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Awareness of Prenatal Suryanamaskar among Indian Women of Childbearing Age: A Cross-Sectional Study

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Abstract: ***Pregnancy is a period of physiological musculoskeletal and psychological changes that may affect physical activity, posture, mobility, sleep and overall well-being. Suryanamaskar is a traditional yoga sequence, while Prenatal Suryanamaskar consists of pregnancy-adapted practice focusing on slower transitions, breathing control and appropriate modifications. This cross-sectional observational study assessed awareness of Prenatal Suryanamaskar among 200 Indian women aged 18–45 years from urban community settings. Participants were recruited through an offline survey and completed a self-developed validated questionnaire reviewed by three subject experts. The questionnaire assessed demographic characteristics, general awareness of yoga and Suryanamaskar, and awareness of Prenatal Suryanamaskar, including modifications, safety precautions and potential benefits. Descriptive analysis was performed using Microsoft Excel. General awareness was high, with 94.5% of participants familiar with yoga and 82.5% having heard of Suryanamaskar. However, only 20.0% had come across the term Prenatal/Antenatal Suryanamaskar and 23.5% knew that it is specifically adapted for pregnant women. The findings indicate limited awareness regarding pregnancy-specific modifications, safety considerations and potential benefits of Prenatal Suryanamaskar.***

Keywords: Prenatal Suryanamaskar; Yoga; Pregnancy; Awareness; Antenatal Exercise

1. Introduction

Suryanamaskar (Sun Salutation) is a traditional yogic sequence consisting of twelve postures performed in rhythmic flow with synchronized breathing. It integrates physical movement, breathing and mental focus and has been associated with improvements in muscular strength, flexibility, endurance and physical conditioning. [1] Prenatal Suryanamaskar is described as a modified form of the classical sequence adapted to the anatomical and physiological requirements of pregnancy. The adaptations include slower transitions, simplified postures and conscious breathing, while unsuitable movements are modified or avoided. [2]

Evidence summarized in the study project indicates that prenatal yoga is associated with maternal physical and psychological well-being, including reduced stress and anxiety, and has been investigated in relation to sleep, posture, flexibility and pregnancy-related outcomes. [3] [4] [5] [6] [7] [8] However, much of the existing literature evaluates the effects of prenatal yoga interventions rather than the level of awareness women have about pregnancy-specific practices.

Pregnancy is accompanied by substantial physical, structural and emotional changes. Musculoskeletal discomfort, postural changes, anxiety and sleep disturbances are commonly reported. [11], [12], [13], [14], [15], [16] Therefore, understanding community awareness of safe and appropriately modified prenatal exercise practices is relevant to maternal health. Although yoga is widely known in India, limited information is available regarding awareness of Prenatal Suryanamaskar specifically among women of childbearing age. The present study therefore assessed awareness of Prenatal Suryanamaskar among Indian women aged 18–45 years, with particular attention to its concept, modifications, safety considerations, precautions and perceived benefits.

2. Literature Survey

Previous literature has primarily examined the effects and acceptability of prenatal yoga rather than awareness of specific pregnancy-adapted practices. Studies have reported associations between prenatal yoga and psychological outcomes such as anxiety and stress [3], [4] while randomized trials have examined pregnancy and maternal outcomes in women participating in yoga-based interventions. [2], [5] Meta-analyses have also examined delivery outcomes and labour-related pain and duration.[6], [7]

A systematic review of yoga for pregnant women highlighted the growing evidence base while identifying the need for further research.[8] In India, a cross-sectional survey among pregnant women in rural Maharashtra found that 16.7% practiced yoga during pregnancy and 53.9% considered yoga acceptable as part of antenatal care [20] The project literature also included research on awareness of antenatal exercises and studies examining pregnancy-related postural and psychological concerns. [10], [11], [12] [13], [14], [19]

The available literature therefore provides evidence regarding prenatal yoga practice, outcomes and acceptability, but

comparatively limited information is available on awareness of Prenatal Suryanamaskar among women of childbearing age. The present study was undertaken to address this awareness gap.

3. Problem Definition

Despite widespread familiarity with yoga and traditional Suryanamaskar, women of childbearing age may have limited knowledge regarding pregnancy-specific adaptations, safety considerations, precautions and potential benefits of Prenatal Suryanamaskar. The problem addressed in this study was the limited information available regarding awareness of Prenatal Suryanamaskar among Indian women aged 18–45 years.

4. Methodology / Approach

A cross-sectional observational study was conducted among 200 Indian women of childbearing age (18–45 years) residing in urban community settings. Participants were recruited through offline community-based surveys from residential areas, educational institutions and women's groups. The sampling technique was simple random sampling. Women aged 18–45 years who were willing to participate and provide informed consent were included. Adults in the healthcare profession and yoga professionals or certified yoga practitioners were excluded.

Data was collected using a self-developed, self-validated questionnaire. Validation was performed by three subject experts. The questionnaire consisted of 29 multiple-choice questions divided into three domains: demographic details (4 questions), general awareness of yoga and Suryanamaskar (6 questions), and awareness of Prenatal Suryanamaskar (19 questions). The questionnaire was available in English, Hindi and Marathi and could be self-administered or interviewer-assisted when required.

