

Impact of Antenatal Care on Progression of Pregnancy in Iraq/Baghdad 2022

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Abstract

Background: Antenatal care is the complex of interventions that a pregnant woman receives from organized health care services. The number of different interventions in antenatal care is large. The purpose of antenatal care is to prevent or identify and treat conditions that may threaten the health of the fetus/newborn and/or the mother, and to help a woman approach pregnancy and birth as positive experiences.

Objective: To identify the determinants of antenatal care (ANC) attendance and its impact on maternal / perinatal outcome.

Methodology: A cross sectional study was conducted on a sample of 200 pregnant from 1st of March to the 1st of July 2022. Four primary health care centers at Al-Adel health care district were included

Results: Among 200 pregnant female, results showed that ANC attendance significantly higher among younger women and significant association between ANC visit on healthy maternal outcome and neonatal death.

Conclusion: Age between (26-35) years reported more ANC visits, financial difficulties have been considered as an important barrier to antenatal care for women.

Key words; Antenatal care, pregnant woman, maternal / perinatal outcome

Introduction

Antenatal care (ANC) is a careful, systematic assessment and follow-up of pregnant women that includes education, counseling, screening, and treatment to assure the best possible health of the mother and her fetus.⁽¹⁾

ANC is an umbrella term used to describe the medical procedures and care that carried out beginning with preconception. It is a care a woman receives throughout her pregnancy and is crucial in helping to promote a healthy pregnancy state and safe delivery.⁽²⁾

Almost all of the maternal deaths (99%) and child deaths (98%) occurred in low- and middle-income countries. These maternal deaths would have been prevented if the pregnant women or adolescent girls had been able to access quality antenatal care (ANC).⁽³⁾

Assuming that antenatal care does confer health benefits, how it prevents maternal and perinatal mortality and morbidity is logically complex. Few of the procedures commonly undertaken have a major impact on morbidity or mortality, and some may have no effect.⁽⁴⁾

The new model increases maternal and fetal assessments to detect problems, improves communication between health providers and pregnant women, and increases the likelihood of positive pregnancy outcomes. It recommends pregnant women to have their first contact in the first 12 weeks of gestation, with subsequent contacts taking place at 20, 26, 30, 34-, 36, 38- and 40-weeks of gestation. This Antenatal care model with a minimum of eight visits recommended reducing perinatal mortality and improving women's experience of care⁽⁴⁾.

Most pertinent studies in this field concentrating on the risk profile of women booking late or neglects booking at all to antenatal care have shown that the most common barriers to attendance at antenatal care in modern Western society are lack of

insurance, low income, low educational level, low social class, unmarried status, ethnic origin of the woman, difficulties in obtaining appointments and long distances.⁽⁵⁾

In Iraq Maternity care services are provided by health care system. The primary level, which includes a network of public primary health care centers (PHCCs), provides preventive services (antenatal care, growth monitoring and immunization) and curative services. Other services provided by some of these PHCCs but to lesser extend include promotion of breastfeeding, family planning and postnatal care. Some of these services particularly curative health services are also provided by the private sector through obstetricians' private clinics that are widely distributed mainly in urban areas.⁽⁶⁾

The antenatal care services in Iraq suffer from problems common to the primary health care system. These problems are mainly related to inappropriate health service delivery including irrational use of health services, poor referral system, poor infrastructure, lack of management guidelines and poor hygiene. Other problems include health workforce challenges like poor qualification of health care providers, uneven distribution and rapid turnover of the health workforce and lack of continuing educational and professional development opportunities; and shortage in resources including shortage and low quality of medical supplies and shortage in financing. Understanding women's perspectives and experiences of antenatal care services is particularly critical as engagement of women in care is important for enhancing effectiveness of healthcare delivery, giving users a voice and making antenatal care services more responsive to women's needs and expectations⁽⁶⁾.

Iraq's healthcare system suffered major setbacks due to decades of war and

economic sanctions. Furthermore, access to healthcare has been further affected by recent instability and ongoing strife. Over the past few years, the Ministry of Health (MOH) policy has been to restructure the health system based on primary healthcare (PHC), but the services currently provided at the PHC level only partially meet the health needs of the population. This

situation, combined with a low perceived quality of care, has led the population to seek care at secondary and tertiary levels, thereby by passing primary care ⁽⁷⁾.

Aim of the study was to identify the determinants of antenatal care (ANC) attendance and its impact on maternal / perinatal outcome.

