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Assessment of Knowledge, Attitude and Practices regarding Antenatal Care among Pregnant Women in Kabul City, Afghanistan

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Abstract: Knowledge, attitude, and practices (KAP) for an antenatal check-up during pregnancy is a key indicator of a healthcare facility in a community. Antenatal care (ANC) is a useful practice for lowering infant and maternal mortality. Therefore, the present study was planned to estimate knowledge, attitudes, and practices regarding (ANC) among pregnant women and determine its association with sociodemographic factors. This hospital-based cross-sectional study was conducted on 406 pregnant women through convenience sampling from March 2022 to February 2024. A semi-structured questionnaire included sociodemographic and obstetrical history, and scored questionnaire on (KAP) was used. The analysis included parametric, nonparametric, and Pearson correlation coefficient tests. The finding of the study revealed that pregnant women had average knowledge (96%), positive attitudes (98.75%), and good practices (58.5%) toward (ANC). The level of overall knowledge had a positive correlation with the practices toward (ANC) (***r* = 0.18, *P* < 0.001**). The sociodemographic association showed that age, type of family, education, and occupation had a significant association with awareness and practices about (ANC). Furthermore, the practice of (ANC) in our study area was low despite good knowledge and attitude toward (ANC). Further, exploratory studies are required and need to be planned to improve practices in prenatal care and ultimately improve their health.

Aim: the present study is undertaken to assess the Assessment of Knowledge, Attitude and Practices regarding Antenatal Care among Pregnant Women's.

Design Methodologies/Approach: The purpose of this research was to improve antenatal care accessibility, financial barriers, healthcare quality, and women's awareness should be eliminated. Community campaigns and mass media should focus on information, education, and communication initiatives. Incentives should be provided to encourage women to use accessible maternal care services, strengthening societal power dynamics and fostering a healthy nation. The sample size for non-probability sampling was calculated by using a single population proportion formula (***n*** = **z2** ∗ (**1** − **p**)/**d2**) to identify a representative sample with the following assumptions *Mulyany (2009), Kassim (2016) Iftikharullah Ghani et al., 2024; Azim Mommand* To increase the study power and cover the probable no-response rate, a **10%** increase in the minimum required sampling is calculated to be**:0.10×369= 36.9≈ 37** Therefore, the calculated number of participants to be selected was **369+37=406.**

Finding: This research focuses on the knowledge, attitude, and practice of antenatal care in Kabul, Afghanistan, a region with a lack of awareness due to economic struggles or political instability. The study was conducted across various hospitals and outpatient departments, including diverse tribes and districts. The large sample size and face-to-face interviews were used to gather data. The aim is to address the existing information gap on antenatal care among pregnant women in Kabul City.

Material & Methods: A cross-sectional study was conducted on 406 pregnant women attending public and private health centers in Kabul City from March 2022 to February 2024. A nonprobability convenient sampling technique was used to select study participants. Face to face interview was conducted to assess women's knowledge, attitude and practice using a structured questionnaire after obtaining verbal consent.

Statistical analysis used: The study utilized SPSS version 27 for data collection, analysis, and correlation between knowledge, attitude, and practice, with a significance level of P-value less than 0.05.

Results and conclusion: The study found that while most pregnant women have good knowledge and a positive attitude towards antenatal care, actual practice is average. Awareness stems from past experiences, traditional teachings, and educational sessions. Barriers like affordability and availability of providers hinder adequate practices among pregnant women.

Key Words: Antenatal Care, Reproductive, Cross-sectional study, Knowledge, Attitude, Practices, Delivery, Antenatal Visits

