

A Community-Based Study Exploring the Impact of Mothers' Education on their Engagement with Prenatal Care and Childcare Resources

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Abstract

Background: Educated women tend to have a greater awareness of the existence of ANC services, are more aware of health problems, know more about the availability of healthcare services, and utilize the information more effectively than non-educated women. Moreover, higher levels of education tend to positively affect health-seeking behaviors, and education may increase a woman's control over her pregnancy. In this study, we tried to analyze to what level maternal education can influence antenatal care services and childcare.

Methods: A community-based cross-sectional study was conducted on 150 randomly selected mothers who have children aged less than 7 years by using a pre-tested structured questionnaire for data collection at RHC, Karimnagar district from January 2021 to June 2022.

Results: Out of 150 study subjects, 12.6% (19) of the study subjects were not registered for antenatal services. The higher the maternal education more the birth spacing between the pregnancies ($p < 0.05$), the more preference for institutional deliveries ($p < 0.05$), the more the birth weight of the child ($p < 0.05$), a smaller number of babies hospitalization due to illness ($p < 0.00001$).

Conclusion: This study revealed that the utilization of ANC services was relatively better for the mother's education higher than secondary school, but they are still low. Educational status is important in having more health-seeking behavior. In this study, it proves that health education is more important than mere school education which can help to improve knowledge on ANC.

Keywords: Antenatal Care, Maternal Education, Health Service Utilization.

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Introduction

Antenatal care services are integral to the primary healthcare delivery system of a country aspiring for a healthy society. In nations like India, grappling with high infant and child mortality rates, along with maternal mortality rates, the utilization of Antenatal Care (ANC) services and maternal and child health programs holds paramount importance. Between 1992-93 and 2019-21, India experienced a notable reduction of more than 50% in the under-five mortality rate. During this period, the annual decrease in under-five mortality is reported to be 1.6% in rural areas and 2.7% in urban areas. Despite these positive trends, the rural population continues to contribute a higher proportion of under-five deaths. The rural-urban disparity in under-five mortality has diminished from 44 per thousand live births in 1992-1993 to 30 per thousand in 2004-2005, further reducing to 14 per thousand in 2019-2021. [1] Despite several changes in the rapidly evolving socioeconomic landscape over the past sixty years, the maternal health situation in India

remains a significant concern. Recent national data reveals that health indicators, including the utilization of antenatal care services, have been as low as 60% in rural India [2]. Understanding the impact of infant and young child feeding (IYCF) practices on enhancing the nutritional status of children under two years of age, the World Health Organization (WHO) has developed a set of core indicators assessing IYCF practices [3]. These indicators encompass both breastfeeding and complementary feeding practices. Appropriate feeding practices involve the timely initiation of solid and semi-solid foods from the age of 6 months, aiming to enhance the quantity and quality of foods consumed by children while maintaining breastfeeding [4]. Previous studies conducted elsewhere have identified several factors associated with appropriate complementary feeding practices for children aged 6-23 months. These factors include higher maternal and paternal education, better household wealth, media exposure, adequate

antenatal and postnatal contacts, child's sex and age, institutional delivery, low parity, maternal occupation, urban residence, knowledge, and frequency of complementary feeding, and receiving feeding advice during immunization [5]. To enhance complementary feeding practices during this critical period of a child's growth and development, evaluating such practices and understanding the influencing factors is crucial [2]. Among various determinants of nutritional status, parental education emerges as a significant factor, perhaps second only to socioeconomic status. A literate mother tends to utilize scarce resources more effectively for the child's welfare compared to an illiterate mother with higher resources [6]. De Souza et al. argue that women's education affects their children's nutritional status through their roles as providers of household health and nutrition [7]. While the association between a mother's education and a child's nutritional status is well-established, the link between the education of the father or both parents combined and the child's nutritional status is less established. Banerjee et al. [8] suggest that the nutrition education of mothers positively influences their children's nutritional status. Other studies have identified a strong connection between maternal education, socioeconomic status, and child nutritional status. [9] Educated women are more likely to secure steady, higher-paying jobs, marry men with higher education and income, and reside in better neighborhoods, all of which influence child health and survival [10].

