



Original Research

Assessment of Knowledge and Utilization of Maternal and Neonatal Health Services in Public Hospitals of District Dera Ghazi Khan Pakistan

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Abstract

Background: Poor utilization of healthcare services during pregnancy, child delivery, and postpartum is a significant cause of maternal and child mortality. Antenatal and postnatal care is the most effective intervention for maternal and infant mortality and morbidity, especially in areas where women's general health is poor. This study was conducted to find out the mother's knowledge about maternal and neonatal services to determine the utilization of maternal and neonatal services in public hospitals of District Dera Ghazi Khan. **Methodology:** A cross-sectional study was conducted in a public hospital of Dera Ghazi Khan. A structured questionnaire was used to collect data about the knowledge and utilization of antenatal care services among pregnant women. **Results:** The findings of present study showed that 58.4% of respondents have good knowledge of antenatal care while 41.6% showed poor knowledge. Among total respondents, 46.32% showed positive utilization of ANC services, while 53.68% showed poor utilization. A statistically significant difference has been found between respondents' income and ANC knowledge ($p=0.02$). A statistically significant difference was found between respondents' education and ANC knowledge ($p=0.01$). Among respondents who have their first pregnancy, 45(72.58%) have good ANC service utilization ($p=0.002$). Among respondents who were satisfied with the ANC services, 81(89.01%) were utilizing early ANC, whereas 10 (10.98%) were utilizing late ANC services ($p=0.01$). **Conclusion:** Overall findings of this research have shown that respondents' knowledge and utilization of ANC was not satisfactory. For more improvement, there is a need to educate women and provide them with adequate facilities to utilize maternal and neonatal care services.



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Introduction

Improved maternal health is one of the essential prerequisites for women's advancement. Dramatic improvement has been observed in the last decade in the mother's health due to improved nutritional practices, maternal and childcare, increased availability of high impact, and low-cost public health measures such as increased vaccine availability and Oral Re-hydration Therapy (ORT) for mothers and children [1]. According to World Health Organization (WHO), interventions such as folic acid and iron supplements, malaria prophylaxis intervention, and dietary and vitamin A supplements for pregnant women improve maternal and child health care. However, the maternal mortality rate is high despite all these services, especially in developing countries. This leads to the low utilization of maternal healthcare services and is mainly influenced by cultural, economic, and social factors and healthcare accessibility and availability [1,2]. Yet, women remain underserved and vulnerable, particularly in rural communities, due to less utilization and access to maternal healthcare services [1]. For this research, maternal health care was included antenatal care, trained birth attendants, and postnatal care. Antenatal care among healthcare services is an important determinant for the continuum of care for safe pregnancy and child delivery [3,4]. Adequate antenatal care allows early detection of disease and its timely treatment to improve maternal health outcomes. For example, the early detection and treatment of high blood pressure help prevent eclampsia and reduce mortality. Similarly, improved maternal health outcomes have been seen in anemia detection and treatment [3]. A typical antenatal care program comprises three main components: mother and fetus assessment, curative and preventive healthcare, and health education and counseling. The benefits of antenatal care services are enormous; however, the content of ANC and the optimal number of ANC visits for high and low-risk pregnancies remain a significant issue and vary between countries [3]. ANC programs often recommend more ANC visits than in developing countries in high-income countries. According to the WHO, for developing countries, four ANC visits with the first visit in the first trimester have been recommended for women having uncomplicated pregnancies. The compulsory measurement of a blood test, urine, blood pressure, and optional height and weight measurement is recommended in every ANC visit. Free ANC check-ups are recommended by WHO to ensure that universal utilization and access to antenatal services. More than 70% of women have at least one antenatal care visit, with coverage remaining high in developed countries (98%) compared to developing countries (67%). The low coverage is mainly found in South East Asia, in which only 53% of the women use antenatal care during pregnancy [5]. Furthermore, approximately 70% of women utilize antenatal care services in African countries. Antenatal care helps augment healthcare during pregnancy through preventive healthcare services providers such as immunization, prophylactic malaria treatment, and screening for sexually transmitted diseases such as hepatitis and HIV infection [5].

Skilled child delivery encompasses trained professionals (nurses, doctors, midwives, and others) and an enabling environment in which drugs, equipment, and other supplies are available for obstetric complications [6]. Furthermore, trained birth attendant assistance is also important for the safe delivery of a baby [6]. Most maternal mortality occurs due to unskilled birth attendants who cannot recognize the complication of delivery and warrant quick referrals.

The skilled birth attendant's presence helps reduce maternal mortality in the community and is one of the most important interventions for reducing pregnancy-related disabilities and deaths. According to the WHO report, in Egypt, a 50% reduction in maternal mortality has been seen by increasing the number of skilled birth attendants by half. However, skilled birth attendant availability is only possible when the healthcare system is functional. The functional healthcare system includes motivated and trained workers, transportation, well-equipped facilities, and a rapid referral system. These factors are usually inadequate and underdeveloped in the healthcare system of most developing countries [7].

The postpartum period which refers to 42 days after childbirth, is very important for mothers. Biologically, this period refers to a time immediately after childbirth to 6 weeks during which the mother's body, including her uterus size and hormone levels, returns to normal [8]. Postpartum care involves prevention, health promotion, disease and complications treatment, provision of advice related to nutrition, contraception, and immunization.

The study's objectives were to find out knowledge of antenatal and natal care in pregnant women coming to public hospitals of district Dera Ghazi Khan. We also determine the utilization of antenatal care services by pregnant women to determine the association of ANC services utilization with socio-demographic features.