Participants were provided with information regarding the purpose and nature of the study and gave written informed consent before participation. Confidentiality and anonymity were maintained. Ethical approval was obtained from the Institutional Ethics Committee (Registration No. EC/NEW/INST/2023/3576;ReferenceNo.KJSCPT/922-A/25-26)before commencement of the study. Descriptive analysis was performed using Microsoft Excel.

5. Results & Discussion

The age distribution of the 200 participants covered the full 18–45-year range, with the largest groups in the 23–27 and 33–37-year categories (18.5% each).

Table 1: Distribution of participants according to age

Age group	Frequency	Percentage
18–22	35	17.5%
23–27	37	18.5%
28–32	35	17.5%
33–37	37	18.5%
38–42	30	15.5%
43–45	26	13.0%
Total	200	100%

Table 2: Participants' responses regarding knowledge and awareness of Prenatal Suryanamaskar

Q.	Question	Yes	No	Not Sure
1	Are you familiar with the concept of yoga?	94.5%	3.5%	2%
2	Have you heard of Suryanamaskar/ aware of 12 postures?	82.5%	10.5%	7%
3	Do you think Yoga should be tailored to different stages of life? (eg. pregnancy, old age)	83.0%	6.5%	10.5%
4	Have you heard of Prenatal/ Antenatal Suryanamaskar?	20.0%	64.4%	15.5%
5	Do you Know it is specially adapted version for pregnant women?	23.5%	59.5%	17.0%
6	Are you aware that Prenatal Suryanamaskar is done slowly, emphasizing breath control?	27.0%	56.0%	17.0%
7	Are you aware that pregnant women should perform Suryanamaskar under the supervision of a qualified instructor?	46.5%	36.0%	17.5%
8	Do you know the potential health conditions (eg. vaginal bleeding, hypertension, severe pain below the belly)	42.0%	40.0%	18.0%
9	Do you think medical approval should be obtained by a gynecologist before starting prenatal suryanamaskar?	51.0%	25.0%	24.0%
10	If medically advised, can pregnant women perform suryanamaskar during all three trimesters?	27.5%	34.0%	38.5%
11	Do you think practicing prenatal suryanamaskar helps in maintaining fitness during pregnancy?	44.0%	35.0%	21.0%
12	Do you think it enhances flexibility, strength, and posture during pregnancy?	46.0%	34.0%	20.0%
13	Do you think it can help in reducing anxiety and emotional stress?	48.0%	33.0%	18.5%
14	Do you think it contributes to better breathing patterns and improves sleep quality for expectant mothers?	50.0%	30.0%	20.0%
15	Do you think practicing Prenatal Suryanamaskar helps in getting ready for child birth?	31.5%	37.0%	31.5%
16	Do you believe yoga may have risks during pregnancy if done incorrectly ?	51.0%	29.0%	20.0%
17	Do you think Women without prior yoga experience can safely practice Prenatal Suryanamaskar?	29.0%	41.0%	30.0%

This study found that although general awareness of yoga (94.5%) and Suryanamaskar (82.5%) was high among the 200 women surveyed, awareness of its prenatal-specific adaptation was considerably lower, with only 20% having heard the term "Prenatal Suryanamaskar" and just 23.5% aware that it is a version specifically modified for pregnancy. Knowledge regarding its safety requirements, physiological benefits, and role in labor and complication prevention was similarly limited across most domains. These findings suggest that while women broadly accept that yoga should be

adapted across life stages, they lack the specific knowledge needed to safely and confidently adopt Prenatal Suryanamaskar during pregnancy

Suryanamaskar is a traditional Indian practice that involves a series of postures designed to enhance strength, flexibility and endurance simultaneously.[1] A similar practice specifically for pregnant women is prenatal suryanamaskar, taking into account the contraindicated positions during pregnancy.[2] The inclusion of such practices in antenatal care is essential as it is a form of exercise that requires minimal effort but maximum benefits, focusing on all aspects: strength, flexibility and endurance as well as mental health.

The physiological rationale for these maternal benefits lies largely in the practice's effect on the autonomic nervous system. The slow, breath-synchronized movement pattern of Suryanamaskar emphasizes prolonged exhalation and rhythmic diaphragmatic breathing, which is known to downregulate sympathetic overactivity. This calming effect is reflected in the reduction of circulating cortisol and self-reported anxiety observed with regular yoga practice during pregnancy [3],[4],[18] By lowering this stress-axis activity, prenatal Suryanamaskar may help counter the elevated physiological stress that pregnancy itself often produces, supporting greater emotional and circulatory stability through gestation. This directly results in better maternal blood pressure regulation. This calming shift in the nervous system also has a direct bearing on blood pressure regulation. As the body moves into this more relaxed physiological state, blood vessels widen and offer reduced peripheral resistance to blood flow, which in turn lowers pressure within the circulatory system. This provides a plausible physiological explanation for the finding that structured yoga practice reduces the incidence of pregnancy-induced hypertension and related complications in high-risk pregnancies,[5] since the same relaxation response responsible for the earlier reductions in cortisol and anxiety may also be easing the vascular strain that contributes to elevated blood pressure during pregnancy. ACOG's guidelines support this link directly, recommending moderate exercise with proper clearance and modification as a means of protecting against hypertensive disorders in pregnancy.[21] The postural transitions in Suryanamaskar are also likely to improve venous return, and by extension, blood flow to the uteroplacental unit.[5]

