Original Article:

IMPACT OF EDUCATION ON PRACTICES OF ANTENATAL CARE IN PREGNANT WOMEN: AN ANALYTICAL SURVEY

Kamran Ashraf[1], Iram Manzoor[2], Abida Hassan[3], Qurat ul Ain Zulfi[4], Minahil Iqbal[5].

ABSTRACT:

Background and Objective: Maternal health is a global public health challenge that is directly affected by the practices during the antenatal period. The objective of this study was to determine factors influencing the effective utilization of antenatal services and to assess the impact of education of women toward practices of antenatal care in women of the reproductive age group in Lahore.

Material and Methods: An analytical cross-sectional study was conducted at Lady Willingdon Hospital, Farooq Hospital, and Akhter Saeed Trust Teaching Hospital, Lahore from March to August 2019. This study included 262 pregnant mothers selected by non-probability convenience sampling from three tertiary care hospitals of Lahore. Data was collected on a structured questionnaire and was analyzed on SPSS version 22. Chi-square test was applied to assess the impact of education on the effective utilization of antenatal services and practices followed during this period.

Results: Out of 262 pregnant women, who participated in this research 199(75.97%) were literate. The majority of them; 196(74.80%) were multigravida. Only 145(55.3%) had planned pregnancy regarding antenatal practices, 66% had reported intake of folic acid, 69.8% iron supplements, and 71.8% calcium supplements. Only 58.8% had TT vaccination coverage. On bivariate analysis, it was observed that strong association was seen between educational status and time of reporting pregnancy (p=0.001), planned pregnancy (p=0.058), folic acid supplementation (p=0.000) iron supplementation (p=0.000), calcium supplementation (p=0.046), hospital delivery (p=0.03) and delivery by a doctor (p=0.024).

Conclusion: Education has a positive impact on good practices during the antenatal period.

Key Words: Antenatal care practices, Multivitamin Supplementation, Planned Pregnancy,

INTRODUCTION:

Antenatal care (ANC) is the care provided to all pregnant women to ensure the best health conditions for the women and their fetuses during pregnancy.[1] WHO recommends a goal-oriented approach that is the diagnosis of pregnancy and the utilization of antenatal services should be as early as possible. WHO recommends a minimum of four antenatal visits for all pregnant mothers, however, statistics show less than four visits, in many developing countries. On a global scale, it is estimated that approximately 80% of maternal deaths[2] and up to two-thirds of neonatal deaths could be avoided if effective health services are provided during birth and the first week of the life of neonate.[3] Early and regular antenatal service utilization throughout pregnancy is recommended globally to improve health statistics related to pregnancy and its outcome.[4] It has been observed that expectant women in poor socio-economic settings start late service utilization[5] and do not fulfill WHO-defined minimum four antenatal visits.[6] According to a survey done in 2015, the Maternal Mortality Rate in Nepal was estimated to be 229 per100,000 live births, and this indicator constitutes 11% of all deaths in females of 15-49 years.[7] Currently, promotion of maternal health service utilization is on the way, however poor socioeconomic status, rural inhabitation and belonging from ethnic minorities are

[1]Student of 4th-Year MBBS, AMDC, Lahore.
[2]Professor & HOD Community Medicine & Director Medical Education, AMDC, Lahore.
[3]Assistant Professor, Community Medicine, AMDC, Lahore.
[4]Demonstrator Community Medicine, AMDC, Lahore.
[5]Student of 4th-Year MBBS, AMDC, Lahore.

limitations.[8] A qualitative study conducted in Nepal showed that pregnant women's heavy work-load, mother-in-law's perception of benefit of antenatal care, her power, and control over resources, and the relationship between mother-in-law and pregnant women also played a vital role in pregnant women's utilization of antenatal care.[9] Another study suggested that women from rich families have three times more chances of having 4 antenatal care visits compared to women from a poor family.[10] The findings from Pakistan are consistent with analysis from the other low and middle-income countries which suggests that there are substantial gaps between antenatal care coverage and the receipt of WHO-recommended content of care.[11] According to a survey, in Pakistan, antenatal utilization has been increased from the last two decades with the percentage increasing from 26% in 1990-91 to 78% in 2012-13.[12] This study aimed to assess the impact of education in the utilization of antenatal care services in Lahore.

MATERIAL AND METHODS:

An analytical cross-sectional study was conducted in three tertiary care teaching hospitals of district Lahore, all in urban settings. These include one Government-owned hospital; Lady Willingdon Hospital and two in the private sector; Akhter Saeed Trust Teaching Hospital and Farooq Hospital, West Wood, Lahore.