Methodology

Study Site

This research study was carried out in Dera Ghazi Khan. The main reason for selecting this division is that in 2017-2018, DG Khan remained low in socioeconomic indicators among all Punjab divisions. For example, almost 57% of the DG Khan population is living below the line of poverty which reports being the highest among all divisions of Punjab. In addition, the literacy rate is only 47% among women aged 15-19 years, and it is again the lowest in the province. Maternal mortality indicators also demonstrated an alarming situation. Only 35.4% of women receive antenatal care visits, and 30% have deliveries from skilled birth attendants. Most of the women in DG Khan (44%) prefer the traditional delivery method, which is highest among all divisions of Punjab. In this district, there are eight hospitals with a total capacity of 553 beds. This comprises One THQs, 9 RHUs, and 23 rural health dispensaries. There are 11 rural healthcare centers and 35 dispensaries. The Basic Health Unit number (BHUs) is 53, with a total capacity of 114 beds. The district has only 7 MCH and 4TB clinics to serve the community. A total of 230 community midwives and 9 LHV's are deployed by the Dera Ghazi Khan MNCH program management (D. G. Khan, n.d.-b)

Study Population

The study populations were pregnant women between the ages of 15-49 years attending antenatal services in public health facilities of DG Khan.

In this study, the study population was defined particularly as pregnant women from 4-9 months. From the previous literature, the number of pregnant women between 2009 and 2010 was 741. Therefore, a sample size of 254 was determined.

Data Collection Procedure

Data was collected from the respondents by using a semi-structured questionnaire prepared after reviewing the previously done studies. The questionnaire consisted of four parts. The first part contained questions about the socio-demographic characteristics of respondents; the second part contained questions related to knowledge about antenatal care and its services and satisfaction. The third part included questions related to the perception of women on the antenatal care services quality. The questionnaire was checked for clarity, understanding, and consistency. The questionnaire was validated for reliability and validated. Questionnaires were administered to respondents who fulfilled the inclusion criteria. The data collection process took four months. The data was collected from the following hospitals: Teaching /DHQ hospital D. G Khan; THQ hospital Khar Fort Munro; BHU Gaddai; BHU Bawata; BHU Rakhi Munh, RHU Sarwar Wali and BHU Choti Bala.

Research Design

A cross-sectional study was carried out in public hospitals of Dera Ghazi Khan to assess the Provision and Utilization of Maternal and Newborn Child Health Services.

Sampling Technique

The list of all public health facilities was taken, and participants were selected randomly from the antenatal care register of the public health facilities of District Dera Ghazi Khan.

Results

The main aim of this chapter is to present the findings to address the proposed hypothesis and research question. The findings in this chapter are based on the responses collected from pregnant women in Dera Ghazi Khan. This chapter presents information about the utilization pattern of antenatal care, prenatal services knowledge and information related to the women's perception and experiences of antenatal care services.

Demographic Information of Respondents

In this study, a total of 254 respondents were recruited. The number of respondents who returned the duly filled questionnaire was 190 giving the response rate of 76%. The respondent's characteristics are summarized in table 1. The respondents' mean age was 31.21 (SD=7.9). All respondents in this study were married and their parity status was found to be between no children to 7 children maximum. Among respondents, 35 respondents (18.42%) had history of pregnancy complications. Education levels of respondents were categorized into four main categories: no education, primary, secondary, and higher. The education level of the majority of respondents was secondary 131 (68.94%) followed by higher level 36 (18.9%) with small proportion of respondents having no 7 (3.68) or primary education

level 16 (8.42%). Majority of the women in this study were unemployed 161 (84.73%). However, most of the husbands were employed 177 (93.15%). The majority of the respondents 89 (46.84 %) had income ranging from PKR. 10000 to PKR. 20000. Almost 49(25.78%) had income ranging from 21000-to 30000. Among respondents 30 (15.78%) had an income in a range of 31000-40000 and only 22 (11.57%) had an income more than 40,000. The majority of respondents in this study were having their first pregnancy 62 (32.63) followed by second 38 (20), third pregnancy 33 (17.36) and fourth pregnancy 31 (16.31).

Respondent's Knowledge of Antenatal Care

The respondents' knowledge was assessed by 16 questions about antenatal care, the importance of antenatal check-ups, doses of TT injection, diet and screening test during pregnancy (**Error! Reference source not found.**). Among respondents, 137 (72.1) have better knowledge about the meaning of antenatal care. Only 32 (16.84) respondents knew that TT is given to pregnant women to protect both mother and child from infection. Most of the respondents 160 (84.21) knew that screening of blood for infection should be carried out during antenatal check-ups. Among respondents 124 (65.26) stated that antenatal check-ups are necessary; 133 (70.0) stated that pregnant women should undergo ultrasound as advised by doctor; 134 (70.52) knew that pregnant women should undergo blood sugar examination and all of the respondents 190 (100.0) stated that blood pressure should be checked regularly during pregnancy. Among respondents, 113 (59.47) knew that iron and folic acid supplements are necessary for both mother and fetus and 110 (57.89) respondents stated that pregnant women should change their diet as advised by their doctors. Most of the respondents 123 (64.73) were aware that any infection during pregnancy could cause harm to baby and 132 (69.47) knew that high blood pressure can affect fetal growth.

