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To Compare the Impact of Antenatal Yoga on Spontaneous versus Induced Labour in Primigravida Women

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A B S T R A C T

Background:
Antenatal yoga may support natural labour and reduce medical interventions, improving maternal and neonatal outcomes. This study examines its effects on spontaneous versus induced labour among primigravida women.

Methodology:
In a randomized control trial at SMS Medical College, Jaipur, 200 primigravida women meeting inclusion criteria were divided into intervention and control groups. The intervention group received 60-minute yoga sessions from 28 to 38 weeks of gestation. Labour outcomes were recorded upon delivery.

Results:
Of the participants, 69% in the intervention group had spontaneous labour versus 57% in the control group (p = 0.043). The intervention group also had fewer labour inductions and cesarean sections.

Conclusions:
Antenatal yoga significantly increases spontaneous labour rates, reduces inductions, and supports natural delivery. This highlights the potential of antenatal yoga in prenatal care.

Keywords: Antenatal, Yoga, Spontaneous, Labour, Induction.

INTRODUCTION

Antenatal yoga is increasingly recognized for its potential to influence labour outcomes, particularly regarding spontaneous versus induced deliveries. Spontaneous labour, which begins naturally without medical intervention, is often associated with fewer complications and a shorter recovery period. In contrast, induced labour involves medical interventions to stimulate contractions, leading to a longer, more intense labour that may necessitate additional interventions, such as cesarean delivery [1].

Practicing antenatal yoga can significantly promote the spontaneous onset of labour by enhancing physical and mental well-being. Yoga improves flexibility, strengthens pelvic muscles, and encourages relaxation, preparing the body for labour. The gentle movements and poses help improve circulation and reduce stress, both crucial for supporting natural labour. Additionally, strengthening the pelvic floor through specific poses may lead to smoother labour progressions and reduce the need for medical intervention [2].

Breathing exercises and meditation, essential components of antenatal yoga, play a vital role in pain management during labour. These techniques promote relaxation and help women stay calm and composed during contractions, which can support the spontaneous onset of labour. Conversely, women requiring induced labour often face increased physical and emotional challenges due to stronger contractions and a greater likelihood of needing pain relief.

While antenatal yoga is beneficial for overall labour preparation, it may also help mitigate the stress and discomfort associated with induced labour by fostering mental resilience. Studies suggest that engaging in regular antenatal yoga can reduce the likelihood of medical interventions, leading to a higher chance of spontaneous labour and lower risks associated with induction. Ultimately, antenatal yoga supports a more positive birthing experience, whether labour begins spontaneously or requires medical intervention.

Materials and Methods

This study is a health facility-based prospective analytical interventional randomized control trial conducted at the Department of Obstetrics and Gynaecology, SMS Medical College and associated hospitals in Jaipur, Rajasthan. Data collection began in November 2022 after receiving institutional ethical committee approval and continued until the target sample size of 200 pregnant women was achieved, followed by 2-4 months for data analysis. Participants included primigravida women attending antenatal clinics who met specific inclusion criteria, such as having a live singleton pregnancy in cephalic presentation, a gestational age of 28 weeks, a prenatal BMI of 18.5-22.9 kg/m², and being aged 20-30 years, while those with prior abortions, cervical insufficiency, high-risk pregnancies, and other specified conditions were excluded. The sample was evenly divided into intervention (100) and control (100) groups. Participants engaged in 60-minute yoga sessions led by a trained instructor approved by the Yog Therapy and Research Centre, held from 28 to 38 weeks of gestation, totaling approximately ten sessions. They were encouraged to practice daily at home and maintain a physical record through diary entries. Upon the onset of labour, participants were admitted for delivery. If gestation exceeded 41 weeks, they underwent induction according to hospital protocols, ensuring that maternal and fetal health was prioritized throughout the study.

The yoga protocol consists of a 10-minute session of Sookshma Yogic Vyayama, which includes various neck, wrist, and shoulder exercises for overall body loosening. This is followed by 25 minutes of asanas, incorporating standing postures like Tadasana and sitting postures such as Bhadrasana, along with prone and supine postures to promote flexibility and strength. The session concludes with 10 minutes of pranayama exercises, including Dheergswas and AnulomVilom, and a meditation component to enhance relaxation and mindfulness.

Real life images of participants practicing Tadasana and meditation under supervision of trained instructor inDepartment of Obstetrics and Gynaecology, SMS Medical College and associated hospitals in Jaipur, Rajasthan.

