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Factors Delaying Antenatal Management Leading to Maternal Morbidity: Empirical Evidence from Tertiary Care Hospital KPK

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ABSTRACT

Antenatal care is a branch of preventive medicine focused on the early detection and prevention of pregnancy disorders. **Objective:** To determine the frequency of factors responsible for delaying antenatal management leading to maternal morbidity. **Methods:** This cross-sectional was conducted at Khyber Teaching Hospital. In this study, a total of 151 patients were observed. Before data collection, approval was obtained from the hospital's ethical committee after approval of the synopsis. All the admitted patients (pregnant women) presented to labor room in Khyber Teaching Hospital meeting the inclusion criteria were recruited for the study explaining the objective of the study to every patient. Inform consent was obtained from the patients. Patients were thoroughly examined according to the routine health assessment protocol of the hospital. Data were collected with the help of a Performa attached. **Results:** The mean age was 30 ± 12.45 years. 67% of patients were from rural areas while 50 (33%) patients were from urban areas. 65 (43%) patients were un-educated, 53 (35%) patients had primary to secondary education and 33 (22%) patients had an education level above secondary. There was a significant association (p-value=0.001) between the distance from the hospital and delays in antenatal care. **Conclusions:** It was concluded that antenatal care is essential for reducing maternal and fetal mortality, particularly in developing regions where the maternal mortality ratio remains significantly high. This study identifies key barriers to Antenatal care utilization in Pakistan, such as low education levels, poor socioeconomic status, geographical inaccessibility, and systemic healthcare issues.

INTRODUCTION

All pregnant women face the risk of obstetrical complications, with the majority occurring during labor and delivery, potentially resulting in maternal morbidity and mortality. In our context, maternal mortality is significantly underestimated [1]. Antenatal care is a branch of preventive medicine focused on the early detection and prevention of pregnancy disorders [2]. It is considered essential to modern obstetrics. This widely adopted strategy promotes skilled care during childbirth and enhances the health of pregnant women [3]. Antenatal care (ANC) is crucial for preventing both maternal and fetal mortality and morbidity. It serves as a vital strategy to enhance maternal and infant health. This improvement can be assessed by calculating the maternal mortality ratio (MMR), which is defined as "the number of maternal deaths during a specified period per 100,000 live births within the same timeframe [4]. The global maternal mortality ratio (MMR) stands at 210 per 100,000 live births. Despite global reductions since 1990, the MMR remains 15 times higher in developing regions compared to developed ones [5]. The number of women utilizing antenatal care is low in many areas and needs to be increased to improve overall health outcomes. Several factors can influence the use of antenatal care services, including literacy levels, awareness of the importance of antenatal care, the number of available facilities, distance from these facilities, socioeconomic status, and more [6]. Antenatal care has reduced maternal and perinatal morbidity and mortality. Low levels of antenatal care are associated with higher perinatal mortality rates [7]. During pregnancy, ensuring maternal health through a proper diet is essential for delivering a healthy baby [8]. Maternal morbidity is

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reduced in women who maintain a good diet, as complications like pre-eclampsia and premature birth occur less frequently [9]. Infants born to mothers who do not receive prenatal care during pregnancy are over twice as likely to die during infancy compared to infants whose mothers receive prenatal care. This association holds regardless of other factors such as the child's sex, assistance during delivery, birth order, mother's age at childbirth, nutritional status, education level, and household living conditions. Prenatal care significantly reduces the risk of infant mortality, even when considering other potential risk factors [10].

This study aims to determine the frequency of factors responsible for delaying antenatal management leading to maternal morbidity in the tertiary hospital of Khyber Pakhtunkhwa.

METHODS

This cross-sectional was conducted at Khyber Teaching Hospital. A convenient sampling approach was applied for the sample selection. Around 1000 patients visited the study location in the study period, out of these around 50% of the patients have the said problem. So according to Krejcie and Morgan [11], the estimated sample size was 217, but due to homogeneity in the units and inclusion criteria, a maximum of 151 samples was selected. Before data collection, approval was obtained from the hospital's ethical committee after approval of the synopsis (CPSC/REU/OBG-2015-020-6585). All the admitted patients (pregnant women) presented to labor room in Khyber Teaching Hospital meeting the inclusion criteria were recruited for the study explaining the objective of the study to every patient. Information consent was obtained from the patients. Patients were thoroughly examined according to the routine health assessment protocol of the hospital. Data were collected with the help of a Performa attached. The reliability of the questionnaire was tested using Cronbach's alpha, which showed a satisfactory reliability level of 0.86. The significance of the associations between factors was using the chi-square test of association. $X2=\Sigma(oij-eij/eij)^2$ [12].

