

Enhancing Antenatal Care Knowledge: The Effect of Comprehensive Antenatal Care among Primigravida women in Rural Himachal Pradesh

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Abstract

Introduction

Antenatal care is vital for maternal and child health, yet many primigravida women, particularly in underserved regions, lack essential knowledge about its importance and practices. This knowledge deficit often results in delayed or inadequate care, increasing the risk of complications such as preterm birth and low birth weight. Comprehensive antenatal care programs that include regular check-ups, nutritional counselling, and health education have proven effective in bridging this gap.

Methods

This study used pre-experimental design to assess impact of comprehensive antenatal care on knowledge regarding antenatal care among primigravida women. A sample of 100 primigravida women, aged 18 to 35, was selected through purposive sampling. The instruments included a demographic profile assessment and a 44-item multiple-choice knowledge questionnaire on antenatal care. The questionnaire's content validity was reviewed by experts, and its reliability was confirmed with a KR-21 coefficient of 0.78.

Results

The significant enhancement of knowledge on antenatal care was supported by the paired t-test, where mean scores rose from 16.93 (SD = 4.801) to 34.8 (SD = 5.743), yielding $t = 17.07$ and $p < 0.0001$. Additionally, analysis revealed a significant association between pre-test knowledge levels and the type of family ($\chi^2 = 8.722$, $p = 0.041$). Collectively, these findings underscore the effectiveness of the comprehensive antenatal care intervention in elevating maternal knowledge.

Conclusion

The comprehensive antenatal care intervention was effective in significantly improving the antenatal care knowledge of primigravida women, thereby potentially contributing to better maternal health outcomes. Hence, this intervention can be recommended as a valuable strategy for enhancing antenatal care knowledge among primigravida women.

Keywords: Antenatal Care, Primigravida Women, Maternal Knowledge, Comprehensive Intervention, Health Education, Maternal Health Outcomes, Pre-Experimental Design

Background

Antenatal care is a cornerstone of maternal and child health, yet many primigravida women, or first-time mothers, often lack adequate knowledge about its significance and practices. This gap in knowledge can have profound implications on both maternal and fetal health outcomes. Primigravida women typically have no prior experience with pregnancy, which can lead to uncertainty and anxiety about what to expect and how to care for themselves and their unborn child. In many rural and under-resourced areas, this lack of knowledge is exacerbated by limited access to healthcare services and educational resources.¹

Studies have shown that primigravida women often have limited awareness of key aspects of antenatal care, including the importance of regular check-ups, nutritional requirements, and the identification of potential complications during pregnancy. This knowledge gap can result in delayed or inadequate care, which in turn increases the risk of adverse pregnancy outcomes such as preterm birth, low birth weight, and maternal and neonatal mortality. Educational interventions are therefore critical to empower these women with the knowledge they need to ensure a healthy pregnancy and delivery.²⁻³

Comprehensive antenatal care programs are designed to address this knowledge gap by providing holistic and continuous support throughout the pregnancy. These programs encompass a range of services including medical check-ups, nutritional counseling, health education, and emotional support. By offering a structured and consistent approach to care, comprehensive antenatal care ensures that primigravida women receive the necessary information and interventions at each stage of their pregnancy.⁴⁻⁵

One of the key benefits of comprehensive antenatal care is its emphasis on health education. Through regular interactions with healthcare providers, primigravida women are educated about the physiological changes that occur during pregnancy, the importance of a balanced diet, the need for micronutrient supplementation, and the signs and symptoms of potential complications. This education empowers them to make informed decisions about their health and to seek timely medical intervention when needed. Moreover, by fostering a trusting relationship between the women and their healthcare providers, comprehensive antenatal care encourages consistent and early engagement with health services.⁶⁻⁷

Furthermore, comprehensive antenatal care programs often include community-based components that extend beyond the clinical setting. Community health workers and midwives play a crucial role in disseminating information and providing support to primigravida women in their own communities. This approach helps to overcome barriers such as distance, transportation, and cultural norms that may otherwise prevent women from accessing care. By bringing education and support directly to the women, these programs enhance their accessibility and effectiveness.⁸

