

Knowledge, Attitude and Practise Regarding Antenatal Exercises Among Pregnant Women Attending Tertiary Care Hospital

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ABSTRACT

Background: Antenatal exercise is an essential component of maternal care, contributing to improved physical and psychological well-being of pregnant women. Despite established guidelines recommending regular physical activity during pregnancy, adherence remains low, often due to inadequate knowledge, misconceptions, and lack of guidance. Assessing knowledge, attitude, and practice (KAP) regarding antenatal exercise is important to identify gaps and inform interventions.

Methodology: A hospital-based cross-sectional study was conducted among 100 antenatal women attending the outpatient department of a tertiary care hospital. Participants were selected using convenient sampling. Data were collected using a pre-designed semi-structured questionnaire covering socio-demographic details, obstetric characteristics, and KAP regarding antenatal exercise. Knowledge, attitude, and practice were scored and categorized using standard criteria. Data were analyzed using descriptive statistics, and associations between variables were assessed using the Chi-square test, with $p < 0.05$ considered statistically significant.

Results: The majority of participants were aged 21–25 years (36%) and resided in urban areas (66%). Moderate knowledge was observed in 45% of women, while 30% had poor knowledge. A positive attitude was reported by 53% of participants; however, 52% demonstrated poor practice. The most common barrier to exercise was lack of advice from healthcare providers (32%). Educational status, residence, and regular antenatal visits showed significant association with KAP scores ($p < 0.05$).

Conclusion: Although awareness and attitudes toward antenatal exercise were moderately favorable, practice remained inadequate. Strengthening antenatal counselling and addressing barriers through healthcare provider involvement are essential to improve exercise practices during pregnancy.

Keywords: Antenatal exercise, Pregnancy, Knowledge attitude practice, Maternal health, Physical activity, Antenatal care, Health education.

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Introduction

Pregnancy is a critical period characterized by profound physiological, anatomical, and psychological changes that influence maternal health and fetal

development. These changes often lead to discomfort, reduced physical activity, excessive weight gain, and increased risk of metabolic and cardiovascular complications [1,2]. In recent years, there has been a

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paradigm shift in antenatal care, with greater emphasis on promoting maternal well-being alongside fetal health. Physical activity during pregnancy has emerged as a key component of comprehensive antenatal care due to its wide-ranging benefits.

Antenatal exercise refers to planned, structured, and repetitive physical activity performed during pregnancy to maintain or improve physical fitness. Common forms include walking, stretching, pelvic floor exercises, breathing exercises, and prenatal yoga [3]. Evidence from contemporary research indicates that regular antenatal exercise is associated with reduced incidence of gestational diabetes mellitus, hypertensive disorders, excessive gestational weight gain, and musculoskeletal discomfort, particularly low back pain [4,5,6]. Additionally, exercise has been shown to improve psychological well-being by reducing stress, anxiety, and symptoms of depression, while also contributing to better labour outcomes and faster postpartum recovery [7,8].

Current international guidelines, including those from professional obstetric and gynecological associations, recommend that pregnant women without contraindications engage in at least 150 minutes of moderate-intensity aerobic activity per week [9]. These recommendations reinforce the safety and importance of exercise as an integral part of routine antenatal care. However, despite strong evidence and clear guidelines, adherence to antenatal exercise remains suboptimal in many populations, particularly in low- and middle-income countries.

Several studies conducted after 2010 have consistently demonstrated inadequate knowledge among pregnant women regarding the types, benefits, and safety of exercise during pregnancy [10,11]. Misconceptions, such as fear of harming the fetus or triggering complications, continue to persist and negatively influence participation. In addition, socio-cultural beliefs, lack of family support, and limited access to professional guidance further contribute to low engagement in physical activity [12].

Attitudes toward antenatal exercise are often mixed. While many women acknowledge its benefits and express willingness to participate, barriers such as fatigue, lack of time, and absence of structured exercise programs limit actual practice [11,12]. This gap between knowledge, attitude, and practice highlights the importance of targeted health education and counselling during antenatal visits.

