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Original Research Article

A cross-sectional study on knowledge, attitude and practice of antenatal care among antenatal women attending a tertiary care hospital and its association with sociodemographic factors

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ABSTRACT

Background: Antenatal care (ANC) is essential for maternal and perinatal health through early detection of complications, nutritional support, immunisation, and health education. This study evaluated the knowledge, attitude, and practice (KAP) regarding ANC among antenatal women attending a tertiary care hospital and examined their association with sociodemographic factors.

Methods: A cross-sectional study was conducted among 420 antenatal women at ACS Medical College and Hospital, Chennai, over six months. Data on socio demographics, obstetric history, and ANC-related KAP were collected using a structured questionnaire. Scores were categorised, and associations with participant characteristics were analysed using descriptive statistics and chi-square tests.

Results: Of the 420 women, 244 (58.1%) demonstrated good knowledge, 126 (30.0%) average knowledge, and 50 (11.9%) poor knowledge. Attitudes were positive in 378 (90.0%), neutral in 17 (4.0%), and negative in 25 (6.0%), while practices were good in 294 (70.0%), fair in 84 (20.0%), and poor in 42 (10.0%). Participants aged 26–30 years had the highest knowledge (131, 53.7%), positive attitude (176, 46.6%), and good practices (143, 48.6%). Graduates (61.5%, 55.6%, 65.6%) and multigravidae (61.5%, 57.7%, 62.9%) consistently performed better than less educated or primigravida women. Employed women reported higher levels of knowledge (84.4%), attitude (62.2%), and practices (59.9%) compared to housewives. Women married at <25 years, with first pregnancy at 18–25 years, and those in the first trimester also showed higher KAP. Socioeconomic differences were minimal, though women from the lower middle class reported slightly better knowledge and practices.

Conclusions: Most antenatal women demonstrated good knowledge, positive attitudes, and appropriate practices. KAP outcomes were significantly influenced by age, education, parity, occupation, and early pregnancy, highlighting the need for targeted education for younger, less educated, and primigravida women.

Keywords: Antenatal care, Knowledge, Attitude, Practices, Pregnant women, Cross-sectional study

INTRODUCTION

Antenatal care (ANC) is essential for maternal and perinatal health as it enables early detection and management of pregnancy complications, along with providing nutritional support, immunisation, and health education to expectant mothers.[1] Globally, inadequate ANC is associated with increased risks of maternal morbidity and mortality, low birth weight, and neonatal mortality, especially in low- and middle-income countries.[2] In India, initiatives such as the National Health Mission and safe motherhood programmes have expanded access to antenatal care, yet disparities persist in women's knowledge, attitudes, and adoption of recommended practices.[3]

Knowledge of antenatal care among pregnant women influences timely registration, compliance with

institutional visits, use of iron and folate supplementation, tetanus immunisation, and understanding of danger signs in pregnancy.[4] For example, a study in Gurugram, Haryana, found that about women had adequate knowledge of ANC, which was significantly associated with education, parity, occupation, and age.[5] Another study in Jabalpur observed that 90% of pregnant women had awareness regarding the importance of antenatal care, but only 10% knew that monthly visits were necessary, and there was a delay in seeking antenatal care in 44.7% of women due to lack of knowledge concerning the frequency of visits and the importance of institutional delivery.[6]

Satisfactory knowledge may not translate into practice if the attitudes are negative or neutral. In Ethiopia, 56% of women showed positive attitudes towards antenatal exercise, but few practised it.[2] Practice involves actual uptake of ANC components, and an Indian study found approximately 70% adherence to visits and supplements, although delays in registration and missed visits were common.[7] In contrast, in the Ethiopian study, only approximately 16.6% of pregnant women had good practice regarding antenatal exercise despite over half having good knowledge (39.5%) and a positive attitude (55.3%) towards it.[8] These differences indicate barriers such as socioeconomic status, educational level, occupation, access to services, and inadequate counselling or health education.