Information Regarding current pregnancy of respondents and utilization of ANC Services

Respondents were asked questions related to the current pregnancy. Among respondents 49 (25.7%) stated that they conceived unexpectedly, while 141 (74.21%) planned their pregnancies. As shown in table 3, 100 (52.63%) respondents have 4 ANC services, starting in the first trimester while 90(47.37%) attended the ANC after the first visit and had less than four visits. Regarding whether the women get any support from their family members for having any ANC visits, 83 (43.68%) were taking care of themselves without much support from their family, whereas 107 (56.31%) were having psycho-social and physical support from their families. Among respondents, 37 (19.47) have received one dose of TT and 39 (20.52%) have received two TT doses. Most respondents were taking iron and folic acid supplements 155 (81.57%). Among respondents 175 (92.10%) have undergone ultrasound during pregnancy. All respondents in this study have stated that a healthcare professional monitored their blood pressure on the last ANC visit. A small number of respondents 63 (33.15) have stated that they undergo blood screening for HCV, HBV, and HIV.

Overall Knowledge of Respondents

There were sixteen questions regarding ANC knowledge and the mean knowledge score was calculated for each respondent on the basis of which respondent knowledge was categorized as good and poor. Among total respondents 58.4% showed good knowledge of ANC while 41.6% showed poor knowledge (Figure 1).

Overall Utilization of ANC services

There were twelve questions regarding the utilization of ANC services. The mean score for ANC utilization was calculated for each respondent based on which utilization was categorized as good and poor. Among total respondents 46.32% showed positive utilization of ANC services while 53.68% showed poor utilization (figure 2).

Association of ANC Knowledge and Socio-Demographics of pregnant mothers

Socio-demographic variables play an important role and it is important to find the association between socio demographic variables and respondents' knowledge. This section thus included the relationship between the knowledge related to the research topic and the socio demographic background of the respondents. As shown in the table, no significant difference has been found between respondents' age and ANC knowledge ($p=0.304$). Out of the total 55 respondents whose age lies in 15-24 years 28 (50.90%) have good knowledge and 27 (49.09%) have poor knowledge. Out of total of 68 respondents whose age lies between 25-34 years, 44 (64.7%) have good knowledge. Among total of 67 respondents whose age lies between 35-44, 39 (58.2%) have good knowledge and 28 (41.79%) have poor knowledge.

A significant difference has been found between respondents' income and ANC knowledge. In terms of income, out of total of 89 respondents who have income between 10000-20000, all of them have good knowledge 43(48.31%) and 46 (51.68 %) have poor knowledge about ANC and out of total of 49 respondents 29(59.18%) have good knowledge about ANC and 20(40.81%) have poor knowledge and their income was from 21000-30000. Out of 30 respondents with income between 31000-40,000 23 (76.6%) have good knowledge. Among Respondents having income >40000, 16 (72.72%) have good knowledge of ANC.

Significant difference was found between respondent's education and ANC knowledge ($p=0.02$). Among respondents with no education 3 (42.8%) and primary education 10 (62.5%) showed good knowledge. Out of 131 respondents with secondary education, 69 (52.67%) have good knowledge and 62 (47.32%) have poor knowledge. Among respondents who have higher education 29 (80.5%) have good knowledge and 7 (19.4%) have poor knowledge.

A Chi-square test was run to determine the association between age at marriage and ANC knowledge. Of respondents whose age lies between 21 to 25 years 108 (92.3%) have good knowledge about ANC and only 9 (7.69%) have poor knowledge. Among respondents between ages 26-31 years 60 (82.19%) respondents have good knowledge and 13(17.80%) have poor knowledge about ANC.

No significant difference was found between respondent's occupation and ANC knowledge. Among respondents who were employed 92 (57.14%) had good knowledge and 69 (42.85%) had poor knowledge. Among unemployed respondents possess 19 (65.51%) possessed good knowledge and 10(34.48%) possessed poor knowledge of ANC. Association was also found between respondent's husband education and ANC knowledge. Among respondents whose husbands were employed 92 (61.01%) have good knowledge and 69 (38.98%) have poor knowledge. Of all respondents whose husbands were unemployed, 103 (58.19%) possessed good knowledge and 74 (41.08%) possessed poor knowledge.

No significant difference was found between no of pregnancies and ANC knowledge of respondents. Among respondents who have their first pregnancy 31 (50%) possess good ANC knowledge. Out of total respondents who have second pregnancy 25 (65.78%) have good knowledge and 13 (34.21%) had poor knowledge.

4.6 Association of Utilization ANC services and Socio Demographics of pregnant mothers

This section thus included the relationship between the knowledge related to the research topic and the socio demographic background of the respondents. As shown in table 6, no significant difference has been found between respondent's age and ANC services utilization ($p=0.07$). Out of total 55 respondents whose age lies in 15-24 years 37 (67.27%) have good ANC utilization and 18 (32.72%) have poor ANC services utilization. Out of 68 respondents whose age lies between 25-34 years, 35 (51.47%) have good utilization of ANC services. Among total 67 respondents whose age lies between 35-44, 46 (68.65%) have good ANC service utilization and 23 (34.32%) have poor ANC service utilization.

Significant difference was found between the respondent's income and ANC services utilization. Out of the total 89 respondents having income between 10000-20000, 66 (74.15%) have good ANC utilization. Out of total 49 respondents 21(42.85%) have good ANC utilization about ANC and their income was from 21000-30000. Out of 30 respondents with income between 31000-40,000 15 (50%) have good utilization of ANC. Among Respondents having income >40000, 16 (72.8%) have good utilization of ANC.