Knowledge, Attitude, and Practice (KAP) studies serve as an effective tool to assess awareness, perceptions, and behavioural patterns related to health

interventions. Evaluating KAP regarding antenatal exercise among pregnant women is essential to identify gaps and barriers, and to design appropriate interventions. Strengthening education and incorporating exercise counselling into routine antenatal care can significantly improve maternal health outcomes and promote safer pregnancies.

Methodology

This study was conducted using a hospital-based cross-sectional design to assess the knowledge, attitude, and practices (KAP) regarding antenatal exercises among pregnant women attending a tertiary care centre. The study was carried out in the Department of Obstetrics and Gynaecology at Sree Balaji Medical College and Hospital, Chennai, over a period of three months from February to April.

The study population comprised antenatal women attending the outpatient department (OPD) for routine antenatal check-ups during the study period. A total of 100 participants were included in the study using a convenient sampling method. The sample size was calculated based on a previous study by Nkhata LA et al., which reported approximately 50% adequate knowledge regarding antenatal exercise among pregnant women, the prevalence (p) was taken as 50% to obtain the maximum sample size. The calculated sample size was 96, which was rounded up to 100 participants for convenience and to account for possible non-response.

Pregnant women in any trimester who were willing to participate and provided informed written consent were included in the study. Women in active labour, immediate postpartum period, or those with high-risk pregnancies where exercise was contraindicated (such as placenta previa, severe preeclampsia, threatened abortion, severe anemia, or cardiac disease) were excluded. Additionally, women who were critically ill or admitted for obstetric emergencies were not included.

Data collection was carried out using a pre-designed semi-structured questionnaire. The questionnaire consisted of five sections: socio-demographic details, obstetric history, knowledge, attitude, and practices related to antenatal exercise. Socio-demographic variables included age, education, occupation, and residence. Obstetric details such as gravida, parity, gestational age, antenatal visit regularity, and presence of complications were also recorded.

The knowledge section assessed awareness of antenatal exercises, perceived safety, types of exercises, and sources of information. The attitude section evaluated participants' perceptions regarding

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benefits, willingness to exercise, and concerns about fetal safety. The practice section included questions on current exercise habits, types, frequency, duration, and barriers to exercise. Knowledge was evaluated using multiple-choice questions, with each correct response scored as 1 and incorrect or “don’t know” responses scored as 0; total scores were categorized as poor (<50%), moderate (50–75%), and good (>75%). Attitude was assessed using Likert-scale responses, with positive statements scored from 5 to 1 and negative statements reverse scored; overall scores were classified as negative (<50%), neutral (50–75%), and positive (>75%). Practice was assessed based on exercise behaviour, with appropriate practices scored as 1 and inappropriate as 0, and categorized as poor (<50%) or adequate (≥50%).

Data were collected through face-to-face interviews conducted during antenatal visits. Confidentiality and privacy of participants were maintained throughout the study. Ethical approval was obtained from the Institutional Human Ethics Committee prior to commencement of the study. Informed consent was obtained from all participants after explaining the purpose and procedures of the study in their local language.

The collected data were entered into Microsoft Excel and analyzed using appropriate statistical methods. Descriptive statistics such as mean, standard deviation, frequencies, and percentages were used to summarize the data. Associations between socio-demographic variables and KAP parameters were analyzed using suitable inferential statistical tests, with a p-value of less than 0.05 considered statistically significant.

Results

The socio-demographic profile of the participants (n = 100) demonstrated that the majority of women belonged to the 21–25 years age group (36%), followed by those aged 26–30 years (32%), indicating that most participants were within the prime reproductive age. Women aged above 30 years constituted 22%, while only 10% were below 20 years. In terms of educational status, 40% of participants had completed secondary education, and 28% were graduates or above, reflecting a relatively educated study population. However, 12% of women had no formal education, suggesting the presence of a vulnerable subgroup.