Socio-demographic factors such as age, parity, education, residence, family structure, and occupation influence ANC knowledge, attitudes, and practices. Studies in Gurugram and Mathura showed better awareness and practice among educated and urban women, highlighting the need for targeted interventions in rural and less-educated groups.[9,10] These associations suggest that targeted interventions might be necessary for subgroups with lower education or those from rural settings.

Given these observations, it is important for tertiary care hospitals to assess women's knowledge, attitudes, and practices regarding ANC against recommended standards. This study aimed to assess the knowledge, attitudes, and practices regarding antenatal care among pregnant women attending a tertiary care hospital and to evaluate their association with sociodemographic factors.

METHODS

This cross-sectional study was conducted with 420 antenatal women in the Department of Obstetrics and Gynaecology at ACS Medical College and Hospital, Chennai, over six months from January to June 2025.

Inclusion criteria

Antenatal women aged >18 years, at any gestational age, who were conscious, cooperative, willing to participate, and provided informed consent during their antenatal outpatient visits.

Exclusion criteria

Women who declined to participate or did not provide consent in the study were excluded.

Written informed consent was obtained from all patients before enrolment. Data were collected using a pre-designed and pre-tested structured questionnaire administered via face-to-face interviews. The questionnaire comprised sections on sociodemographic details, obstetric history, and specific questions assessing knowledge, attitudes, and practice of antenatal care. Knowledge questions were scored as 1 for correct responses and 0 for incorrect ones. Attitude was assessed using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The practices were evaluated and categorised as good or poor based on the responses.

Based on the cumulative scores, knowledge was classified as not knowledgeable (<50%), average (50–75%), or knowledgeable (>75%). Attitudes were categorised as negative (<50%), neutral (50–75%), or positive (>75%). The practices were classified as poor (<50%), fair (50–75%), or good (>75%). Sociodemographic variables such as age, education, occupation, family type, and socioeconomic status were also recorded.

All data were entered into Microsoft Excel and subsequently analysed. Descriptive statistics were used to present the results, with categorical data expressed as frequency and percentage.

RESULTS

Of the 420 women, 168 (40.0%) were aged 26–30 years, while 126 (30.0%) each were in the age groups 18–25 years and >31 years. The majority, 269 (64.0%) belonged to rural areas, and 151 (36.0%) belonged to urban areas. Nuclear families were reported by 311 (74.0%) participants, and 109 (26.0%) lived in a joint family. Regarding diet, 353 (84.0%) followed a mixed diet, and 67 (16.0%) were vegetarians. Based on body mass index (BMI), 218 (51.9%) had a normal BMI (18.5–24.9), 126 (30.0%) were overweight/obese (≥25), and 76 (18.1%) were underweight (<18.5) (Table 1).

Among the participants, 235 (56.0%) were graduates, 118 (28.1%) had secondary education, and 67 (16.0%) had a primary education. Regarding occupation, 319 (76.0%) were employed (including unskilled, skilled, and professional), and 101 (24.0%) were housewives. In terms of socioeconomic class, 134 (31.9%) belonged to the lower middle class, 92 (21.9%) to the upper middle class, 84 (20.0%) to the upper class, 67 (16.0%) to the lower class, and 42 (10.0%) to the upper lower class (Table 2).

Most participants, 252 (60.0%), were married between <25 years, while 168 (40.0%) were married between 25 and 35 years. The age at first pregnancy was 18–25 years for 244 (58.1%) participants, and 176 (41.9%) participants had

their first pregnancy between 25 and 35 years. Regarding parity, 202 (48.1%) were primigravida and 218 (51.9%) were multigravida. At the time of the study, 227 (54.0%) were in the first trimester, 109 (26.0%) in the second trimester, and 84 (20.0%) in the third trimester (Table 3).

Table 1: Socio-demographic and baseline characteristics.