Subjects and Method

This was a cross-sectional study carried out for the period of four months extending from the 1st of March to the 1st of July 2022. A multistage random sampling was used. Al-Karkh was selected out of two sides of Baghdad, then the Adel health sector was selected out of 10 sectors. Five PHCC in Adel health sectors were included in the study. All pregnant women more than 6 month gestational age were included in the study.

Age was categories into, 18-25years, 26-35years, and > 35years. Gravida was categories into 0, 1-2, and >3. Parity was categorise in to 0, 1-2, and 2 crowding index was categories <2, 2, and >2. ⁽⁸⁾

Data organization, presentation and analysis were done using SPSS software (version26) and Microsoft Excels 2016. The main results and outcomes of the study were summarized and presented in table and graphs. Frequencies and proportions were calculated for the study variable. Chi-square test was used to find out if there was any association between the studied variables. P value less than 0.05 was considered statistically significant.

RESULTS

As showed in table (1), the peak age was in group 26-35 years (76%), those who was above 35 years represented the lowest proportion (7%). Half of participant's height was 150-160 cm. The peak of

The data were collected through face-to-face interview of the mothers by the investigator after obtaining verbal consent. A majority of the questions were drawn from published studies, the questionnaire included three parts:

(1) socio-demographic characteristics of the mothers (age, marital status, mother's education, mother's occupation, family income, time taken to reach a health center);

(2) obstetric characteristics of the mothers (parity, history of previous abortion, unplanned pregnancy, number of ANC visits, trimester at 1st ANC presentation;

(3) barriers experienced by mothers in utilization of ANC.

Ethical consideration

The proposal was fully discussed and approved by the ethical and Scientific Committee of Iraqi Board of Medical Specialization / Scientific Council of Family and Community Medicine. The agreement of health authority in included primary health care centers was taken before starting data collection. A verbal consent from each mother was taken by the investigator before obtaining the data from mothers.

weight was 66-75 kg (37%) while those who was >85 kg represented the lowest proportion (8%). Gravida and parity of participants categorized: females with history of gravida 1 represented 34.5%,

while participants with history of gravida more than 3, represented 24%. Females with parity 0 represented 25%, and those with parity more than 3 represented 32%. Regarding marital status: married participants were higher (93.5%) than divorced (4.5%) and widowed (2%). More than half of participants lives in their own

house (61%) while (39%) of them lives in rented house. According to number of people in the house, 65% were (<5) people, and (4%) were more than (10) people in the house. 70% of participants had enough monthly income. Regarding educational level (4.5%) was illiterate, and (66.5%) had post-secondary education.

Table (1): Socio-demographic profile of study sample

Characteristics		No.	Percentage %
Age	18-25 years	34	17
	26-35 years	152	76
	>35 years	14	7
Height	150-160 cm	100	50
	161-170 cm	92	46
	>170 cm	8	4
Weight	50-65 Kg	64	32
	66-75 Kg	74	37
	76-85Kg	46	23
	>85Kg	16	8
Gravida	1	69	34.5
	2-3	83	41.5
	>3	48	24
Parity	0	50	25
	1-2	76	38
	>2	74	32
Marital status	Married	187	93.5
	Divorced	9	4.5
	Widowed	4	2
Crowding index	<2	130	65
	2	62	31
	>2	8	4
Level of education	Illiterate	9	4.5

Regarding Antenatal care services, half of women were achieving 1-3 visits to PHCC for ANC purpose. While nearly third of them (39%) were achieving four

visits, on the other hand unfortunately still 11% of pregnant women have no ANC visit at all (came for another purpose other than ANC). As shown in the figure (1)