Most participants were homemakers (60%), while 30% were employed and 10% were self-employed. A majority (66%) resided in urban areas, whereas 34% were from rural settings. (Table 1)

Table 1: Socio-demographic Characteristics of Study Participants (n = 100)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	<20	10	10.0
	21–25	36	36.0
	26–30	32	32.0
	>30	22	22.0
Education	No formal education	12	12.0
	Primary	20	20.0
	Secondary	40	40.0
	Graduate & above	28	28.0
Occupation	Homemaker	60	60.0
	Employed	30	30.0
	Self-employed	10	10.0
Residence	Urban	66	66.0
	Rural	34	34.0

The obstetric characteristics showed a nearly equal distribution between multigravida (52%) and primigravida (48%) women.

Most participants were in the second trimester (46%), followed by the third trimester (38%), while only 16% were in the first trimester, indicating increased antenatal care utilization in later stages of pregnancy. A substantial proportion (74%) reported regular antenatal visits, whereas 26% had irregular follow-up. Additionally, 24% of participants had pregnancy-related complications, while the majority (76%) reported no complications. (Table 2)

Table 2: Obstetric Characteristics of Study Participants (n = 100)

Variable	Category	Frequency (n)	Percentage (%)
Gravida	Primigravida	48	48.0
	Multigravida	52	52.0
Trimester	First	16	16.0
	Second	46	46.0
	Third	38	38.0
Antenatal visits	Regular	74	74.0
	Irregular	26	26.0
Complications	Yes	24	24.0
	No	76	76.0

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The most frequently reported barrier to antenatal exercise was the lack of advice from healthcare providers (32%), followed by lack of knowledge (28%), fear (22%), and lack of time (18%), underscoring the crucial role of healthcare guidance in promoting exercise.

Regarding knowledge, 45% of participants demonstrated moderate knowledge, while 30% had poor knowledge and only 25% exhibited good knowledge, indicating a notable gap in awareness.

In terms of attitude, more than half of the participants (53%) exhibited a positive attitude toward antenatal exercise, whereas 32% were neutral and 15% had a negative attitude.

Despite this, 52% of participants reported poor exercise practices, and only 48% demonstrated adequate practice, highlighting a significant gap between knowledge and actual behavior. (Table 3)

Table 3: Barriers to Exercise and Overall KAP Scores (n = 100)

Variable	Category	Frequency (n)	Percentage (%)
Barriers to exercise	Lack of knowledge	28	28.0
	Fear	22	22.0
	Lack of time	18	18.0
	No advice from doctor	32	32.0
Knowledge score	Poor	30	30.0
	Moderate	45	45.0
	Good	25	25.0
Attitude score	Negative	15	15.0
	Neutral	32	32.0
	Positive	53	53.0
Practice score	Poor	52	52.0
	Adequate	48	48.0

The overall distribution of KAP scores revealed that moderate knowledge (45%) was most prevalent, followed by poor (30%) and good knowledge (25%). A positive attitude (53%) predominated among participants, while 32% exhibited neutral and 15% negative attitudes.

However, practice levels remained suboptimal, with 52% demonstrating poor practice and only 48% reporting adequate engagement in antenatal exercise, indicating a clear discrepancy between awareness and implementation. (Table 4)

Table 4: Overall KAP Scores Distribution (n = 100)

Parameter	Category	Frequency (n)	Percentage (%)
Knowledge	Poor	30	30.0
	Moderate	45	45.0
	Good	25	25.0
Attitude	Negative	15	15.0
	Neutral	32	32.0
	Positive	53	53.0
Practice	Poor	52	52.0
	Adequate	48	48.0

No statistically significant association was observed between age and knowledge score ($p = 0.321$), although a trend toward better knowledge with increasing age was noted.

A statistically significant association was found between educational status and knowledge ($p = 0.002$), with higher education levels corresponding to better knowledge scores. Notably, women with graduate-level education demonstrated the highest proportion of good knowledge, whereas those without formal education predominantly exhibited poor knowledge.