Significant difference was found between respondents' education and ANC knowledge ($p=0.000$). Among respondents with no education 3 (42.85%) showed good utilization of ANC and respondents with primary education 16 (100%) showed good utilization of ANC. Out of 131 respondents with secondary education, 70 (53.43%) have good ANC utilization and 61 (46.56%) have poor utilization of ANC. Among respondents who have higher education 29(80.55%) have good ANC utilization and 7 (19.4%) have poor ANC utilization.

No significant difference was found between respondents age at the time of marriage and ANC utilization ($p=0.25$). Among respondents whose age at the time of marriage lies between 21 to 25 years 70 (53.43%) have good ANC service utilization and 47 (35.87%) have poor utilization of ANC. Among respondents between ages 26-31 years 48 (65.75%)

respondents have good utilization of ANC and 25(34.24%) have poor utilization of ANC. Among respondents who were employed, 98 (60.86%) had good ANC utilization, and 63 (39.13%) had poor utilization of ANC. Among unemployed respondents, 20 (68.96) had good utilization of ANC, and 9 (31.03%) had poor ANC utilization.

No significant association was also found between respondent's husband's education and ANC service utilization ($p=0.4$). Among respondents whose husbands were employed 109 (61.58%) have good utilization of ANC and 68 (38.41%) have poor ANC utilization. Of respondents whose husbands were unemployed 9 (69.23%) have good utilization of ANC services and 4 (30.76%) have poor utilization of ANC. Significant difference was found between number of pregnancies and ANC service utilization by respondents ($p=0.002$). Among respondents who have their first pregnancy 45(72.58%) have good ANC service utilization and 17 (27.41%). Out of total respondents who have second pregnancy 22(57.89%) have good utilization of ANC and 16 (42.10 %) have poor ANC service utilization.

4.7 Early and Late Utilization of ANC

Out of 190 respondents, 36.65 were utilizing early ANC services and 63.64% were utilizing late ANC services (Figure 3).

4.8 Respondents Age and Early and Late Utilization of ANC

The findings showed that among respondents who were between 15 and 24 years, 43 (78.18%) were utilizing early ANC and 12 (21.81%) were utilizing late ANC. Among respondents between the ages 23-34, 36 (52.94%) were utilizing early ANC and 32 (47.05%) were utilizing late ANC service utilization. Among respondents between 35-44years 38 (56.71%) were using early ANC and 29 (43.28%) were utilizing late ANC (Figure 4).

4.9 Education Level of Respondents and Early and Late ANC Utilization

Among respondents with no education 7 (100%) utilized late ANC services. Those with primary education 16 (100%) utilized early ANC services. Among respondents with secondary education 65 (49.61%) utilized early ANC and 66 (50.38%) utilized late ANC services. Those respondents with higher education 36 (100%) utilized early ANC services (Figure 5).

4.10 History of Pregnancy Complication and ANC Service Utilization

Among total respondents with history of pregnancy complications 28 (80%) were utilizing early ANC services. Of those respondents with no previous complication of pregnancy 89 (57.41%) were utilizing early ANC services and 66 (42.58%) were utilizing late ANC services.

4.11 Respondents Occupation and Early and late Utilization of ANC

Among the total employed respondents, 88 (54.65%) were utilizing early ANC services, and 73 (45.34%) were utilizing late ANC. Those respondents with no employment 29 (100%) were utilizing late ANC services (Figure 6).

4.11 Respondents Occupation and Early and late Utilization of ANC

Among the total employed respondents, 88 (54.65%) were utilizing early ANC services, and 73 (45.34%) were utilizing late ANC. Of those respondents with no employment 29 (100%) utilized late ANC services (Figure 7).

4.12 Respondents' level of Satisfaction and ANC Utilization

Among respondents satisfied with the ANC services 81(89.01%) were utilizing early ANC whereas 10 (10.98%) were utilizing late ANC services. Almost all respondents who were dissatisfied with the ANC at public hospital 63 (95.45%) were utilizing late ANC. Of those with a neutral view on ANC services, 33 (100%) were utilizing early ANC (Figure 8).

4.13 Respondents Knowledge and Early and Late ANC service utilization

Among respondents who have good knowledge of ANC, 81 (75%) utilized early ANC services, and 27 (25%) utilized late ANC services. Those respondents who have poor ANC knowledge 36 (43.91%) were utilizing early ANC services and 46 (56.09%) were utilizing late ANC services (Figure 9).

Discussion

Both reproductive age extremes are considered a risk for adverse pregnancy outcomes. Low birth weight, premature pregnancy, and postnatal mortality usually occur in young mothers. Late pregnancies are usually concerned with higher maternal and obstetric complications such as eclampsia and cesarean section. A study conducted by Londero et al. (2019) [9] supported the influence of the maternal age on pregnancy and emphasized the importance of maternal health care services to provide support and knowledge to mothers and to determine the adverse outcomes early signs [9]. Almost all studies that have been conducted previously on maternal healthcare services utilization have considered the influence of maternal age on the utilization of maternal healthcare services. In this study, maternal age has not influenced the antenatal care services utilization among respondents in Dera Ghazi Khan. The findings are in line with the previous studies, in which it is shown that antenatal care services utilization was not signed by the age of women [10,2,11]. In contrast, findings in a previous qualitative study conducted by (Mathole et al., 2004) [12] demonstrated that women under 34 years visit ANC clinics more to know about the position and growth of baby. In contrast, older women are less concerned about early and frequent ANC visits, especially if they have had no pregnancy complications before [12].

