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Maternal Knowledge of Antenatal Care, Teratogens and Patient Satisfaction in Tertiary Care Hospitals of Rawalpindi /Islamabad: a Cross-Sectional Analytical Study

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ABSTRACT

Objective: To assess maternal knowledge of antenatal care teratogens and to determine patient satisfaction among women visiting tertiary care hospitals of Rawalpindi/Islamabad.

Study Design: Cross-sectional analytical study.

Place and Duration of Study: Two Tertiary Care Hospitals of Rawalpindi/ Islamabad, Pakistan from Jan to May 2023.

Methodology: The study was conducted on pregnant females visiting tertiary care hospitals in Rawalpindi and Islamabad from January to May 2023. Participants aged 18-45 were recruited through a convenience sampling technique. A pre-tested questionnaire comprising socio-demographic and Likert scale scoring regarding knowledge of antenatal care teratogenic medicine and consultation satisfaction was used. Differences in scores by age, perinatal status, education, and income were analysed.

Results: The study included 120 participants, of which 86(71.7%) were less than 30 years of age, 34(28.3%) were more than 30 years, and 47(39.5%) of the women had attended school till matriculation. The median knowledge of antenatal care score was 69.3(79.6-58.7), teratogen score was 85.1(95.3-74.5) and patient satisfaction score was 73.4(79.7-66.3). The patient's status (p<0.001), peri-natal status (p=0.013), the patient's education (p<0.001), husband's education (p<0.001), and the family income (p<0.001) had a significant effect on the antenatal knowledge scores. The education (p<0.001). husband's education(p=0.018) and the family income (p=0.003) significantly effected knowledge of teratogens score.

Conclusions: Knowledge of antenatal care and teratogens was higher among younger women and peri-natal patients with higher socioeconomic levels and education. Despite the general satisfaction with consultations, there were knowledge gaps in significant ANC components, like early checkups and health screenings,

Keywords: Antenatal Care, Attitude, Knowledge, Patient Satisfaction, Teratogens.

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INTRODUCTION

Pregnancy, delivery, and the postpartum period are among the leading causes of death and disability for women of reproductive age worldwide. Every year, 10.7 million women die before the age of 25 due to maternal causes.[1] According to the World Health Organization (WHO), approximately 810 people die every day due to complications in pregnancy and childbirth. Most of these maternal deaths (99%) and child deaths (98%) occur in low- and middle-income countries (LMIC).[2] Pakistan, with a maternal mortality ratio of 186 per 100,000 live births, ranks 53rd globally for high maternal mortality rates and is the sixth most populous country in the world.[3]

Medication use during pregnancy presents a unique challenge, as some drugs can cross the placental barrier, potentially harming the developing fetus.[4] Each year, 7.9 million infants, or 6% of births, are affected by serious congenital anomalies, of which 3.2 million result in lifelong disability.[5] Evidence has shown that two out of three congenital disabilities occur in babies whose mothers use non-routine medications during pregnancy.[6] This issue is exacerbated by the lack of awareness among pregnant women regarding the risks of teratogenic drugs, which can lead to adverse outcomes for both mother and child.[7]

In addition to medication safety, satisfaction with antenatal care (ANC) services is a crucial determinant of maternal and neonatal health. Studies from LMIC report satisfaction levels ranging from 21.5% to 90%, influenced by factors such as healthcare providers' skills, emotional support, and overall service quality.[8] Patient satisfaction is pivotal in ensuring adherence to treatment plans and continued utilization of ANC services, ultimately improving health outcomes.[9] There is limited research in Pakistan on pregnant women's knowledge of ANC and teratogenic

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medications. This study aims to assess patient satisfaction with consultations and their understanding of antenatal care and teratogens to identify gaps in awareness and healthcare delivery, focusing on women visiting tertiary care facilities in Rawalpindi/Islamabad.