Residence was also significantly associated with knowledge ($p = 0.041$), with urban participants demonstrating better knowledge levels compared to their rural counterparts.

Similarly, regular antenatal visits were significantly associated with higher knowledge levels ($p = 0.012$).

However, no significant association was found between knowledge and gravida ($p = 0.214$) or presence of complications ($p = 0.267$). (Table 5)

Table 5: Association of Knowledge Score with Socio-demographic and Obstetric Variables

Variable	Category	Poor (%)	Moderate (%)	Good (%)	p-value
Age (years)	<20	5 (50.0)	3 (30.0)	2 (20.0)	0.321
	21–25	14 (38.9)	15 (41.7)	7 (19.4)	
	26–30	7 (21.9)	16 (50.0)	9 (28.1)	
	>30	4 (18.2)	11 (50.0)	7 (31.8)	

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Education	No formal education	8 (66.7)	3 (25.0)	1 (8.3)	0.002*
	Primary	10 (50.0)	7 (35.0)	3 (15.0)	
	Secondary	10 (25.0)	22 (55.0)	8 (20.0)	
	Graduate & above	2 (7.1)	13 (46.4)	13 (46.4)	
Residence	Urban	16 (24.2)	32 (48.5)	18 (27.3)	0.041
	Rural	14 (41.2)	13 (38.2)	7 (20.6)	
Antenatal visits	Regular	16 (21.6)	36 (48.6)	22 (29.8)	0.012*
	Irregular	14 (53.8)	9 (34.6)	3 (11.6)	
Gravida	Primigravida	18 (37.5)	20 (41.7)	10 (20.8)	0.214
	Multigravida	12 (23.1)	25 (48.1)	15 (28.8)	
Complications	Yes	10 (41.7)	9 (37.5)	5 (20.8)	0.267
	No	20 (26.3)	36 (47.4)	20 (26.3)	

There was no significant association between age and attitude ($p = 0.276$), although a more positive attitude was observed among older participants.

A significant association was observed between education and attitude ($p = 0.008$), with higher educational levels linked to more positive attitudes toward antenatal exercise.

Residence also showed a significant association ($p = 0.036$), with urban women demonstrating a more positive attitude compared to rural women.

Furthermore, regular antenatal visits were significantly associated with a positive attitude ($p = 0.015$).

No statistically significant association was observed between attitude and gravida ($p = 0.301$) or complications ($p = 0.221$). (Table 6)

Table 6: Association of Attitude Score with Socio-demographic and Obstetric Variables

Variable	Category	Negative (%)	Neutral (%)	Positive (%)	p-value
Age (years)	<20	3 (30.0)	4 (40.0)	3 (30.0)	0.276
	21–25	7 (19.4)	14 (38.9)	15 (41.7)	
	26–30	3 (9.4)	9 (28.1)	20 (62.5)	
	>30	2 (9.1)	5 (22.7)	15 (68.2)	
Education	No formal education	5 (41.7)	4 (33.3)	3 (25.0)	0.008*
	Primary	5 (25.0)	8 (40.0)	7 (35.0)	
	Secondary	4 (10.0)	18 (45.0)	18 (45.0)	
	Graduate & above	1 (3.6)	2 (7.1)	25 (89.3)	
Residence	Urban	7 (10.6)	18 (27.3)	41 (62.1)	0.036
	Rural	8 (23.5)	14 (41.2)	12 (35.3)	
Antenatal visits	Regular	8 (10.8)	20 (27.0)	46 (62.2)	0.015*
	Irregular	7 (26.9)	12 (46.2)	7 (26.9)	
Gravida	Primigravida	9 (18.7)	18 (37.5)	21 (43.8)	0.301
	Multigravida	6 (11.5)	14 (26.9)	32 (61.6)	

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Complications	Yes	6 (25.0)	10 (41.7)	8 (33.3)	0.21
	No	9 (11.8)	22 (28.9)	45 (59.3)	

Although practice improved with increasing age, the association was not statistically significant ($p = 0.118$). A strong significant association was observed between educational status and practice ($p = 0.001$), with higher education levels associated with better exercise practices.