Research has shown that comprehensive antenatal care can significantly improve knowledge and practices related to pregnancy and childbirth among primigravida women. For example, a study conducted in rural India found that women who participated in comprehensive antenatal care programs had higher levels of awareness about the importance of regular check-ups, the need for iron and folic acid supplementation, and the benefits of institutional delivery. These women were also more likely to attend the recommended number of antenatal visits and to follow nutritional and health advice.⁹⁻¹⁰

Enhancing the knowledge of primigravida women about antenatal care through comprehensive programs is essential for improving maternal and neonatal health outcomes. By providing continuous and holistic support, these programs empower first-time mothers with the information and resources they need to navigate their pregnancies safely and confidently. As healthcare systems continue to evolve, the integration of comprehensive

antenatal care into maternal health strategies will be crucial in addressing the knowledge gaps and improving the overall well-being of mothers and their children.

Methods

Study Design

This investigation employed pre experimental design aimed at evaluating the impact of comprehensive antenatal care on knowledge regarding antenatal care among primigravida women.

Participants

The target group consisted of primigravida women living in the rural areas of Himachal Pradesh. The inclusion criteria were the participants had to be between 18 and 35 years and available during the data collection phase. Based on these inclusion criteria, a total of 100 primigravida women were selected for the study.

Sampling Technique

A purposive sampling strategy was used in which participants were deliberately chosen by the researcher. This method relied on informed judgment regarding the relevance of the women to the study's objectives rather than random selection.

Instruments

Section A: Demographic Profile

It collects key background information on the participants, including age, gestational period, educational level, occupation, family structure, religious affiliation, monthly family income, prior awareness of antenatal care, and sources of health information regarding antenatal services.

Section B: Antenatal Care Knowledge Assessment

This questionnaire comprises 44 multiple-choice questions designed to thoroughly evaluate primigravida women understanding of crucial antenatal care topics. Each question provides four possible responses and allocates one point for every correct answer, permitting a maximum score of 44. The content spans general antenatal knowledge as well as specific areas such as nutrition, screening procedures, physical exercise, and supplementation. The scoring system is categorized as follows: scores above 76% (34–44 points) denote strong knowledge, scores between 50% and 75% (23–33 points) indicate average knowledge, and scores below 50% (0–22 points) reflect inadequate knowledge. The questionnaire has been carefully structured to ensure its practical use in both research and clinical settings by meeting reliability and validity standards.

Validity of the Instrument

To establish content validity, a detailed evaluation form was designed based on the criteria outlined by Yaghmaie (2003)¹¹, which evaluates each item for relevance, clarity, simplicity, and ambiguity across a four-point scale. A panel of seven experts—four nursing professionals (each with a PhD and over 15 years of experience) and three seasoned medical specialists (each holding an MD and having comparable experience)—reviewed the instrument. Their constructive feedback was instrumental in revising and refining the questionnaire to comprehensively represent the intended content domain.

Reliability of the Instrument

The internal consistency of the questionnaire was assessed using the Kuder-Richardson 21 (KR-21) formula. The resulting reliability coefficient of 0.78 indicates that the instrument demonstrates an acceptable level of consistency in its measurement.

Comprehensive Antenatal care Intervention

The comprehensive antenatal care intervention encompasses several critical components to support expectant mothers. It begins by clarifying the meaning of antenatal care and emphasizing its importance in ensuring both maternal and fetal well-being through regular monitoring. The program advises on maintaining a balanced diet and incorporating safe exercise routines, while also outlining necessary safety precautions to prevent complications. It provides guidance on the treatment of minor pregnancy issues, ensuring mothers can address common discomforts effectively. Additionally, it highlights the essential benefits of breastfeeding and the nutritional value of colostrum, underscoring their vital role in the newborn's early development.

Data Collection

In this study, a purposive sampling technique was employed to recruit 100 primigravida women as participants. Written informed consent was obtained from all participants, thereby confirming their voluntary involvement in the study. On the first day, a pre-test was conducted using a structured knowledge questionnaire to assess baseline antenatal care knowledge. Following the administration of a comprehensive antenatal care intervention, a motivational follow-up session was provided on Day 10 to reinforce engagement. A post-test, identical in format to the pre-test, was subsequently administered 21 days after the initial assessment to evaluate changes in knowledge.