RESULTS AND DISCUSSION

A total of 200 eligible participants were initially recruited after applying inclusion and exclusion criteria. They were allocated into "Control" and "Intervention" arm through block randomization. During the study period 8 participants in the "Control" group and 13 participants in the "Intervention" group were lost to follow up.

Table 1: Reasons for Loss to follow up in control and intervention

Reason for Loss to follow up	**Control**, N = 8[1]	**Intervention**, N = 13[1]
Discontinued	4 (50%)	7 (54%)
Non-Response	3 (37.5%)	4 (30%)
Obstetric/Medical complications	1(12.5%)	2(16%)
[1]n (%)		

Among the control group, 50% of loss to follow up participants "Discontinued" participation in the study, 37.5% loss to follow up participants became "Non-respondent" to research team, and 12.5% loss to follow up participants were removed from study due to Obstetric/Medical complications.

In the intervention group, 54% loss to follow up participants discontinued participation, 30% became non-responders, 16% developed Obstetric/Medical complications.

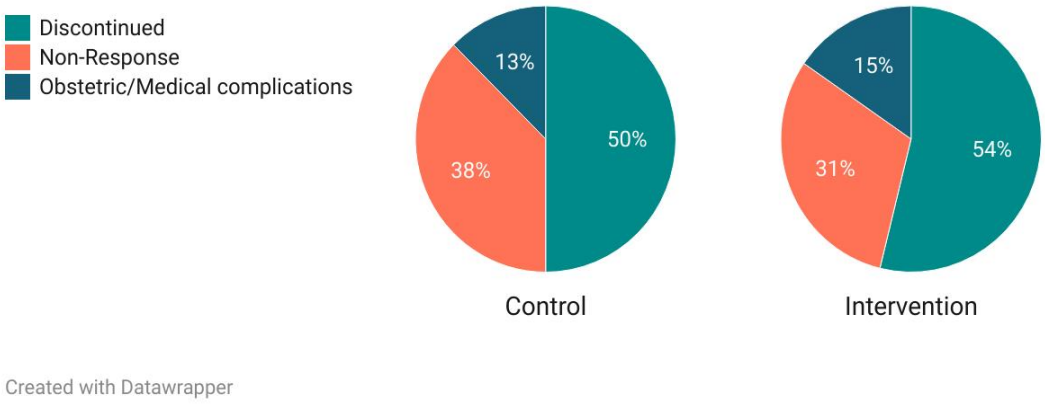

Figure 1: Proportion of Reasons for Loss to Follow up

In this study, median age of control group is 25 (IQ 23.00, 27.00) and that of intervention is 24 (IQ 23.00, 26.00). Hence both groups are comparable.

Table 2: Age Distribution among Control and Intervention groups

Characteristic	**Control**, N = 92[1]	**Intervention**, N = 87[1]
Age (Years)	25.00 (23.00, 27.00)	24.00 (23.00, 26.00)
[1]Median (IQR)		

In this study, 79 (86%) were Hindu and 13 (14%) were Muslim in the control group. 72 (83%) were Hindu and 15 (17%) were Muslim in the intervention group

Table 3: Distribution on the basis of Religion among Control and Interventiongroups

Religion	**Control**, N = 92[1]	**Intervention**, N = 87[1]
Hindu	79 (86%)	72 (83%)
Muslim	13 (14%)	15 (17%)
[1]N (%)		

In the control group 26 (28%) of participants were graduate, 4 (4.3%) were matriculate, 29 (32%) had cleared senior secondary, 15 (16%) had primary education and 18 (20%) were illiterate, Similarly in the intervention group 20 (23%) were graduate, 18 (21%) were matriculate, 16 (18%) had primary education, 16 (18%) had cleared senior secondary and 17 (20%) were illiterate.

