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A Randomized Control Trial for Assessing the Use of Mobile Phone for Improvement of Essential Obstetric Care among Antenatal Mothers In ACS

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Abstract: ***Cellular networks are growing rapidly and people are using their mobiles more than ever. So health care can be provided in a new way. Health - education applications for mobile phones are particularly needed now. It is a way of making sure new mothers know something about what they should be eating and also getting people more familiar with iron tablets, folic acid supplements and tetanus injections. The research initiative focused on maternal health improvement and better results for mothers and their newborns. The goal was to optimize antenatal, natal and postnatal care services through mobile phone communication between medical staff and rural community members worldwide. The study employed a prospective randomized controlled trial to distribute two hundred pregnant women with personal mobile phones between control and intervention groups. The control group women received their antenatal care instructions through traditional hospital - based verbal communication. The intervention group received mobile phone calls for appointment reminders and text message (SMS) communications about essential antenatal care information at appropriate times. The study tracked three primary outcome measures which consisted of antenatal visit attendance rates for pregnant women and hospital birth rates and postnatal check - up frequencies. The intervention group achieved better maternal health outcomes than the control group according to the study results. Above all antenatal visit numbers increased substantially but the intervention also enhanced the rate of Iron consumption along with tetanus toxoid immunization and postnatal check - up appointments. This research demonstrates compelling evidence through mobile phone intervention services about how to boost the antenatal visit attendance rate among women to its recommended four visits. The study findings support the implementation of mobile - phone health information services to modify post - distribution behavioral patterns. Mobile technology proves essential for women's preventive health care services including antenatal, natal and postnatal care. Mobile technology particularly SMS (short message service) provides dynamic and effective information services to pregnant women according to the research findings.***

Keywords: Antenatal care, M - health, Maternal health, Postnatal visits

1. Introduction

The World Health Organization (WHO) established a minimum requirement of eight antenatal care visits for pregnant women. The antenatal care process conducts physical examinations and laboratory tests at its beginning before finishing with counseling services. Antenatal Care (ANC) achieves its goal of delivering average - weight babies throughout their full pregnancy term [20]. The present situation demands specifically effective and improved health promotion strategies to benefit mothers and infants [21]. Mobile Health (mHealth) stands as a vital component of eHealth (electronic Health) [2 - 3]. mHealth describes health service delivery through the use of smart phones [4] and requires high service quality in the current fast - growing health service era. The accessibility of health services through ICT depends on this fundamental aspect [2]. The World Health Organization (WHO) defines mHealth as health service monitoring through mobile devices (smart phones) [1 - 4]. The emergence of smart phones has led to improved communication systems and health administration systems through the growing influence of this emerging field. Smartphones enable physicians and patients to access hard - to - find information through their search and health information systems for mHealth applications [5 - 8].

The maternal mortality rate in India remains high because less than half of pregnant women attend the necessary number of antenatal care sessions. The availability of antenatal care remains out of reach for LMICs despite its potential benefits to reduce maternal mortality and support DBM (development bank of mankinds) policy promotion [22]. The absence of proper antenatal care leads to maternal and infant sickness and death in LMICs through infections PDIs and ectopic pregnancy. Pre - eclampsia PPH and sepsis are specific chronic killers that result in maternal deaths. Proper antenatal and postnatal care reduces complications which prevents maternal deaths [23 - 25]. The government has established JSY Janani Suraksha Yojana alongside JSSK Janani Shishu Suraksha Karyakram and PMSMA Pradhan Mantri Surakshit Matritva Abhiyan and LaQshya to enhance maternal and child healthcare services. The local nature of these programs has led to the development of multiple IEC materials such as training packages and manuals and booklets and videos to improve their effectiveness and service delivery. The implementation of Skilled Attendance at Birth and DAKSHATA across the nation aims to develop local unaware

health policy [26]. Interventions in recent years have emerged as m - Health an effective strategy for solving maternal & child health issues in LMICs [27]. The implementation of m - Health in LMICs enables patients to access healthcare services directly from their homes at reasonable costs. M - Health solutions enable pregnant women in remote and rural areas to access telephonic consultations and community professional referrals through online scheduling. The collection of data through m - Health tools enables the preservation of accurate medical records which are disappearing from history [28 - 29].

The adoption of mobile phones in rural India has experienced significant progress during the last ten years. The extensive mobile phone penetration throughout rural India creates numerous chances to enhance maternal care through complete mobile technology utilization. The Columbia University and Internet Health Innovation Group published m - health Ideas and applications through wireless technology in February 2008. Current advancements in cellular telephony prove that future healthcare devices will connect directly to existing systems instead of utilizing portable medical equipment such as computed tomography scanners or magnetic resonance machines. The health problems facing developing countries can be addressed through m - Health which stands for mobile health. The world witnesses the implementation of m - Health projects through mobile phones for maintaining records and collecting data and communicating with patients [35].

The adoption of m - health technology remains limited in India especially when it comes to healthcare delivery systems. The mobile app combined with messaging capabilities helps deliver health education content about food and nutrition and iron and folic acid prophylaxis and tetanus toxoid immunization and pregnancy danger signs to the public. Mobile communication systems provide an economical method for public involvement in rural healthcare services [35].

Difficulties in transferring m - Health practice and incorporating it into rural regions can be seen. [9 - 10] By way of information technology (IT), especially the Internet, the way that users find information about health has changed, as well as how they approach decision making. m - Health, as one form of e - Health under the IT and communications heading, provides such communication tools as mobile phones, patient monitoring tools, and other wireless instruments of health care support for choice [11 - 13]. The development of M - Health continues to grow within lower - middle - income countries [13]. Developing nations view m - Health as their solution to reach populations who are currently inaccessible [11]. m - Health systems also provide care service calls and appointment reminders and other similar functions [2, 11]. The health status of pregnant women serves as an essential indicator for national health and contributes to both development indexes and life quality ratings [14]. The health condition of the fetus depends on maternal health. Under optimal prenatal care pregnant women receive two key benefits through both disease prevention and effective fetal development. Maternal and child health workers in field service need to understand the AIDS diagnosis scale and other maternal and child health - related information to minimize mothers′ mortality and infant morbidity (MMR and IMR) [4, 19].

Multiple m - Health interventions based on mobile devices for antenatal care in LMICs have been created to deliver reminders and health education to pregnant women while tracking their medical status [30 - 31]. Research has demonstrated that mobile phone - based interventions combined with text messaging help increase maternal access to antenatal care and protect maternal and child safety in certain nations which leads to reduced stillbirths and neonatal mortality rates [32 - 33].