Results

Table 1: Demographic Profile

Demographic Variables		f	%
Age in years:	18 to 20	10	10.0
	21 to 25	28	28.0
	26 to 30	37	37.0
	31 to 35	18	18.0
	36 to 40	7	7.0
Gestational period	1 to 3	27	27.0
	4 to 6	53	53.0
	7 to 9	20	20
Educational status	No formal education	8	8.0
	Primary	37	37.0

	High school	6	6.0
	Higher secondary	43	43.0
	Degree/ Diploma	6	6.0
Occupation	Home maker	44	44.0
	Coolie/ farm work	27	27.0
	Semi- skilled	20	20.0
	Student	2	2.0
	Professionals	7	7.0
Type of family	Nuclear	59	59.0
	Joint	38	38.0
	Extended	3	3.0
Religion	Hindu	66	66.0
	Muslim	12	12.0
	Christian	22	22.0
Family's monthly income (Rs)	Up to 10,000	13	13.0
	10,001 – 20,000	36	36.0
	Above 20,000	51	51.0
Is there any previous knowledge regarding antenatal care	Yes	39	39.0
	No	61	61.0
If yes then source of health information regarding antenatal care	Friends	28	28.0
	Health professionals	29	29.0
	Mass media	43	43.0

Table 2: Percentage of sample based on level of knowledge on antenatal care among primigravida women

n= 100

Level of Knowledge	Pre test		Post test	
	f	%	f	%
Poor	80	81	5	5.0
Average	20	20	23	23.0
Good	0	0	72	72.0

Table 2 presents the distribution of antenatal care knowledge levels among 100 primigravida women measured at two time points—before and after the intervention. In the pre-test, the majority of women (81%) exhibited poor knowledge, while 20% demonstrated average knowledge, and none were classified as having good knowledge. Post-intervention, there was a substantial improvement in knowledge: only 5% remained in the poor category, 23% were classified as having average knowledge, and a significant 72% (n = 72) achieved good knowledge. This marked shift in the distribution underscores the effectiveness of the comprehensive antenatal care intervention in substantially enhancing the participants' knowledge.

Table 3: Paired t test to assess Pre and Post-test Knowledge scores of Primigravida

n= 100

Test	Mean	S.D.	Paired t test and P value
Pre test	16.93	4.801	t=17.07 P= 0.0001 ***
Post test	34.8	5.743	

Table 3 displays the results of a paired t-test comparing antenatal care knowledge scores before and after the intervention among 100 primigravida women. The pre-test mean score was 16.93 (SD = 4.801), which increased to a post-test mean score of 34.8 (SD = 5.743). The paired t-test revealed a t-value of 17.07 with a p-value of 0.0001, indicating that the improvement in knowledge scores following the intervention is statistically significant. This significant change suggests that the antenatal care intervention was highly effective in enhancing the participants' knowledge.

Table 4: Association of knowledge scores of primigravida women regarding Antenatal care with selected socio-demographic variables. **n=100**