Paper Types: Research Papers

Introduction: Pregnancy and childbirth mark crucial stages in a woman's life, aiming to safeguard the well-being of both mother and child. Antenatal care (ANC) stands as a cornerstone of safe motherhood initiatives, emphasizing optimal health throughout pregnancy and the early postpartum period. *Iftikharullah Ghani et al., 2024; Azim Mommand (2023);* Originating in early 20th-century Europe, ANC has evolved to encompass comprehensive screening protocols for all expectant mothers. It provides a structured approach to monitoring and managing maternal health, nurturing the physical welfare of both mother and child. *2020 Michael Armstrong Mwita (2020) (2020) Iftikharullah Ghani et al., 2024;* ANC also promotes access to skilled childbirth assistance and encourages postpartum care seeking. Despite its benefits, ANC often falls short, contributing to half a million maternal deaths annually due to pregnancy complications. Its primary objective remains ensuring the delivery of a healthy mother and baby through recommended periodic check-ups. The Safe Motherhood package, introduced by the World Health Organization in 1994, *Mulyany (2009), Kassim (2016) Iftikharullah Ghani et al., 2024; Azim Mommand* consists of four key elements: antenatal care, family planning, secure delivery, and essential obstetric care. Antenatal care (ANC) is one of the four pillars of safe motherhood initiatives, emphasizing good health during pregnancy and the early postpartum period. Originally designed for women in socially difficult living conditions, ANC has evolved to include more specific screening procedures for all pregnant women. ANC is a systematic approach to monitoring and managing a woman's health during pregnancy, promoting and maintaining the physical well-being of both the mother and the child. It also serves as an opportunity to advocate for skilled assistance during childbirth and educate women about the benefits of child spacing. However, ANC is often insufficient in developing countries, where half a million girls and women die due to complications during pregnancy. *Iftikharullah Ghani et al., 2024; Azim Mommand (2023);* ANC should extend beyond monitoring for complications and offer guidance, consultations, and preventive measures, covering aspects such as dietary recommendations, delivery care, and postnatal care.

RQ1, what is the level of knowledge, attitude, and practice towards antenatal care among pregnant women attending public and private hospitals in Kabul City, Afghanistan**?**

RQ2, what is the relationship between antenatal knowledge, attitudes, practice, and the socio-demographic background of pregnant women**?**

Background of study: Pregnancy and childbirth are significant phases in a woman's life, with the ultimate goal of ensuring the well-being of both the mother and the child. Antenatal care (*ANC*) is one of the four pillars of safe motherhood initiatives, emphasizing good health during pregnancy and the early postpartum period. *Iftikharullah Ghani et al., 2024; Azim Mommand (2023);* Originally designed in Europe in the early 20th century, ANC has evolved to include more specific screening procedures for all pregnant women. It is a systematic approach to monitoring and managing a woman's health during pregnancy, promoting and maintaining the physical well-being of both the mother and the child. ANC serves as an opportunity to advocate for skilled assistance during childbirth and encourage women to seek postpartum care. However, despite its advantages, ANC is often insufficient, with half a million girls and women losing their lives due to complications during pregnancy. The goal of ANC is to ensure the delivery of a healthy mother and baby, with recommended visits at various intervals.

MATERIALS AND METHOD

Aims and objectives:

- Study the role of relationship between antenatal knowledge, attitudes, practice, and the socio-demographic background of pregnant women.
- To Provide the antenatal (KAP) of pregnant women and to compare them against international standards, identify factors that mitigate antenatal KAP and make suggestions for minimizing obstacles to satisfactory antenatal care.

Selection of patients: Participants were chosen through a non-probability convenient sampling method, specifically targeting pregnant mothers who had lived in Kabul City for at least five years. This decision was made to fill a research gap, as previous studies had not assessed the Knowledge, Attitude, and Practice (KAP) levels in this particular demographic within the study area.

Inclusion criteria:

- All pregnant women who visited the pediatric, obstetrical and gynecological outpatient and inpatient departments (OPD & IPD) of either the public or private hospitals in Kabul city, Afghanistan, during a period of 24 months (March, 2022 to Feb, 2024), were included.

- Permanent residents of Kabul city, Afghanistan.
- Women who had the ability to provide medical-demographic information.