METHODOLOGY

The cross-sectional analytical study was conducted from January to May 2023 in two Tertiary Care Setups of Rawalpindi/Islamabad, Pakistan after obtaining ethical approval from the Ethical Review Committee of Army Medical College, National University of Medical Sciences (ERC/ID/11/434). The Raosoft sample size calculator was used to determine the sample size, considering the following parameters: population size: 20,000, response distribution: 95%.[10] The non-probability convenience sampling technique was employed.

Inclusion criteria: Women aged 18 to 45 years of age visiting the obstetric department for antenatal or postnatal checkups were included.

Exclusion criteria: Women with cognitive impairments, those visiting for purposes other than prenatal or postnatal checkups, and those requiring emergency treatment were excluded.

A questionnaire was designed following a literature review and improvisation based on earlier research.[11,12] The questionnaire was pre-tested with a convenient group of 20 individuals, after which necessary improvements were made. Content validity was ensured by seeking expert opinions from obstetrics and maternal health professionals. The reliability of the questionnaire, as determined by Cronbach's Alpha, was 0.7. Data was collected using this pre-tested questionnaire, which was distributed in person by the researchers to ensure women's direct participation after obtaining written informed consent. The questionnaire was translated into the local language for women unable to read, and responses were recorded during interviews. The process of completing the questionnaire took approximately 20–25 minutes.

The questionnaire consisted of four sections. The first section gathered socio-demographic information, including age, peri-natal or post-natal status, educational level of the female and her husband, and family income. The second, third, and fourth sections included questions assessing knowledge of antenatal care, teratogens, and patient satisfaction, respectively, using a 5-point Likert scale (0: Do not know, 1: Strongly disagree, 2: Disagree, 3: Agree, 4: Strongly agree). Reverse coding was performed for negative statements where disagreement indicated the correct response. The overall knowledge score ranged from 0 to 100.[13]

Statistical analysis was conducted using the Statistical Package for Social Sciences (SPSS) Version 25.0. Frequency and percentages were calculated for qualitative variables, and median and interquartile range were calculated for knowledge of antenatal care (ANC), teratogens, and patient satisfaction. For comparison between study groups, Mann Whitney U test was applied. The *p*-value of 0.05 or less was taken as significant.

RESULTS

One hundred thirty-eight questionnaires were distributed to women visiting tertiary care hospitals, and 120 questionnaires were returned, making a response rate of 87%. Almost two-thirds of the participants, 86(71.7%), were less than 30 years of age, while one-third, 34(28.3%), were more than 30 years. Most women, 104(86.7%), were in the peri-natal period of pregnancy, whereas 16(13.3%) were postnatal. The majority, 83(69.2%), had a history of previous pregnancies, while 37(30.8%) were experiencing pregnancy for the first time: almost half, 56(47%) of the women presented during the second trimester of pregnancy. A total of 47(39.5%) of the women had attended school till matriculation or below, while 51(42.6%) of their husbands had studied to this level. In contrast, 68(57.4%) of the husbands had completed education up to intermediate or more. More than half, 64(53.2%) of the participants belonged to families with less than 30,000 PKR, while 56(46.8%) came from families earning 30,000 PKR or more. The Median ANC knowledge scores, Teratogens knowledge scores, and satisfaction with consultation scores (Interquartile range) were compared across different subgroups, and p-values are mentioned in respective tables. The median knowledge of antenatal care score was 69.3(79.6-58.7), knowledge of teratogen score was 85.1(95.3-74.5) and patient satisfaction score was 73.4(79.7-66.3).

The comparison of median knowledge of Antenatal care (ANC) score across different socio-demographic variables is summarized in Table-I. Significant differences in knowledge scores across several socio-demographic variables are as follows: patient status ($p< 0.001$), educational status ($p< 0.001$), husband's

education (p< 0.001), and family income (p< 0.001). No significant difference was observed for age (p= 0.227).

