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Assess The Pregnant Mother's Attitude on the Implementation of Artificial Intelligence (AI) In Antenatal and Intranatal Care- A Cross-Sectional Study

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ABSTRACT

Artificial Intelligence (AI) is increasingly being explored for its potential to revolutionize healthcare delivery. In obstetrics, AI applications are emerging in areas such as risk prediction for pregnancy complications, automated analysis of ultrasound images, personalized monitoring, and decision support for healthcare professionals during labor and delivery. These technologies hold the promise of improving diagnostic accuracy, enhancing patient safety, and optimizing the overall pregnancy experience.

However, the successful integration of AI in antenatal and intranatal care is not solely dependent on technological advancements. The attitude and acceptance of the end-users, particularly pregnant mothers, are critical factors that can influence the adoption and effectiveness of these tools. Understanding their beliefs, attitudes, and concerns regarding AI in such a sensitive and personal experience is essential.

This cross-sectional study seeks to address this gap by investigating the attitude of pregnant mothers on the implementation of AI in their antenatal and intranatal care. By exploring their understanding of AI, perceived benefits and risks, trust in AI-driven systems, and ethical considerations, this research aims to provide a comprehensive assessment of maternal viewpoints. The findings will contribute to a more nuanced understanding of the socio-technical aspects of AI integration in obstetrics, paving the way for a more patient-centered and ethically sound implementation.

The landscape of healthcare is undergoing a significant transformation, driven by the rapid advancements in Artificial Intelligence (AI). This technological 1 paradigm shift presents unprecedented opportunities to enhance the efficiency, accuracy, and personalization of medical care across various specialties. Obstetrics, a field deeply rooted in human interaction and nuanced clinical judgment, is not immune to this evolving landscape. The potential for AI to augment and even transform antenatal (pregnancy before birth) and intranatal (during labor and delivery) care is becoming increasingly tangible. From sophisticated risk stratification tools that can identify pregnancies at higher risk of complications to AI-powered ultrasound analysis aiding in fetal monitoring and diagnostic accuracy, the applications of AI in this domain are diverse and rapidly expanding.

This cross-sectional study aims to delve into these critical aspects by systematically assessing the perspectives of pregnant mothers on the potential implementation of AI in their antenatal and intranatal care journey. By capturing their awareness,

perceived benefits and risks, levels of trust, ethical considerations, and overall acceptance, this research seeks to provide a crucial patient-centered lens through which the future of AI in obstetrics can be thoughtfully and responsibly shaped. The findings will offer invaluable guidance for healthcare professionals, AI developers, and policymakers as they navigate the complex landscape of integrating cutting-edge technology into the deeply personal and significant experience of bringing new life into the world. Ultimately, the goal is to ensure that the implementation of AI in antenatal and intranatal care is not only technologically advanced but also deeply aligned with the needs, values, and well-being of pregnant mothers.

Key Words: Artificial Intelligence, Antenatal Mother, Intranatal Mother, Attitude

Objectives

1. To assess the Pregnant mother's attitude on the implementation of artificial intelligence (AI) in antenatal and Intranatal care.
2. To determine the association of Pregnant mother's attitude on the implementation of artificial intelligence (AI) in antenatal and Intranatal care with their selected demographic variables.

MATERIALS AND METHODS

An anonymous survey conducted on antenatal mother's and those who were about to present to the labor and delivery unit at selected hospitals from October 2024–January 2025. We assessed the role and interplay of patient demographic factors, healthcare literacy, understanding of use of AI, comfort levels on various AI scenerios, and preferences for use of AI in Antenatal and Intranatal care with the help of Self-structured 3 point Likert scale.

RESULT ANALYSIS

DEMOGRAPHIC PROFILE OF THE SUBJECTS

SOCIO-DEMOGRAPHIC PROFORMA		PERCENTAGE(%)	FREQUENCY(*f*)
Age of mother	Upto 20 years	5%	3
	21-25 years	52%	31
	26-30 years	35%	21
	31-35 years	8%	5
Age At Marriage	16-20 years	42%	25
	21-25 years	50%	30
	26-30 years	8%	5
Education Qualification	No formal education	10%	6
	Primary	65%	39
	Secondary	22%	13
	Graduate or above	3%	2
Employment of Women	Homemaker	78%	47
	Government job	0%	0
	Private job	18%	11
	Self employed	3%	2
Family Income	10000-15000	52%	31
	15001-20000	27%	16
	20001-25000	22%	13
Religion	Hindu	80%	48

	Muslim	20%	12
	Sikh	0%	0
	Christian	0%	0
	Others	0%	0
Family Type	Nuclear	20%	12
	Joint	80%	48
	Extended	0%	0

- **Age of Women**: Most participants (52%) are aged between 21-25 years, followed by 35% aged 26-30 years.
- **Age at Marriage**: Half of the participants (50%) married between 21-25 years, with 42% marrying at 16-20 years.
- **Education**: Most women (65%) have primary education, while 60% of spouses have secondary education.
- **Employment**: The majority of women (78%) are homemakers, while 58% of spouses are in private jobs.
- **Family Income**: More than half (52%) have an income of ₹10,000-15,000.
- **Religion**: The majority (80%) follow Hinduism.
- **Family Type**: The majority (80%) live in joint families.