Exclusion criteria:

- Pregnant women who refused to consent to an interview.
- Pregnant women who were not residents of the respective locality.
- Pregnant women who had difficulties to conduct the interview due to critical condition

Problem statement: Pregnancy is a transformative journey for women, requiring self-adjustment and significant changes in maternal systems. While not an illness, it poses health risks like morning sickness, heartburn, and constipation. A healthy diet and lifestyle are crucial for optimal baby growth and long-term health benefits. Antenatal care (ANC) prevents maternal and neonatal morbidity and mortality through regular check-ups, nutritious diets, treatment for complications, and adequate fluid intake. Maternal mortality in developing countries is a significant issue, with 529,000 women dying annually due to complications from pregnancy or childbirth. The primary cause is limited access to maternal healthcare, with 810 people dying daily due to complications. Over 500,000 mothers die annually due to pregnancy-related complications, with 20% being indirect deaths from pre-existing conditions like anemia and malaria. Afghanistan has one of the highest maternal mortality ratios globally, with estimates ranging from 418 to 6507. Common causes include postpartum hemorrhage, obstructed labor, pre-eclampsia/eclampsia, and sepsis, which can be prevented or treated with skilled healthcare. Afghanistan is considered the "most challenging country for motherhood," with one in five children not surviving beyond their fifth birthday. Only 60% of pregnant women attend at least one antenatal visit, and 16% adhere to recommended four visits. Factors influencing antenatal care utilization include educational level, residence, prior health education, media exposure, socio-economic status, transportation availability, and healthcare personnel behavior. Limited data exists on these factors, emphasizing the need for a Knowledge, Attitude, and Practice (KAP) descriptive study to mitigate morbidity and mortality rates.

Literature Review/ Hypotheses developments: Antenatal care (ANC) is a crucial health intervention for pregnant women, aiming to prevent maternal morbidity and mortality. The World Health Organization recommends a minimum of four ANC visits, including tetanus toxoid vaccination, infection screening, and pregnancy-related warning signs. Despite the Millennium Development Goals (MDGs) aiming to reduce maternal and childhood mortality, none of the member countries achieved these goals. Traditional ANC follows WHO's recommendation of 4-5 visits for pregnant women without medical complications, with at least three visits suggested. Regular utilization of ANC allows health workers to anticipate and manage pregnancy complications, ensuring favorable outcomes. However, sub-Saharan Africa experiences low ANC coverage and delayed attendance, posing challenges in adhering to WHO's recommended schedule. (**1**) Knowledge regarding antenatal care among pregnant women**:** A study in India found that most pregnant women were aware of antenatal care (ANC) services, but only 73.1% knew the first check-up should be done within the first three months. In Jempol, Orang Asli et al., 2022 Mulyany *(2009), Kassim (2016) Iftikharullah Ghani et al., 2024;* women knew about ANC check-ups, but only 73.1% knew the first check-up should be done. In Somalia, 75% of pregnant women were aware of antenatal care, with sources of awareness coming from healthcare providers, husbands, friends, relatives, neighbors, and traditional birth attendants. (**2**) Attitude of pregnant women regarding antenatal care**:** A (KAP) study in Jempol et al., 2022 found that Orang Asli women have a positive attitude towards antenatal care and medication use. They emphasize the importance of early booking, vitamin supplements, and regular follow-ups to reduce complications and improve delivery. In Libya, 96.7% of pregnant women support routine screening tests and antenatal booking. In Somalia, 80% believe antenatal care is necessary for safe delivery. In Pakistan, 79.8% of pregnant women receive antenatal care, with most visiting doctors regularly. The majority recommend monthly, twice-monthly, or thrice-monthly checkups. The attitudes of pregnant women towards antenatal care and medication use vary across countries. (**3**) Practice of pregnant women regarding antenatal care**:** A study in India found that 60% of pregnant women received antenatal care in rural childcare centers, with the majority attending primary health centers. Delays in seeking healthcare were attributed to lack of awareness, accessibility, and funds. A study in Jempol found that 92.3% attended antenatal check-ups, but only 48.1% attended the first three months of pregnancy. In Sudan, 75.3% had average practice, and Tanzania had 73.7%. In Eritrea, 59.4% visited health facilities. (**4**) Relationship between knowledge, attitude and practice**:** A study by *Rosliza AM and Muhamad JJ 2024* found a significant positive and moderate relationship between knowledge and attitude scores among Orang Asli women in Jempol *(2016) Iftikharullah Ghani et al., 2022.* However, knowledge score was not significantly associated with early antenatal booking or home delivery. *Sumaira Bashir's (2020) Iftikharullah Ghani et al., 2024;* research in India found a positive correlation between overall knowledge and practices towards antenatal care (ANC), while a negative correlation was found with attitude. *Hala K. Ibrahim's (2018) Iftikharullah Ghani et al., 2022;* research in Libya showed a significant direct correlation between overall knowledge and practice towards ANC, but an insignificant correlation with attitude. (**5**) Knowledge, Attitude, and Practice on Antenatal Care Among Pregnant Women and its Association with Sociodemographic Factors**:**The study by Hailemichael Gebremariam, *Berhe Tesfai, 2020 Michael Armstrong Mwita (2020) (2020)* and others found that the knowledge, attitude, and practice of antenatal care among pregnant women are influenced by sociodemographic