Residence was also significantly associated with practice ($p = 0.029$), with urban women demonstrating better practice compared to rural women.

Additionally, regular antenatal visits were significantly associated with adequate practice ($p = 0.004$).

However, no significant association was observed between practice and gravida ($p = 0.289$) or complications ($p = 0.173$). (Table 7)

Table 7: Association of Practice Score with Socio-demographic and Obstetric Variables

Variable	Category	Population (%)	Adequate Practice (%)	p-value
Age (years)	<20	7 (70.0)	3 (30.0)	0.118
	21–25	22 (61.1)	14 (38.9)	
	26–30	14 (43.8)	18 (56.2)	
	>30	9 (40.9)	13 (59.1)	
Education	No formal education	10 (83.3)	2 (16.7)	0.001*
	Primary	14 (70.0)	6 (30.0)	
	Secondary	22 (55.0)	18 (45.0)	
	Graduate & above	6 (21.4)	22 (78.6)	

Residence	Urban	30 (45.5)	36 (54.5)	0.029
	Rural	22 (64.7)	12 (35.3)	
Antenatal visits	Regular	32 (43.2)	42 (56.8)	0.004*
	Irregular	20 (76.9)	6 (23.1)	
Gravida	Primigravida	28 (58.3)	20 (41.7)	0.289
	Multigravida	24 (46.2)	28 (53.8)	
Complications	Yes	16 (66.7)	8 (33.3)	0.173
	No	36 (47.4)	40 (52.6)	

Discussion

The present hospital-based cross-sectional study evaluated the knowledge, attitude, and practice (KAP) regarding antenatal exercise among pregnant women and explored key determinants influencing these domains. The findings demonstrate a clear disparity between awareness and implementation, supported by both descriptive and inferential statistical evidence.

In the current study, the majority of participants belonged to the 21–30-year age group (68%), representing the optimal reproductive age. Although age did not show a statistically significant association with knowledge ($p = 0.321$), attitude ($p = 0.276$), or practice ($p = 0.118$), a gradual trend toward improved KAP scores with increasing age was observed. Women above 30 years demonstrated relatively higher proportions of good knowledge (31.8%), positive attitude (68.2%), and adequate practice (59.1%). This trend suggests experiential learning and increased exposure to healthcare services, consistent with previous literature [1,2].

Educational status emerged as the most significant determinant across all three domains of KAP. A highly significant association was observed between education and knowledge ($p = 0.002$), attitude ($p = 0.008$), and practice ($p = 0.001$). Notably, 46.4% of women with graduate-level education demonstrated

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good knowledge, compared to only 8.3% among those without formal education. Similarly, 89.3% of graduates exhibited a positive attitude, and 78.6% reported adequate exercise practices, indicating a strong gradient effect. These findings reinforce the role of education in enhancing health literacy, decision-making capacity, and behavioral adoption, aligning with Ribeiro MM et al. [10] and Harrison AL et al. [11], who identified education as a key facilitator of antenatal physical activity.

Residence also showed statistically significant associations with knowledge ($p = 0.041$), attitude ($p = 0.036$), and practice ($p = 0.029$). Urban women demonstrated better outcomes across all domains, with 27.3% having good knowledge and 62.1% expressing a positive attitude, compared to 20.6% and 35.3%, respectively, among rural participants. Adequate practice was also higher in urban women (54.5%) than rural women (35.3%). These findings highlight disparities in access to information, healthcare services, and structured antenatal counselling, which are more readily available in urban settings.

Antenatal care utilization was another critical determinant. Women with regular antenatal visits (74%) demonstrated significantly better knowledge ($p = 0.012$), attitude ($p = 0.015$), and practice ($p = 0.004$). Among those with regular visits, 29.8% had good knowledge and 56.8% reported adequate practice, compared to only 11.6% and 23.1%, respectively, among those with irregular visits. This underscores the pivotal role of antenatal clinics as platforms for health education and behavioral reinforcement, consistent with global recommendations emphasizing counselling during routine antenatal care [8,9].