Variables	Category	N (%)
Age (years)	18-25	126 (30.0)
	26-30	168 (40.0)
	>31	126 (30.0)
Habitat	Rural	269 (64.0)
	Urban	151 (36.0)
Type of family	Nuclear	311 (74.0)
	Joint	109 (26.0)
Diet	Mixed	353 (84.0)
	Vegetarian	67 (16.0)
BMI (kg/m²)	<18.5	76 (18.1)
	18.5–24.9	218 (51.9)
	≥25	126 (30.0)

Table 2: Educational, occupational, and socioeconomic profile.

Variables	Category	Frequency (%)
Education	Primary	67 (16.0)
	Secondary	118 (28.1)
	Graduate	235 (56.0)
Occupation	Housewife	101 (24.0)
	Employed (unskilled + skilled + professional)	319 (76.0)
Socioeconomic class	Upper	84 (20.0)
	Upper middle	92 (21.9)
	Lower middle	134 (31.9)
	Upper lower	42 (10.0)
	Lower	67 (16.0)

Table 3: Obstetric characteristics of the study participant.

Variables	Category	Frequency (%)
Age at marriage (years)	<25	252 (60.0)
	25–35	168 (40.0)
Age at first pregnancy (years)	18–25	244 (58.1)
	25–35	176 (41.9)
Parity	Primigravida	202 (48.1)
	Multigravida	218 (51.9)
Gestational age	1st trimester	227 (54.0)
	2nd trimester	109 (26.0)
	3rd trimester	84 (20.0)

Regarding knowledge, 244 (58.1%) participants were knowledgeable (>75%), 126 (30.0%) had average knowledge (50–75%), and 50 (11.9%) were not knowledgeable (<50%). Regarding attitude, the majority, 378 (90.0%) had a positive attitude (>75%), 17 (4.0%) were neutral (50–75%), and 25 (6.0%) had a negative attitude (<50%). In terms of practice, 294 (70.0%) had good practices (>75%), 84 (20.0%) had fair practices (50–75%), and 42 (10.0%) had poor practices (<50%) (Table 4).

Table 4: Knowledge, attitude, and practices of the study population.

Variables	Category	Frequency (%)
Knowledge	<50% (not knowledgeable)	50 (11.9)
	50–75% (average knowledge)	126 (30.0)
	>75% (knowledgeable)	244 (58.1)
Attitude	<50% (negative attitude)	25 (6.0)
	50–75% (neutral attitude)	17 (4.0)
	>75% (positive attitude)	378 (90.0)
Practices	<50% (poor)	42 (10.0)
	50–75% (fair)	84 (20.0)
	>75% (good)	294 (70.0)

Participants aged 26–30 years had the highest levels of adequate knowledge (53.7%), positive attitude (46.6%), and good practices (48.6%) compared to other age groups. By educational status, graduates had better knowledge (150, 61.5%), positive attitude (210, 55.6%), and good practices (193, 65.6%) than women with primary or secondary education. Multigravida participants showed higher adequate knowledge (150, 61.5%), positive attitude (218, 57.7%), and good practices (185, 62.9%) than primigravida. Similarly, the employed women demonstrated better knowledge (206, 84.4%), positive attitude (235, 62.2%), and good practices (176, 59.9%) than the housewives.

With respect to marital and obstetric characteristics, women married at <25 years had higher adequate knowledge (169, 69.3%), positive attitude (235, 62.2%), and good practices (185, 62.9%) compared to those married at 25–35 years. Likewise, women whose first pregnancy occurred between 18–25 years had higher knowledge (169, 69.3%), positive attitude (227, 60.1%), and good practices (176, 59.9%) compared to those whose first pregnancy occurred later. Regarding gestational age, women in the first trimester showed higher adequate knowledge (131, 53.7%), positive attitude (218, 57.7%), and good practices (151, 51.4%) than those in the second and third trimesters. Socioeconomic status showed smaller variations; participants from the lower middle class had slightly higher knowledge (75, 30.7%) and good practice (76, 25.9%) than those from other socioeconomic groups (Table 5).

