

## The Influence of Hatha Yoga on Birth Outcomes of First-time Mothers

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### Abstract:

*This research work has examined the effect of yoga on pain intensity and fetal outcome during the process of labour among primi gravid women through Quasi experimental design which was conducted with 260 primi gravid women with equal members in both the Yoga and Control arms. The yoga arms were involved in four sessions a week during the intensive phase, followed by practice sessions for 3 days a week, and each session lasted for 45 minutes. The planned asanas were taught within the set time limits and they were asked to practice the same under researcher's guidance. Their performances were assessed during 7<sup>th</sup>, 8<sup>th</sup> and 9<sup>th</sup> month. The Yoga group was found to have significant drift which showed decreased labour pain, improved Apgar score and birth weight of the babies than the control group. The results were supporting that an integrated approach of yoga during pregnancy is safe. Better labour outcomes with less pain during stage I and stage II of labour helped in promoting bonding between mother and child in the initial start of newborn life.*

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**Key words:** Yoga, Labour pain, Fetal outcome, Birth weight, Apgar score

## **Introduction:**

Labour is a very painful event for most of the women. The degree of pain and women's ability to cope with it are influenced by numerous factors, including ethnic, cultural practices, psychological factors, the quality and frequency of contractions, the size and position of the fetus, and the use of painful obstetric interventions [1]. Even though delivery is a natural phenomenon pain is considered severe or extreme in more than half of cases. Besides conventional approaches, many complementary or alternative methods have been reported to reduce pain during labour and delivery (Le Carayol, Breart, Goffinet 2007). Most women in labour require pain relief. Pain management strategies include non-pharmacological interventions (that aim to help women cope with pain in labour) and pharmacological interventions (that aim to relieve the pain of labour). Controlling the pain without harm to mother, fetus, or labour progress remains a major focus in maternity care. Despite vast improvements in pharmacologic methods of pain relief, the so-called gold standard, the epidural block in its myriad forms, requires highly trained staff, as it is an elaborate procedure which requires numerous safeguards<sup>1</sup>. In this study the effect of selected asanas including relaxation asana and pranayama on labour pain and fetal outcome was assessed.

The non-pharmacologic approach to pain includes a wide variety of techniques to address not only the physical sensations of pain but also to prevent suffering by enhancing the psycho emotional and spiritual components of care. Pain is perceived as a side effect of a normal process, not a sign of damage, injury, or abnormality. Rather than making the pain disappear, the midwife and other caregivers assist the woman to cope with it, build her self-confidence, and maintain a sense

of mastery and well-being. In fact, the element that best predicts a woman's experience of labour pain is her level of confidence in her ability to cope with labour [2].

The management of labour pain is one of the main goals in maternity care. The two models of care, often referred to as the medical model and the midwifery model, use fundamentally different means to achieve that end. In the former, the emphasis is largely on the elimination of the physical sensation of labour pain, whereas in the latter, emphasis is largely on the prevention of suffering. Suffering includes any of the following psychological elements: a perceived threat to the body and/or psyche; helplessness and loss of control; distress; insufficient resources for coping with the distressing situation; even fear of death of the mother or baby [3].

Complementary therapies are increasingly popular with expectant mother and are gradually being integrated into conventional maternity care, primarily by midwives (Train et al., 2004). Yoga is a complete holistic mind-body discipline used for overall health and well-being. Thus practicing prenatal yoga trains the mother to utilize deep breathing and relaxation to cope up with pregnancy changes and there by prepare her body for childbirth, all the way from pre conception into motherhood [4].

### **Background of the study:**

Mind-body interventions such as relaxation, meditation, visualization and breathing were commonly used for labour, and can be widely accessible to women through teaching during antenatal classes [2]. Yoga, meditation and hypnosis may not be so accessible to women, but together these techniques may have a calming effect and help the women to manage, by providing distraction from pain and tension [5].

Another similar study on Yoga during pregnancy, effects on maternal comfort, labour pain and birth outcomes-A

randomized trial was conducted among 74-primigravid women who were equally divided into two groups (experimental and control). The yoga program involved six, 1-h sessions at prescribed weeks of gestation was given to the mothers. Maternal comfort, labour pain and birth outcomes were assessed. The experimental group was found to have higher levels of maternal comfort during labour and 2h post-labour, and experienced less labour pain and shorter duration of the first stage of labour, than the control group [6]. The influence of hatha yoga on birth outcomes of first-time mothers was studied in New Zealand by Moore, Sharon Dee (2010) [7]. This study of antenatal yoga among first-time mothers found that the practice of antenatal yoga to be safe and associated with a number of benefits in the outcomes including birth weight and 1 minute apgar score and nature of delivery. Other complementary therapy methods adopted to reduce labour pain were also reviewed.