ATTITUDE SCORE				
FREQUENCY DISTRIBUTION		Mean	S.D	N
Age of Women	Upto 20 years	25.33	1.15	3
	21-25 years	25.48	2.89	31
	26-30 years	24.76	2.91	21
	31-35 years	25.40	1.67	5
Age At Marriage	16-20 years	25.28	2.81	25
	21-25 years	25.23	2.81	30
	26-30 years	24.80	2.28	5
Education Qualification	No formal education	28.17	3.92	6
	Primary	24.74	2.48	39
	Secondary	25.46	2.33	13
	Graduate or above	24.00	0.00	2
Employment of Women	Homemaker	25.09	2.90	47
	Government job			0
	Private job	25.73	2.15	11
	Self employed	25.50	2.12	2
Family Income	10000-15000	25.87	2.73	31
	15001-20000	24.13	3.01	16
	20001-25000	25.00	2.00	13
Religion	Hindu	25.46	2.74	48

	Muslim	24.25	2.60	12
	Sikh			0
	Christian			0
	Others			0
Family Type	Nuclear	22.83	1.70	12
	Joint	25.81	2.62	48
	Extended			0

Age of Women

- The highest mean attitude score was for women aged **31–35 years** (Mean = 25.40, SD = 1.67).
- Women aged **26–30 years** had the lowest mean attitude score (Mean = 24.76, SD = 2.91).

Age at Marriage

- Women married between **16–20 years** had a slightly higher mean attitude score (Mean = 25.28, SD = 2.81).
- Those married at **26–30 years** had the lowest mean score (Mean = 24.80, SD = 2.28).

Education Qualification

- Women with **no formal education** had the highest mean attitude score (Mean = 28.17, SD = 3.92).
- Women with education levels **Graduate or above** had the lowest score (Mean = 24.00).

Employment of Women

- Women in **private jobs** had the highest mean attitude score (Mean = 25.73, SD = 2.15).
- Homemakers had a slightly lower mean score (Mean = 25.09, SD = 2.90).

Family Income

- Families with an income of **₹10,000–15,000** had the highest mean score (Mean = 25.87, SD = 2.73).
- Families earning **₹15,001–20,000** had the lowest mean score (Mean = 24.13, SD = 3.01).

Religion

- Hindus had a slightly higher mean attitude score (Mean = 25.46, SD = 2.74) compared to Muslims (Mean = 24.25, SD = 2.60).

Family Type

- Women from **joint families** had the highest mean attitude score (Mean = 25.81, SD = 2.62).
- Women from **nuclear families** had the lowest mean score (Mean = 22.83, SD = 1.70).

Association of attitude scores with demographic variables

DEMOGRAPHIC VARIABLES		N= 60			ASSOCIATION WITH ATTITUDE SCORE				
Variable		**POSITIVE**	**NEUTRAL**	**NEGATIVE**	**Chi Test**	**P Value**	**df**	**Table Value**	**Result**
Age of Women	Upto 20 years	0	3	0	2.996	0.809	6	12.592	Not Significant
	21-25 years	0	28	3					
	26-30 years	1	19	1					
	31-35 years	0	5	0					

Age At Marriage	16-20 years	0	23	2	1.447	0.836	4	9.488	Not Significant
	21-25 years	1	27	2					
	26-30 years	0	5	0					
Education Qualification	No formal education	1	5	0	12.607	0.013	4	9.488	Significant
	Primary	0	35	4					
	Secondary	0	13	0					
	Graduate or above	0	2	0					
Employment of Women	Homemaker	1	42	4	1.509	0.825	4	9.488	Not Significant
	Government job	0	0	0					
	Private job	0	11	0					
	Self employed	0	2	0					
Family Income	10000-15000	1	30	0	2.614	0.271	2	5.991	not Significant
	15001-20000	0	12	4					
	20001-25000	0	13	0					
Religion	Hindu	1	44	3	0.313	0.855	2	5.991	Not Significant
	Muslim	0	11	1					
	Sikh	0	0	0					
	Christian	0	0	0					
	Others	0	0	0					
Family Type	Nuclear	0	10	2	12.607	0.013	4	9.488	Significant
	Joint	1	45	2					
	Extended	0	0	0					

- **Age of Women**:
  No significant association was observed between the age of women and their attitude scores (p=0.809p = 0.809p=0.809).
- **Age at Marriage**:
  There was no significant relationship between the age at marriage and attitude scores (p=0.836p = 0.836p=0.836).
- **Educational Qualification**:
  The education level of women was significantly associated with their attitude scores (p=0.013p = 0.079p=0.079).
- **Employment of Women**:
  Women's employment status showed no significant association with attitude scores (p=0.825p = 0.825p=0.825).
- **Family Income**:
  Family income was significantly associated with attitude scores (p=0.013p = 0.013p=0.013). Families with higher income tended to have more positive attitudes.
- **Religion**:
  No significant association was observed between religion and attitude scores (p=0.855p = 0.855p=0.855).
- **Family Type**:
  Family type did not show any significant association with attitude scores (p=0.271p = 0.271p=0.271).

CONCLUSION

This cross-sectional study of 60 pregnant mothers reveals about attitude on the implementation of artificial intelligence (AI) in antenatal and intranatal care. While a notable proportion of mothers acknowledge the potential benefits of AI in

enhancing diagnostic accuracy, improving monitoring, and personalizing care during pregnancy and childbirth, concerns regarding the lack of human interaction, trust in the technology, and potential ethical implications persist.

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