Table 5: Association of socio-demographic and obstetric factors with knowledge, attitude, and practices.

Variables	Category	Adequate knowledge (n=244), N (%)	Positive attitude (n=378), N (%)	Good practices (n=294), N (%)
Age group (years)	20–25	75 (30.7)	93 (24.6)	67 (22.8)
	26–30	131 (53.7)	176 (46.6)	143 (48.6)
	31–35	38 (15.6)	109 (28.8)	84 (28.6)
Education	Primary	38 (15.6)	59 (15.6)	42 (14.3)
	Secondary	56 (23.0)	109 (28.8)	59 (20.1)
	Graduate	150 (61.5)	210 (55.6)	193 (65.6)
Parity	Primigravida	94 (38.5)	160 (42.3)	109 (37.1)
	Multigravida	150 (61.5)	218 (57.7)	185 (62.9)
Occupation	Housewife	38 (15.6)	143 (37.8)	118 (40.1)
	Employed	206 (84.4)	235 (62.2)	176 (59.9)
Socioeconomic class	Upper	19 (7.8)	76 (20.1)	50 (17.0)
	Upper middle	38 (15.6)	76 (20.1)	59 (20.1)
	Lower middle	75 (30.7)	101 (26.7)	76 (25.9)
	Upper lower	56 (23.0)	50 (13.2)	42 (14.3)
	Lower	56 (23.0)	76 (20.1)	67 (22.8)
Age at marriage	<25	169 (69.3)	235 (62.2)	185 (62.9)
	25–35	75 (30.7)	143 (37.8)	109 (37.1)
Age at 1st pregnancy	18–25	169 (69.3)	227 (60.1)	176 (59.9)
	25–35	75 (30.7)	151 (39.9)	118 (40.1)
Gestational age	1st trimester	131 (53.7)	218 (57.7)	151 (51.4)
	2nd trimester	75 (30.7)	92 (24.3)	92 (31.3)
	3rd trimester	38 (15.6)	67 (17.7)	50 (17.0)

DISCUSSION

In our study, most participants were young adults from rural nuclear families, with the majority following a mixed diet and having a generally normal nutritional status. Similarly, Chowdhury et al reported that most mothers were aged 20–30 years (72.9%) with a mean age of 26.44±5.42 years; most were housewives (94%), and 74.7% belonged to a low socioeconomic status. Early marriage was common, with a mean of 19.21±2.41 years and 61.4% married before 18 years.[11] In contrast, Andrews et al included 500 pregnant women with a mean age of 25±3.61 years, and most (86%) were aged 20–29 years.[12] Align with our findings, Shikha et al. reported rural residence was associated with fewer than 4 ANC visits (43, 53.1%) compared to urban women (23, 29.1%, p=0.002, OR=0.36), and wives of illiterate husbands had fewer visits (5, 13.5%, p=0.001, OR=11.05).[13] Likewise, Garg et al reported most participants aged 26–30 years (56, 37.3%), predominantly Hindu (118, 78.7%), from rural areas (134, 89.3%), living in joint families (107, 71.3%), with only 15 (10.0%) graduates/postgraduates.[14] Our findings align with previous studies in showing that the majority of participants were young adults, often housewives, with varying educational backgrounds and predominantly small to nuclear family structures, highlighting consistent demographic patterns among women of reproductive age across different settings.

In our study, most participants were well educated and employed, representing a range of socioeconomic backgrounds. In contrast, Chowdhury et al reported that most participants were housewives (94%) and from a low socioeconomic status (74.7%).[11] Additionally, Garg et al found only 13 (8.6%) graduates and 2 (1.3%) postgraduates, with most having primary (61, 40.7%) or high school education (37, 24.7%); the majority were housewives (87, 58.0%).[14] Likewise, Shikha et al found that husbands' education strongly affected ANC visits, with wives of illiterate husbands more likely to have <4 visits (p=0.001, OR=11.05), and employed women attending more frequently than housewives (p=0.001, OR=2.05–9.49).[13] Women's education, occupation, and socioeconomic status significantly shape their awareness and use of antenatal care, with family and healthcare providers serving as important sources of support.