It has been suggested from the findings of previous studies that antenatal care service utilization is mainly influenced by parity that is more prominent at the start. One study found that the higher the women's parity, the less is the chance of starting ANC visits timely [13]. As the women's parity increases, they usually rely on previous pregnancy experiences and do not take the ANC visit frequently as soon as they did in their first pregnancy [14]. Different studies have shown that higher parity is mainly a barrier to ANC utilization. According to one study conducted in Tanzania, it is found that women in their first pregnancy are more likely to utilize ANC early than those with high parity. Similar results

have been found in this study in which women with low parity took ANC visits earlier and more frequently than women with higher parity. In contrast to the above findings, studies conducted in India and Ethiopia showed that women with higher parity utilize ANC more frequently [15,16].

The influence of occupation and education on women utilization of ANC services has been determined in various studies. Almost all previous studies have shown that women's education is a significant predictor of the usage of antenatal care. Women with a higher level of education are more likely to utilize antenatal services and have more awareness of the benefits of utilizing ANC services. In one study conducted by (Onasoga et al.,2012) [17] it has been shown that women control over their health-seeking behavior and pregnancies are affected by their level of education. Educated women are more aware of health problems and use ANC services more [17].

Furthermore, it is stated in this study that education help women to know about the signs and complication of pregnancies and to take action timely and appropriately. The findings of this study are in line with the previous studies, which showed that women with a higher level of education use ANC services more than those with a lower education level.

Strength of Study

This study was one of its kinds that high response rate from participants. The current study has included knowledge and utilization of neonatal services. The questionnaire tool used to collect data was reliable and responsive. Since it was easy for participants to apprehend and respond has been designed to determine level of knowledge and utilization of maternal and neonatal services and factors associated with them.

Limitation of Study

The current study was limited to public sector hospitals. This study is limited to time duration and budget. The sample size was limited because of time duration and COVID-19 pandemic. Small size of sample because of the specific criteria restricting our participant selection.

Conclusion

This cross-sectional study was conducted in public hospitals to explore the antenatal care service utilization in Dera Ghazi Khan. The study was carried out to find the association between general characteristics, antenatal care services quality, comprehension and satisfaction with the provided services. The study population was pregnant women taking antenatal care services in public hospitals of Dera Ghazi Khan. Data were collected using the structured questionnaire, and analysis was carried out using a descriptive statistic, chi-square and frequency distribution. This research has shown that respondents' knowledge and utilization of ANC were not satisfactory. Poor knowledge and utilization for antenatal care were more likely to be reported by those with low income, less income, and age at marriage. Among respondents (47.8%) in this study were satisfied with the antenatal care services utilization in a public hospital.

Recommendation

Health system level

1. The federal government should collaborate with the district health authority to increase antenatal care service utilization.
2. The government should take steps through the Health Ministry to assist district D G Khan with healthcare infrastructure, including not limited to clinics, hospitals, and laboratories.
3. Immediate assistance should be provided to public hospitals to keep them functioning effectively and efficiently.

Health care delivery level

- 1- Supportive maternal healthcare delivery in public hospitals that links with formal system of health are needed to increase utilization of maternal healthcare services.
- 2- Strengthened ANC policies implementation with the active participation for the better maternal and neonatal services supply in public hospitals of D G Khan.

Patient level

- 1- The government should provide grants, loans and other types of financial empowerment to the women of D G Khan.

This research suggests that it is appropriate to educate women about the importance of antenatal care for complete maternal and child health and provide appropriate and adequate facilities to make for them.

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Table 1: Respondents Demographic Information.

Demographic Variables	Categories	Response N (%)
Age of respondents	15-24	55 (28.9)
	25-34	68 (35.7)
	35-44	67(35.26)
	Mean Age	31.21
Income per month (PKR)	10000-20000	89 (46.84)
	21000-30000	49 (25.78)
	31000-40000	30 (15.78)
	>40000	22 (11.57)
Education of respondents	No education	7 (3.68)
	Primary	16 (8.42)
	Secondary	131 (68.94)
	Higher	36(18.9)
History of complication in previous pregnancy	Yes	35(18.42)
	No	155 (81.57)
Age at marriage	21-25	117(61.57)
	26-31	73 (38.42)
Occupation of respondents	Employed	161 (84.73)
	Un Employed	29 (15.26)
Occupation of Respondents Husband	Employed	177 (93.15%)
	Un employed	13 (6.84)
No of Pregnancies	First	62 (32.63)
	Second	38 (20)
	Third	33 (17.36)
	Fourth	31 (16.31)
	Fifth	26 (13.68)
Month of pregnancy	4 th and 5 th month	55 (28.94)
	6 th and 7 th month	51 (26.84)
	8 th and 9 th month	84 (44.21)