factors. In Amatere Health Center, *Massawa, Eritrea, (2020) (2024)* the majority of mothers have good comprehensive knowledge (84.1%) and attitude (99%). Age, ethnicity, marital status, occupation, gravidity, and parity also have a significant association with comprehensive knowledge. Single and unemployed mothers have poorer knowledge compared to married and housewife mothers. Multigravida and multiparous mothers have better knowledge compared to primigravid and nulliparous mothers. In India, *Sumaira Bashir (2009), Kassim (2016)* and her friends found no significant association between age, type of family, occupation, education, parity, and socioeconomic status (SES) with the overall knowledge, attitude, and practices of antenatal care. (**6**) KAP surveys, originated in the 1950s, are a method of family planning and population research used to assess health-related behaviors and practices. They use semi-structured or structured questionnaires, encompassing both qualitative and quantitative methods, to gather knowledge, attitudes, beliefs, and practices. *Adan, A., Hassan, F. M., Gedi, M. A., & Mohamud, M. D. (2017)* (**7**) Knowledge of Antenatal care**:** Antenatal care involves understanding pregnancy registration, recognizing pregnancy warning signs, using preventive iron and folic acid tablets, and adopting family planning methods during pregnancy. (**8**) Attitude on Antenatal care**:** Knowledge of Antenatal care: Antenatal care involves understanding pregnancy registration, recognizing pregnancy warning signs, using preventive iron and folic acid tablets, and adopting family planning methods during pregnancy. (**9**) Practices on Antenatal care**:** Antenatal care behaviors refer to observable actions taken by a pregnant woman, including attending hospital for check-ups, arranging visits, and adopting family planning methods, influenced by pregnancy danger signs.

Theoretical Framework:

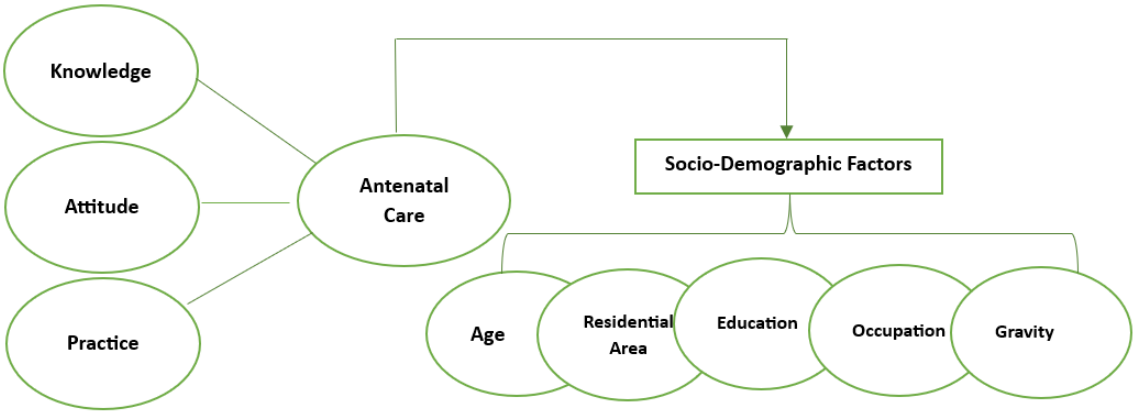


Figure: 1 Assessment of Knowledge, Attitude and Practicesregarding Antenatal Care among Pregnant Women