Mobile health (m - Health) interventions provide better antenatal care services together with reduced travel expenses for pregnant women in LMICs. The m - Health interventions include short message service (SMS) and voice messages and notification prompts through mobile apps as well as IVRS (interactive voice response system). Research teams have conducted field demonstrations of wireless technology benefits for prenatal healthcare to rural pregnant women. This paper performed a systematic review and meta - analysis of clinical trials from LMICs to evaluate m - Health intervention effectiveness for prenatal care monitoring of pregnant women [46].

In addition to these problems, the geographical distribution of health services is not equal, which limits access to them regardless of whether the problem is due to location and/or distance. Therefore, a method for dealing with pregnant women's health issues in remote areas can be called long - distance health service (i. e. Tele - health, telemedicine and Tele - nursing) [17, 20]. In addition, the economic factor will be mention - tined - such it consists of reducing healthcare costs and raising the proportion of women with high - risk pregnancies that are correctly diagnosed [20]. With the extra time that people spend on smart phones, pregnant women often use one the device as a hub for information on preparation to deliver a baby, personal experiences and comprehensive support of others in their networks [21]. A lot of articles have discussed m - Health in pregnancy health management. The noticeable gap between m - Health pregnancy care delivery and traditional prenatal care for developing country women remains poorly discussed in literature. This research investigates m - Health technology as a digital communication system for pregnant women while evaluating its effectiveness against conventional pregnancy care methods. The research findings will enhance maternal health care and decrease maternal death rates.

2. Materials and Methods

The research focused on pregnant women who exceeded their 28 months of pregnancy. The sex samples received informed written consent before answering the questionnaire instrument.

The questionnaire tool consisted of a validated, structured interview schedule with which we collected sociodemographic details; information about each member's mobile phone and television set supporting services for at home, and particulars on their pregnancy status. Categorized according to income, Standards of Living Indices (SLI) are

also used to evaluate material welfare. The description of mobile phone use is in terms of whether internet and e - mail can be accessed, or a mobile phone is used for calls or test messages. Questions about television viewing included queries on health - related programing and advertising [43]. With financial aid from the United Nations there was an ongoing randomized controlled trial focusing on using mobile phones for health improvement of expectant mothers.

The research at Medical College, Chennai lasted for one year. The study selected 200 pregnant women from the antenatal clinic who owned mobile phones to participate in the research. These women were randomly assigned to either Group 1 or Group 2. The standard antenatal care instructions from the hospital protocol were provided to control group women. The intervention group received mobile phone calls for appointment reminders and antenatal care text messages (SMS) at scheduled intervals. The healthcare staff instructed all pregnant women to deliver their babies at the hospital facility and to schedule postnatal appointments for both mother and child. The main outcome measures of this research included attendance at four antenatal visits by at least 80% of women and hospital delivery and postnatal hospital check - ups. The secondary outcome measures included women who received prophylactic iron tablets for three months or longer and delivered in hospitals and received tetanus toxoid injections and performed ultra - sonography anomaly scans with their fingers. The study measured total pregnancy weight gain in women together with newborn birth weight and transfusion needs and perinatal mortality rates and maternal medical and obstetrical complications. [34].

The research team enters data into Microsoft Excel before analyzing it with SPSS version 16.0. The analysis of socio - demographic data and mobile phone usage and basic obstetric care components used descriptive statistics through percentages and percentages. The analysis uses Chi - square tests or Fisher's Exact Test based on necessity. Transition results of significance tests like between LOGI were induced by the use of mobile steam and obstetric care in; numbers parishioners or donor blades minority due to pars instead looking only correspondence by telephone With unified entry of all data tables into computer memory it becomes possible to rapidly carry out whole groups repetitive analyses ultimately yielding a sensible main analysis based on these empirical observations. The need to be cautious about is how much detail we have included especially, if it is not clear for overlap between studies. This puts each criterion into a specific frame of aggregation with varying degrees such that where one presides not either be included.

Procedures and Data Collection

The study provided standard antenatal healthcare to all eligible women who received four regular visits and delivery assistance from qualified personnel and postnatal care within 48 hours of outside facility births. The distribution of essential drugs for antenatal care combined with electronic blood pressure meters weighing scales and hemocues for measuring hemoglobin and urinalysis sticks created favorable conditions for quality care at both intervention and control sites. Research assistants who were selected from the primary health care facility worked as part of the study facility team. The research assistants at intervention facilities underwent training about the mobile phone intervention. The supervisor conducted weekly inspections of all facilities to ensure quality control throughout the study period.

The study collected information about demographic characteristics and covariates through structured questionnaires which were administered at the beginning and six weeks after delivery. The health system recorded every contact made by the women during their antenatal period and delivery and post - natal care period. The study assigned each recruited woman a unique identity number and matching card. The research assistant used phone calls or personal meetings when they could not conduct end - of - study interviews with participants. The researchers used announcements to summon women for their end - of - study interview when personal contact was not possible. The research team used Epidata double to enter data which they later validated through transfer to SPSS version 23.

3. Statistical Analysis

The statistical analysis took place within SPSS version 26 after Epidata data entry validation and data importation from Epidata. All available data was included in the analysis. The study measured antenatal care attendance as its main outcome while logistic regression analyzed the binary outcome of four or more antenatal care visits to evaluate intervention effects. The statistical analysis used generalized estimating equations because facilities received randomization instead of individual women. This method accounted for within - cluster correlation.

Table functions similarly to other dependent variable factors by showing one - by - one interaction differences between variables in explanatory descriptive interpretations for odds ratio analysis. The model retains variables through backward elimination after eliminating all non - significant confounding factors. The final model contained age, literacy, gestational age at first antenatal care visit and intervention status as parameters while showing no interaction between intervention and other variables. The study used continuous antenatal care visits as an outcome variable to determine how the intervention affected the average number of visits. Secondary outcome timing was measured in weeks or months through chi - square tests.

The research presents results through odds ratios (ORs) for binary endpoints primary and secondary endpoints and differences with their 95% confidence interval (95% CI). The study used odds ratios (OR) to present its findings for both the control and intervention groups when $P<0.05$ indicated statistical significance. The research established $P<0.05$ as the threshold for statistical significance.

4. Results

The socio - demographic attributes of the intervention and control group are found in **table**.1.