Table-I: Comparison of Mean Knowledge of Antenatal Care Scores across Socio-Demographic Variables (n=120)

Socio-demographic Variables	Frequency (n)	Median(IQR)	*p*-Value
Age Group			
< 30 years	86	74.5(80.4-67.0)	0.227
≥ 30 years	34	71.3 (78.3-64.3)	
Patient Status			
Perinatal	104	68.7(78.4-58.0)	<0.001
Postnatal	16	71.8(81.9-63.3)	
Perinatal Status			
First Trimester	26	69.5(80.3-60.5)	0.013
Second Trimester	25	68.4(78.4-56.8)	
Third Trimester	52	68.7(77.6-56.6)	
Educational Status			
Matric or less	47	70.1(81.2-58.7)	<0.001
Intermediate and above	73	69.0(76.6-58.4)	
Husband's Education			
Matric or less	49	68.9(79.9-58.7)	<0.001
Intermediate and above	71	70.2(79.4-58.3)	
Family Income			
< 30,000 PKR	52	70.0(56.8-77.5)	<0.001
≥ 30,000 PKR	68	69.0(77.5-59.8)	

The comparison of median knowledge of teratogens scores across different socio-demographic variables is shown in Table-II. Significant differences were found for educational status (p<0.001), husband's education (p= 0.018), and family income (p=0.003). Age and patient status did not show significant associations. Table-III compares patient satisfaction scores across different socio-demographic variables. No significant differences (p>0.05) were observed across different socio-demographic variables.

DISCUSSION

This study explored the knowledge of pregnant females visiting tertiary care setups of Rawalpindi/Islamabad, antenatal care, and teratogens, along with their satisfaction with consultation. The findings of this study revealed that the median antenatal care (ANC) knowledge score was 69.3(79.6-58.7). However, a study conducted in Peshawar indicated a greater score. That could be attributed to socioeconomic factors, education level, cultural disparities, and inadequate healthcare facilities.[13] There was no significant difference in knowledge of ANC score across younger and older age groups (p=0.287); in contrast, according to a study conducted in Massawa, Eritrea, the older a woman is, the more knowledgeable she is about ANC (p=0.011). Overall, 84.1% of women had good knowledge.[14] However, a qualitative study from Cameron reported contradictory findings that could have resulted from differences in healthcare infrastructure, cultural perceptions of healthcare, socioeconomic factors, or varying levels of access to antenatal education between regions.[15] Most women in the perinatal period, 86.7%, had good knowledge of antenatal care. A statistically significant relationship between peri-natal status and knowledge of antenatal care (p=0.013). Women in the third trimester had a better perception of ANC. This could be due to increased health concerns as the delivery is approaching.

Table-II: Comparison of Knowledge of Teratogens Scores across Sociodemographic Variables (n=120)

Socio-demographic Variables	Frequency(n)	Median(IQR)	*p*-value
Age Group			
< 30 years	86	84.3(93.9-74.2)	0.287
≥ 30 years	34	88.5(99.3-74.6)	
Patient Status			
Perinatal	104	86.0(96.0-75.5)	0.420
Postnatal	16	75.9(89.2-63.1)	
Perinatal Status			
First Trimester	26	80.2(90.1-70.8)	0.404
Second Trimester	25	87.4(99.1-83.8)	
Third Trimester	52	86.5(98.4-75.5)	
Educational Status			
Matric or less	47	82.2(97.5-75.2)	<0.001
Intermediate and above	73	85.3(94.1-73.1)	
Husband's Education			
Matric or less	49	80.4(94.6-72.8)	0.018
Intermediate and above	71	87.4(96.9-76.4)	
Family Income			
< 30,000 PKR	52	84.1(96.0-74.4)	0.003
≥ 30,000 PKR	68	85.3(95.1-74.6) ± 12.6	

In contrast to our findings, a study conducted in Pakistan stated inadequate knowledge of the content of antenatal care and its association with peri-natal status (p=0.001).[16] Study participants overall had a high knowledge of teratogens score of 85.1(95.3-74.5), in contrast to a study conducted in Malaysia where only 17% of women had high knowledge of the teratogenic effect of medication during pregnancy. Possible reasons for these scores in our study can be

attributed to urban settings and the better educational status of women.[17]

Table-III: Comparison of Patient Satisfaction Scores across Sociodemographic Variables (n=120)