Demographic group)	Variables (control	Below Mean of pre-knowledge test		Above Mean of pre-knowledge test		Chi-Square Test
		f	%	f	%	
Age in years:	18 to 20	1	10.0	9	90.0	$\chi^2= 4.923$ P=0.295 Df= 4 Not Significant
	21 to 25	11	39.3	17	60.7	
	26 to 30	16	43.2	21	56.8	
	31 to 35	8	44.4	10	55.6	
	36 to 40	4	57.1	3	42.9	
Gestational period	1 to 3	13	48.1	14	51.9	$\chi^2= 2.672$ P=0.263 Df= 2 Not Significant
	4 to 6	22	41.5	31	58.5	
	7 to 9	5	25.0	15	75.0	
	Multi Gravida	26	43.3	34	56.7	
Educational status	No formal education	1	12.5	7	87.5	$\chi^2= 4.556$ P=0.334 Df= 4 Not Significant
	Primary	16	43.2	21	56.8	
	High school	2	33.3	4	66.7	
	Higher secondary	17	39.5	26	60.5	
	Degree/ Diploma	4	66.7	2	33.3	
Occupation	Home maker	17	38.6	27	61.4	$\chi^2= 1.073$ P=0.898 Df= 4 Not Significant
	Coolie/ farm work	10	37.0	17	63.0	
	Semi- skilled	8	40.0	12	60.0	
	Student	1	50.0	1	50.0	
	Professionals	4	57.1	3	42.9	
Type of family	Nuclear	21	35.6	38	64.4	$\chi^2= 8.722$ P=0.041 Df= 2 Significant
	Joint	17	44.7	21	55.3	
	Extended	2	66.7	1	33.3	
Religion	Hindu	25	37.9	41	62.1	$\chi^2= 0.631$ P=0.729 Df= 2 Not Significant
	Muslim	6	50.0	6	50.0	
	Christian	9	40.9	13	59.1	
Family's monthly income (Rs)	Up to 10,000	7	53.8	6	46.2	$\chi^2= 2.586$ P=0.275 Df= 2 Not Significant
	10,001 – 20,000	11	30.6	25	69.4	
	Above 20,000	22	43.1	29	56.9	
Is there any previous knowledge regarding antenatal care	Yes	19	48.7	20	51.3	$\chi^2= 2.085$ P=0.155 Df= 1 Not Significant
	No	21	34.4	40	65.6	
If yes then source of	Friends	10	35.7	18	64.3	$\chi^2= 2.344$ P=0.310
	Health professionals	15	51.7	14	48.3	

health information regarding antenatal care	Mass media	15	34.9	28	65.1	Df= 2 Not Significant
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The data presented in Table 4 portrays that the association between pre-test level of knowledge and the demographic variables. Pearson Chi-square test was used to calculate the association. There was significant association between pre-test level of knowledge and demographic variables such as type of family ($\chi^2 = 8.722$, $p = 0.041$).

Discussion

The present study demonstrated a significant improvement in antenatal care knowledge following the intervention. Specifically, the mean post-test score (34.8 ± 5.743) was markedly higher than the pre-test score (16.93 ± 4.801), with a paired t-test yielding a value of $t = 17.07$ and a corresponding p-value of < 0.0001 , confirming the efficacy of the educational intervention.

These findings are in alignment with those reported in previous research. For instance, Patel et al. (2016)¹² conducted a study involving 384 pregnant women during their final trimester at a tertiary care hospital in Pune, Maharashtra, where a pretested interview schedule was used to categorize participants' knowledge based on a 70% threshold. Similarly, Hamazi (2017)¹³ assessed 400 pregnant mothers, equally divided into experimental and control groups, and demonstrated that the experimental group—who received a video-assisted instructional module—achieved a markedly higher knowledge score (83.89%) compared to the control group (41.11%), in addition to observing improved pregnancy outcomes.

Furthermore, Kaur et al. (2021)¹⁴ evaluated antenatal care knowledge using a 21-item questionnaire and identified that approximately 55% of the participants exhibited adequate knowledge as defined by the 70% cutoff. In another study, Yogeshwari and Jayasankari (2020)¹⁵ reported that while 60% of antenatal mothers initially possessed inadequate knowledge, the intervention led to a notable shift, with a majority attaining moderate to sufficient understanding. Additionally, Mathew (2017)¹⁶ documented an increase in mean knowledge percentage from 55.5% (SD = 2.94) pre-intervention to 93.67% (SD = 1.19) post-intervention, denoting a significant improvement of 38.17 percentage points.

Collectively, these studies underscore the effectiveness of structured educational programs—particularly those enhanced by video-assisted instructional modules—in significantly improving antenatal care knowledge among pregnant women.

Conclusion

The comprehensive antenatal care intervention was effective in significantly improving the antenatal care knowledge of primigravida women, thereby potentially contributing to better maternal health outcomes. Hence, this intervention can be recommended as a valuable strategy for enhancing antenatal care knowledge among primigravida women.

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