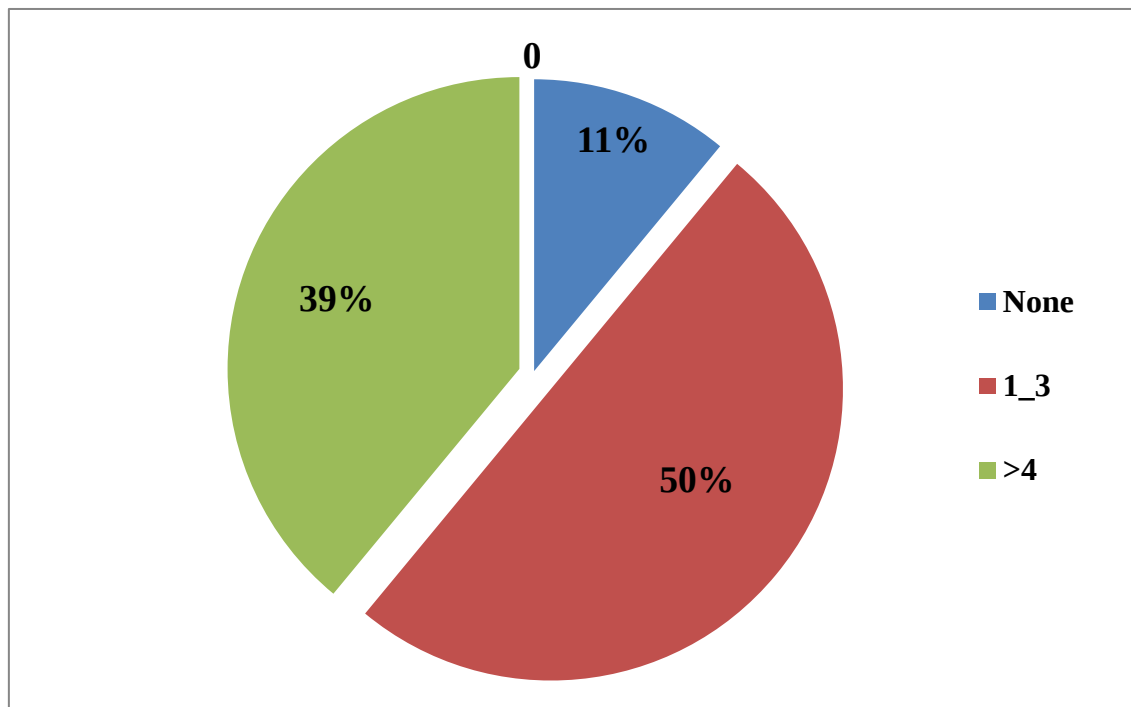


Figure (1): Percentage of ANC visits.

Majority of women got their 1st ANC visits in the 1st trimester (53%), had partial immunization (49.5%), had iron supplementation (79%), had folic acid (82%), had screening for anemia (53%) had ultra-sonogram (74%), had problem in current pregnancy (30%). 24% of Participants were smoker. 50% were stick to the date of visit, 43% had economic barriers preventing them from starting ANC visits (Table 2).

One hundred sixteen (44%) of women referred to be patients during pregnancy. Anemia was noticed in 88 (44%) as shown in table (3). Regarding Perinatal

outcome, Five (2.5%) of participants had history of neonatal death, 25 (12.5%) had stillbirth. Thirty one (15.5%) had small for date neonate while 20 (10%) large for date. Rh iso-immunization was 14 (7%). Three (1.5%) had major congenital anomaly. Thirty eight (14%) had polyhydramnios or oligohydramnios.

Fifty five (27.5%) had malpresented (breech or transverse) fetus, 16.5% had low birth weight, as table (4) showed.

Table (2): Distribution of studied sample regarding antenatal care details

		No.	Percentage
Number of ANC visits	None	22	11
	1-3	100	50
	>4	78	39
First ANC visit (trimester)	1 st	106	53
	2 nd	53	26.5
	3 rd	21	10.5
TT immunization	None	25	12.5
	Partial	99	49.5
	Full	76	38
Iron supplementation	Yes	158	79
	No	42	21
Folic acid supplementation	Yes	164	82
	No	36	18
Antenatal tests	Screening for syphilis, HIV, hepatitis	40	20
	Hemoglobin, blood group, Rh	112	56
	Ultra- sonogram	148	74
Problem in the current pregnancy	Yes	61	30.5
	No	139	69.5
History of Previous pregnancy >41 week	Yes	19	9.5
	No	181	90.5
Smoker any time during pregnancy	Yes	48	24
	No	132	66
Seeking medical care other than PHC care	Never	6	3
	Sometimes	112	56
	Always	82	41
Stick to the date of visit	Never	16	8
	Sometimes	84	42
	Always	100	50
Barrier preventing from starting ANC	Economic	87	43.5
	Waiting time	74	37
	Access to service	39	19.5