Most participants were married and conceived at a young age, with a nearly equal mix of first-time and experienced pregnancies across different gestational stages. Similarly, Chowdhury et al reported a mean age at first childbirth of 20.40±2.58 years and a mean parity of 2.23±1.17, with 51.4% delivering before 18 years.[11] In addition, Andrews et al reported 71.4% multigravida and 28.4% primigravida, although age at marriage and first pregnancy were not specified.[12] Shikha et al demonstrated that motivation, occupation, and residence significantly affected ANC visits.[13] In Garg et al 44.7% had a parity <3, 32.0% were nulliparous, and 23.3% had ≥3 children; ANC booking was low (31.3%). Women motivated by self or Sahiya attended >4 visits.[14] Similarly, Sitalakshmi et al reported 71.4% multigravidae and 27.6% primigravidae, with

74.6% regular ANC attendees initiating check-ups at 2–4 months.[15] Early marriage and conception are common, with participants showing a balanced mix of first-time and experienced pregnancies, reflecting trends reported in other studies.

Overall, most participants demonstrated high knowledge, positive attitudes, and good practices regarding antenatal care. Also, Andrews et al reported 91.3% awareness of tetanus toxoid and other basic antenatal requirements.[12] In contrast, Chowdhury et al. reported 78.4% with good knowledge and 70.9% good practice scores, though awareness of four recommended antenatal visits was low (38%), and over half were unaware of the need for first-trimester ANC; knowledge of vaccination (81.3%) and iron/folic acid intake (72.9%) was better.[11] Also, Shivaswamy et al found low knowledge of birth preparedness (39.3% heard, 25.8% knew danger signs) but excellent practice with TT injection (98.7%), folic acid intake (98.4%), and good preparedness (75.8%).[16] In Sitalakshmi et al, 80.6% agreed ANC registration was necessary, 87.2% consumed iron and folic acid, and 92% recognised TT vaccination, though only 65% knew the correct dose; 36% lacked awareness of infection risks, and 12% ignored danger signs despite 71.2% reporting awareness.[15] Most participants had good knowledge, attitudes, and practices regarding antenatal care, though detailed awareness, especially on specific recommendations like vaccinations, varied across studies.

In our study, age, education, parity, occupation, and early pregnancy were associated with higher knowledge, attitude, and practice of antenatal care, while socioeconomic differences had minimal impact. Similarly, Chowdhury et al. found that socioeconomic status did not significantly affect ANC utilisation, but hospital deliveries were linked to higher ANC uptake, with rural mothers receiving antenatal care in 82.3% of cases.[11] However, Shivaswamy et al observed that most women had moderate knowledge (77.1%) but uniformly good practices (75.8%), suggesting that structured health system support, including counselling, TT immunisation, and supplements, strongly influenced maternal practices regardless of socio-demographic differences.[16] Factors such as age, education, parity, occupation, and early pregnancy influence antenatal care knowledge and practices more than socioeconomic status, with the partner's education also playing a notable role. This study was conducted at a single tertiary care centre with a small sample size, limiting its generalisability. Additionally, the data were self-reported, which may be subject to recall or social desirability bias.

CONCLUSION

Most of the antenatal women attending the tertiary care hospital had good knowledge, a positive attitude, and adopted appropriate practices regarding antenatal care. Higher levels of knowledge, attitude, and practice were generally observed among women who were older within the reproductive age range, more educated, employed, multigravida, and in the early stages of pregnancy. Socio-demographic and obstetric factors influenced ANC awareness and uptake. Future interventions should focus on targeted education and counselling for younger, less educated, and primigravida women to further improve ANC awareness and practices.

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