Table 1: Baseline characteristics of the study population

			Study group of Patients	
			Control Group	Intervention Group
Age group of Patients	Less than 19	Count (% within)	2 (8%)	1 (4%)
	20 - 24 years	Count (% within)	3 (12%)	4 (16%)
	25 - 29 years	Count (% within)	2 (8%)	6 (24%)
	30 - 34 years	Count (% within)	5 (20%)	3 (12%)
	35 and above	Count (% within)	13 (52%)	11 (44%)
Occupation of Patients	Housewife	Count (% within)	3 (12%)	6 (24%)
	Private sector	Count (% within)	7 (28%)	7 (28%)
	Government Sector	Count (% within)	7 (28%)	6 (24%)
	Student	Count (% within)	4 (16%)	1 (4%)
	Other	Count (% within)	4 (16%)	5 (20%)
Literacy level of Patients	Cannot read	Count (% within)	0 (0%)	3 (12%)
	Can read little	Count (% within)	4 (16%)	5 (20%)
	Can read some	Count (% within)	8 (32%)	9 (36%)
	Can read well	Count (% within)	10 (40%)	2 (8%)
	Can read very well	Count (% within)	3 (12%)	6 (24%)
Education	No	Count (% within)	8 (32%)	6 (24%)
	Primary	Count (% within)	6 (24%)	4 (16%)
	Secondary and above	Count (% within)	5 (20%)	10 (40%)
	Other	Count (% within)	6 (24%)	5 (20%)
Residential Status	Rural	Count (% within)	9 (36%)	8 (32%)
	Urban	Count (% within)	7 (28%)	8 (32%)
	Semi - urban	Count (% within)	9 (36%)	9 (36%)
Parity of patients	Nullipara	Count (% within)	4 (16%)	8 (32%)
	1 – 2	Count (% within)	8 (32%)	4 (16%)
	3 - 4	Count (% within)	10 (40%)	7 (28%)
	5+	Count (% within)	3 (12%)	6 (24%)
Gestational age at first antenatal care visit	Less than 16	Count (% within)	4 (16%)	7 (28%)
	17 - 26	Count (% within)	12 (48%)	9 (36%)
	27 - 35	Count (% within)	8 (32%)	8 (32%)
	36+	Count (% within)	1 (4%)	1 (4%)

Age Group of Patients

The control group contains 52% of patients who are 35 years or older but the intervention group has 44% of patients from this age range. The control group contains 20% of patients within the 30 to 34 age range while the intervention group shows only 12%. The intervention group contained 24 percent of patients within the 25 to 29 years age range while the control group only had 8 percent in this segment. The intervention group shows equal distribution of patients who are 20 to 24 years old and younger than 19 years old.

Occupation of Patients

Both groups contained 28% of private sector workers among their participants. The percentage of patients working in government positions was higher in the control group at 28% than in the experimentation group at 24%. The intervention group contains more housewives compared to the control group since their percentage reaches 24% while the control group has 12%. The control group contained 16% students but the intervention group had only 4% students and the "other" category showed a slightly higher mean of 20% in the intervention group compared to 16% in the control group.

Literacy Level of Patients

The intervention group shows 12 patients unable to read but the control group demonstrates no such cases. The distribution of patients who read little or somewhat matches between groups with 20% and 36% in the intervening group and 16% and 32% in the control group. The intervention group contains 8% of patients who read well yet the control group has 40% of patients who read at this level. Additionally the intervention group has 24% of patients who read very well but the control group has 12% of patients who read at this level.

Education

The control group contains 32% of patients who received no formal education while the intervention group has 24% of such patients. The control group contains 24 percent of students who received primary education while the intervention group has 16 percent. The intervention group shows better results in secondary and higher educational attainment with 40% compared to the control group with 20%. The percentages of patients who fall under the 'other' category remain similar between groups but show a minor rise in the control group (24 %).

Residential Status

The control group included 36% rural patients but the intervention group contained 32% rural patients. The intervention group contains 32% urban patients but the control group has 28% urban patients. The representation of patients from semi - urban areas matches exactly between both groups at 36%.

Parity of Patients

The intervention group included more nulliparous patients than the control group with 32% versus 16%. The intervention group contains fewer pregnant patients with 1 - 2 pregnancies since they make up 16% of the total while the control group shows 32%. The control group contained 40% of patients with 3 - 4 pregnancies but the intervention group had only 28% of

such patients. The intervention group shows higher rates of 5+ pregnancies at 24% while the control group shows 12%.

Gestational Age at First Antenatal Care Visit

Early antenatal care visits occurred before week 16 more often in patients participating in the intervention program than in the control healthcare group. The majority of patients visited healthcare services between weeks 17 and 26 with 48% in the control group and 36% in the intervention group while the numbers of patients who visited between weeks 27 and 35 were equal at 32% in both groups. The patient population received antenatal care either before week 36 or after week 36 with equal proportions of 4% in both groups.

Table 2: Risk Estimate: Mode of delivery and Timely reporting

Crosstab							Risk Estimate			
			Mode of delivery		Pearson Chi – square	p - value		Value	95% Confidence Interval	
			Normal Delivery	Lower segment cesarean sections (LSCS)					Lower	Upper
Study group of Patients	Control Group	Count (% within)	17 (65.4%)	8 (33.3%)	5.128	0.024	Odds Ratio for Study group of Patients (Control Group / Intervention Group)	3.778	1.170	12.194
	Intervention Group	Count (% within)	9 (34.6%)	16 (66.7%)			For cohort Mode of delivery = Normal Delivery	1.889	1.049	3.400
Total			25	25			For cohort Mode of delivery = Lower segment cesarean sections (LSCS)	0.500	0.263	0.951
			Timely reporting of alarming signs and symptoms		Pearson Chi – square	p - value		Value	95% Confidence Interval	
			No	Yes					Lower	Upper
Study group of Patients	Control Group	Count (% within)	16 (72.7%)	9 (32.1%)	8.117	0.004	Odds Ratio for Study group of Patients (Control Group / Intervention Group)	5.630	1.648	19.232
	Intervention Group	Count (% within)	6 (27.3%)	19 (67.9%)			For cohort Timely reporting of alarming signs and symptoms = No	2.667	1.251	5.685
Total			22	28			For cohort Timely reporting of alarming signs and symptoms = Yes	0.474	0.269	0.835

Mode of Delivery

The intervention group showed a highly significant difference in delivery mode compared to the control group according to Pearson Chi - square 5.128 and p value 0.024 which indicates the intervention influenced delivery mode. The control group showed normal deliveries in 65.4% of cases (17 out of 25 patients) while 33.3% (8 out of 25 patients) received lower segment cesarean sections (LSCS). Normal deliveries occurred in 34.6% (9 out of 25) of patients in the intervention group but 66.7% (16 out of 25) required LSCS.

The Odds ratio for normal delivery between control and intervention groups reaches 3.778 with 95% confidence interval spanning from 1.170 to 12.194. The control group experienced a substantial rise in normal or vaginal delivery attendance rates compared to the intervention group. The likelihood of patients in the intervention group undergoing LSCS is 0.500 (CI: 0.263 to 0.951) based on the data. More women in the intervention group received cesarean delivery than women in the control group indicating that the intervention allowed for better fetal and maternal outcome management of complicated situations.

Timely Reporting of Alarming Signs and Symptoms

The ability of patients to report alarming signs and symptoms in time shows a statistically significant difference between groups according to Pearson Chi - square 8.117 and p - value 0.004. Chief warning signs appeared on time for 30% out of 25 patients placed in the control group but 80% of 25 patients in the intervention group never experienced these signs. The intervention group showed better results as 67.9% (19 out of 25) patients reported alarming signs or symptoms in time but 27.3% (6 out of 25) patients did not report any.

