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The Impact of Home Visits by Community Health Nurses (ASHAs) on Maternal Health Outcomes in Rawatpur Village of Prayagraj, Uttar Pradesh

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Abstract: This Study is conducted to evaluate the impact of home visits by Accredited Social Health Activist (ASHAs) on maternal health outcomes in Rawatpur village, located in the Prayagraj District of Uttar Pradesh. Assessment was conducted on the frequency and quality of home visits by ASHAs, as well as their impact on key maternal health indicators such as antenatal care, institutional deliveries, postnatal care, and maternal morbidity rates. The results revealed that in a group of 50 women (mean age 26.6 ± 3.1 years) with mixed education (40% secondary, 20% graduate, 40% primary or no education) and mostly low income (60%), an average of 3.1 ± 1.2 Accredited Social Health Activist visits (40% weekly, 30% biweekly, 30% monthly) was associated with high use of maternal services — antenatal care 80%, institutional delivery 76%, immunization 84%, nutrition counseling 78% — with 24% reporting maternal complications. Health scores improved from 63.2 ± 5.1 to 88.6 ± 7.2 ($p < 0.001$). Women with more than two visits had higher service use (antenatal care 100% vs. 56%; institutional delivery 92% vs. 56%; immunization 96% vs. 60%; nutrition counseling 93% vs. 52%) and fewer complications (11% vs. 36%). More than two visits (adjusted odds ratio 3.5, $p = 0.021$) and graduate education (adjusted odds ratio 2.8, $p = 0.032$) significantly predicted institutional delivery. In conclusion, the study demonstrates that frequent Accredited Social Health Activist visits substantially enhance maternal health outcomes and increase institutional delivery, with maternal education further strengthening these effects, underscoring the vital role of community health workers in improving maternal care among disadvantaged populations.

IndexTerms **- Antenatal care, Immunization, ASHAs, Maternal health.**

I. INTRODUCTION

Community Health Nurses, particularly Accredited Social Health Activists (ASHAs), are a vital approach to enhancing maternal health outcomes in rural India. These visits constitute a vital connection between the healthcare system and communities, enabling access to prompt prenatal, intrapartum, and postnatal care for women in marginalized regions [1]. ASHAs, as community health workers, frequently possess analogous cultural and socioeconomic backgrounds to the individuals they serve, facilitating their ability to effectively advocate for health awareness and behavioral modification [2].

Maternal health, which includes the welfare of women during pregnancy, childbirth, and the postpartum phase, is a crucial component of public health [3]. Worldwide, maternal mortality continues to be a significant issue despite advancements in healthcare accessibility and quality. Maternal mortality remains unacceptably high worldwide. In 2023, approximately 260,000 women lost their lives during pregnancy and childbirth. Alarmingly, about 92% of these maternal deaths occurred in low- and lower-middle-income countries, with the vast majority being preventable. Mitigating maternal mortality and enhancing newborn health are pivotal objectives under the Sustainable Development Goals (SDGs) to be accomplished by 2030 [4].

In India, home-based care provided by ASHAs is a critical element in addressing maternal health inequities, especially in rural regions like Rawatpur hamlet in the Prayagraj district of Uttar Pradesh [5]. These healthcare professionals provide routine home visits to facilitate the early detection of high-risk pregnancies, promote institutional births, and offer essential postpartum assistance. Notwithstanding its crucial function, problems such as inadequate training, financial limitations, and sociocultural influences frequently hinder the complete efficacy of ASHA programs [6,7].

This study seeks to evaluate the influence of ASHA home visits on maternal health outcomes in Rawatpur village. The study examines how these visits augment healthcare accessibility, elevate awareness, and affect health behaviors among pregnant and breastfeeding women. This study's insights will guide policies and programs aimed at enhancing maternal healthcare delivery within communities, ultimately improving health outcomes for mothers and babies.

II. RESEARCH METHODOLOGY

2.1 Population and Sample

The study was conducted in Rawatpur village, located in the Prayagraj district of Uttar Pradesh, to assess the impact of home visits by Accredited Social Health Activists (ASHAs) on maternal health outcomes. The study population consisted of

pregnant women and mothers up to six months postpartum who had received at least one ASHA home visit during pregnancy or the postpartum period. This population formed the universe of the study.