There's also a clear structural reason the practice helps with labor. Several of the postures, the lunge (Ashwa Sanchalanasana) in particular, along with the modified forward bends stretch and open up the hip flexors, adductors, and pelvic floor. This lines up with the reported gains in flexibility, posture, and balance among pregnant practitioners,[11]and with physiotherapy research showing that correcting pregnancy-related postural and pelvic misalignment cuts down on musculoskeletal strain and fall risk.[12] This same hip and pelvic mobility connects directly to the low awareness around childbirth preparation noted above: meta-analyses of prenatal yoga report shorter labor duration and reduced labor pain [6],[7] most plausibly because a more mobile pelvic girdle facilitates fetal descent and rotation during the first stage of labor, while the accompanying reduction in muscular tension and anxiety lowers pain perception.

These benefits are not limited to pregnancy and labor alone they may extend meaningfully into the postpartum period as well. Postpartum depression and anxiety are common yet frequently under-recognized complications of childbirth, and community-based data show they affect a meaningful proportion of women, with symptoms often dismissed as a normal part of new motherhood rather than identified and addressed. A meta-analysis of randomized controlled trials has shown that yoga practiced during pregnancy significantly reduces postpartum depression symptoms compared to standard care. Given that this study found awareness of Prenatal Suryanamaskar's anxiety and stress-reducing benefits during pregnancy to already be limited (48%), it is reasonable to infer that the practice's protective role in postpartum mental health is even less recognized among this population.This represents a further dimension of the awareness gap that antenatal counselling could address.By the third trimester, most women deal with increasing back pain, pelvic heaviness, and general physical fatigue simply because of the growing size and weight of the baby. Prenatal yoga has been shown to ease exactly this kind of discomfort during the third trimester. [14] Since participants in this study showed only moderate awareness of Prenatal Suryanamaskar's effect on posture and flexibility (46%), it is likely that this more immediate comfort benefit is even less recognized, even though it may be one of the easier benefits to help a pregnant woman appreciate.

Prenatal Suryanamaskar also helps prevent some serious pregnancy complications, not just improve comfort. One study found that women who practiced yoga during high-risk pregnancies had fewer cases of high blood pressure, preeclampsia, gestational diabetes, and slow fetal growth, compared to women who did not practice yoga.[5] Their babies also had better birth weights and APGAR scores at birth. Another study found similar results women who did yoga had less preeclampsia and fewer early deliveries, and their babies were healthier at birth.[2] A third study looked specifically at women already at risk of high blood pressure in pregnancy, and found that 20 weeks of yoga reduced their chances of developing hypertension and improved outcomes for both mother and baby.

These findings matter because preeclampsia and high blood pressure are two of the most common and dangerous problems in pregnancy. If a simple practice like Prenatal Suryanamaskar can lower this risk, then not knowing about it becomes a real problem, not just a small gap in knowledge. In this study, only 42% of women knew which health conditions could make Prenatal Suryanamaskar unsafe during pregnancy, and only 51% thought a doctor's approval was needed before starting. This means most women do not have the information they would need to safely use Prenatal Suryanamaskar to help protect themselves from these complications.

Taken together, these findings suggest that the barrier to Prenatal Suryanamaskar's wider adoption is not a lack of belief in yoga's value during pregnancy, but limited knowledge of its technique, its safety requirements, and the benefits spanning maternal comfort, labor preparation, postpartum mental health, and the prevention of serious complications like hypertension and preeclampsia actually

occur. Addressing this gap through antenatal counselling, involving physiotherapists, obstetricians, gynecologists, and certified prenatal yoga instructors, could meaningfully improve both awareness and safe practice of Prenatal Suryanamaskar among Indian women of childbearing age.

6. Conclusion

The findings of the present study show that women of childbearing age were generally familiar with yoga and traditional Suryanamaskar, but awareness of Prenatal Suryanamaskar was considerably lower. Although 94.5% of participants were familiar with yoga and 82.5% had heard of Suryanamaskar, only 20.0% had heard of Prenatal Suryanamaskar. Awareness regarding pregnancy-specific modifications, safety precautions and potential benefits was also limited. These findings highlight the need for clear and reliable information regarding Prenatal Suryanamaskar through appropriate antenatal and community-based education.

7. Future Scope

Further studies can include larger and more diverse populations to assess awareness across different geographical and socioeconomic groups. Future research may evaluate awareness and acceptability following structured educational interventions and may examine pregnancy-specific Suryanamaskar practices in appropriately designed clinical studies.

Declarations

Ethical Approval: Approved by the Institutional Ethics Committee.

Informed Consent: Written informed consent was obtained from participants.

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Conflict of Interest: The authors declare that they have no conflict of interest.

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