This research was done in Obstetrics and Gynaecology outdoors (OPD) of all three hospitals from March 2019 to August 2019. A total of 262 pregnant mothers fulfilling inclusion criteria and willing to participate were selected through a non-probability convenient sampling method. Consent was taken first from the IRB committee of Akhter Saeed Medical and Dental College and then Medical Superintendent (MS) of concerned hospitals to collect data. The data was collected through a pretested structured questionnaire. The response rate was 100%. Data was collected on gravidity, planned pregnancy, time of antenatal visits and intake of supplements, investigations, and developing complications.

Data was entered and analyzed on SPSS version 22. Chi-square test was applied for bivariate analysis between education and practices during the antenatal period. p-value was fixed at ≤ 0.05 to declare a significant association between two variables.

RESULTS:

This study is conducted on a sample of 262 pregnant females who reported in the OPD of selected hospitals. The socio-demographic profile showed that a vast majority of 220(83.90%) were between 20 – 40 years. As Lahore is an urban and well-developed city, 199(75.95%) of the pregnant females who participated in the study were literate. Out of 262 participants, 250 (95.42%) were housewives and had a monthly income of more than Rs. 10,000. Seventy-four percent of the respondents were multigravida. Only 145(55.3%) had planned their current pregnancy.

Table 1: Socio-demographic profile of Participants

Variables	Frequency n = 262	Percentage (%)
Age		
Less than 20 years	42	16.03
21 – 40 years	220	83.96
Educational Status		
Illiterate	63	24.04
Literate	199	75.95
Employment Status		
Employed	12	4.58
Housewives	250	95.42
Gravidity		
Primi-Gravida	66	25.2
Multi-Gravida	196	74.80
Planned pregnancy		
Yes	145	55.3
No	117	44.7

The results showed poor reporting during early pregnancy. Only 61(23.3%) of the participants reported their pregnancy within first 4 weeks of conception and 201(76.71%) reported it after 4 weeks. Routine tests were conducted diligently by the participants as 236(90%) reported that

they have undergone for complete urine examination, 233(88.9%) had blood examination and 233(88.9%) had done their ultrasounds.

Table 2: Practices during antenatal period

Practices Pregnancy	Frequency n = 262	Percentage (%)
Folic Acid Supplements		
Yes	173	66
No	89	34
Iron Supplements		
Yes	183	69.8
No	79	30.2
Calcium Supplements		
Yes	188	71.8
No	74	28.2
TT Vaccination		
Yes	154	58.8
No	108	41.2

One hundred and seventy-three (66%) expectant mothers reported intake of folic acid. 183(69.8%) iron supplements and 188 (71.8%) calcium supplements. One hundred and fifty-four (58.8%) had tetanus toxoid vaccination. Hypertension and Diabetes Mellitus, two major non-communicable diseases were reported as 55(21%) and 34(12.9%) by the respondents. Hundred pregnant women which constituted (38.2%) were anemic.

Chi-square test was applied to bivariate analysis to assess the effect of education on practices of pregnant women during the current pregnancy. It was observed that there was a significant association between educational status and time of reporting their pregnancy during the first antenatal visit (p=0.001).

Educated mothers had planned pregnancies (p=0.058). There was a significant association between the education of mothers and the intake of folic acid during the first trimester (0.000), intake of iron supplements (0.000), and calcium supplements (0.046). No significant difference was observed for TT vaccine coverage between educated and non-educated women (0.551). Educated women preferred hospital-based deliveries with a p-value of 0.003 as compared to non-educated women, who preferred home-based deliveries. A significant difference was also observed in choices for conduction of deliveries where the majority of educated women preferred doctors for this purpose (p=0.024).