Material and Methods

This cross-sectional study was a school-based study conducted by the Department of SPM, Prathima Institute of Medical Sciences, Naganoor, Karimnagar. Institutional Ethical approval was obtained for the study after following the due protocol for ethical approval for human research. Permission was obtained from the principals of the respective schools for the conduct of the study. A Pretested semi-structured questionnaire was developed and validated. It consists of socio-demographic details of the individual and the family for data collection in RHTC.

Inclusion criteria

1. Mothers with children aged less than 7 years old
2. Visiting RHTC of Prathima Institute of Medical College Karimnagar.
3. Mothers who gave consent for filling out the questionnaire
4. Willing to participate in the study voluntarily.

Exclusion criteria

1. Not willing to participate
2. Not as per the inclusion criteria

Sample size calculation: The sample size is calculated based on an estimated mean prevalence of 10%. Considering a confidence interval of 95%, absolute precision of 4%. $N = Z_{1-\alpha}^2 pq/d^2$ Where, $Z_{1-\alpha}$ = standard normal deviant at 95% confidence level i.e. 1.96, p = prevalence = 8%, $q = 100 - p = 92\%$, d = margin of error of 5% (25) = 117 we included 120 subjects in the study.

Statistical analysis: The existing data was meticulously processed and inputted into an MS Excel spreadsheet, followed by entry into a computerized database using SPSS version 21.0 (IBM Corp., Armonk, NY, USA). Continuous variables were expressed in terms of mean, standard deviation, and percentages, while categorical variables were conveyed through p-values, with significance determined at a threshold of (<0.05).

Results

Maternal education and age: Table 1 shows that most mothers with secondary education (50) are under 20 years old, while most mothers with primary education (10) and illiterate mothers (4) are aged 21-30. There is a statistically significant association between maternal education and age (p -value = 0.0124), suggesting that younger mothers are more likely to have lower levels of education.

Maternal education and pregnancy registration: Table 1 shows that almost all mothers, regardless of their education level, registered for pregnancy. There is no statistically significant association between maternal education and pregnancy registration (p -value = 0.840), suggesting that most mothers in this population seek prenatal care.

Table 1: Maternal education on age, registration for pregnancy, birth spacing

Age in years	Maternal Education levels				P value
	Secondary	Primary	Illiterate	Total	
< 20	50	10	4	64	0.0124
21 – 30	46	2	2	50	
31 – 35	4	1	1	6	
Pregnancy registration					
Yes	94	10	3	107	0.840
No	6	3	4	13	
Birth Spacing					
Primi	71	6	4	78	0.0189
12 – 24 months	16	4	2	24	
> 24 months	13	3	1	18	

Maternal education and birth spacing: Table 1 shows that mothers with secondary education are more likely to have birth spacing months compared to mothers with primary education and illiterate mothers. There is a statistically significant association between maternal education and birth spacing (p-value = 0.0189), suggesting that mothers with lower levels of education are more likely to

have shorter intervals between births. This suggests that there is a relationship between maternal education and several factors related to pregnancy and childbirth. Mothers with lower levels of education are more likely to be younger, have shorter birth intervals, and may have less access to prenatal care.

Table 2: Maternal education levels with antenatal visits, person conducting delivery, and place of delivery

Age in years	Maternal Education levels				P value
	Secondary	Primary	Illiterate	Total	
Number of antenatal Visits					
< 4	15	3	5	23	0.932
> 4	85	10	2	97	
Person conducted delivery					
Dai and others	2	2	3	7	0.233
Doctor	89	8	2	99	
ANM	9	3	2	14	
Place of delivery					
Hospital	96	10	3	109	0.032
Home	4	3	4	11	

Table 2 explores the link between maternal education and various aspects of childbirth experiences. Antenatal Visits: Number of visits: There's no significant difference (p-value = 0.932) in attending fewer than 4 antenatal visits across education levels. However, mothers with secondary education have the highest proportion (85/99) attending more than 4 visits. Interpretation: Mothers with higher education seem to utilize antenatal care more frequently, potentially indicating greater awareness and access to healthcare services.