Table 2: Respondents Knowledge of Antenatal Care

Questions	Categories	Response N (%)
What do you understand by antenatal care?	It is regular medical and nursing care recommended for women during pregnancy	137 (72.1)
	It is to treat and prevent potential health problems throughout the course of the pregnancy.	53 (27.89)
Why antenatal check-up is necessary?	To know the condition of the baby	39 (20.52)
	To know the health of the mother	16 (8.42)
	To avoid complication	117 (61.57)
	For safe delivery	18 (9.47)
What is the perfect time to initiate ANC visit?	Within the first four months	128 (67.3)
	Between 4 and 8 months	48 (25.2)
	Last Month	14 (7.37)
Why is injection TT given to pregnant women?	To protect the child from tetanus	32 (16.84)
	To protect the mother from tetanus	48 (25.26)
	Both A and B	25 (13.15)
	Don't know	85 (44.73)
How many doses of injection TT should be given to a pregnant mother?	One	3 (1.57)
	Three	28 (14.73)
	Don't Know	159 (83.68)
Screening of blood for infections should be carried out during antenatal check-up	Yes	160 (84.21)
	No	30 (15.78)
Blood pressure should be checked regularly during pregnancy	Yes	190 (100.0)
	No	0 (0.0)
Antenatal booking should be done before the 3rd month of pregnancy	Yes	125 (65.78)
	No	65 (34.21)
Does a pregnant woman need to undergo Blood sugar examination?	Yes	134 (70.52)
	No	56(29.47)
Can high blood pressure affect fetal growth?	Yes	132 (69.47)
	No	40 (21.05)
	Don't Know	18 (9.47)
An antenatal check-up is necessary for women after becoming pregnant	Yes	124 (65.26)
	No	66 (34.73)
Pregnant women should undergo USG as advised by the doctor to monitor fetal growth	Yes	133 (70.0)
	No	57 (30.0)
Supplementation of iron and folic acid are good for the mother and fetus	Yes	113 (59.47)
	No	77 (40.52)
Pregnant women should change dietary habit as advised by the doctor	Yes	110 (57.89)
	No	80 (42.10)
Is maternal smoking harmful to the fetus?	Yes	190 (100.0)

	No	0 (0.0)
Are you aware that any infection during pregnancy can cause harm to your baby?	Yes	123 (64.73)
	No	67 (35.26)
Are you aware that any medicines other than those prescribed by the doctor can cause harm to your baby?	Yes	102 (53.69)
	No	88 (46.31)

Table 3: ANC Services Utilization by Respondents

Questions	Categories	Response N (%)
At which month of pregnancy, you first visit the health center for an antenatal check-up?	Within First Trimester	85 (44.73)
	After first Trimester	105 (55.26)
Number of Antenatal care visits	≥ 4 visits	82 (43.16)
	< 4 visits	108 (56.84)
No of TT doses you received during current pregnancy?	1	37 (19.47)
	3	39 (20.52)
	Don't know	114 (60.0)
Are you taking supplements (iron and folic acid)?	Yes	155 (81.57)
	No	35 (18.42)
Have you undergone ultrasound during pregnancy?	Yes	175 (92.10)
	No	15 (7.89)
Is your BP monitored by the health care provider on last ANC visit	Yes	100 (52.63)
	No	90 (47.36)
The blood glucose level has been checked by the health care provider on last ANC visit	Yes	103 (54.21)
	No	87 (45.78)
How many hours of rest you take per day?	5-6 hrs.	88 (46.31)
	7-8 hrs.	91 (47.89)
	More than 8 hrs.	11 (5.7)
Support from Family members	Husband and family support	107 (56.31%)
	Self-care	83 (43.68%)
Expense (ANC services and laboratory test cost)	Affordable	148 (77.89)
	Not Affordable	42 (22.10)
Healthcare professional during ANC visit	Nurse	100 (52.63)
	Doctor	47 (24.7)
	Both	43 (22.63)
Have you undergone blood screening for HCV, HBV, and HIV	Yes	63 (33.15)
	No	127 (66.84)

Table 4: Association of ANC Knowledge and Socio demographics of pregnant mothers.

Demographic Variables	Categories	Good Knowledge	Poor Knowledge	Chi Value; P value
Age of respondents	15-24	28	27	X ² =2.385 P=.304
	25-34	44	24	
	35-44	39	28	
Income per month (PKR)	10000-20000	43	46	X ² =9.719 P= 0.02
	21000-30000	29	20	
	31000-40000	23	7	
	>40000	16	6	
Education of respondents	No education	3	4	X ² =9.851 P= 0.02
	Primary	10	6	
	Secondary	69	62	
	Higher	29	7	
Age at marriage	21-25	108	9	X ² =4.951 P= 0.03
	26-31	60	13	
Occupation of respondents	Employed	92	69	X ² =7.709 P= 0.264
	Unemployed	19	10	
Occupation of Respondents Husband	Employed	103	74	X ² =0.056 P= 0.813
	Unemployed	8	5	
No of Pregnancies	First	31	31	X ² =7.27 P=0.12
	Second	25	13	
	Third	16	17	
	Fourth	23	8	
	Fifth	16	10	

Table 5: Association of utilization ANC services and socio demographics of pregnant mothers

Demographic Variables	Categories	Good Utilization	Poor Utilization	Chi value P value
Age of respondents	15-24	37	18	X2=5.114 P=0.07
	25-34	35	33	
	35-44	46	21	
Income per month (PKR)	10000-20000	66	23	X2=16.129 P=0.001
	21000-30000	21	28	
	31000-40000	15	15	
	>40000	16	6	
Education of respondents	No education	3	4	X2=20.25 P=0.000
	Primary	16	0	
	Secondary	70	61	
	Higher	29	7	
	No	53	102	
Age at marriage	21-25	70	47	X2=.670 P=0.25
	26-31	48	25	
Occupation of respondents	Employed	98	63	X2=.684 P=0.271
	Unemployed	20	9	
Occupation of Respondents Husband	Employed	109	68	X2=.301 P=0.409
	Unemployed	9	4	
No of Pregnancies	First	45	17	X2=16.533 P=0.002
	Second	22	16	
	Third	11	22	
	Fourth	21	10	
	Fifth	19	7	