Table (3): Maternal outcome

Maternal out come	No.		Percentage%
Healthy outcome		84	42
Bad maternal outcome	PIH	6	3
	Eclampsia	2	1
	Anti-Partum Hemorrhage	4	2
	Ruptured uterus	1	0.5
	Retained placenta	6	3
	Post-Partum Hemorrhage	8	4
Diabetes		10	5
Controlled by diet only		8	4
Insulin used		2	1
Heart disease		2	1
Hypertension		12	6
Chronic renal disease		1	0.5
Other medical disorder (epilepsy or asthma		18	9
Past bad obstetrical Hx		22	11
Gestational hypertension		20	10
Proteinuria		10	5
Gestational diabetes documented		21	10.5
Anemia		88	44

Table (4): Perinatal outcome

Perinatal out come	No.	%
Neonatal death	5	2.5
Stillbirth	25	12.5
Small for date	31	15.5
Large for date	20	10
Rh iso-immunization	14	7
Major congenital anomaly	3	1.5
Polyhydramnios or oligohydramnios	38	19%
Malpresentation	55	27.5%
LBW	33	16.5

Regarding Delivery outcome: Cesarean section was noticed among 146(73%). Abortion was 10(5%). Vaginal bleeding <20 and >20 weeks were

42(21%) and 15(7.5%), respectively. Term and preterm deliveries were 169(84.5%) and 31(15.5%), respectively. As show in table (5).

Table (5): Delivery Outcome:

	No.	Percentage
Type of delivery; Cesarean	146	73
Normal Vaginal Delivery	54	27
Abortion between 12 and 20 weeks	10	5
Vaginal bleeding <20 weeks	42	21
Vaginal bleeding > 20 weeks	15	7.5
Term of pregnancies; Term	169	84.5
Preterm	31	15.5

The peak of inadequate ANC (1-3 visits) was noticed among the mother of age 26-35 years. A significantly association of age with visit of ANC was noticed ($P=0.0002$). Women with weight 66-75 Kg showed the highest significant number of visit ($P=0.000001$). A significant peak of number of visits was noticed among those with gravida 2-3

($P=0.0005$).With parity significant least number of women received adequate ANC were primiparous women ($P=0.01$).There was a significant difference in number of ANC visit between marital status ($p=0.0004$).Negatively association between crowding index and a number of visits ($p=0.0001$) (Table 6).

Table (6): Association between socio-demographic characteristics and No. of ANC visits

Characteristics		No.	None	1-3	>4	P value
Age	18-25 years	34	10 (29.4%)	19(55.9%)	5 (14.7%)	0.0002
	26-35 years	152	10 (6.6%)	77(50.6%)	65 (42.8%)	
	>35 years	14	2 (14.3%)	4(28.6%)	8 (57.1%)	
Height	150-160 cm	100	13 (13%)	50(50%)	37 (37%)	0.759
	161-170 cm	92	8 (8.7%)	45(48.9%)	39 42.4%)	
	>170 cm	8	1 (12.5%)	5(62.5%)	2 (25%)	
Weight	50-65 Kg	64	5 (7.8%)	15(23.4%)	44(68.8%)	0.000001
	66-75 Kg	74	8(10.8%)	50(67.6%)	16(21.6%)	
	76-85 Kg	46	7(15.2%)	27(58.7%)	12(26.1%)	
	>85 Kg	16	2(12.5%)	8(50%)	6(37.5%)	
Gravida	1	69	13(18.8%)	20(29%)	36(52.2%)	0.0005
	2-3	83	5(6%)	52(62.7%)	26(31.3%)	
	>3	48	4(8.3%)	28(58.3%)	16(33.3%)	
Parity	0	50	3(6%)	17(34%)	30(60%)	0.01
	1-2	76	10(13.2%)	42(55.2%)	24(31.6%)	
	>2	74	9(12.2%)	41(55.4%)	24(32.4%)	
Marital status	Married	187	16(8.6%)	96(51.3%)	75(40.1%)	0.0004
	Divorced	9	5(55.6%)	2(22.2%)	2(22.2%)	
	Widowed	4	1(25%)	2(50%)	1(25%)	
House	Own	122	12(9.8%)	64(52.5%)	46(37.7%)	0.638
	Rent	78	10(12.8%)	36(46.2%)	32(41%)	
Crowding index	<2	130	10(7.7%)	67(51.5%)	53(40.8%)	0.0001
	2	62	7(11.3%)	31(50%)	24(38.7%)	
	>2	8	5(62.5%)	2(25%)	1(12.5%)	
Level of education	Illiterate	9	5(55.6%)	3(33.3%)	1(11.1%)	0.00001
	Educated	191	17(8.9%)	97(50.8%)	77(40.3%)	

Women with morbid pregnancy has significantly higher number of ANV visit (p=0.015) (table 7).