Table 3: Impact of education on practices of antenatal care

Variables	Education		Total	p-value
	Educated	Non-educated		
Antenatal Visits				
1-4 weeks	46 (75.4%)	15 (24.6%)	61 (100.0%)	.001*
5-8 weeks	73 (85.9%)	12 (14.1%)	85 (100.0%)	
9-12 weeks	50 (80.6%)	12 (19.4%)	62 (100.0%)	
13-16 weeks	18 (64.3%)	10 (35.7%)	28 (100.0%)	
17-20 weeks	4 (50.0%)	4 (50.0%)	8 (100.0%)	
More than 20 weeks	8 (44.4%)	10 (55.6%)	18 (100.0%)	
Pregnancy planned				
Yes	116 (80.0%)	29 (20.0%)	145 (100.0%)	.058*
No	83 (70.9%)	34 (29.1%)	117 (100.0%)	
Folate supplements during 1st trimester				
Yes	145 (83.8%)	28 (16.2%)	173 (100.0%)	.000*
No	54 (60.7%)	35 (39.3%)	89 (100.0%)	
Iron supplements during Pregnancy				
Yes	152 (83.1%)	31 (16.9%)	183 (100.0%)	.000*
No	47 (59.5%)	32 (40.5%)	79 (100.0%)	
Calcium supplements pregnancy				
Yes	149 (79.3%)	39 (20.7%)	188 (100.0%)	.046*
No	50 (67.6%)	24 (32.4%)	74 (100.0%)	
TT vaccine during this pregnancy				
Yes	119 (77.3%)	35 (22.7%)	154 (100.0%)	.551
No	80 (74.1%)	28 (25.9%)	108 (100.0%)	
Delivery will be carried out in				
Home	2 (28.6%)	5 (71.4%)	7 (100.0%)	.003*
Hospital	197 (77.3%)	58 (22.7%)	255 (100.0%)	
Delivery will be conducted by				
Doctor	195 (77.4%)	57 (22.6%)	252 (100.0%)	.024*
Dai	3 (42.9%)	4 (57.1%)	7 (100.0%)	
LHV	1 (33.3%)	2 (66.7%)	3 (100.0%)	

*p<0.05 significant

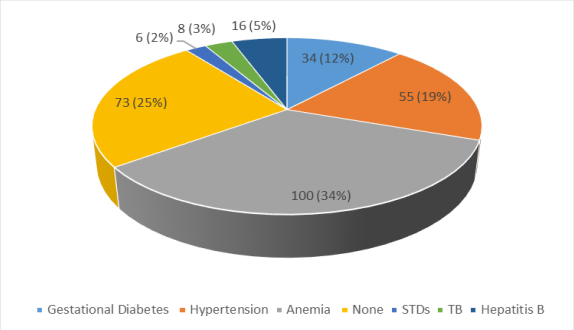

Fig. 1: Comorbidities associated with pregnancy

Results showed that a vast majority of 100(34%) had anemia during this pregnancy. 55(21%) developed hypertension, 34(13%) developed gestational diabetes. A small proportion developed STDs and tuberculosis. Only 28% were reported without any comorbidity.

DISCUSSION:

Antenatal care is a preventive approach to promote and safeguard maternal health as it filters high-risk mothers for further referrals to higher-level health care facilities. Antenatal care is essential for better health outcomes and reduces the incidence of maternal and perinatal morbidity. In 2018, a study was done regarding the association between antenatal care utilization (ACU) and maternal morbidity, which showed 34.6% women didn't receive adequate antenatal services so maternal morbidity was seen in 2.9% and neonates showed perinatal morbidity 5.5%.[13]

In this study, out of 262 females, 61 had their first antenatal visit to the hospital between 1 – 4 weeks. A similar study, conducted in Kenya showed only 14% of pregnant women opted for early antenatal care in the first three months of gestation.[14]

According to this research, 55.3% of pregnancies were planned. In Swaziland, a study was conducted among 1124 women and 70% of pregnancies were unplanned (teenagers and multiparas), and 30% were planned.[15]

Intake of iron and folic acid supplements is necessary for females but during pregnancy, body demands for these micronutrients increase significantly. In an Ethiopian study 2017, 28.7% of females of the reproductive age group took folic acid and iron.[16] In another cross-sectional study done in Uganda (2017) about 12% of the mothers attending antenatal clinic adhered to iron supplements.[17] Contrary to the results of the present study where 66% were taking folic acid and 69.8% were taking iron supplements. The major reason could be better awareness because it was an urban population and the majority were educated mothers.

Increased calcium intake is also a requirement of pregnancy. Calcium helps in fetal bone development. According to this study, 71.8% were taking calcium supplements during pregnancy. A study published in 2019 in Ethiopia, revealed that out of 492 pregnant females, 91% had calcium intake below the estimated average requirement.[18] The results of this study showed a significant association of education with the intake of oral supplementation during pregnancy.