Purposive sampling was adopted to select participants, based on village health records maintained by the local health center and ASHAs. A total of 50 eligible mothers were identified and approached. Mothers who declined participation or were not available during the study period were excluded. Ethical approval was obtained from the Institutional Ethics Committee of United University, Prayagraj, and informed consent was obtained from all participants.

2.2 Data and Sources of Data

The study primarily relied on primary data, collected through structured interviews and pre-tested questionnaires. Data were gathered in two phases:

a) Pretest (baseline data): Collected during the first interaction to assess initial maternal health status.

b) Posttest (follow-up data): Collected during the final meeting to measure changes after ASHA interventions.

The primary data included variables such as antenatal care utilization, institutional delivery, immunization coverage, maternal complications, and perceived support from ASHAs. Additional information regarding ASHA visit frequency, topics covered during visits, and maternal demographic characteristics was also collected. To enrich the quantitative data, qualitative data were obtained through participant observation, in-depth interviews, and detailed field notes following community ethnography practices. These qualitative insights helped contextualize the maternal health environment and validate findings through triangulation.

2.3 Theoretical framework

Table 2.3: Variables and description used for data record

Sr. No.	Variable Name	Type	Description	Values/Ranges
1.	Participant ID	Numeric	Unique ID for each participant	1 to 50
2.	Maternal Age	Numeric	Age of mother in years	18 to 40
3.	Education Level	Categorical	Mother's education level	No formal education, Primary, Secondary, Graduate
4.	Socioeconomic Status	Categorical	Socioeconomic status (SES)	Low, Middle, High
5.	Number of ASHA Visits	Numeric	Total number of home visits by ASHA	1 to 5
6.	ASHA Visit Frequency	Categorical	Frequency of visits	Weekly, Biweekly, Monthly
7.	Topics Covered	Categorical	Key topics discussed during visits (nutrition, immunization, ANC, complications)	Multiple choice, e.g. ANC & Nutrition
8.	Antenatal Care Utilization	Binary (Yes/No)	Whether ANC visits were done	Yes, No
9.	Institutional Delivery	Binary (Yes/No)	Whether delivery occurred in a health facility	Yes, No
10.	Immunization Coverage	Binary (Yes/No)	Whether infant immunizations are up to date	Yes, No
11.	Nutrition Counseling Received	Binary (Yes/No)	Whether mother received nutrition counseling	Yes, No
12.	Maternal Complications	Binary (Yes/No)	Any maternal complications during pregnancy or postpartum	Yes, No
13.	Perceived Support Score	Numeric (1-5)	Mother's rating of support from ASHA visits	1 (low) to 5 (high)
14.	Pretest Health Score	Numeric (0-100)	Baseline maternal health composite score	50 to 90
15.	Posttest Health Score	Numeric (0-100)	Follow-up maternal health composite score	60 to 100

2.4 Statistical tools and econometric models

Data were analyzed using SPSS version 25. After data cleaning and coding, descriptive and inferential statistics were applied. Descriptive statistics (frequencies, percentages, means, and standard deviations) were used to summarize participant characteristics such as age, education, socioeconomic status, ASHA visit frequency, and maternal health service utilization.

To examine the relationship between the number of ASHA visits and maternal health outcomes (ANC utilization, institutional delivery, immunization, nutrition counseling, and maternal complications), Pearson's Chi-square test was used, as both variables were categorical. Significant associations ($p < 0.05$) were found for all outcomes except maternal complications.

To identify predictors of institutional delivery, binary logistic regression was performed with institutional delivery as the dependent variable and ASHA visits, maternal age, education, and SES as independent variables. Adjusted Odds Ratios (AOR) and 95% confidence intervals were calculated. ASHA visits and maternal education emerged as significant predictors.

To assess the effectiveness of the educational intervention, paired sample t-test was conducted comparing pretest and posttest maternal health scores. The test showed a significant improvement in knowledge after the intervention ($p < 0.001$). Graphs and tables were used to support the presentation of results.

III. RESULTS AND DISCUSSION

The study comprised a group of women with a mean age of 26.6 ± 3.1 years, suggesting that most were in their prime reproductive years. Educational background varied across the group: 40% had completed secondary education, 20% were graduates, and another 40% had either no formal education or only primary education. This distribution highlights a mixed literacy level among the participants, with a significant proportion lacking higher education, which can influence health awareness and decision-making.