Table (7): Association between ANC visits and maternal outcome

			No.	None	1-3	>4	P value
Maternal outcome Morbid pregnancy	healthy	84	84(100%)	16(19%)	38(45.2%)	30(35.7%)	0.008
	Anemia	88	116(100%)	6(5.2%)	62(53.4%)	48(41.4%)	
	PIH	6					
	Eclampsia	2					
	APH	4					
	Hand prolapsed	1					
	Ruptured uterus	1					
	Retained placenta	6					
	PPH	8					
Diabetes	yes	10	1(10%)	4(40%)	5(50%)	0.76	
	no	190	21(11%)	96(50.5%)	73(38.4%)		
Hypertension	yes	12	3(25%)	6(50%)	3(25%)	0.23	
	no	188	19(10.1%)	94(50%)	75(39.9%)		
Other medical disorder	yes	18	8(44.4%)	7(38.9%)	3(16.7%)	0.00001	
	no	182	14(7.7%)	93(51%)	75(41.2%)		
Past bad obstetrical Hx	yes	22	6(27.3%)	7(31.8%)	9(40.9%)	0.22	
	no	178	16(9%)	93(52%)	69(39%)		
Gestational hypertension	yes	20	8(40%)	5(25%)	7(35%)	0.00001	
	no	180	14(7.8%)	95(52.8%)	71(39.4%)		
Proteinuria	yes	10	5(50%)	2(20%)	3(30%)	0.00024	
	no	190	17(8.9%)	98(51.6%)	75(39.5%)		
Gestational diabetes documented	yes	21	6(28.6%)	11(52.3%)	4(19%)	0.01	
	no	179	16(8.9%)	89(49.7%)	74(41.3%)		
Anemia	yes	88	10(11.4%)	37(42%)	41(46.6%)	0.11	
	no	112	12(10.7%)	63(56.3%)	37(33%)		

Neonatal death was notice among women without ANC (p=0.001). No significant association in a number of visit

between viable and still birth delivery (p=0.08), (Table 8).

Table (8): Association between ANC visits and perinatal out come

		No .	None	1-3	>4	P value
Neonatal death	Yes	5	3(60%)	1(20%)	1(20%)	0.0018
Stillbirth	Yes	25	6(24%)	10(40%)	9(36%)	0.08
Small for date	Yes	31	9(29%)	15(48.4%)	7(22.6%)	0.001
Large for date	Yes	20	6(30%)	9(45%)	5(25%)	0.01
Rh iso-immunization	Yes	14	7(50%)	5(35.7%)	2(14.3%)	0.00001
Major congenital anomaly	Yes	3	1(33.3%)	1(33.3%)	1(33.3%)	0.45
Polyhydramnios or ligohydramnios	Yes	38	8(21.1%)	17(44.7%)	13(34.2%)	0.0887
Malpresentation	Breech /transverse	55	15(27.3%)	22(40%)	18(32.3%)	0.00003
	Normal	145	7(4.8%)	78(53.8%)	60(4.1%)	
Birth weight of baby	Normal>2500Kg	167	167	14(8.4%)	85(50.9%)	0.0015
	LBW<2500Kg	33	33	8(24.2%)	15(45.5%)	

There was a significant association as shown in table 9.
between ANC visit and delivery outcome

Table (9): Association between ANC visit and delivery out come

		No.	None	1-3	>4	P value
Type of Delivery	Cesarean	146	12(8.2%)	75(51.4%)	59(40.4%)	0.1
	NVD	54	10(18.5%)	25(46.3%)	19(35.2%)	
Abortion between 12 and 20 weeks and under 500 gram	Yes	10	5(50%)	3(30%)	2(2%)	0.0003
Bleeding < 20 weeks	Yes	42	13(31%)	19(45.2%)	10(23.8%)	0.00001
Bleeding > 20 weeks	yes	15	1(6.7%)	8(53.3%)	6(40%)	0.853
Term of pregnancies	Term	169	13(7.7%)	87(51.5%)	69(40.1%)	0.002
	Preterm	31	9(29%)	13(41.9%)	9(29%)	