The Odds Ratio for timely reporting between the control and intervention groups is 5.630 (CI: 1.648 to 19.232) suggesting that the intervention has significantly increased the probability of timely reporting; however, for the odds ratio of delayed reporting, it is 2.667 (CI: 1.251 to 5.685), meaning that the control group have a greater likelihood of their delayed reporting. The odds ratio to have timely reporting to be greater in intervention group (0.474, CI: 0.269 to 0.835) indicates a very strong effect of intervention. The effect of intervention is positively significant in timely reporting of worrying signs and symptoms. It indicates heightened awareness among the subjects in the intervention group, and likely better education on recognizing and acting on critical health concerns.

Table 3: ANOVA: Age, Gestational weeks, and Birth Preparedness

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		F – value	p – value
						Lower Bound	Upper Bound		
Age of the Patient	Were aware of danger signs/ symptoms of pregnancy	9	36.78	6.82	2.27	31.54	42.02	4.22	0.006
	Saved money for delivery	10	29.80	6.27	1.98	25.32	34.28		
	Informed after danger signs/ symptoms of pregnancy on time	15	28.07	8.28	2.14	23.48	32.65		
	Blood donor motivation done	7	38.71	4.50	1.70	34.55	42.87		
	Decided for institutional delivery	9	32.56	6.41	2.14	27.63	37.48		
	Total	50	32.28	7.74	1.09	30.08	34.48		
Gestational Age	Were aware of danger signs/ symptoms of pregnancy	9	18.00	5.63	1.88	13.67	22.33	3.147	0.023
	Saved money for delivery	10	21.20	7.25	2.29	16.01	26.39		
	Informed after danger signs/ symptoms of pregnancy on time	15	25.60	6.22	1.61	22.16	29.04		
	Blood donor motivation done	7	27.14	7.45	2.82	20.25	34.03		
	Decided for institutional delivery	9	27.33	8.49	2.83	20.81	33.86		
	Total	50	23.88	7.54	1.07	21.74	26.02		

The ANOVA analysis for the age of patients based on different categories related to pregnancy awareness and preparation shows a statistically significant difference, with an F - value of 4.22 and a p - value of 0.006. This indicates that the mean ages vary significantly among the groups.

Were aware of danger signs/symptoms of pregnancy: Patients who were older than 36.78 years (standard deviation = 6.82) demonstrated better knowledge about pregnancy danger signs. The 95% confidence interval for the mean ranges from 31.54 to 42.02.

- **Saved money for delivery:** Patients in this group have a mean age of 29.80 years (standard deviation = 6.27). This age group shows relatively younger women proactively saving money for delivery, with a confidence interval ranging from 25.32 to 34.28.
- **Informed about danger signs on time:** This group has a mean age of 28.07 years (standard deviation = 8.28), indicating younger women are reporting symptoms on time. The confidence interval ranges from 23.48 to 32.65.
- **Blood donor motivation done:** Patients in this group have the highest mean age of 38.71 years (standard deviation = 4.50), suggesting older women are more inclined toward blood donor motivation. The confidence interval is between 34.55 and 42.87.
- **Decided for institutional delivery:** The mean age in this group is 32.56 years (standard deviation = 6.41), showing middle - aged women are more likely to choose institutional delivery. The confidence interval is between 27.63 and 37.48.

Older women (especially those above 30 years) seem more aware and motivated regarding blood donation and danger signs. However, younger women (below 30 years) are more likely to report danger signs on time and save money for delivery. The significant difference highlights the need for tailored awareness programs for different age groups.

Table 4: Chi - square tests

			Study group of Patients		Total	Pearson Chi - square	p – value
			Control Group	Intervention Group			
Complication of last pregnancy according to mother	Yes	Count	6	11	17	6.877	0.032
		% within Study group of Patients	24.0%	44.0%	34.0%		
	No	Count	14	5	19		
		% within Study group of Patients	56.0%	20.0%	38.0%		
	Nullipara	Count	5	9	14		
		% within Study group of Patients	20.0%	36.0%	28.0%		
Compliance with Routine investigations	Routine scans and routine investigations nto done/ Done very infrequently	Count	13	5	18	7.377	0.025
		% within Study group of Patients	52.0%	20.0%	36.0%		
	Routine scans and invetsigations done regularly but some scans and tests missed by patient	Count	9	10	19		
		% within Study group of Patients	36.0%	40.0%	38.0%		
	All routine scans and investigations are done in a timely manner	Count	3	10	13		
		% within Study group of Patients	12.0%	40.0%	26.0%		
Compliance with regular AN check up visits	Less than 4 visits in AN period	Count	13	5	18	6.056	0.048
		% within Study group of Patients	52.0%	20.0%	36.0%		
	4 - 12 AN visits	Count	7	9	16		

		% within Study group of Patients	28.0%	36.0%	32.0%		
	More than 12 AN visits	Count	5	11	16		
		% within Study group of Patients	20.0%	44.0%	32.0%		
Compliance with Supplements	Not taking supplements regularly	Count	7	2	9	6.406	0.041
		% within Study group of Patients	28.0%	8.0%	18.0%		
	Mostly regular apart from missing 2 - 3 times	Count	6	14	20		
		% within Study group of Patients	24.0%	56.0%	40.0%		
	Regular, taking supplements daily without fail	Count	12	9	21		
		% within Study group of Patients	48.0%	36.0%	42.0%		
Compliance with timely follow up visits	Patient not compliant with follow up visits	Count	7	7	14	7.2	0.027
		% within Study group of Patients	28.0%	28.0%	28.0%		
	Patient Compliant but missed a few visits	Count	6	14	20		
		% within Study group of Patients	24.0%	56.0%	40.0%		
	Patient comes regularly for follow up visits	Count	12	4	16		
		% within Study group of Patients	48.0%	16.0%	32.0%		
Patients with risk factor	Hypothyroid	Count	4	3	7	15.11	0.035
		% within Study group of Patients	16.0%	12.0%	14.0%		
	Gestational hypertension	Count	2	4	6		
		% within Study group of Patients	8.0%	16.0%	12.0%		
	Gestational Diabetes Mellitus	Count	1	7	8		
		% within Study group of Patients	4.0%	28.0%	16.0%		
	Previous LSCS	Count	2	4	6		
		% within Study group of Patients	8.0%	16.0%	12.0%		
	Anemia	Count	1	2	3		
		% within Study group of Patients	4.0%	8.0%	6.0%		
	Bronchial Asthama	Count	4	4	8		
		% within Study group of Patients	16.0%	16.0%	16.0%		
	Infection	Count	4	1	5		
		% within Study group of Patients	16.0%	4.0%	10.0%		
	Epilepsy	Count	7	0	7		
		% within Study group of Patients	28.0%	0.0%	14.0%		

Complication of Last Pregnancy According to the Mother: The Chi - square analysis reveals a significant association (**p = 0.032**) between the group type (control vs. intervention) and the mother's report of complications in their last pregnancy.