Research Methodologies: The questionnaire underwent pretesting and daily review by principal investigators to ensure data quality. It was adjusted and refined, and a pilot study was conducted for months before the study began, excluding participants. The questionnaire underwent testing and revisions. The study used SPSS version 27 for statistical analysis, focusing on knowledge about antenatal care and perceived danger signs during pregnancy. 11 questions were asked, and the knowledge score was calculated using percentages. Pregnant women with higher knowledge scores (>75%), average knowledge (50%-75%), and low knowledge scores (<50%) were categorized as high, average, or low.

The study assessed respondents' attitudes towards antenatal visits, infection checkups, blood pressure measurement, dietary plans, home deliveries, and IFA. Attitudes were graded as positive, neutral, or negative. Practices were assessed using questions about delivery type, contraception method, and frequency of visits. Percentages were used to grade practices, with higher scores indicating better practice, while lower scores indicated inadequate practices.

Socio-demographic characteristics of the study population: The study involved 406 women aged 18-25, with a majority (45.1%) aged between 26-35. The majority (63.8%) were from urban areas, with a high percentage of uneducated candidates (67.5%). The majority (93.1%) were unemployed. The majority (66.3%) had their first pregnancy, with 21.7% having their second. The mean number of pregnancies was 2.92.

Variables		Frequency (n=406)	Percentage
Age groups (years)			
	18-25	183	45.1%
	26-35	170	41.9%
	36-45	52	12.8%
	46-50	1	2%
Residential Area			
	Urban	259	63.8%
	Rural	147	36.2%
Education			
	Uneducated	274	67.5%
	Primary School	25	6.2%
	Secondary School	39	9.6%
	High School	36	8.9%
	University	32	7.9%
Occupation			
	Employed	20	4.9%
	Housewife	386	95.1%
No. of Pregnancy (Gravidity)			
	First	66	16.3%
	Second	88	21.7%
	Third	63	15.5%
	Fourth and above	189	46.6%

Table.1. 1 Socio-demoagraphic characteristics of the candidates.

Practices of the pregnant women on antenatal care: The study analyzed the practices of pregnant women on antenatal care, with 66.7%) having normal previous deliveries, 18.2% having C/S, and 15.0% conceiving for the first time. Contraception methods used included oral tablets, injections, IUCD, Norplant, barrier methods, and natural methods. Most participants had their first visit in the first trimester, with 65.8% being regular. The number of antenatal visits varied, with 38.4% visiting once, 12.8% visiting thrice, 14.0% visiting four times, and 41.4% attending more than five times.

Q/N	Questions	Options	Frequency	Percentage
1.	Type of previous delivery?	Normal	271	66.7%
		C/s	74	18.2%
		Primigravida	61	15.0%
2.	Type of contraception?	Oral	29	7.1%
		Injection	32	7.9%
		IUCD	14	3.4%
		Norplant	11	2.7%
		Barrier method	40	9.9%
		Natural method	48	11.8%
		None	232	57.1%
3.	In which trimester of pregnancy, you did first visit at antenatal clinic.	In first trimester	335	82.5%
		In second trimester	49	12.1%
		In third trimester	22	5.4%
4.	Are you regular in your Antenatal care visit schedule.	Yes	267	65.8%
		No	139	34.2%
5.	No. of antenatal visits did you make?	One	38	9.4%
		Two	39	9.6%
		Three	52	12.8%
		Four	57	14.0%
		Five	52	12.8%
		Above	168	41.4%
6.	Are you taking folic acid and iron as prescribed by your Doctor?	Yes	311	76.6%
		No	95	23.4%
7.	Do you take proper rest as advised by your attending Doctor?	Yes	301	74.1%
		No	105	25.9%
8.	Did you made changes in Diet plan as advised?	Yes	342	84.2%
		No	64	15.8%

Table.2. 1 Practice of candidates on antenatal care.

