing. It was sub categorized as rigid, if the arch did not appear on toe standing (Jack test), and flexible if the arch did appear on toe standing

No radiological investigations were included in this study and all above diagnosis were purely based upon clinical examination by orthopedic experts. All the participants were given appropriate treatment.

Inclusion criteria: All participants age more than 18 years and who were willing to give consent for participation.

Exclusion criteria: Participants having excruciating knee joint pain and back pain were excluded.

Out of 181 sadhus only 82 (45.30%) performed yoga while 99 (54.70%) did not perform yoga.

Out of 82 sadhus doing yoga, 69 (84.15%) specifically included spinal extension exercises in their routine while 13 (15.85%) did not.

Around 137 (79.79%) sadhus performed meditation in cross legged position and 44 (24.30%) did not do meditation in cross legged position.

Only 12 individuals (6.63%) did not wear any footwear routinely while 169(93.37%) sadhus did wear footwear routinely. Only one individual used wooden footwear routinely, rest 168 sadhus wore regular common footwear. Out of 169 sadhus only 14 (8.2%) used footwear which had great toe support. Others, 155 (91.71%) preferred sandals/footwear without great toe support.

Mean height of sadhus was 165 cm (minimum 152cm, maximum 182 cm.)

Mean weight of sadhus was 70.52 kg (minimum 50 kg, maximum 100 kg.)

Mean BMI was 25.91 kg/m<sup>2</sup> (minimum 18.73 kg/m<sup>2</sup>, maximum 31.64kg/m<sup>2</sup>.)

Prevalence of low back ache was in 104 individuals (57.46%)

Prevalence of pain in knee was in 52.49%.

Prevalence of flexible flat feet was in 20.44% and none had rigid flat feet while 53 (29.28%) sadhus complained of occasional pain in feet.

All sadhus were divided into two groups i.e. individual doing yoga and individual not doing yoga. Chi square test was performed to mark association of yoga and prevalence of backache.

A similar analysis as on above lines was done to check association between cross legged meditation and yoga on knee pain.

**Results:** There is no significant association between history of doing yoga and incidence of pain in back. There is significant association between history of cross legged meditation and yoga on incidence of knee pain

**Discussion:** Mahakumbh is a religious gathering of Hindus happening at 4 places Nashik, Haridwar, Ujjain and Allahabad.<sup>(5)</sup> This gathering takes place every 3 yearly at one of these places. Ateach place this event happens after a gap of 12 years.

The festival is attended not only by citizens but also by religious leaders who dwell in groups (akhadas) at the base of Himalayan foot ranges. Not much knowledge exists in the literature about their way of living and the impact of their lifestyle on their health.<sup>(3)</sup> Hence the study was conducted as a cross sectional study to know about their lifestyle and the impact it has on their orthopedic ailments.

It is generally believed that sadhus dwelling in akhadas have a lifestyle which includes meditation in cross legged position for long hours and performances of various yogas.

However our study reveals that majority of the sadhus do not include yoga as daily routine (sadhus not doing yoga 54.70 %).

Meditation was an integral part of most of the sadhus daily routine ( sadhus doing meditation in cross legged position 79.79 %)

Yoga is known to reduce the incidence of chronic low backache<sup>(1)</sup>. It is an exercise which is getting popular in the masses and common citizens are embracing these exercises. However we were not able to prove any statistical association between yoga and low back pain in this study group. This might be attributed to the fact that majority of the sadhus were not practicing this lifestyle.

Cross legged sitting is generally believed to increase osteoarthritis and knee pain<sup>(2)</sup>,hence replacement surgeons advice patients to prevent this posture in order to reduce the articular cartilage degeneration. This study shows that meditation in cross legged position and yoga has direct positive effect on development of knee pain. Hence meditation and yoga should be done in chair position to prevent articular cartilage denudation.

Majority of sadhus preferred regular footwear outdoors. They also spent majority time in akhadas without footwear. None of them had rigid flatfeet. 20 % sadhus had flexible flat feet. Benjamin et al has proven this, that flat feet happens less in individuals not wearing foot wear<sup>(6)</sup>. Our study concurred with this finding.

The limitation of the study was that it had a predominant male population. The study group was skewed for male gender, as very few females adopt the life of a sadhavi .

**Conclusion:** Majority of the sadhus who have attended Nashik Mahakumbh 2015 were doing cross legged meditation for long hours. They were in a habit of wearing regular footwear outdoors. However, majority did not include yoga as a way of life.

There was no statistical association between low backache and yoga, however there is significant association between cross legged meditation and yoga on pain in knee.

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**Annexure:**

**Table no. 1: Age & sex wise distribution of Indian Sadhus**

Age	Frequency	Percentage
18-45	32	17.68%
45-60	73	40.33%
>60	76	41.99%
<b>Sex</b>		
Male Sadhus	162	89.50 %
Female Sadhavi	19	10.50 %
Total	181	100%

**Table no. 2: Distribution of Sadhus doing Yoga and Cross legged meditation**

<b>History of doing Yoga</b>		
	Frequency	Percentage
Yes	82	45.30%
No	99	54.70%
<b>History of doing cross legged meditation</b>		
Yes	137	75.69%
No	44	24.31%
Total	181	100.00%

**Table no. 3: Distribution of orthopaedic complaints among Sadhus**

PAIN IN BACK	Frequency	Percentage
Yes	104	57.46%
No	77	42.54%
<b>PAIN IN KNEE</b>		
Yes	95	52.49%
No	86	47.51%
<b>PAIN IN FEET</b>		
Yes	53	29.28%
No	128	70.72%
Total	181	100.00%

**Table no. 4: Association between history of Low back ache and spinal tenderness at various level**

Spinal level tenderness		PAIN IN BACK		Total	P value
		Yes	No		
L1	Yes	31 (29.81%)	6 (7.79%)	37 (20.44%)	<0.005
	No	73 (70.19%)	71 (92.21%)	144 (79.56%)	
L2	Yes	47 (45.2%)	6 (7.79%)	53 (29.28%)	<0.005
	No	57 (54.80%)	71 (92.21%)	128 (70.72%)	
L3	Yes	43 (41.35%)	2 (2.59%)	45 (24.86%)	<0.005
	No	61 (58.65%)	75 (97.41%)	136 (75.14%)	
L4	Yes	48 (46.16)	2 (2.59%)	50 (27.62%)	<0.005
	No	56 (53.84%)	75 (97.41%)	131 (72.38%)	
L5	Yes	42 (40.39%)	2 (2.59%)	4 (2.20%)	<0.005
	No	62 (59.61%)	75 (97.41%)	137 (97.8%)	
	Total	104(100%)	77 (100%)	181 (100%)	

**Table no. 5: Association between history of cross legged meditation and pain in knee joint**  
 Strong positive association between cross legged meditation and knee pain  
 (Chi- Square value – 9.05, df = 1, p value <0.005significant)

MEDITATION IN CROSS LEGGED POSITION	PAIN IN KNEE		Total
	Yes	No	
Yes	63(66.31%)	74(86.94%)	137(75.69%)
No	32(33.69%)	12(13.06%)	44(24.31%)
Total	95(100%)	86(100%)	181(100%)