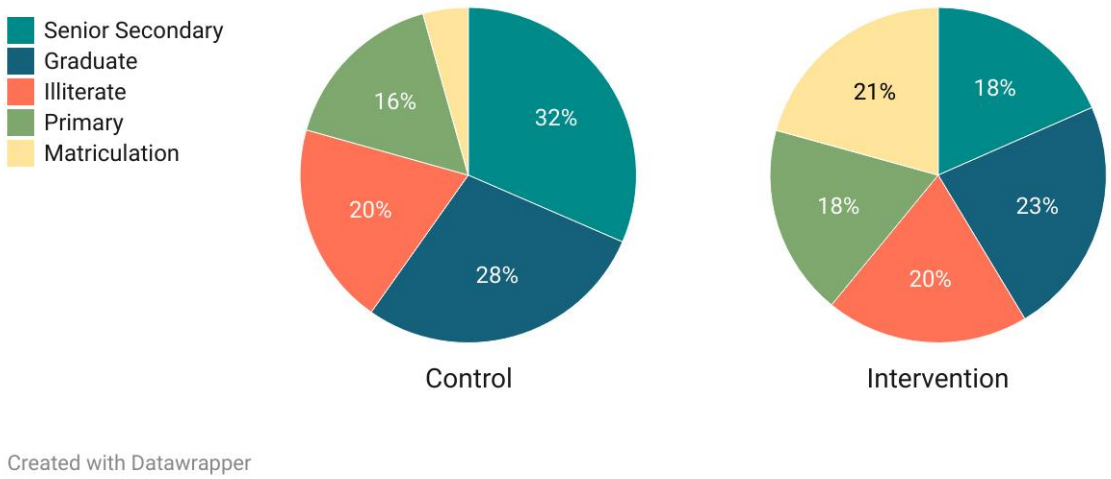

Figure 2: Distribution according to Education level of Participant among Control and Intervention groups

Table 4: Distribution on the basis of Weight among Control and Intervention groups

	Control, N = 92[1]	**Intervention**, N = 87[1]
Weight (kg)	60.2 (57.8, 63.0)	58.3 (55.2, 61.5)
[1]Median (IQR)		

In present study, median weight (prenatal) of control group was 60.2 (IQ 57.8, 63.0) and that of intervention was 58.3 (IQ 55.2, 61.5). As this was not significant both groups were comparable.

Table 5: Distribution on the basis of Height among Control and Intervention groups

	Control, N = 92[1]	**Intervention**, N = 87[1]
Height (m)	1.57 (1.49, 1.62)	1.60 (1.54, 1.65)
[1]Median (IQR)		

In present study, median height of control group was 1.57 (IQ 1.49, 1.62) and that of intervention was 1.60 (IQ 1.54, 1.65). As this was not significant both groups were comparable.

Table 6: Distribution on the basis of presence of induction among Control and Intervention groups

Category	**Control (N=92)**	**Intervention (N=87)**

Induction Required	40 (43%)	27 (31%)

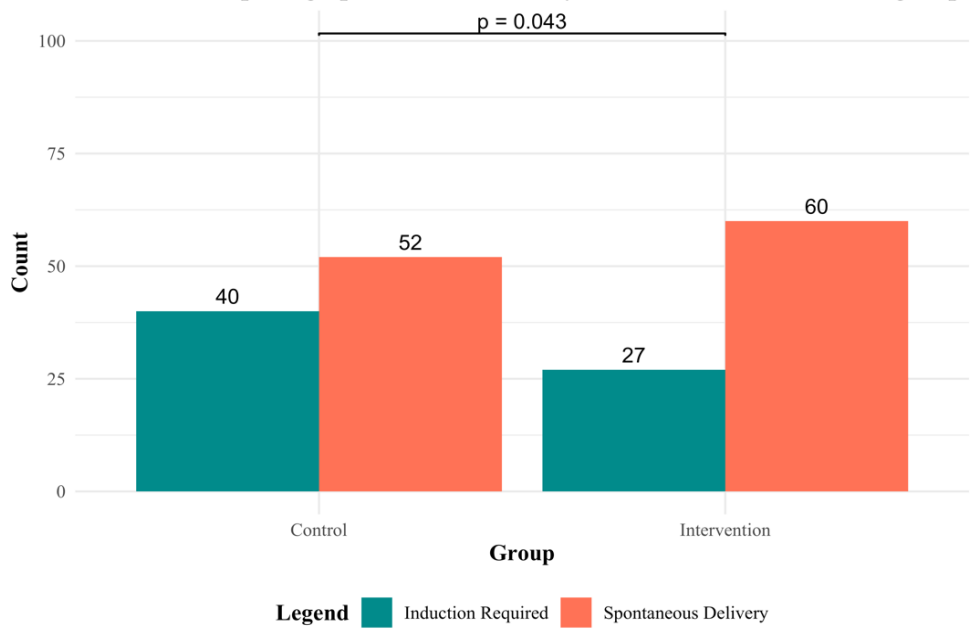

Figure 3: Distribution on the basis of presence of induction among Control and Intervention groups

LeiliYekefallah [3] and colleagues conducted a study titled "The Effect of Yoga on the Delivery and Neonatal Outcomes in Nulliparous Pregnant Women in Iran: A Clinical Trial Study" (2021), which found that yoga exercises significantly decreased the need for labour induction ($p = 0.02$, $\chi^2 = 5.41$). Similarly, Bolanthakodi*et al.*, [4] reported in their study "Prenatal Yoga: Effects on Alleviation of Labour Pain and Birth Outcomes" (2018) that 82% of participants in their yoga group experienced spontaneous labour, compared to only 64% in the control group, with a statistically significant p-value of 0.044.