Person Conducting Delivery: Delivery personnel: The majority across education levels deliver with a doctor (89 secondary, 8 primary, 2 illiterate). Dai (traditional birth attendants) and others are used minimally (2 secondary, 2 primary, 3 illiterate). Interpretation: Doctors seem to be the preferred choice for delivery regardless of education level,

suggesting a potential emphasis on skilled birth attendance.

Place of Delivery: Delivery location: Most mothers, regardless of education, deliver in hospitals (96 secondary, 10 primary, 3 illiterate). Only a small number deliver at home (4 secondary, 3 primary, 4 illiterate). Interpretation: Hospital delivery is prevalent across education levels, possibly indicating better access or preference for institutionalized care. However, a small portion, especially of illiterate mothers, still deliver at home. Mothers with higher education tend to attend more antenatal visits, suggesting better healthcare utilization. Doctors are the preferred choice for delivery across education levels, indicating an emphasis on skilled attendance. Hospital delivery is overwhelmingly favored, but a small number, especially of illiterate mothers, still deliver at home.

Table 3: Maternal education on birth weight, number of feeds, and stoppage of breastfeeding

	Maternal Education levels				P value
	Secondary	Primary	Illiterate	Total	
Mean Birth weight in Kg	2.92 ± 0.54	2.51 ± 0.41	2.25 ± 0.62	-	0.011
Pre-lacteal feeds					
Yes	9	1	1	11	0.623
No	91	12	6	109	
Exclusive breastfeeding					
Primi	71	6	4	78	0.0189
12 – 24 months	16	4	2	24	
> 24 months	13	3	1	18	
Total stoppage of breastfeeding					
< 1 year	3	3	2	8	0.336
> 1 year	97	10	5	112	

Table 3 explores how maternal education might influence various aspects of infant feeding. Birth Weight: Mean birth weight: Babies born to mothers with secondary education have the highest average weight (2.92 kg), followed by primary (2.51 kg) and illiterate mothers (2.25 kg). Statistical significance: There's a significant difference in birth weight across education levels (p-value = 0.011), suggesting higher education might be associated with better birth outcomes.

Pre-lacteal Feeds: Most mothers, regardless of education level, did not give pre-lacteal feeds (formula or other liquids before breastfeeding) to their babies (91 secondary, 12 primary, 6 illiterate). No significant difference: There's no statistically significant difference in offering pre-lacteal feeds across education groups (p-value = 0.623), suggesting this practice might not be strongly linked to education level.

Exclusive Breastfeeding: Exclusive breastfeeding duration: Mothers with secondary education have the longest exclusive breastfeeding duration across birth spacing categories (Primi: 71 months, 12-24 months: 16 months, >24 months: 13 months). Statistical significance: There's a significant difference in exclusive breastfeeding duration across birth spacing categories for secondary education mothers (p-value = 0.0189), suggesting potential challenges in maintaining exclusivity with shorter birth intervals.

Total Breastfeeding Stoppage: Breastfeeding stoppage timing: Most mothers across education levels stopped breastfeeding after 1 year (97 secondary, 10 primary, 5 illiterate). No significant difference: There's no statistically significant difference in stopping breastfeeding before or after 1 year across education groups (p-value = 0.336),

suggesting education level might not be a major factor in this decision.

Overall, it appears that Mothers with higher education tend to have babies with higher birth weights, potentially indicating better access to prenatal care and healthy lifestyle choices. Education level doesn't seem to significantly influence pre-lacteal feeding practices. Mothers with secondary education practice exclusive breastfeeding for longer, especially for their firstborns, suggesting better knowledge or support systems. The timing of total breastfeeding stoppage is not significantly linked to education level.

Table 4 shows the potential link between a mother's education level and their child's health outcomes related to hospitalization, weight, and growth.

Baby Hospitalization (Hospitalization for sickness): Children of mothers with secondary education have a significantly lower rate of hospitalization (25 out of 100) compared to children of mothers with primary education (6 out of 13) and illiterate mothers (3 out of 7). The p-value (0.002) indicates a statistically significant association. Mothers with higher education might have better access to preventive healthcare, knowledge about hygiene and early child development, or resources to seek timely medical attention, potentially leading to lower hospitalization rates for their children.

