

## ORIGINAL ARTICLE

## Use of mobile phones and television for essential obstetric care among women availing maternal and child health services at a rural maternity hospital in South Karnataka

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[Abstract](#) | [Introduction](#) | [Methodology](#) | [Results](#) | [Conclusion](#) | [References](#) | [Citation](#) | [Tables / Figures](#)

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### Article Cycle

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### Abstract

**Background:** To improve on Maternal and Neonatal Mortality Rates, newer technologies need to be explored to achieve Sustainable Development Goals of 2030. **Objectives:** To assess the use of mobile phones for essential obstetric care and associated factors among women availing obstetric services at a rural maternity hospital in South Karnataka. **Material & Methods:** A cross sectional study was done among the women availing obstetric services in Snehalaya Hospital, Solur in Ramnagara District. **Results:** There were 236 women included in the study, with a mean age 23.3 (3.22) and 11.78 (2.87) mean years of completed education. 99.15% had mobile phones but only 65% among them had their own phone. None of the women received text messages from MCTS (Government MCH Texts). Of the 53.4% women who had smartphone at home, only 42.4% used the smartphone to search for general health information and none of them used their mobile phone to access essential obstetric care. 48.2% watched health related advertisements and promotions on TV. Antenatal care was adequate among the women, but birth preparedness was found to be poor. **Conclusion:** The rural women in this study had poor utilization of mobile phones in obstetric care despite the presence of smartphones at home.

### Keywords

Pregnancy; Cell Phone; Cross-Sectional Studies; Hospitals; Maternity

### Introduction

India accounts for a quarter of all maternal and child deaths in the world. Around 45,000 women die each year in the country from causes related to pregnancy and childbirth. Approximately 6,40,000 new-born do not survive into infancy.(1) We are still a long way

from the SDG Goals of 2030, that is to reduce MMR to the target of 70 per 100,000 and NMR to 12 per 1000.(2) In rural India, only 61.6% women are registered in their first trimester and only 39.6% get more than 4 antenatal check-ups.(3) About 5.7% pregnant women do not receive TT injections and

only 29.1% pregnant women have taken more than 100 Iron and Folic acid tablets during pregnancy.(3) Around 1183 million wireless telecom connections are registered in India with nearly 500 million connections in rural areas. (4) Even-though internet can be a major source of health information during pregnancy, not all utilize this adequately. Technology like mobile phone has potential to improve health in underserved communities. (5)

### Aims & Objectives

To assess the use of mobile phones for essential obstetric care and associated factors among women availing obstetric services at a rural maternity hospital in South Karnataka.

### Material & Methods

A cross sectional study was done in a missionary-run maternity hospital in a rural area of Ramnagara District in southern Karnataka. Institutional Ethics Committee approval (IEC no. 183/2018) and permission from the hospital authorities were obtained prior to the commencement of the study. Study subjects were pregnant women of >28 weeks gestation attending antenatal clinic, women admitted for delivery and mothers availing immunization services for their infants. A sample size of 221 was calculated with 5% relative precision and 95% confidence limits from a previous study by Sherwin D'Souza (6), where the proportion of households with mobile phones was found to be 87.4%.

Written Informed Consent was taken from the participants before the study tool was administered. The study tool comprised of a face-validated, structured questionnaire which included socio demographic details, details of mobile phone and television usage and obstetric details. Standard of Living Index (SLI) was used to assess the socio-economic status. Mobile phone usage was described in terms of access and use of internet, email, WhatsApp, phone calls and text messages. Television usage included questions on health-related programs and advertisements. The use of mobile phone technology for availing different components of essential obstetric care was documented; such as early registration, ANC visits, TT injections, IFA and Calcium Tablets, ANC records and birth preparedness.

The data collected are entered in Microsoft Excel and analyzed using SPSS version 16.0. Descriptive statistics like percentages and proportions were

used to describe the socio-demographic data, the use of mobile phones and the various components of essential obstetric care. Tests of significance like Chi-square tests and Fischer exact test (where necessary) was used to look for association between the use of mobile phones and essential obstetric care.

### Results

A total of 236 women were included in the study. Among them, 100 (42.3 %) were antenatal women >28 weeks gestation, 45(19.2 %) were women admitted for delivery and 91(38.5 %) were mothers availing immunization services for their infants. The mean age of the study subjects was 23.3 (SD= 3.22, range =18-35). The mean number of years of formal education of the women was 11.78 (SD= 2.87) and the median monthly family income was INR 20,000 (IQR= 14,000 – 25,000). Majority were Hindus (88%), from Nuclear Family (55%), belonging to High Class (95%) according to Standard of Living Index (SLI). Among them, 153 (64.8%) had just completed or were currently in their first pregnancy.