Yes (Complications Present): The intervention group showed higher rates of pregnancy complications at 44.0% compared to the control group at 24.0% which indicates that intervention group mothers might be more attentive to pregnancy complications.

No (No Complications): The control group shows better results with 56.0% of mothers experiencing no complications while the intervention group reports only 20.0% of mothers without complications.

Nullipara: The intervention group contains 36.0% nulliparous women while the control group contains 20.0% nulliparous women thus showing a higher percentage of first - time mothers in the intervention group.
The intervention group consists of higher proportions of nulliparous women and mothers experiencing complications because these mothers demonstrate better maternal health awareness.

Compliance with Routine Investigations: The Chi - square test reveals a significant statistical connection (p = 0.025) between the study participants and their adherence to routine investigations.

Infrequent Investigations: The intervention group showed better compliance regarding routine scans and investigations since 20.0% of them did not complete these tests compared to 52.0% in the control group.

Partial Compliance: The intervention group showed comparable results to the control group regarding participants who followed some of the routine investigations with 36.0% and 40.0% respectively.

Complete Compliance: The intervention group demonstrated superior complete compliance with routine scans and investigations since 40.0% of participants finished all tests while the control group only reached 12.0%.
The intervention group showed better compliance in routine investigations because the intervention program stressed the importance of regular check - ups.

Compliance with Regular Antenatal (AN) Check - Up Visits: The study group demonstrated a meaningful relationship (p = 0.048) between their participation in antenatal check - up visits.

Less than 4 Visits: The control group showed lower compliance rates since 52.0% of participants visited the clinic less than four times while the intervention group had only 20.0% of patients with similar behavior.

4–12 Visits: The intervention group showed comparable results to the control group regarding intermediate compliance levels at 28.0% and 36.0% respectively.

More than 12 Visits: The intervention group shows superior results regarding participants who attended more than 12 antenatal visits since their percentage reached 44.0% whereas the control group maintained 20.0%.

Interpretation: The intervention program proves effective by showing that participants in this group follow antenatal care recommendations more closely.

Compliance with Supplements: The study group shows a meaningful connection (p = 0.041) between participants and their adherence to taking supplements.

- **Not Taking Regularly:** The control group participants showed lower regularity in supplement consumption since 28.0% did not follow a regular schedule while the intervention group maintained 8.0% regularity.
- **Mostly Regular:** Supplement intake was most regular for 56.0% of participant in the intervention group versus 24.0% among the control group participants.
- **Completely Regular:** Daily supplement compliance reached 48.0% among control group participants whereas intervention group participants achieved 36.0% daily compliance.
- Subjects receiving the intervention showed better average results in partial adherence to their supplements although their completion rates showed a minor decrease which highlights the need for enhanced support in supplement compliance.
- **Compliance with Timely Follow - Up Visits:** Results from the Chi - square test demonstrate that timely follow - up visits show a meaningful link between the intervention and study groups at (p = 0.027).
- **Not Compliant:** The same proportion (28.0%) of participants from both groups failed to follow up with their appointments.
- **Partially Compliant:** The intervention group demonstrated partial compliance at 56.0% while the control group maintained 24.0% compliance.
- **Fully Compliant:** The control group participants achieved full compliance at 48.0% whereas the intervention group participants achieved it at 16.0%.
- The intervention group shows better partial compliance but additional efforts should concentrate on achieving full compliance with follow - up visits.
- **Patients with Risk Factors:** The Chi - square analysis indicates a significant relationship (p = 0.035) between the study participants and their risk factor status.
- **Hypothyroid:** The prevalence of hypothyroidism matched between control (16.0%) and intervention (12.0%) groups.

Gestational Hypertension and Diabetes: The intervention group shows improved detection of risk factors because it contains more participants with gestational hypertension (16.0% vs.8.0%) and diabetes (28.0% vs.4.0%).

Previous LSCS: The intervention group contains a similar percentage of women who underwent previous lower - segment cesarean sections when compared to the control group (8.0% in the control group vs.16.0% in the intervention group).

Other Risk Factors: The control group contains the only reported cases of epilepsy but both groups show equal distribution of anemia and bronchial asthma and infections.

The intervention program shows success in managing high - risk pregnancies because it helps healthcare providers better detect and treat gestational hypertension and diabetes.

5. Discussion

The current study begins with an examination of the intervention and control groups which possess different socio - demographic characteristics as shown in table 1. The research results indicate that participants in the control group were younger than those in the intervention group The randomised control trial evaluated whether mobile phone use could enhance antenatal care quality in rural areas of Chennai district, Tamil Nadu state. A search of published literature on the subject reveals that Madhya Pradesh and some other states within India have only one or no report. But the vast majority comes from the African subcontinent. Meanwhile fresh studies into topic are published there every month! The survey was conducted at a tertiary centre hospital where most patients receive their antenatal care. This however means that it may not be representative of those who attend smaller satellite centers nearby. Another survey was conducted prior to the beginning of study to find out whether mobile phone was available among our respondents i. e. pregnant women.

The study showed that 45 percent of antenatal clinic visitors had their own mobile phone while 40 percent had access to mobile phones at home. The pregnant woman had access to mobile phone ownership through her close relatives who lived with her. The survey results indicated that pregnant women used their mobile phones to both make phone calls and receive text messages. The mobile phone users successfully received phone calls and sent text message responses. The majority of participants did not possess personal communication devices which integrated internet capabilities such as BlackBerry (PDA Phone). The experiment's potential subjects were asked about their interest in participating in the study. The participants showed preference for phone calls and text messages in their native language according to their survey responses which contradicted [34].

From the present investigation with the different socio - demographic attributes we get the results here: for control group are shown many less than 52% of patients are over 35 years of age, while 44 percent belong to the same age group for intervention group only. The 30 to 34 year age span is more prominent in control group at 20% as opposed 12% of intervention patients are in this category. By contrast, intervention patients consist of 25 - 29 year olds at 24% and less than 8%, control subjects. Fortunately for younger patients aged from 20 to 24 years or under 19, these groups are meshed equally between both groups with only slightly more found in the intervention group than in this one. Finally, the number employed in private firms is about equal, 28% in each group. There were slightly more people (28% versus 24%) assigned to government jobs in the control group compared with what was observed among subjects who received kudos for something worthwhile - - whatever it may have been, here 24% of these perpetrators people on average

across various comprehensive schooling exercises done last week but the intervention group has higher proportion housewives, 24 percent versus 12% at its dear old self! At 16%, students were at a considerably high 4% in control group and the "other" category all have a slightly higher mean score for intervention group at their favourite pimmed - up 20%rafle than in fosterage versus less that so like 16%.