RESULTS

A total of 151 patients were included in the study and analysis. The mean age was 30 ± 12.45 years. 79 (52%) patients were primi-para, 54 (36%) were multi para and 18 (12%) patients were grand multi-para (Table 1).

Table 1: Age, Education and Parity Distributions of Patients (151)

Age Distribution	
Variables	**Frequency (%)**
Age	
18-30 Years	103 (68%)
31-44 Years	48 (32%)
Total	151 (100%)

Education of the Patients	
Un-Educated	65 (43%)
Primary to Secondary Educated	53 (35%)
Above Secondary	33 (22%)
Total	151 (100%)
Parity Distribution	
Primi Para	79 (52%)
Multi Para	54 (36%)
Grand Multi Para	18 (12%)
Total	151 (100%)

A residential area of 151 patients was analyzed as 101 (67%) patients were from rural areas while 50 (33%) patients were from urban areas. 58 (38%) patients were previously delivered by dai, 60 (40%) patients were previously delivered by nurses, 33 (22%) patients were previously delivered by LHW (Table 2).

Table 2: Previously Delivery (n=151)

Previously Delivery	Frequency (%)
Dai	58 (38%)
Nurses	60 (40%)
Lady Health Workers (LHW)	33 (22%)
Total	151 (100%)

Sixty-five (43%) patients were un-educated, 53 (35%) patients had primary to secondary education and 33 (22%) patients had an education level above secondary. The most common factor delaying the management of antenatal care was low education level as 97 (64%) patients were below middle and 54 (36%) patients were above the middle (Table 3).

Table 3: Factors of Delaying in the Management of Antenatal Care

Factors of Delaying		Frequency (%)
Education Level	Below Middle	97 (64%)
	Above Middle	54 (36%)
Socio-Economic Status	≤ 20,000/ Rs	94 (62%)
	>20,000/ Rs	57 (38%)
Distance From Hospital	< 20km	63 (42%)
	>20km	88 (58%)
Health System	Satisfactory	53 (35%)
	Non-Satisfactory	98 (65%)
Cultural Constraint	Yes	35 (23%)
	No	116 (77%)

85 (56%) patients had a monthly income range of Rs ≤15,000/–. 57 (38%) patients had a monthly income range of Rs 15,000 -50,000/- while 9 (6%) patients had a monthly income range of Rs. >50,000/–. Low socio-economic status as 94 (62%) patients had monthly income <20,000Rs and 57 (38%) patients had monthly income Rs >20,000. There is a significant association (p-value=0.001) between the distance from the hospital and delays in antenatal care. The data shows that for those who live less than 20 km from the hospital, 63 out of 151 reported delays (23 decided by the

husband, 26 by the mother-in-law, and 14 by self). In contrast, for those living more than 20 km away, 88 out of 151 reported delays (33 decided by the husband, 37 by the mother-in-law, and 18 by self). The p-value of 0.001 indicates that the distance from the hospital significantly impacts the likelihood of delays in receiving antenatal care, with longer distances contributing to more delays. Un satisfactory health system as 98 (65%) patients had an unsatisfactory health system while 53 (35%) patients had a satisfactory health system and cultural constraints as 35 (23%) patients had cultural constraints while 116 (77%) patients didn't have cultural constraints. The p-value of 0.03 suggests that dissatisfaction with the health system contributes to more significant delays in antenatal care (Table 4).