According to this study, 58.8% of pregnant females vaccinated for tetanus and similar results were obtained in a study conducted in Egypt. It showed that out of 277 pregnant females 60.6% had taken all required doses of Tetanus Toxoid vaccine.[19]

The current study showed 21 % of pregnant females presented with hypertension as a complication of pregnancy whereas A study conducted in Greece showed 9.2% of pregnancies were complicated by hypertension.[24] Anemia is also aggravated during pregnancy. In our current study, 38.2% of pregnant women were found anemic. Similarly, in a previous study carried out in Faridabad, Haryana a high prevalence of anemia; 91.3% among pregnant ladies was noticed[25] and this observation is very common in developing countries. Contrary to the results of the present study, where only 2.29% of pregnant ladies had a history of sexually transmitted infections, a study in KwaZulu Natal, South Africa reported 32.3% of pregnant ladies were suffering from sexually transmitted diseases.[20]

Results of the current study showed a smaller proportion of women were affected with Tuberculosis and similar findings were observed from studies conducted in South India that showed only 0.02% of pregnant ladies were suffering from tuberculosis.[21] but this range is different in different parts of India. 6.1% of the pregnant ladies had a history of Hepatitis B infection. In this study whereas in Northwest Ethiopia 45.5% were diagnosed with hepatitis B.[22]

The results of this study showed that 12.9% had gestational diabetes and this incidence has been reported from 3.2% to 18% in different of the world.[23]

As satisfactory knowledge and awareness were noticed regarding institutional care, 96.6% of respondents were willing for hospital delivery. A study conducted in Kenya regarding the place of birth revealed out of 379 pregnant females, 103 (26%) delivered at home.[26]

LIMITATIONS OF STUDY:

1. This study is conducted in Lahore. Although the researcher has targeted Government-owned and private both types of hospitals to include a greater variety of participants whereas urban setting is a major limitation.
2. The hospital-based study does not reflect the true picture of responses so results can be affected by the selection technique.

CONCLUSION:

Education has a positive impact on good practices during the antenatal period.

RECOMMENDATIONS:

1. Enhancing the educational status of women can indirectly save maternal lives. Education has a great impact on safe practices during the antenatal period.
2. It is strongly recommended to create awareness through Public Education campaigns to increase knowledge of pregnant women at the household and community level for safe practices during the antenatal period.

AUTHOR'S CONTRIBUTION:

KA: Write up of introduction & extensive literature search
IM: Results analysis and write up of results, critical evaluation, finalization of article
AH: Conceptualization, supervision of project
QZ: Write up of discussion, literature search and referencing
MI: write up of methodology and data collection

REFERENCES:

1. Yeoh PL, Hornetz K, Dahlui M. Antenatal care utilisation and content between low-risk and high-risk pregnant women. PLoS One. 2016;11(3).
2. Pattinson R, Kerber K, Buchmann E, Friberg IK, Belizan M, Lansky S, Weissman E, Mathai M, Rudan I, Walker N, Lawn JE. Stillbirths: how can health systems deliver for mothers and babies?. The Lancet. 2011 May 7;377(9777):1610-23.
3. World Health Organization. Newborns: reducing mortality (2016) https://www.who.int/news-room/fact-sheets/detail/newborns-reducing-mortality
4. Pervin J, Moran A, Rahman M, Razzaque A, Sibley L, Streatfield PK, Reichenbach LJ, Koblinsky M, Hruschka D, Rahman A. Association of antenatal care with facility delivery and perinatal survival–a population-based study in Bangladesh. BMC pregnancy and childbirth. 2012 Dec 1;12(1):111.
5. Thiam S, Kimotho V, Gatonga P. Why are IPTp coverage targets so elusive in sub-Saharan Africa? A systematic review of health system barriers. Malar. J. 2013 Dec 1;12(1):353.
6. Thiam S, Kimotho V, Gatonga P. Why are IPTp coverage targets so elusive in sub-Saharan Africa? A systematic review of health system barriers. Malar. J. 2013 Dec 1;12(1):353.
7. Deo KK, Paudel YR, Khatri RB, Bhaskar RK, Paudel R, Mehata S, Wagle RR. Barriers to utilization of antenatal care services in Eastern Nepal. Public Health Front. 2015 Aug 14;3:197.
8. Bhandari P, Chan L. Socio-cultural Inequality in Women's Health Service Utilization in Nepal. APPJ. 2016 Dec 1;31(2).