Effectiveness of touch and massage in reducing pain and suffering during labour was assessed. One of the trials [8] included in the systematic review studied it among 90 women. The "touch" group received 5 to 10 seconds of reassuring touch each time the woman expressed anxiety during a 30-minute period between 8- and 10-cm dilation. The control group mothers received usual care. The women's blood pressure and the number of expressions of anxiety significantly were decreased in the "touch" group. The postpartum assessments of anxiety during the study period were low in the "touch" group. The second trial of massage [9] described in the systematic review was compared with (N = 28) out of randomized women who received either usual care (control group). Massage of head, back, hands, and feet was given by their partners was given for 20 minutes per hour for 5 hours during labour. The frequent massage reduced the women's pain and anxiety and improved their mood.

Report of study relating to change of position, on

labouring women to make them more comfortable was reviewed [10]. The summary, of these trials in both the first and second stages of labour suggested that the use of upright positions, interspersed with other positions, decreases pain and may shorten labour. Skilnand et al. compared a "real" acupuncture group (n = 106) with a "false" or "minimal" acupuncture group (i.e., needles were inserted shallowly in non-acupuncture points) (n = 102). [10] Pain assessments was carried out by 11-point visual analog scale before the acupuncture was started pain was same in the 2 groups but significantly lower in the real acupuncture group 30, 60, and 120 minutes after acupuncture was given. Assessments at 2 hours postpartum period and during labour were also lower in the real acupuncture group. Furthermore, in the real acupuncture group, there was significantly less need for epidural analgesia (10% Vs. 25.5%,  $P = .01$ ) or Pethidine (Demerol) (14% vs 35%,  $P < .001$ ) [11]. The reviewed studies on the following therapy like touch, massage, change of position, acupuncture etc., showed effectiveness in reducing labour pain and labour duration. These literatures confirms that there is significant supportive evidence of the effect of non-pharmacological intervention on labour outcome

## **Methodology:**

### **Objective:**

The work was aimed to assess the effect of pregnancy yoga on pain intensity and fetal outcome during the process of labour among primi gravid women.

### **Design:**

A Quasi experimental research design was conducted with 260 primi gravid women's equally in the Yoga and Control arms. The work was processed in the two different health centers which were made to have similar study settings as per the

principles quoted by the ethical committee. The recruits were the Primi mothers who were in low risk group at the gestational age of 20-22 weeks. The yoga arms were involved for a four sessions in a week during the intensive phase, followed by practice sessions for 3 days a week, and each session lasted for 45minutes. The planned asanas were taught within the set time limits. In between, relaxation time was given to the mothers by sitting relaxation posture (extending the legs). The mothers were asked to practice the same under researcher's guidance. Their performance in doing yoga was assessed during 7<sup>th</sup>, 8<sup>th</sup> and 9<sup>th</sup> month and recorded accordingly. Their practice of yoga was recorded in data sheet which included 31 calendar dates.

Control arm mothers were also monitored and routine care was given. The following labour outcome was assessed during the labour process of the mothers. Pain I was assessed during 5-6 cm dilatation and pain II was assessed just immediately after the delivery of the baby, fetal wellbeing i.e., apgar and birth weight of baby was assessed as outcome.

## **Results:**

Data were double-verified, entered and analysed using SPSS version 14.0 (Statistical Package for the Social Sciences Inc, Chicago, IL, USA). Variables were expressed in terms of proportions and Percentages. Statistical differences between the control and yoga groups were determined with chi-square test and Yates correction except when expected values of less than 5 required the use of the Fisher exact test. Significance was determined at 5%. Crude odds ratios (OR) and 95% confidence intervals (CI) were determined using the Controls as the reference group. The results were grouped in two categories those pertaining to normal delivery and those to all type of delivery. Pain I and Pain II was compared with normal delivery whereas fetal outcome was compared for all type of delivery.

Initially, they were checked for their homogeneity in the baseline characters such as age, Residence, Marriage Type, Food Habit, Education, Income, Occupation, relaxation, Personal Hygiene and Family Type.

In that Table 1 shows that the Residence of the cases alone having heterogeneity due to the locality of the study centers at 5% level of significance. Similarly, the psychological factors such as support, Stress and Sadness were not significant between the control and yoga group. But, there is an upright observation in the yoga practitioners.