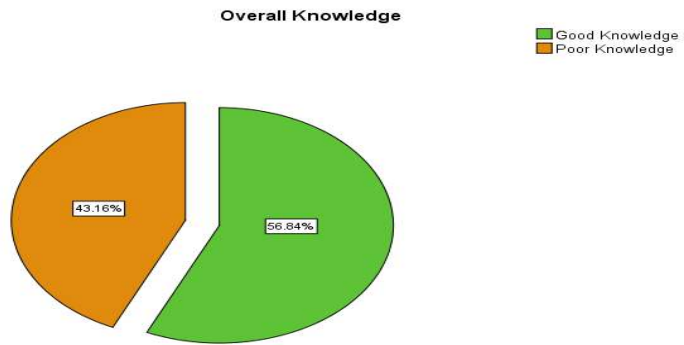


Figure1: Overall Knowledge of Respondents.

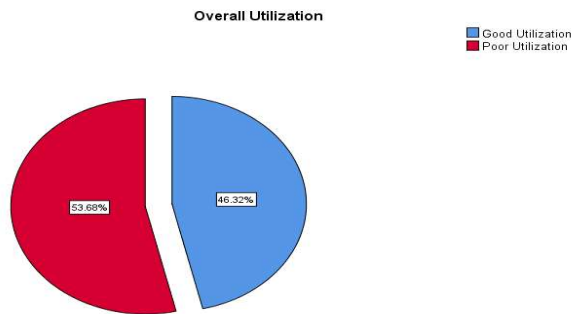


Figure 2: Overall Utilization of ANC services

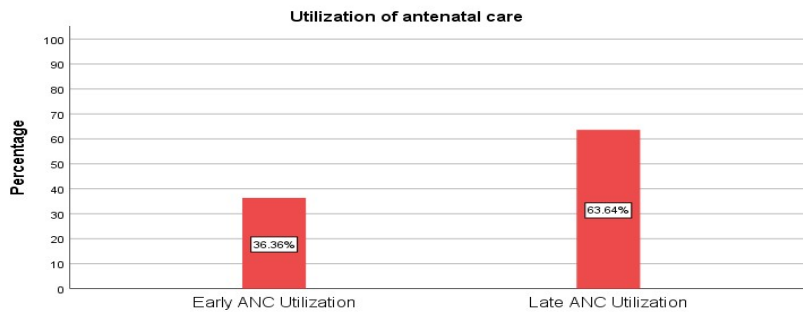


Figure 3: Early and Late Utilization of ANC

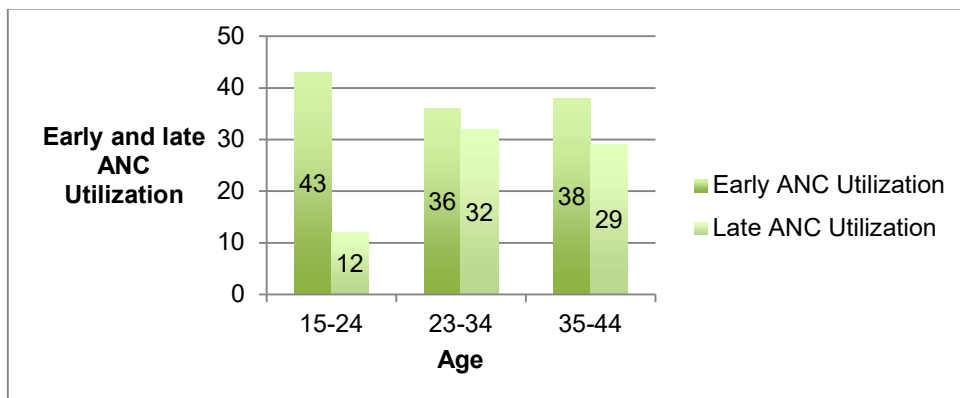


Figure 4: Respondents Age and Early and Late Utilization of ANC

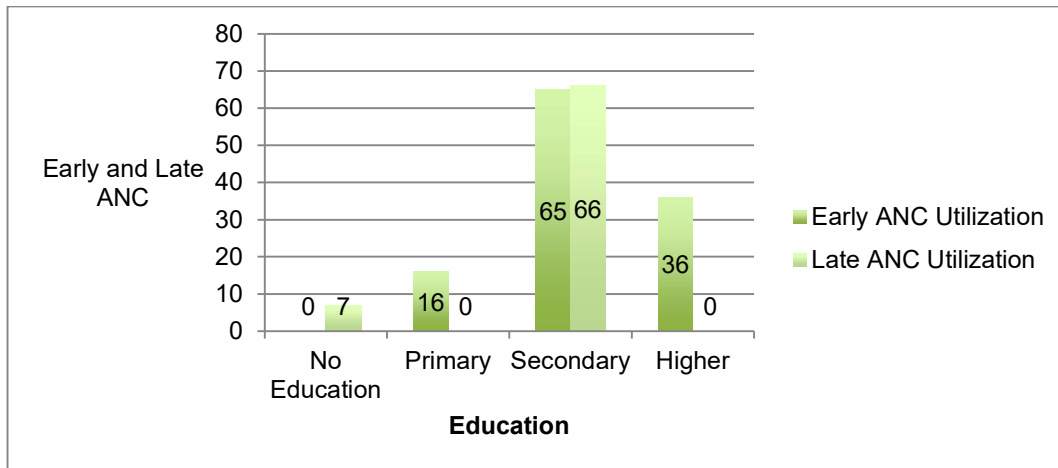


Figure 5: Education Level of Respondents and Early and Late ANC Utilization