9. Simkhada B, Porter MA, Van Teijlingen ER. The role of mothers-in-law in antenatal care decision-making in Nepal: a qualitative study. BMC pregnancy and childbirth. 2010 Dec 1;10(1):34.
10. Acharya J. Are free maternity services completely free of costs?. OPHRP. 2016 Feb 1;7(1):26-31.
11. Conrad P, Schmid G, Tientrebeogo J, Moses A, Kirenga S, Neuhann F, Müller O, Sarker M. Compliance with focused antenatal care services: do health workers in rural Burkina Faso, Uganda and Tanzania perform all ANC procedures?. TM&IH. 2012 Mar;17(3):300-7.
12. Agha S, Tappis H. The timing of antenatal care initiation and the content of care in Sindh, Pakistan. BMC pregnancy and childbirth. 2016 Dec 1;16(1):190.
13. Linard M, Blondel B, Estellat C, Deneux-Tharaux C, Luton D, Oury JF, Schmitz T, Mandelbrot L, Azria E, PreCARE Study Group, Bourgeois-Moine A. Association between inadequate antenatal care utilisation and severe perinatal and maternal morbidity: An analysis in the Pre CARE cohort. BJOG: Int. J. Gynecol. Obstet. 2018 Apr;125(5):587-95.
14. Ochako R, Gichuhi W. Pregnancy wantedness, frequency and timing of antenatal care visit among women of childbearing age in Kenya. Reproductive health. 2016 Dec 1;13(1):51.
15. Hultstrand JN, Tydén T, Jonsson M, Målqvist M. Contraception use and unplanned pregnancies in a peri-urban area of eSwatini (Swaziland). Sexual & Reproductive Healthcare. 2019 Jun 1;20:1-6.
16. Derso HD, Agegnehu G, Atenafu A, Dagnew B, Dagne H. Adherence to Iron and folic acid supplement and associated factors among antenatal care attendant mothers in lay Armachiho health centers, northwest, Ethiopia, 2017. BioRxiv. 2018 Dec 11.
17. Kiwanuka TS, Ononge S, Kiondo P, Namusoke F. Adherence to iron supplements among women receiving antenatal care at Mulago National Referral Hospital, Uganda-cross-sectional study. BMC research notes. 2017 Dec;10(1):510.
18. Tesfaye B, Sinclair K, Wuehler SE, Moges T, De-Regil LM, Dickin KL. Applying international guidelines for calcium supplementation to prevent pre-eclampsia: simulation of recommended dosages suggests risk of excess intake in Ethiopia. Public health nutrition. 2019 Mar;22(3):531-41.
19. Hassan AM, Shoman AE, Abo-Elezz NF, Amer MM. Tetanus vaccination status and its associated factors among women attending a primary healthcare center in Cairo governorate, Egypt. JEPHA. 2016 Sep 1;91(3):127-34.
20. Moodley D, Moodley P, Sebitloane M, Soowamber D, McNaughton-Reyes HL, Groves AK, Maman S. High prevalence and incidence of asymptomatic sexually transmitted infections during pregnancy and postdelivery in KwaZulu Natal, South Africa. Sexually transmitted diseases. 2015 Jan 1;42(1):43-7.
21. Vijayageetha M, Kumar AM, Ramakrishnan J, Sarkar S, Papa D, Mehta K, Joseph NM, Rajaram M, Rajaa S, Chinnakali P. Tuberculosis screening among pregnant women attending a tertiary care hospital in Puducherry, South India: is it worth the effort?. Global health action. 2019 Jan 1;12(1):1564488.
22. Gedefaw G, Waltengus F, Akililu A, Gelaye K. Risk factors associated with hepatitis B virus infection among pregnant women attending antenatal clinic at Felegehiwot referral hospital, Northwest Ethiopia, 2018: an institution based cross sectional study. BMC research notes. 2019 Dec 1;12(1):509.
23. Meharry PM, Tengera O, Rulisa S, Byambu AK, Nietert PJ, Byiringiro S, Habimana C, Gishoma C, King LR. Prevalence of gestational diabetes mellitus among women attending antenatal care at public health centers in Rwanda. diabetes research and clinical practice. 2019 May 1;151:252-9.
24. Kintiraki E, Papakatsika S, Kotronis G, Goulis DG, Kotsis V. Pregnancy-induced hypertension. Hormones. 2015 Apr 1;14(2):211-23.
25. Kant S, Malhotra S, Haldar P, Kaur R, Kumar R. Anemia among pregnant women attending antenatal clinic at a secondary health care facility in district Faridabad, Haryana. IJCFM. 2019 Jan 1;5(1):51.
26. Moindi RO, Ngari MM, Nyambati VC, Mbakaya C. Why mothers still deliver at home: understanding factors associated with home deliveries and cultural practices in rural coastal Kenya, a cross-section study. BMC Public Health. 2015 Dec;16(1):114.