In the intervention group, a small percentage of subjects are unable to read: 12 to be exact. The control group has no such data. For reading little or somewhat, both groups are represented as if in a clear balance: 20% and 36% in the intervention group while it is 16% and 32% respectively for controls. More than either of those, well can be read by 40% in the control group and only 8% in the intervention group; and so can very well only. The intervention group shows higher numbers of participants with 24% while the control group has 12%. The control group shows a high percentage of 32% uneducated individuals while the intervention group maintains an average of 24% uneducated people. The intervention group shows 16% primary education level while the control group shows 24%. People who reside in section (20%) hold less secondary and higher educational degrees than those who come from section (40%). The percentage of participants in this section shows no significant difference between groups but control groups have a slightly higher number at 24%. The intervention group contained 32% rural patients while the control group had 36%.

The intervention group includes 32 percent of urban patients while the control group contains 28 percent urban patients. Both groups maintain the same 36 percent of semi - urban patients. Nulliparous patients show a higher percentage of participation in the intervention group (32%) compared to the control group (16%). The control group contains more pregnant patients with 1 - 2 pregnancies (32%) than the intervention group (16%). The control group leads over the intervention group when it comes to patients who have 3 - 4 pregnancies since they make up 40% of the control group while the intervention group consists of 28%. The intervention group contains more pregnant women with 5 or more pregnancies (24%) than the control group (12%). Women who initiated antenatal care services early.

The majority of patients visited healthcare services between weeks 17 and 26 according to data from both the control group with 48% patients and the intervention group with 36% patients. Both groups had equal numbers of patients visiting between weeks 27 and 35 at 32%. The patient population seeking care after week 36 represented only 4 percent of the total in both groups.

The analysis revealed a substantial difference between intervention group participants who failed to schedule their 4 monthly check - up and control group participants who did not schedule their 4 monthly check - up. The absence of antenatal visits occurred primarily among women who belonged to the control group. The women in the intervention group visited their clinic more times than the necessary minimum number of appointments. Each year the intervention group members scheduled six medical appointments. The control group participants made antenatal visits that exceeded four or six only at a rate of six percent. The study subjects from the intervention group attended more antenatal visits than the minimum requirement of four visits which control and intervention groups previously received. Intervention group participants made more than six visits in 24 percent of cases while control group participants only reached six visits in 6 percent of cases. During this phase thirty - four percent of intervention group women made 4 - 6 antenatal visits while control group women only reached 17 percent of this total which depends on fate. The statistical analysis showed a significant difference between antenatal visit percentages between control and intervention groups [34].

Lund et al. discovered that mobile phone interventions led to higher attendance rates at antenatal care appointments. The intervention group showed that 44% of women attended at least four antenatal care visits whereas the control group had 31% (OR, 2.39; 95% CI, 1.03 - 5.55). The m - Health programs demonstrated positive outcomes according to West DM [37]. Text4Baby attracted 281, 000 new mothers to join its services. Research conducted in China demonstrated that appointment - attendance arrival rates increased by 7% through text message and telephone reminders and Malaysian studies showed new mothers' nonattendance rates decreased by 40%. According to Lund et al the majority of intervention women (59%) reported text messages influenced their antenatal care attendance frequency [36]. The instructional messages provided by the system helped 71% of users learn about pregnancy danger signs and receive health system confirmation of their well - being [34]. The m - Health intervention showed positive effects on health service utilization according to Bangal et al. 's review article.3 Among the seven studies focusing on antenatal healthcare utilization two utilized RCT designs. The two studies deliver SMS text message education to pregnant women with one study providing mobile phone vouchers and the other study distributing cash payments for text message follow - ups.

In some studies that measure attendance for antenatal care, the residual signals of self - reporting from either client or provider were statistically significant. For instance, one study on the provision and use of postnatal health care facilities took in patients who had a consultation at present or future date set for their normative appointment. It found that people in this experimental group, who received by text message reminder about such appointments, were far less likely than 50% ($p<0{\cdot}01$) ever to miss the place of prostitution or fail altogether for one month before it was clear what had probably happened. These two projects have led to changes in every implementation area. The research demonstrated that women who participated in the study received at least four antenatal care visits by more than 10 percent during their involvement period compared to non - participating women. The project analyzed antenatal healthcare use through an m - Health application which improved patient record management and automated appointment reminder notifications. The study revealed that patients showed a statistically significant improvement in their attendance at antenatal health checks after implementation (in accordance with the services DA video in 71 report starting with practice results). The intervention group received text message reminders for antenatal care support and health advice in

China which resulted in statistically better antenatal care attendance times than the historical control group. [34]

The research showed that women experienced behavior change through improved postnatal care attendance when they received voice or SMS messages containing information and reminders. [38] In their paper on 191 women, Fedha T. et al, demonstrated that 7.4% (14 women) of followed - up pregnancies had fewer than four pre - natal visits. This was compared with 18.6% of pregnancies not followed up: 35 in total had less than 4 visits and 3: had just 1 visit graph via $\chi 2=0.004$ clearly showing a significantly higher proportion for women on follow - up had more than 4 prenatal visits.9 There was a significantly higher proportion for women on follow up of whom were given advice about diet (P less than 0.001), place for delivery counselling ($P<0.001$), malarial prophylaxis ($p=0.001$), iron and vitamin supplements and regular dewormings (all p - values not calculated). [39] Noordam AC et al., initiated the development of sound consistent policies which linked health manpower funding to infrastructure incentives for quality standards and worker learning opportunities at all health care system levels. [39]
Risk mode of delivery serves as an essential reporting mechanism because it allows quick and cost - effective problem reporting.1 The analysis includes Law Regulations which produce the following important findings. The intervention group showed a very significant difference in delivery mode compared to the control group according to Pearson Chi - square 5.128 with an associated p value equal to 0.024 indicating the intervention affected delivery mode. The control group patients experienced routine deliveries at a rate of 65.4% (17 out of 25) but lower segment caesarean sections (LSCS) occurred in 33.3% (8 out of 25) of patients. The intervention group demonstrated a 34.6% (9 out of 25) rate of normal delivery but LSCSs occurred in 66.7% (16 out of 25) patients. The preference rate for LSCS among intervention group patients stands at 0.500 (CI: 0.263 to 0.951) thus demonstrating their preference for LSCS. The intervention group performed more cesarean deliveries than the control group indicating that intervention provided superior monitoring services leading to appropriate LSCS decisions which should result in better outcomes for mothers and babies in complex situations.