Table 3.0: Details of participants on the basis of different variables-

Variable	Category/Measure	Frequency (n)	Percentage (%)	Mean ± SD
Maternal Age (years)	—	—	—	26.6 ± 3.1
Education Level	No formal education	10	20	—
	Primary education	10	20	—
	Secondary education	20	40	—
	Graduate	10	20	—
Socioeconomic Status (SES)	Low	30	60	—
	Middle	15	30	—
	High	5	10	—
Number of ASHA Visits	—	—	—	3.1 ± 1.2 visits
Frequency of ASHA Visits	Weekly	20	40	—
	Biweekly	15	30	—
	Monthly	15	30	—
Antenatal Care (ANC) Utilization	Yes	40	80	—
	No	10	20	—
Institutional Delivery	Yes	38	76	—
	No	12	24	—
Immunization Coverage	Yes	42	84	—
	No	8	16	—
Nutrition Counseling	Yes	39	78	—
	No	11	22	—
Maternal Complications	Yes	12	24	—
	No	38	76	—
Perceived Support Score	—	—	—	4.2 ± 0.8 (scale 1-5)
Pretest Health Score	—	—	—	63.2 ± 5.1
Posttest Health Score	—	—	—	88.6 ± 7.2

In terms of socioeconomic status (SES), a majority of the participants (60%) were from low-income households, followed by 30% from middle-income and only 10% from high-income backgrounds. This socioeconomic composition indicates that the study primarily focused on underserved or economically vulnerable populations, who are often more reliant on government health services and frontline workers like ASHAs.

The average number of ASHA (Accredited Social Health Activist) visits reported was 3.1 ± 1.2, with 40% of participants receiving visits weekly, and 30% each receiving biweekly or monthly visits. This frequency suggests that many women were in regular contact with ASHAs, which could significantly influence their health knowledge, practices, and service utilization.

Utilization of maternal health services was notably high. Antenatal care (ANC) was accessed by 80% of women, indicating good awareness and availability of prenatal services. Similarly, institutional deliveries were reported by 76%, reflecting trust in health facilities for childbirth and possibly better outcomes. Immunization coverage was achieved in 84% of the cases, indicating strong follow-through on infant health post-delivery. Nutrition counseling was received by 78%, emphasizing that a large portion of participants were educated on dietary needs during pregnancy and postpartum.

Despite these positive indicators, 24% of women reported maternal complications, which is a significant concern. This finding points to the need for continued support even when service utilization is high—underscoring that access alone is not sufficient, and quality of care and follow-up are equally critical.

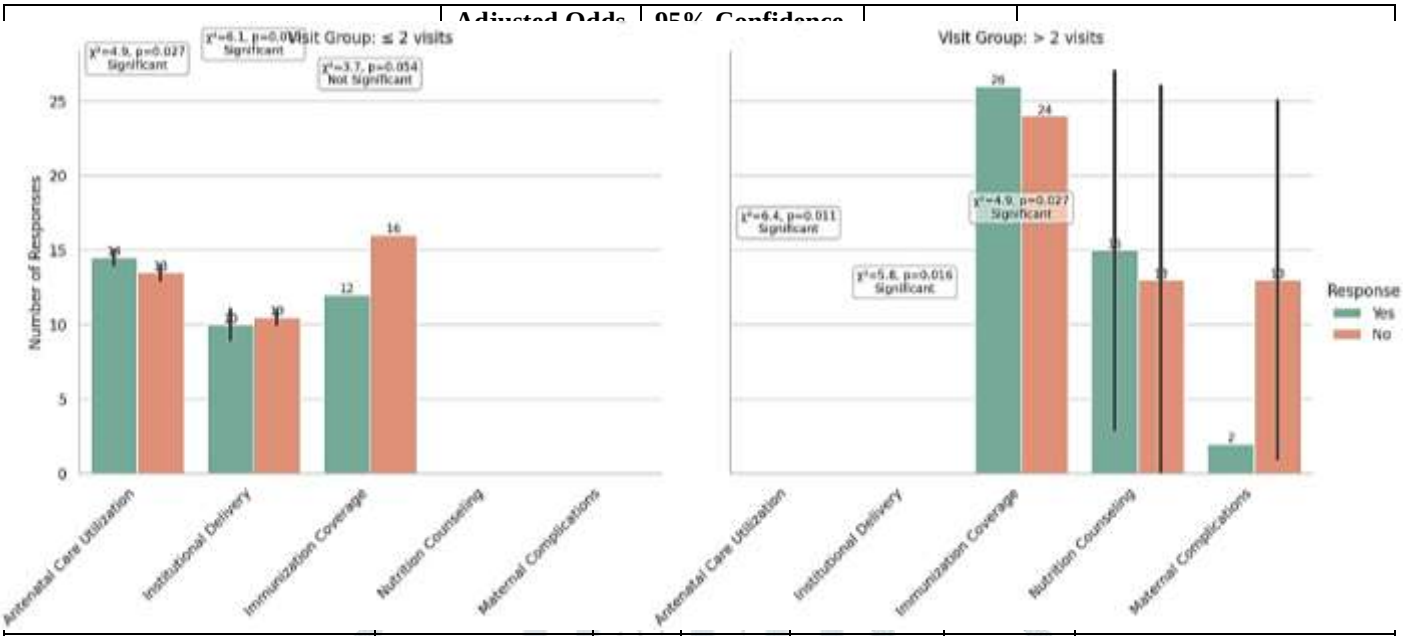
On the psychosocial front, the perceived support score was high at 4.2 ± 0.8 (on a scale of 1 to 5), suggesting that women generally felt supported during pregnancy and childbirth—possibly due to consistent ASHA engagement. Additionally, there was a remarkable improvement in overall health status, as shown by an increase from a pretest health score of 63.2 ± 5.1 to a posttest score of 88.6 ± 7.2. This jump highlights the effectiveness of maternal health interventions and educational efforts delivered during the study period.