Sociodemographic Variables	Frequency(n)	Median(IQR)	*p*-value
Age Group			
< 30 years	86	74.5(80.4-67.3)	0.301
≥ 30 years	34	71.3(78.3-64.3)	
Patient Status			
Perinatal	104	73.3(79.6-65.9)	0.232
Postnatal	16	73.8(79.6-65.9)	
Perinatal Status			
First Trimester	26	76.1(79.7-63.6)	0.817
Second Trimester	25	71.7(79.5-64.4)	
Third Trimester	52	72.9(79.8-67.6)	
Educational Status			
Matric or less	47	73.3(79.1-65.7)	0.281
Intermediate and above	73	73.6(79.9-66.9)	
Husband's Education			
Matric or less	49	73.1(79.5-65.4)	0.242
Intermediate and above	71	74.1(80.1-67.6)	
Family Income			
< 30,000 PKR	52	73.6(79.6-65.9)	0.963
≥ 30,000 PKR	68	73.4(79.9-68.0)	

Knowledge score of teratogens was higher in the better socioeconomic status group (p=0.003) and higher education(p<0.001), owing to enhanced access to quality care, better awareness, and proactive health decisions. Similarly, a study conducted in Saudia Arabia reported a significant association between the level of education (p=0.001) and family income status (p=0.001). Better access to quality healthcare services and information on antenatal care in better socioeconomic groups led to better awareness. In addition, education promotes adherence to health recommendations during the antenatal period.[18]

The mean patient satisfaction score was 73.4(79.7-66.3), which is in line with a study conducted in Tanzania using different instruments; women expressed a high level of satisfaction (88.9%) with the treatment they received from healthcare providers, including respect, healthcare, how they were made to feel, and the opportunity to ask questions.[19] However, a study conducted in Laos documented low satisfaction with antenatal care consultation, which was attributed to poor communication skills of healthcare providers and increased workload.[20] In this study, their educational level did not influence patients' satisfaction with ANC consultations (p=0.281). However, in contrast to our findings in a study from Ethiopia, women with primary education or those who did not pursue formal education had 2.5 and 2.2 times higher odds of being satisfied with ANC services. These contrasting findings can be attributed to poor education and lack of access to healthcare services; whatever is available, they are content with that.[21] Patients' satisfaction with consultation and antenatal services did not vary among age groups (p>0.05). Regardless of age or patients' peri-natal or postnatal status, patients were generally satisfied with antenatal consultations and treatments (p=0.404). In contrast with our findings, research from Fiji reported factors such as waiting time, doctor communication, and patient trust (p<0.001) as significant determinants of patient satisfaction.[22] The discrepancies in the results could be due to the influence of age-specific requirements, healthcare quality, and cultural norms on satisfaction levels. The differing results could also be attributed to variations in study design, sample size, and geographic contexts. The present patients with better education had better knowledge of teratogens and their side effects (p<0.001). Patients with a good socioeconomic status showed a significant association with their knowledge of ANC and teratogens (p=0.003). These findings are supported by a systematic review conducted by Adeyemo *et al.*,[23] Therefore, all women of childbearing age should be provided with vital information on prenatal care and all possible teratogenic drugs. It will significantly impact their perception and practices.

LIMITATIONS OF STUDY

Some of the limitations of this study include the fact that the findings can only be extrapolated to urban women or those few rural females who were attending antenatal services in the hospital from which our data was collected. Furthermore, there is a possibility of recall bias in the study participants.

CONCLUSION

Knowledge of antenatal care (ANC) and teratogens was higher among younger women, pregnant patients, and those with higher socioeconomic levels and education. Despite the general satisfaction with consultations, there were significant knowledge gaps about ANC components, like early checkups and health screenings. All females of childbearing age should be given essential information about antenatal care and all potential teratogens through media, seminars, and one-on-one patient-doctor interactions. In order to improve understanding of prenatal care and assist in reducing drug errors during pregnancy, hospitals and other healthcare facilities should allocate sufficient resources to counseling expectant mothers.

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Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

MS & BASA: Data acquisition, data analysis, drafting the manuscript, critical review, approval of the final version to be published.

AS & UZ: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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