Table 4: Stratification of Factors of Delaying in Management of Antenatal Care Concerning Decision Makers

Factors pf Delaying		Husband	Mother in Law	Self	Total	*p-value
Education level	Below Middle	36	41	20	97	0.9960
	Above Middle	20	22	12	54	
	Total	56	63	32	151	
Socio-Economic Status	≤20,000/ Rs	35	39	20	94	0.9998
	>20,000/ Rs	21	24	12	57	
	Total	56	63	32	151	
Distance from Hospital	< 20km	23	26	14	63	0.001
	> 20km	33	37	18	88	
	Total	56	63	32	151	
Health System	Satisfactory	20	22	11	53	0.03
	Non-Satisfactory	36	41	21	98	
	Total	56	63	32	151	
Cultural Constraint	Yes	13	15	7	35	0.9975
	No	43	48	25	116	
	Total	56	63	32	151	

DISCUSSION

Antenatal care (ANC) is crucial for preventing both maternal and fetal deaths and complications. It plays a vital role in enhancing maternal and infant health, which can be assessed by calculating the maternal mortality ratio (MMR). Despite global declines since 1990, the maternal mortality ratio (MMR) remains 15 times higher in developing regions compared to developed regions [13]. A woman's lifetime risk of maternal death is significantly influenced by her economic and social environment, the number of pregnancies she has had, and the availability of maternal health services. Women in developing countries often face challenges in maintaining good health, especially if they are poor [14]. The literacy rate among females in Pakistan is one of the lowest in the world at 28%, which keeps them uninformed about reproductive rights and health facilities [15]. In our study, most of the patients (67%) were from urban areas and were uneducated, lacking awareness of

antenatal care. This lack of awareness is one of the primary reasons for maternal deaths. Complications such as a ruptured uterus were less frequent among urban patients because they had access to qualified medical personnel during delivery. In contrast, rural patients faced difficulties finding qualified medical personnel at the time of delivery due to the lack of mismanagement of traditional birth attendants (dais) [16]. There are numerous obstacles to the early initiation and use of antenatal care. Among these, documented organizational barriers include financial challenges, such as the lack of health insurance [17]. Several key factors contributing to delays in the initiation and utilization of antenatal care were identified. The most prevalent factor was a low level of education, with 64% of the patients having an educational attainment below middle school. Low socioeconomic status was also a significant barrier, as evidenced by the fact that 62% of the patients had a monthly income of less than Rs 20,000. These findings are consistent with previous research indicating that educational attainment, socioeconomic status, geographical accessibility, and healthcare system quality are critical determinants of antenatal care utilization [18, 19]. The study also highlighted systemic issues within the healthcare system, with 65% of the patients reporting dissatisfaction with the health system. The association between low educational levels and reduced healthcare utilization is well-documented, suggesting that educational interventions may be an effective strategy to improve antenatal care uptake [20]. Moreover, addressing financial barriers through policy measures such as subsidized healthcare and transportation vouchers could mitigate some of the socioeconomic challenges identified in this study [21]. Our findings on geographical barriers align with studies such as those conducted in rural Mali and Tanzania, which also found that long distances to healthcare facilities significantly reduce access to antenatal care. Furthermore, the dissatisfaction with the healthcare system reported by a majority of the participants indicates a need for systemic improvements. Ensuring better quality of care, reducing waiting times, and enhancing the patient-provider relationship could improve perceptions of the healthcare system and encourage earlier and more consistent use of antenatal services [22]. Geographical barriers also played a crucial role, with 58% of the patients living more than 20 kilometers from the nearest hospital. This long-distance likely contributes to both the financial burden and the time required to access care. Cultural barriers, while less prevalent, still affect a significant minority of patients and should be addressed through culturally sensitive healthcare practices and community engagement initiatives. In the current study, cultural

constraints were noted as a barrier by 23% of the patients, underscoring the complex interplay of social factors that influence healthcare utilization. Overall, this study highlights the multifaceted nature of barriers to antenatal care and underscores the importance of comprehensive strategies that address educational, socioeconomic, geographical, systemic, and cultural factors. Future research should focus on intervention studies to evaluate the effectiveness of targeted strategies in overcoming these barriers and improving antenatal care utilization rates.

CONCLUSIONS

It was concluded that antenatal care is essential for reducing maternal and fetal mortality, particularly in developing regions where the maternal mortality ratio is significantly high. This study identifies key barriers to ANC utilization in Pakistan, such as low education levels, poor socioeconomic status, geographical inaccessibility, and systemic healthcare issues.

Authors Contribution

Conceptualization: SS[1]
Methodology: SS[1], SS[2]
Formal analysis: SS[1], ZI
Writing review and editing: ZI

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

All the authors declare no conflict of interest.

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