Despite these favorable determinants, the overall KAP distribution revealed important gaps. While 45% of participants demonstrated moderate knowledge and 53% had a positive attitude, a higher proportion (52%) exhibited poor exercise practices. This discordance clearly indicates that knowledge and attitude alone are insufficient to ensure behavioral change. Similar gaps have been reported in earlier studies [11,12], suggesting that external barriers significantly influence practice.

The most commonly reported barrier in this study was lack of advice from healthcare providers (32%), followed by lack of knowledge (28%), fear (22%), and lack of time (18%). This finding is particularly important, as it reflects a modifiable health system gap rather than individual-level resistance. The strong association between regular antenatal visits and improved practice further supports the argument that

structured counselling is currently inadequate or inconsistently delivered. Harrison AL et al. [11] and Adjabu DE et al. [12] have similarly identified insufficient professional guidance and safety concerns as major deterrents to antenatal exercise.

The knowledge assessment revealed that only 25% of participants had good knowledge, while 30% had poor knowledge, indicating persistent informational gaps despite increasing access to healthcare. This is concerning given the robust evidence base supporting antenatal exercise. Systematic reviews by Davenport MH et al. [4] and Da Silva SG et al. [5] have demonstrated that regular antenatal exercise significantly reduces the risk of gestational diabetes mellitus, hypertensive disorders, and excessive weight gain. Furthermore, Wiebe HW et al. [6] confirmed that supervised exercise does not adversely affect fetal growth, reinforcing its safety profile.

Although more than half of participants (53%) exhibited a positive attitude, only 48% practiced exercise adequately. This discrepancy suggests that psychological readiness alone is insufficient without enabling environments and structured support systems. Fear of fetal harm, lack of time, and absence of guided programs remain critical barriers. These findings emphasize the need to move beyond awareness campaigns toward implementation strategies that integrate exercise counselling into routine antenatal protocols.

Importantly, no significant association was observed between gravida and KAP scores ($p > 0.05$), suggesting that prior pregnancy experience alone does not necessarily translate into better knowledge or practice. Similarly, the presence of complications did not significantly influence KAP, indicating that even high-risk perception does not automatically improve engagement in preventive behaviors.

Overall, the findings of this study provide strong evidence that socio-demographic factors, particularly education, residence, and antenatal care utilization, play a decisive role in shaping KAP regarding antenatal exercise. However, the persistence of poor practice despite moderate knowledge and positive attitudes highlights a critical implementation gap.

Limitations

This study has certain limitations. The hospital-based design limits external validity and generalizability to community settings. The relatively small sample size ($n = 100$) may reduce statistical power for subgroup analyses. The use of self-reported measures introduces potential recall and social desirability bias, particularly in assessing practice. Additionally, the cross-sectional

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design precludes causal inference between determinants and outcomes. The study also did not quantify exercise intensity, duration, or adherence to guideline-recommended thresholds, which could provide deeper insights into practice patterns.

Conclusion

The present study highlights that while a considerable proportion of pregnant women demonstrated moderate knowledge and a generally positive attitude toward antenatal exercise, actual practice remained suboptimal. Educational status and regular antenatal visits were significantly associated with better knowledge, attitude, and practice, emphasizing the importance of awareness and consistent healthcare engagement. The findings also revealed that lack of advice from healthcare providers and insufficient knowledge were major barriers to exercise during pregnancy.

These results underscore the need for structured health education and effective counselling on antenatal exercise as part of routine antenatal care. Strengthening the role of healthcare professionals in providing timely guidance can help bridge the gap between knowledge and practice. Promoting awareness and addressing misconceptions can enhance participation in safe physical activity during pregnancy, ultimately contributing to improved maternal and fetal health outcomes.

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