Weight/Age of Child (Wasting): The prevalence of wasting (low weight for height) does not show a significant difference across education levels (p-value = 0.274). However, numerically, children of mothers with secondary education have the lowest wasting rate (17 out of 100). Normal weight: The majority of children across education levels have normal weight for their age (83 secondary, 9 primary, 4 illiterate)

Table 4: Role of maternal education on baby hospitalization for sickness, proportion of wasting and stunted growth

	Maternal Education levels				P value
	Secondary	Primary	Illiterate	Total	
Child Hospitalization					
Yes	25	6	3	34	0.002
No	75	7	4	86	
Weight/Age of child					
Normal	83	9	4	96	0.274
Wasting	17	4	3	24	
Weight/Age of child					
Normal	79	8	4	91	0.472
Stunting	21	5	3	29	

Stunting: There's no statistically significant difference in stunting prevalence across education levels (p-value = 0.472). However, numerically, children of mothers with secondary education have the lowest stunting rate (21 out of 100). While the differences in wasting and stunting are not

statistically significant, the numerical patterns suggest a potential benefit of higher maternal education on child anthropometry. Further research with larger sample sizes might be needed for stronger conclusions.

Overall, Children of mothers with higher education have a significantly lower rate of hospitalization, suggesting the potential benefits of better access to healthcare and knowledge.

Discussion

This study included 120 mothers with children less than 7 years old visiting RHTC for various reasons. Most of the study population were educated up to the secondary level schools 83.33% and 10.83% were educated up to primary education and 5.83% were illiterates. Our study found that pregnancy registration was 89.17% out of which 84.85% were registered by higher-educated mothers (table 1). In a similar study by B Singh et al. [11] 28% of females were not registered and did not receive antenatal care. In this study, we found more birth spacing in mothers with higher levels of education the p-values were 0.0189. This suggests that there is a relationship between maternal education and several factors related to pregnancy and childbirth. MA Fattah et al. [12] in a similar study found more birth spacing likely in mothers with higher education. In this study, we found the number of antenatal visits was >4 in cases of higher educated mothers with higher education although the p values were not found to be significant. H Borah et al. [13] in a similar study found 40% of illiterate subjects had less than 4 antenatal visits agreed with the results found in the current study. Higher-educated women preferred hospitals for delivery. However, RO Mondini et al. [14] reported 24.4% higher educated women delivered at home. In this study, we found that higher education levels were also associated with significantly higher birth weight of the baby. BS Akoijam et al. [15] in a similar result. In this study, we found that 9% of educated mothers feed children with pre-lacteal feeds. V Khannal et al., [16] found that 15.25% of educated females feed their children with pre lacteal feeds. 93.33% of all females irrespective of educational status in this study stopped breastfeeding only after one year and only 6.67% had stopped breastfeeding before the completion of the first year (Table 3). Tigist Kassa et al. [17] found that 91.9% of females stopped exclusive breastfeeding after the completion of one year. 30% of mothers of the children with kwashiorkor were illiterate and 17% of mothers with kwashiorkor were higher educated. In this study, 20 were hospitalized for kwashiorkor and 14 were hospitalized for other non-nutritional diseases. The occurrence of disease and hospitalizations were significantly lower in educated females as compared to illiterate females (table 4). Sive et al; [6] while comparing 53 children hospitalized for kwashiorkor with 106 children hospitalized for non-nutritional diseases observed that the major difference between the two groups was the educational status of the mother. In a study carried out at Parbhani, Marathwada (Maharashtra), Arya et al; [18] have

shown that the children of literate mothers have better anthropometric measurements than children of illiterate mothers. 24.16% of the study children had stunted growth compared to 33% of stunted growth in rural Telangana according to NFHS-IV. [19]

Conclusion

The findings of this study indicate that the utilization of ANC services tends to be higher among mothers with education beyond secondary school, although the overall utilization rates remain relatively low. Notably, in certain aspects such as the duration of breastfeeding, illiterate mothers exhibit similar performance compared to their more educated counterparts. The study underscores the significance of educational status in influencing health-seeking behavior. It suggests that health education holds more weight than formal schooling alone, emphasizing the potential for improving ANC knowledge. The study advocates for the importance of Information, Education, and Communication (IEC) initiatives and household-level discussions to enhance ANC service utilization in the district.

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