Demographic Variables		Bad Practice N (%)	Average Practice N (%)	Good Practice N (%)	P value
Educational level	uneducated	47 (17.2)	171 (62.4)	56(20.4)	0.02
	Primary School	1 (4)	16 (64)	8 (32)	
	Secondary School	1 (2.2)	26 (66.7)	12 (30.8)	
	High school	3 (8.3)	21 (58.3)	12 (33.3)	
	University	0 (0)	17 (53.1)	15 (46.9)	
Residence	Urban	23 (8.9)	155 (59.8)	81 (31.3)	0.000
	Rural	29 (19.7)	96 (65.3)	22 (15)	
No. of pregnancy	First	14 (21.1)	51 (77.3)	1 (1.5)	0.000
	Second	11 (12.5)	59 (67)	18 (20.5)	
	Third	5 (7.9)	39 (61.9)	19 (30.2)	
	Fourth or above	22 (11.6)	102 (54)	65 (34.4)	

Association between socio-demographic factors and practice level regarding antenatal care: The study found that socio-demographic factors such as educational level, residence, and pregnancy number significantly influence the practice level of candidates regarding antenatal care.

Table.3. 1 Association between socio-demographic factors and practice level regarding antenatal care

Significance of study: This research aims to bridge the existing gap in understanding the knowledge, attitudes, and practices of the community regarding antenatal care. By conducting this study, the community administration can assess the awareness, attitudes, and behaviors of pregnant women in relation to antenatal care. *Adan, A., Hassan, F. M., Gedi, M. A., & Mohamud, M. D. (2017)* The study's findings will be communicated to the community members and presented to higher authorities and policymakers. The results will serve as valuable input for decision-makers, stakeholders, and policymakers to enhance or formulate specific policies addressing maternal mortality and morbidity rates within the community. Additionally, the study aims to raise awareness among participants about the significance of antenatal care and illuminate the potential health impacts resulting from its absence.

Scope of the study: The study will exclusively target Kabul City, the capital of Afghanistan, chosen for its diverse demographic makeup and extensive healthcare infrastructure. The focus will be on pregnant women residing within Kabul City.

Geographical Scope

- The study will focus exclusively on Kabul City, the capital of Afghanistan, due to its diverse demographic composition and significant healthcare infrastructure.

Demographic Focus

- Target population: 406 pregnant women residing in Kabul City.
- Inclusion criteria: pregnant women of all ages and socioeconomic backgrounds who are currently receiving antenatal care services in Kabul.

Sample and Sampling Techniques: All participants fulfilling the inclusion criteria were invited to participate. The sample size for non-probability sampling was calculated by using a single population proportion formula ($\boldsymbol{n} = \mathbf{z2} * \mathbf{p}(\mathbf{1} - \mathbf{p})/\mathbf{d2}$) to identify a representative sample with the following assumptions: Where **n** is the sample size, **p** is the prevalence of the outcome expressed as a proportion of **60%** (Rahmani & Brekke, 2013), **d2** is the margin of error, which is **0, 5** (**5%**) in this case, and **1.96** is the standard normal **z**-value corresponding to the **95%** confidence interval (CI). The calculated sample size for this study will be **369** participants. Calculations

$\boldsymbol{n = \frac{z2\times(1-P)}{D^2}} = \frac{(1.96)2\times0.6(1-0.6)}{(0.05)^2} = 369$ To increase the study power and cover the probable no-response rate, a **10%** increase in the minimum required sampling is calculated to be**:** $\mathbf{0.10\times369 = 36.9\approx 37}$ Therefore, the calculated number of participants to be selected was **369+37= 406.**

Correlations

		K	A	PA
K	Pearson Correlation	1	.893**	.860**
	Sig. (2-tailed)		.000	.000
	N	406	406	406
A	Pearson Correlation	.893**	1	.861**
	Sig. (2-tailed)	.000		.000
	N	406	406	406
PA	Pearson Correlation	.860**	.861**	1
	Sig. (2-tailed)	.000	.000	