3.1 Association Between Number of ASHA Visits and Maternal Health Outcomes -

In table 4.1 analysis reveals a strong and positive association between the number of ASHA (Accredited Social Health Activist) visits and key maternal health outcomes. Women who had more than two ASHA visits showed significantly better health behaviors and service utilization compared to those who had two or fewer visits. For instance, 100% of women with more than two visits utilized antenatal care services, while only 56% of those with two or fewer visits did the same. A similar pattern is seen in institutional delivery, where 92% of women with more than two visits delivered in a health facility compared to 56% in the lower visit group. Immunization coverage was also much higher in the group with more visits (96% vs. 60%), as was participation in nutrition counseling (93% vs. 52%).

Table 3.1: Association Between Number of ASHA Visits and Maternal Health Outcomes (Chi-Square Test)

Graph-3.1 Association Between Number of ASHA Visits and Maternal Health Outcomes (Chi-Square Test)



	> 2 visits	24	2			
Immunization Coverage	≤ 2 visits	15	10	4.9	0.027*	Significant
	> 2 visits	27	1			
Nutrition Counseling	≤ 2 visits	13	12	6.1	0.013*	Significant
	> 2 visits	26	2			
Maternal Complications	≤ 2 visits	9	16	3.7	0.054	not significant
	> 2 visits	3	25			

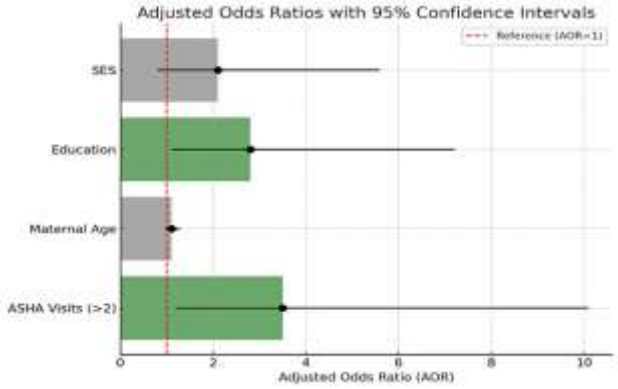
3.2 Regression results for institutional delivery-

The logistic regression analysis examined the predictors of institutional delivery, adjusting for maternal age, education level, and socioeconomic status (SES). The results indicate that the number of ASHA visits was a significant determinant of institutional delivery. Specifically, women who received more than two ASHA visits had 3.5 times higher odds of delivering in a health facility compared to those who received two or fewer visits (Adjusted Odds Ratio [AOR] = 3.5; 95% Confidence Interval [CI]: 1.2–10.1; p = 0.021). This finding highlights the critical role of ASHA workers in promoting institutional delivery.