In terms of timely reporting alarming signs and symptoms patients' also have a significant difference between control groups (May et al.1990). This is demonstrated by the obtained Pearson Chi - square value of 8.117 and corresponding P - value 0.004 which reflects a statistically significant difference between groups. In the control group, only 32.1% (9 out of 25) of patients with alarming signs and symptoms reported these before they became criticalities. As far as the intervention group are concerned, none did not report any potentially critical signs or symptoms once they had begun to appear (May et al.1990). However, in the intervention arm 67.9% (19 out of 25) of these patients reported terrifying signs or symptoms, whereas 27.3% (6 out 20) didn't report any; if even the people at highest risk failed to do it enthusiastically the rate could be so low. If this way of life doesn't change for the worse then we're really finished as human beings. And yet is there a magic alternative to changing our habits scientifically? May be there is one - - but not as of yet. May be the present generation will bring forth evidence that rid itself of all relies on suspicious or unwarranted institutions of an inquiring nature and clears the way for a peaceful development ahead. A thorough scientific study of possibilities for alternative life styles.

Unfortunately, if the Odds Ratio for timely reporting between the control and intervention groups is 5.630 (CI: 1.648 to 19.232) that means intervention has had a significant effect in increasing the probability of a timely history taking. However, for odds ratio of late reporting it is 2.667 (CI: 1.251 to 5.685), meaning the control group have greater tendency to their delayed reporting. The odds ratio for timely reporting that intervention group (0.474, CI: 0.269 to 0.835) means intervention is so effective. Intervention has had a very positive effect on timely reports of worrying signs and symptoms. It points out heightened awareness among subjects in the intervention group - - as well as the likelihood that they have had better education about recognizing and handling critical health problems.

When the carry out an ANOVA analysis of age based on different pregnancy awareness and preparation confidence levels, the difference is statistically significant. The F - value is 4.22 and p - value 0.006, meaning that mean ages do indeed vary significantly between population groups. This group of patients has an average age of 36.78 years (standard deviation=6.82), suggesting that older women are more likely to know about danger signs. With a 95% confidence interval for the mean scoring 31.54–42.02. Those in this group of patients average 29.80 years old. Younger women save for delivery relatively actively in this age group, with a confidence interval of 25.32–34.28. Mean age in this group of patients is 28.07 years (standard deviation=8.28), with younger women reporting symptoms on time.95% Confidence intervals from 23.48 to 32.65. The patients in this group have the highest average age, at 38.71 years (standard deviation=4.50), indicating that older women might be more willing to donate blood. The confidence interval is 34.55 Southern women. This group has an average age of 32.56 years (standard error of the mean=6.41), indicating that middle - aged women are more inclined to choose institutional birth. The 95 percent confidence interval is between 27.63 and 37.48. "The women (especially those over 30 years old) seem to be more aware of blood donation and danger signs. However, younger women (aged under 30) are more likely to report danger signs on time and save money for delivery. This stark difference implies the need for targeted awareness programs suited to different age groups.

The mobile phone features small size and portability and widespread use at affordable prices while expanding network coverage enables communication in rural and isolated areas. It had a high potential. Mobile telephones have gained rapid global adoption which reduces the time needed to access healthcare services. [45]The study led by Beuermann DW et al demonstrated that SMS messaging effectively raised prenatal care attendance figure by 5 percent and on - time visit frequency by 10 percent according to provisional results. [35]Young female patients who reside near health centers experience more significant effects from these services. U Car, Josip et al. (2005) presented three studies showing mobile phone text message reminders increased health - care appointment attendance rates better than no reminders

(relative risk (RR) 1.10 (95% confidence interval (CI) 1.03 to 1.17).

Identically, they found was that this module seemed to facilitate their entire course from prenatal examinations or immunization coverage in certain places along our northern national frontier to the eastern countries near the sea part for both Thais (those whose husbands are still Thailanders) and non - all living as "Bozou" either temporary residents or permanent settlers - even so. The number of antenatal check - ups and spots for injections with biological vaccines that were entered as numbers of months from delivery to next visit when increase in ANC otherwise followed by EPI was not quite pushing back dates arrayed as far forward on the horizontal axis. Delay time of pregnancy checking duty posts and vaccine receiving points quite distinctly fell. Mushamiri I et al., showed that the programme improved the adherence to antenatal care, PNCs and PMTCTs. M - Health tools in CHW systems/programs could significantly improve the compliance of women treated within community - based maternity clinics established by government health authorities and also give help make the work more "integrated". [47] Datta SS, et al. Research shows that 70% of pregnant women want health information delivered through mobile text messages while 98.33% believe text messages can effectively spread health Knowledge and scores showed significant differences between pre - test and post testing after text message transmission.

The Chi - square analysis results demonstrate that group type (control vs. intervention) significantly affects mother's report of complications from her last pregnancy with P value = 0.032. The intervention group showed a higher rate of pregnancy complications at 44.0% compared to 24.0% in the control group which suggests that the intervention may attract mothers who monitor pregnancy issues more closely. The control group contained more mothers who experienced no pregnancy complications (56.0%) than the intervention group (20.0%). The intervention group includes 36.0% nulliparous women while the control group contains 20.0% nulliparous women thus demonstrating a higher percentage of first - time mothers in the intervention group. The intervention group contains more nulliparous women who report complications possibly because they actively monitor maternal health issues.

The chi - square test shows a significant association between the study group and compliance with routine investigations (P = 0.025).52.0% of controls and 20.0% of intervention group members did not finish carrying out routine scans and tests, leading to the conclusion that intervention group people do better in this aspect. Similar proportions were observed in those who were partially compliant: 36.0% for the control group and 40.0% for the intervention. A significantly higher percentage of the intervention group (40.0%) did all routine scans and investigations compared to the control group (12.0%). The intervention group is more compliant with routine investigations, as is likely to be due to the intervention rules of regular check - ups.

The study group shows a significant relationship (p = 0.048) between the number of antenatal visits. The intervention group showed better compliance with antenatal care visits since 52.0% of participants attended fewer than four visits while control participants only reached 20.0%. The intervention group showed better compliance with antenatal visits than the control group as 44.0% of intervention members made more than 12 visits compared to 20.0% of control members. However, the percentage of members in both groups who made less than four visits remained similar at 30% for controls and 36% for intervention members. The intervention group exceeded the recommended antenatal visit count for each participant which demonstrates successful program outcomes. The study group demonstrates a meaningful relationship (p = 0.041) between participants who follow their supplement regimen. The control group showed lower regular supplement usage at 28.0% while intervention groups maintained only 8.0% regular supplement usage. Additionally the intervention group demonstrated 56.0% regular supplement usage which contrasts with control groups at 24.0% usage. Daily supplement usage was higher in the control group at 48.0% compared to 36.0% in the intervention group.