Variables		Group		$\chi^2$
		Control n (%)	Yoga n (%)	(P-Value)
Age	20 - 25 Years	64 (49.2)	69 (53.1)	0.385
	>25 Years	66 (50.8)	61 (46.9)	(0.535)
Residence	Urban	18 (13.8)	39 (30.0)	
	Rural	80 (61.5)	79 (60.8)	16.834
	Semi-Urban	32 (24.6)	12 (09.2)	(0.001)
Marriage Type	Consanguineous	17 (13.1)	18 (13.8)	0.033
	Non-Consanguineous	113 (86.9)	112 (86.2)	(0.856)
Food Habit	Vegetarian	13 (10.0)	13 (10.0)	
	Ova-Vegetarian	02 (01.5)	08 (06.2)	3.761
	Non-Vegetarian	115 (88.5)	109 (83.8)	(0.153)
Sleep & Rest	< 6 Hrs	00 (00.0)	1 (00.8)	
	6 - 8 Hrs	51 (39.2)	60 (46.2)	2.424
	8 - 10 Hrs	77 (59.2)	67 (51.5)	(0.489)
	> 10 Hrs	2 (01.5)	2 (01.5)	
Personal Hygiene	Good	4 (03.1)	10 (07.7)	
	Moderate	34 (26.2)	39 (30.0)	3.613
	Poor	92 (70.8)	81 (62.3)	(0.164)
Family Type	Nuclear	47 (36.2)	49 (37.7)	0.066
	Joint	83 (63.8)	81 (62.3)	(0.797)
Education	Primary	15 (11.5)	15 (11.5)	
	Middle	21 (16.2)	18 (13.8)	
	High	28 (21.5)	19 (14.6)	3.075
	Higher Secondary	50 (38.5)	61 (46.9)	(0.545)
	College & Above	16 (12.3)	17 (13.1)	
Occupation	Housewife	62 (47.7)	79 (60.8)	
	Skilled Worker	30 (23.1)	17 (13.1)	6.606
	Unskilled Worker	25 (19.2)	19 (14.6)	(0.086)
	Professional	13 (10.0)	15 (11.5)	
Income (Yearly)	Upto 40000	02 (01.5)	01 (00.8)	
	40001 – 80000	62 (47.7)	52 (40.0)	2.113
	80001 – 120000	55 (42.3)	63 (48.5)	(0.549)

	> 120000	11 (08.5)	14 (10.8)	
Social Support (Husband)	Poor	03 (02.3)	03 (02.3)	
	Mild	45 (34.6)	45 (34.6)	0.327
	Moderate	63 (48.5)	66 (50.8)	(0.955)
	Good	19 (14.6)	16 (12.3)	
Social Support (In Law)	Poor	11 (08.5)	09 (06.9)	
	Mild	45 (34.6)	52 (40.0)	1.026
	Moderate	65 (50.0)	62 (47.7)	(0.795)
	Good	09 (06.9)	07 (05.4)	
Social Support (Parent)	Poor	05 (03.9)	02 (01.6)	
	Mild	51 (39.2)	58 (44.6)	3.68
	Moderate	35 (26.9)	41 (31.5)	(0.298)
	Good	39 (30.0)	29 (22.3)	
Stress	Never	28 (21.5)	44 (33.8)	
	Sometimes	56 (43.1)	52 (40.0)	5.504
	Often	46 (35.4)	34 (26.2)	(0.064)
Sad	Never	32 (24.6)	38 (29.2)	
	Sometimes	85 (65.4)	76 (58.5)	1.328
	Often	13 (10.0)	16 (12.3)	(0.515)
Total		130 (50.0)	130 (50.0)	

**Table1: Comparison of Socio-Demographic profile of mothers**

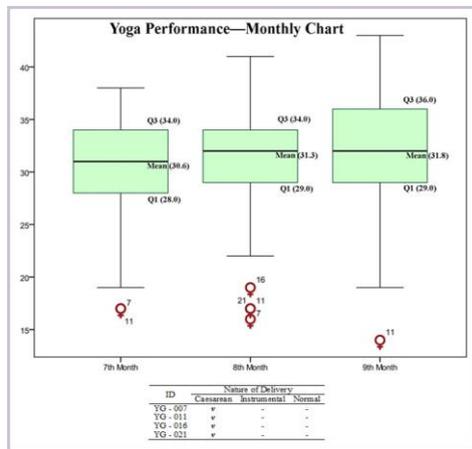
In the nature of delivery, the normal delivery was higher in the yoga (58.5%) when compared to the control (44.6%) whereas the instrumental and caesarean cases were lower in the yoga arms. After excluding the caesarean cases from the data which revealed that there was significant association in pain I, pain II, Apgar score and Birth weight among the groups at 5% level of significance using Chi square association test in Table 2.