Table 3.2: Regression for Institutional Delivery (Adjusted for Age, Education, SES)

In table 4.2 maternal education was also significantly associated with institutional delivery. Women with graduate-level education had 2.8 times higher odds of institutional delivery compared to women with no formal education (AOR = 2.8; 95% CI: 1.1–7.2; p = 0.032). This suggests that higher educational attainment enhances awareness and possibly the ability to access healthcare services during childbirth. In contrast, maternal age did not show a statistically significant association with institutional delivery. Each additional year of age was associated with a 10% increase in the odds of institutional delivery (AOR = 1.1; 95% CI: 0.95–1.3), but this effect was not significant (p = 0.22). Similarly, socioeconomic status, comparing high versus low SES, was not a significant predictor (AOR = 2.1; 95% CI: 0.8–5.6; p = 0.12), although the odds ratio suggested a positive trend towards higher odds of institutional delivery among women of higher SES.

Graph 3.2: Regression for Institutional Delivery (Adjusted for Age, Education, SES)



3.3 Pretest vs Posttest Maternal Health Scores-

To assess the effectiveness of an educational intervention on maternal health knowledge, a pretest-posttest design was employed, and data were analyzed using a paired sample t-test. The analysis included 50 participants. The mean pretest score was 63.2 ± 5.1, indicating the baseline level of knowledge regarding maternal health prior to the intervention. Following the educational program, there was a marked increase in the mean posttest score, which rose to 88.6 ± 7.2. This improvement in scores suggests a substantial gain in knowledge among the participants.

Table 3.3: Pretest vs Posttest Maternal Health Scores (Paired t-test)-

Measure	Mean Score ± SD	t-value	Degrees of Freedom (df)	p-value	Interpretation
Pretest Score	63.2 ± 5.1				
Posttest Score	88.6 ± 7.2	16.3	49	< 0.001*	Significant improvement in health knowledge.

The paired t-test revealed a t-value of 16.3 with 49 degrees of freedom (df = 49). The corresponding p-value was < 0.001, indicating a statistically significant difference between the pretest and posttest scores. The significance level ($p < 0.001$) confirms that the observed improvement is highly unlikely to have occurred by chance and reflects a real effect of the intervention.

This result provides compelling evidence that regular home visits by Accredited Social Health Activists (ASHAs) have a significant and positive impact on maternal health outcomes in Rawatpur village of Prayagraj District, Uttar Pradesh. Despite socioeconomic and educational limitations among the study population—where 60% belonged to low-income households and 40% had no formal or only primary education—the utilization of key maternal health services was notably high. Specifically, 80% of participants accessed antenatal care, 76% underwent institutional delivery, 84% completed immunization schedules, and 78% received nutrition counseling.

A statistically significant association was identified between the frequency of ASHA visits and improved maternal health service utilization. Women who received more than two ASHA visits exhibited substantially higher rates of antenatal care (100% vs. 56%), institutional delivery (92% vs. 56%), immunization (96% vs. 60%), and participation in nutrition counseling (93% vs. 52%) compared to those with two or fewer visits ($p < 0.05$ for all). Although fewer maternal complications were reported among women with more frequent visits (11% vs. 36%), this association did not reach statistical significance ($p = 0.054$), suggesting a trend that warrants further investigation.

Multivariate logistic regression analysis, adjusted for age, education, and socioeconomic status, revealed that receiving more than two ASHA visits significantly increased the odds of institutional delivery (AOR = 3.5; 95% CI: 1.2–10.1; $p = 0.021$). Additionally, higher educational attainment was also a significant predictor (AOR = 2.8; 95% CI: 1.1–7.2; $p = 0.032$), whereas maternal age and socioeconomic status were not statistically significant after adjustment.

Furthermore, the educational intervention implemented as part of the study demonstrated a marked improvement in maternal health knowledge. The mean health knowledge score increased from 63.2 ± 5.1 to 88.6 ± 7.2, a difference that was highly statistically significant ($t = 16.3$; $p < 0.001$), as confirmed by paired t-test analysis.

In conclusion, the findings underscore the pivotal role of ASHAs in enhancing maternal health behaviors and service uptake in underserved communities. Strengthening the frequency and quality of ASHA engagement, alongside continued health education initiatives, can serve as an effective public health strategy to improve maternal health outcomes in rural India.

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