DISCUSSION:

Adequate ANC visits significantly higher were among younger age group ($p=0.0002$) it is with that of published data. The demographic characteristics of Iraqi population enhanced the picture. It is in contrary with that in Ethiopia and Vietnam. The difference might be explained by cultural issues.⁽⁹⁾

study from Central Ethiopia found that the odds of attending ANC are 1.2 times higher ($OR=1.168$) for women in the age group of 20-34 years as compared to those in the age group 15-19 years women. Similarly, a study conducted in Vietnam found that older women (more than 25 years old) were more likely to utilize ANC. Likewise, a study conducted in China also found that women between the ages of 25 and 30 and women older than 30 were more likely to have adequately utilized antenatal care than younger women.⁽¹⁾

Even though the results showed lower percentage of ANC visits were among those with height more than 170cm, there is insignificant association between maternal height and number of ANC visits. This could be due to less percentage of women in the sample with height more than 170cm. These results consistent with study in four developing countries in which the mean and standard deviation of new ANC was 157 ± 6.6 cm.⁽¹⁰⁾

There was significant association between maternal weight and ANC visits (increased weight associate with decrease ANC visits) and this could be explained by that thinner women keen to have good health in addition to regular and standard ANC visits.

Parity was a negatively affecting the ANC visits ($p=0.0005$) it is in contrast with published report.⁽¹⁾ The explanation for the difference that women depend on experience from the past pregnancies

There was significant association between marital status and ANC, married

women had more ANC visits, this could be explained by these women had more opportunity to get support from their spouse than widowed and divorced women. Socioeconomic status was determinant of ANC visits (utilization of ANC services) ($p=0.0001$). Similar finding reported from Ethiopia.⁽²⁾

Educated women tend to have a greater awareness of the existence of ANC services and the advantages of using such services, so this study showed significant association between ANC visits and women's education. Moreover, higher levels of education tend to positively affect health-seeking behaviors, and education may increase a woman's control over her pregnancy. Studies have shown that women with lower education usually have less knowledge about ANC services and more difficulties to get access to ANC services. A study conducted in Central Ethiopia found that women with some education were more than two times more likely to attend ANC ($OR=2.645$) as compared with those who had no education.⁽¹⁾ And similar findings were found in the study conducted in North Ethiopia, Nigeria and China.⁽¹⁾ Education was positively affect the ANC visits (ANC services utilization) ($p=0.00006$). This finding is in the line of that literature.

Unhealthy maternal outcome significantly associated with ANC this could be explained by women didn't visit health care services unless she had medical cause. This study demonstrated significant association between other medical disorder (eclampsia and epilepsy for example) in addition to gestational related disease (gestational diabetes, hypertension and proteinuria). These finding consistent with Indian study in which presence of problem in the current pregnancy associated with higher percentage of antenatal care attendance.⁽¹⁰⁾

Large for date was significantly associated with high number of ANC visits

($p=0.01$), this finding might attributed of fact that PHCCs encourage those with high risk pregnancy to attend frequently to ANC. Significant higher ANC visits was noticed among those delivered small for date infant ($P=0.01$). This finding might explained by the fact of encouraging high risk pregnant mother to utilized ANC services. Some of health or social problems are difficult to manage eg, nutrition, maternal hypertension etc.

Surprising, 7% were end with Rh incompatibility, although those women got ANC services. Previously, the exchange

transfusion for Rh incompatibility was common in Iraq. ⁽¹¹⁾

There was insignificant association between ANC visits and type of delivery but women with cesarean section had more ANC visits. Abortion and bleeding were significantly associated with increased ANC visits and this also observed in the study of developing countries. ⁽¹⁰⁾

LBW was 16.6%. It is lower than that reported in Iraq, previously (34%). ⁽¹²⁾ The difference might be explained by the fact of the improvement in maternal nutritional status. During 1990, the rate of LBW was 51.8% ⁽¹³⁾.

Conclusions and Recommendations

- 1- Young women were looking for ANC services prominently.
- 2- Gravida, parity, anthropometric measure were determinant of ANC.
- 3- Socioeconomic status is a determinant of ANC.
- 4- Financial difficulties have been considered as an important barrier to antenatal care for women.
- 5- Increase awareness about the importance of standard ANC visits.
- 6- Enhance education about general health and its effect on the mother and baby together.
- 7- Further research about barriers that prevents ANC visits.

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