Several recent studies further support the positive effects of yoga on delivery and neonatal outcomes. A meta-analysis found that prenatal yoga significantly increases the likelihood of vaginal delivery and decreases the incidence of premature births compared to standard care. Specifically, the analysis showed that women practicing yoga had a 71% higher chance of vaginal delivery (OR = 1.71) and a 54% reduction in premature births (OR = 0.46) [5].

Additionally, research indicates that yoga enhances maternal comfort during labour. For instance, a study involving nulliparous women showed that those who participated in yoga classes experienced significantly less pain and greater comfort during labour compared to the control group. The yoga group had shorter labour durations, with the first stage lasting approximately 520 minutes versus 660 minutes in the control group [6].

Overall, these studies highlight the benefits of yoga not only in reducing the need for medical interventions but also in promoting a more natural and less painful labour experience. Integrating yoga into prenatal care may lead to better outcomes for both mothers and their babies, as it encourages relaxation and optimal fetal positioning during labour.

Spontaneous labour is beneficial for various reasons. It often requires fewer medical interventions and complications, such as episiotomies or instrumental deliveries, which can negatively impact recovery. Moreover, spontaneous labour is associated with a lower risk of cesarean sections, which not only shortens recovery time for mothers but also minimizes the potential complications that arise from surgical deliveries.

Additionally, infants born through spontaneous labour typically have better APGAR scores and a reduced need for neonatal intensive care, indicating better immediate health outcomes. The body's natural progression through the stages of labour allows for a more instinctive and less stressful experience for both mother and baby. Conversely, induced labour can be more challenging, often resulting in prolonged labour, an increased likelihood of postpartum haemorrhage, puerperal sepsis, and a higher chance of operative vaginal delivery, which can complicate the birthing experience. Therefore, fostering spontaneous labour through interventions like yoga may enhance overall maternal and neonatal outcomes.

CONCLUSIONS

In urban India, the average age of first pregnancy is around 22.5 years, reflecting better access to education and healthcare. This study included 79% Hindu and 14% Muslim participants in the control group, while the intervention group had 83% Hindu and 17% Muslim participants, mirroring Jaipur's demographics [9]. Education levels were similar, with 60% of the control group and 62% of the intervention group having completed higher secondary education or above. Median prenatal weight was 60.2 kg for the control group and 58.3 kg for the intervention group, while median heights were 1.57 m and 1.60 m, respectively, aligning with ICMR standards [7, 8].

In the intervention group, 27 participants (31%) required labour induction, while 60 participants (69%) experienced spontaneous labour. Conversely, in the control group, 40 participants (43%) underwent induction, with 52 participants (57%) achieving spontaneous labour, highlighting a statistically significant difference ($p = 0.043$). Women who practiced yoga demonstrated a notably higher rate of spontaneous labour onset, which reduced the need for medical induction and its associated risks. Furthermore, the study indicated a lower incidence of cesarean sections in the yoga group, suggesting that yoga may enhance optimal fetal positioning and facilitate natural labour processes, ultimately leading to a greater number of normal vaginal births.

Ethics approval and consent to participate

Ethical clearance was taken from the "Research and Review Board" of SMS Medical College and written and informed consent was taken from all participants involving.

List of abbreviations

If abbreviations are used in the text they should be defined in the text at first use, and a list of abbreviations should be provided.

Conflicts of Interest: The author(s) declare(s) that there is no conflict of interest regarding the publication of this paper.

Supplementary Materials:YOGA PROTOCOL

Sookshma Yogic Vyayama (10 minutes):

Neck exercise
Loosening fingers
Wrist movement
Elbow movement
Shoulder movement
Hand stretch
Chest exercise
Ankle exercise

Asanas (25 minutes):

Standing Postures
Tadasana
TriyakaTadasana
Ardhkatichakrasana
Katichakrasana
Sitting postures:
Utkatasana
Bhadrasana
Dandasana
Vajrasana
Prone Posture:
Marjariasana
Supine posture:
Savasana (left lateral)

Pranayama (10 minutes):

Dheergswas
Anulomvilom
Sitli
Sitkari
Bhrameri
Om Chanting

Meditation

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