Although the intervention group showed some slight improvement in partial compliance it also had a slightly lower total compliance status, suggesting more remains to be done to support adherence. The survey inquires, using other information including age, sex, occupation and smoking habit as reference points but all other variables were left unspecified for simplicity's sake The association between study group and timely return visits is significant according to chi square tests (p = 0·027). The both groups, 28% of attached persons were non - compliant with returning once they left the node. Percentage - wise, the intervention group showed partial compliance for a significantly higher rate (56.0%) than did the control group with 34%. The control group had a higher proportion (48.0%) of non - compliant participants than their counterparts in the intervention group, where only 16% were non - compliant. The intervention group Neither entirely good nor all bad can be termed as a partial success, shuns all round failure Chi square (p = 0.035) shows that there are significant associations between study group and whether there is an underlying risk factor. There was the same proportion of hypothyroidism in both groups (16% in the control group as for 12% amongst those in intervention). Moreover, gestational hypertension - - with a 16% difference from control's 8% - - and diabetes (28% vs.4%) are more common. But for previous lower segment caesarean section rates, both of which now come in at 8% for women from our intervention together with 16% regress since these factors include more no actions than actions when broken out were Next we can look at some related factors across two groups and see how they are distributed. Anemia in parallel, bronchial asthma or infection etc all show up about equally between the groups. However if we take epilepsy then this only materializes in our control group. The group that received the intervention is better at identifying and managing gestational diabetes, whereas it is the exact opposite for the control group. This showed the program just for high - risk pregnancy having efficacy.

The provision of accessible antenatal care services for first - time pregnant women in their home neighbour - hoods represents a new challenge for both health staff and the general population. Women in rural areas must not depend on waiting at AAZ for food and consumption during the period

after paddy harvests because this time is a slack period without planting work. Hospital communication through telephone or other messaging methods led families to become more involved in antenatal care visits at the spinet. Less educated women need to convince their male relatives to accompany them to antenatal clinics. Men in rural areas show no interest in women's health matters [34].

The phone call proved to be the most efficient communication method among all other modes in our research findings. The hospital phone call about their appointment reached 92% of the respondents. A survey revealed that thirty percent of patients forgot their appointment dates but receiving a phone call two days in advance helped them plan their travel expenses [plane] and other costs. Anticipation Sixty - eight point six percent of intervention group women remembered their exact appointment dates. The system enabled patients to schedule appointments with their regular doctor on their designated date. The approach enabled women to establish friendships with their doctors. The system enabled women to develop trust and confidence regarding hospital service quality. The control group women either forgot their antenatal appointments or they could not recall their scheduled dates for visiting their regular doctor.

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Health staff and popular masses encounter a new challenge to deliver accessible antenatal care services for first - time pregnant women in their residential areas. The women living in rural areas should not rely on waiting at AAZ for food and consumption during the paddy harvest season because this period includes no planting activities. The use of hospital communication methods including telephone and messaging systems prompted families to send multiple members to their antenatal care appointments. Women with limited education must request their male relatives to accompany them to antenatal clinics. Research indicates that rural men do not care about women's health issues [34]. The hospital's services faced increased distrust and discomfort which caused people to question its reliability. The intervention group received higher rates of oral haematinic tablets distribution compared to the control group participants. The intervention group showed a higher rate of women who took iron and calcium preparations for 3 months or longer at the beginning of this study compared to the control group (13.5% vs 20.7%). Rural women depend on their family members to purchase their iron tablets. The intervention group received doctor and nurse phone calls which led to higher completion rates of the program despite unknown reasons for non - completion. The intervention group demonstrated better results regarding tetanus toxoid immunization coverage through injections when compared to the control group.

Lund et al. have found a trend favoring intervention across all the secondary outcome measures, but not statistically significant.7 In the intervention group 12% of the nulliparous women received two doses of the double antigen vaccination versus 56%, that is altogether 83 daughters now 24 months old in control group and 68 (82%) of the 83 cases where M surplus and/or the anti - M campaign; for cases diagnosed as having suffered both (with percentage each it mattered little whether one was counted twice if there were two such episodes such a century literary society also). The term prenatal death describes deaths that happen during intrauterine life beyond 28 weeks of pregnancy until seven days after birth which includes both macerated and fresh still births and early neonatal deaths [34].

The majority of prenatal deaths occur within high risk pregnancy conditions. The main risk factors for prenatal death include unbooked status and inadequate pregnancy supervision together with substandard natal care and insufficient neonatal care facilities. The intervention group at Young San Rural Hospital experienced lower prenatal mortality (2.94%) compared to the control group (8%). The improved antenatal care combined with institutional childbirths and proper delivery routes and quality natal and neonatal care services likely contributed to these results. The research revealed that control group needed blood transfusions for anaemia treatment at a rate of 3.00% while intervention group did not require any transfusions (0.00%). The intervention group received no parenteral iron therapy for treating iron deficiency anaemia while the control group did. The control group used parenteral iron therapy at a rate of 5.00% while the intervention group used it at a rate of 2.00%. The control group needed parenteral iron therapy or blood transfusion for anaemia treatment by 8.00% of women but the intervention group required it by only 2.00%. This difference was significant [34].

Better antenatal care combined with more frequent visits and improved nutrition after receiving dietary advice through telephone calls and SMS messages and specialist consultations at antenatal clinics could explain why the intervention group needed fewer medications for their anaemia. Other researchers documented comparable findings in their work [36]. During the postpartum visit healthcare providers should offer couples contraceptive guidance because it serves as an excellent time to explain the value of family planning and small family size. The couple needs to receive information about different contraceptive methods which includes surgical sterilization and drug - based options like the Pill. The research included pregnant women and their husbands who received text message alerts about postnatal visit importance. The intervention group visited Young San Hospital 170 times (85%) while the control group only made 41 visits (21%) which became a key observation and result. The process of entering and exiting becomes simpler because of this factor. The husband of the woman or a close family member visited the hospital for child immunizations in three

wards providing together with data collected through routine reporting monitors which were presented at a national workshop In the Northern Region: 44. The Ministry of Health published a Policy Planning Monitoring Evaluation Division report for the experimental district area yet it did not include data from other districts. The pilot district reduced its defaulting client pursuit time from 20 days to less than one week for antenatal care visits during the past 12 months. The time required for postnatal visits decreased from two days in the previous year to slightly more than slightly more than half a day today.

6. Conclusion

The mobile phone intervention led to a substantial increase in women receiving four antenatal care visits during pregnancy while showing positive trends for preventive health service delivery and ante - partum complication detection and referral. The mobile phone intervention through calls and messages improved both institutional delivery rates and health - related behaviors among women and their community members. Research findings demonstrate that m - Health technology allows practitioners to change behaviors and help women obtain preventive healthcare including pregnancy and postpartum services. The pregnant women actively engaged with m - health services while making full use of these services and expressing their appreciation for this initiative during the present research.

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