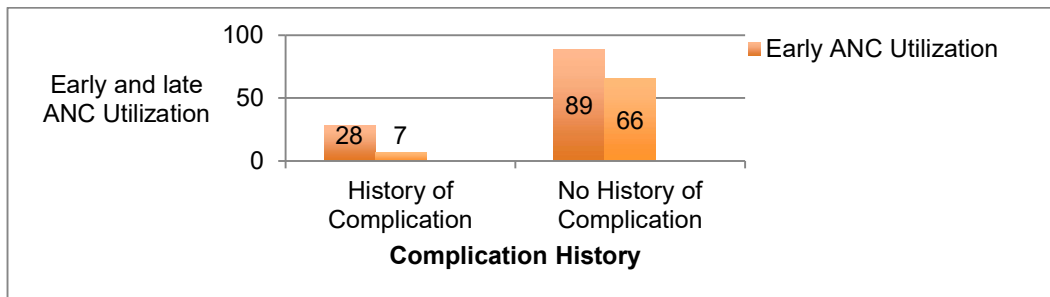


Figure 6: History of Pregnancy Complication and ANC Service Utilization

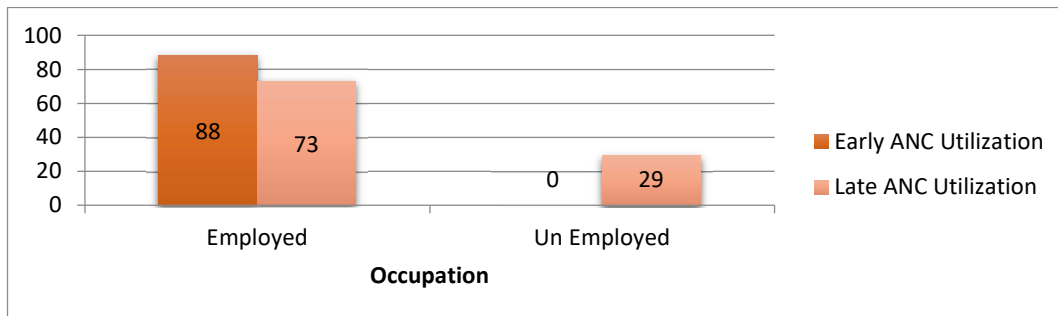


Figure 7: Respondents Occupation and Early and late Utilization of ANC

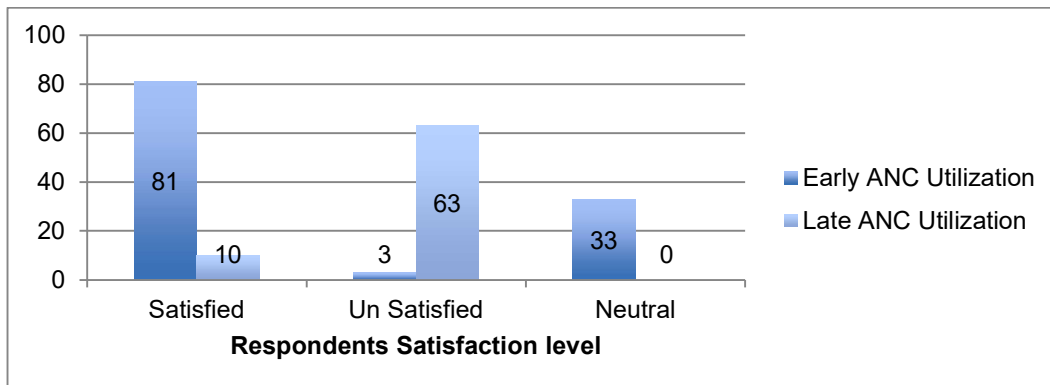


Figure 8: Respondent's level of Satisfaction and ANC Utilization

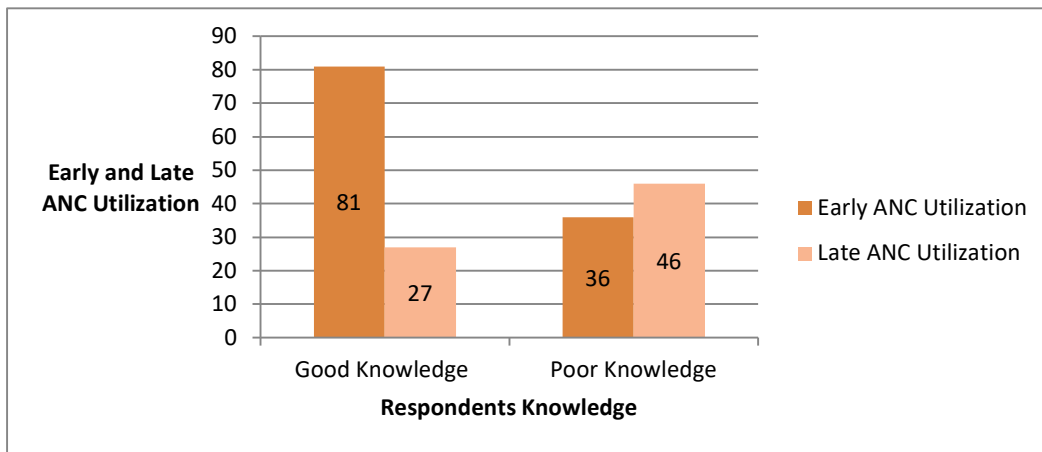


Figure 9: Respondents Knowledge and Early and Late ANC service utilization