N	406	406	406

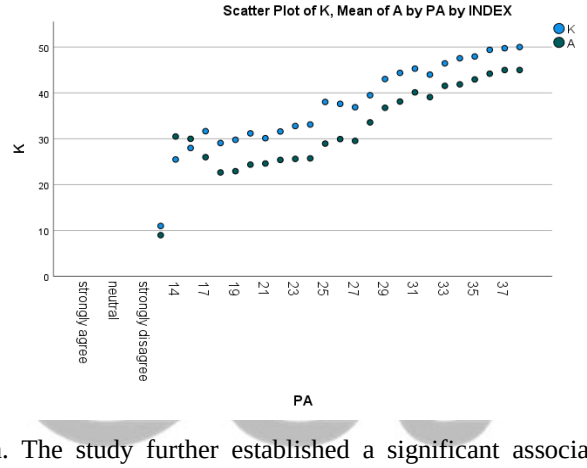
**. Correlation is significant at the 0.01 level (2-tailed).

Descriptive Statistics

	Mean	Std. Deviation	N
K	37.90	7.747	406
A	31.66	7.843	406
PA	26.15	5.355	406

The study uses Pearson correlation coefficients to analyze the relationship between three variables: K, A, and PA. The correlation matrix shows a perfect positive correlation between K and itself, indicating a strong relationship between variables. The cross-correlation analysis shows a strong positive correlation between K and A, indicating a strong relationship between variables. The correlation coefficients above.860 also indicate a strong positive relationship between K and PA. These findings suggest a high degree of association between K, A, and PA, with high significance levels indicating they are statistically significant. The findings suggest that these correlations are likely due to chance.

The data provided consists of Pearson correlation coefficients between three variables: K, A, and PA. Let's



Conclusions: The findings of this study highlight the importance of antenatal care (ANC) in ensuring maternal and child health, particularly in Kabul, Afghanistan, where awareness about ANC remains limited due to economic struggles and political instability. While most pregnant women demonstrated good knowledge (**96%**) and a positive attitude (**98.75%**) toward ANC, actual practice (**58.5%**) was comparatively lower. This gap between knowledge, attitude, and practice suggests that barriers such as financial constraints, lack of healthcare accessibility, and availability of trained professionals hinder effective ANC utilization. The study further established a significant association between sociodemographic factors (such as **age, family type, education, and occupation**) and ANC awareness and practices. Additionally, a positive correlation between knowledge and practice (**r = 0.18, P < 0.001**) indicates that increasing knowledge may contribute to better ANC practices. Given these findings, there is an urgent need for strategic interventions, including awareness campaigns, improved healthcare infrastructure, financial support programs, and mass media education initiatives to encourage better ANC practices. Future research should focus on longitudinal and qualitative studies to explore deeper behavioral, cultural, and systemic barriers affecting ANC adherence. Addressing these issues through policy reforms and strengthened maternal healthcare services can contribute to reducing maternal and infant mortality rates and fostering a healthier society.

Implications: The findings of this study suggest that the **Ministry of Health**, along with both private and public healthcare policymakers, should develop comprehensive strategies to enhance maternal and child healthcare services. This includes increased awareness campaigns, training programs, and improved internal communication to ensure better antenatal care (ANC) practices. Strengthening healthcare employees' work support systems, offering incentives, and fostering motivation among personnel can enhance service delivery and maternal health outcomes (*Hume & Hume, 2015; Sahibzada et al., 2019; Azim, Mommand et al., Ghani, 2024).*

Limitations and future research: The first (**KAP**) study in Kabul City, Afghanistan, found that all pregnant women responded to **100%** of questions without dropouts. However, the study's limitations include its focus on Kabul City, potential recall bias, and respondent bias due to in-laws and community hospital-based interviews. The use of convenience sampling and self-reported data may introduce selection bias, leading to overestimation or underestimation of knowledge, attitudes, and practices (**KAP**) regarding antenatal care (**ANC**). The study also did not explore underlying behavioral or cultural influences affecting healthcare-seeking behavior.

The study was cross-sectional, limiting the ability to establish causal relationships between KAP and ANC practices. Future research should adopt a multicenter or community-based approach, incorporate qualitative research methods, assess intervention programs, and integrate financial and structural perspectives to strengthen maternal healthcare systems and foster sustainable health improvements.

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