Outcome Variables		Group		Total	$\chi^2$ (Sig. (2 - Tailed))
		Control n (%)	Yoga n (%)		
Pain I	Worst Pain	63 (61.8)	35 (32.1)	98 (46.4)	18.629
	Dreadful Pain	39 (38.2)	74 (67.9)	113 (53.6)	(0.001)
Pain II	Worst Pain	40 (39.2)	19 (17.4)	59 (28.0)	12.414
	Dreadful Pain	62 (60.8)	90 (82.6)	152 (72.0)	(0.001)
Nature of Delivery	Abnormal	44 (43.1)	33 (30.3)	77 (36.5)	3.761
	Normal	58 (56.9)	76 (69.7)	134 (63.5)	(0.052)
Apgar Score	5 to 7	03 (02.9)	16 (14.7)	19 (09.0)	8.86
	8 to 10	99 (97.1)	93 (85.3)	192 (91.0)	(0.003)
Birth	1.5 to 3 Kg	62 (60.8)	51 (46.8)	113 (53.6)	4.149

Weight	> 3 Kg	40 (39.2)	58 (53.2)	98 (46.4)	(0.042)
Fetal Distress	No	83 (81.4)	96 (88.1)	179 (84.8)	1.839
	Yes	19 (18.6)	13 (11.9)	32 (15.2)	(0.175)
Total		102 (100.0)	109 (100.0)	212 (100.0)	

**Table 2: Comparison of labour outcome among the Normal Delivery Cases.**

In both the pain types, the worst pain was highly associated with the control groups. Similarly, the Apgar score and Birth weight showed significant difference which has higher apgar score and birth weight were associated with the yoga arms. The yoga performance were scored and assessed with the outcomes which also indicated that good performances ended with better outcome. Low performance mothers ended with more of operative delivery (Fig. 1.).



**Figure 1: Yoga Performance**

The binary logistic regression was performed using Enter method which showed that the outcome factor in both arms seemed to significantly different i.e., outcome Pain I was 27.9% varied in the worst and dreadfulness with an Odds Ratio: 0.345 (0.184 to 0.647),  $P < 0.001$ , which revealed that 65.5% better outcome in Pain I i.e., during first stage of labour of yoga arm. Pain II i.e., during second stage of labour was 21.8% varied in the worst and dreadfulness with an Odds Ratio: 0.173 (0.079 to 0.352),  $P < 0.001$ , which indicated that 82.7% mothers had

better coping during the second stage labour pain in yoga arm. Nature of Delivery was 12.8% varied in the abnormal and normal with an Odds Ratio: 0.239 (0.105 to 0.545),  $P < 0.001$ , which proved that 76.1% betterment in the nature of delivery among yoga arm. Apgar scores were significant with an Odds Ratio: 8.817 (2.023 to 38.423),  $P < 0.010$  which was influenced by the practice of yoga as shown in Table 3.

Factors	B	S.E.	Wald	df	Sig.*	Exp(B)	95% C.I.for	
							EXP(B)	Upper
Pain I	-1.063	0.320	11.018	1	0.001	0.345	0.184	0.647
Pain II	-1.753	0.403	18.885	1	0.000	0.173	0.079	0.352
Nature of Delivery	-1.432	0.421	11.578	1	0.001	0.239	0.105	0.545
Apgar Score	2.177	0.751	8.401	1	0.004	8.817	2.023	38.423
Birth Weight	-0.328	0.320	1.055	1	0.304	0.720	0.385	1.348
Fetal Distress	0.443	0.522	0.722	1	0.395	1.558	0.560	4.332
Constant	1.252	0.640	3.831	1	0.050	3.498		

\*Control Arm was Taken as reference at 5% level of Significance thru Enter method.

**Table 3: Factors Influenced by yoga practices**

Though there is a difference in fetal distress and birth weight, it doesn't have statistical significance. The procedure was repeated with the step wise algorithm which indicated that Pain in both the first and second stage labour, Nature of delivery and Apgar score were significant at entry 5% and Removal 10% level of significance.

### Discussion:

The nature of pain, delivery and duration of delivery influences fetal health. Respiratory Distress Syndrome is five times more likely to occur in infants born by c-section than those born by vaginal delivery (Levine, Ghai, Barton, & Strom, 2001). These complications may be due to increased fluid in the infant's lungs after a c-section birth. Wall and Malzack (2005) [5] believed that pain must be relieved effectively because severe and continuous pain accompanied with stress reactions has

harmful effects on mother and probably the fetus and newborn.

Another study by Bagharpoosh, G. Sangestan et al. (2010)<sup>[6]</sup> also presented the same findings, in which 62 pregnant women during their labour were selected using convenience sampling and were divided randomly in two groups. The first group (control) received routine way of care during their labour and the second group (test) went through the relaxation technique after training. The intensity of pain was determined using a standard pain number rating scale, and the behavioral reactions were recorded using an observational checklist. The findings showed significant difference in intensity of pain and also between the behavioral reactions between the two groups.

### **Conclusion:**

The findings of the study revealed that practicing yoga helped in improving coping with labour pain, and better fetal outcome among primi gravid women.

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