#### Mobile Phone and TV Usage:

The presence of a mobile phone in the household was reported by 234 (99%) women, but only 153 (65.3%) had a personal mobile phone which was not shared with any other family member. The different aspects of mobile phone usage are portrayed in (Figure 1). Of the 53.4% women who had smartphone at home, only 42.4% used the smartphone to search for general health information. Majority phone usage frequency was for every 2 hours (72 women, 31%) and almost everyone (98%) use phone for less than 2 hours a day. Overall, only 53 (23%) reported using the mobile phone for accessing health-related information. This included watching YouTube videos (50, 21.2 %) on nutrition, fetal development and how babies are delivered. Smart Applications for pregnancy like 'Baby Centre', 'Parent-tune' and 'Mom Junction' were also used (3, 1.27%). None of the participants received any health-related text messages from the health workers as a part of the MCTS (Mother and Child Tracking System) nor did they use the mobile phone to keep alarms or reminders for their tablets, injections or appointments. The median mobile phone usage in a day was 2 hours (Range 0 – 6 hours).

Among all the study subjects, 230(97.4%) reported having a television at home, but only 111 (48.2%) saw health related advertisements and promotions

like Pulse Polio, and 5 (2%) watched programs like 'Dr Live in Zee Kannada' and 'Jeevan Rekha in E TV'. More than half the participants (56%) watched TV for less than 2 hours a day. The median television usage was 3 hours (Range 0 – 5 hours).

#### Essential Obstetric Care:

Among all the participants, the availing of essential obstetric care is shown in (Figure 2). There was 100% attainment in TT injections, USG scans and 100 IFA tablets. Regarding Birth Preparedness and Complication Readiness (BPCR), knowledge about danger signs and decision on transport, blood donor and hospital are the parameters where the proportion was low (Figure 3).

#### Mobile Phone & TV usage Essential Obstetric Care:

This study looked at the components of essential obstetric care like early registration, ANC visits, TT injections, IFA and Calcium Tablets, ANC records and birth preparedness and their association with mobile phone and TV use. While none of the participants reported that they had specifically used the mobile phone to avail any component of essential obstetric care, there was a significant association between health –related mobile phone use and identifying a blood donor.

Women who used the mobile phone to access online health information and videos, were significantly more likely to have identified a blood donor in advance. There was also a statistically significant association between watching health-related television programs and having knowledge about danger signs in pregnancy. Those who watched health-related Television programs were also significantly more likely to have decided the hospital for delivery in advance (Table 1).

## Discussion

Essential Obstetric care remains an important strategy to reduce maternal and neonatal mortality. With improving tele-density (4) and improving socio economic standards coupled with affordable mobile phones, there exists a great potential of using mobile phones to achieve essential obstetric care.

In our study, the mobile phone penetration in the community was found to be high with 99.2% of the households possessing a mobile phone.(5) An exploratory study done in this same rural area five years ago (6) showed that 87.4% households had owned a mobile phone. This increase in proportion indicates the improving mobile phone usage in rural communities.

However, not every woman in our study population had their own mobile phone and often had to share it with other family members, mostly the husband. A study done in South Africa (7) showed that all pregnant women owned a mobile phone and a few shared it with others. It was seen that even though mobile phone reach and usage are adequate, health related mobile usage was still limited (23%). Online health seeking behavior is varied between different sections of the populations. More educated people who have some awareness about their symptoms and know how to use internet to seek information do it rather than the women in rural areas who have comparatively less awareness. A study done in Singapore (8) showed the most health information sought by general population is regarding diseases (56.5%), treatment (44.2%) and medications (25%).

This is possibly because of lack of smartphone usage and lack of access to the internet. A systemic review (9) points out that 91% pregnant women had access to internet but in our study, only 36.8% antenatal women had internet access. This is because just over half the women in our study had access to a smart phone. Owning a mobile doesn't always mean access to internet as showed by the South Africa (7) study where only 35% had internet access which is lower than our study. Also, in a study done in Canada (10), even though expectant and new mothers had access to smartphones, only 35% used fitness or health apps among them.

Even with internet, people probably did not know what to search for or where to look. The mobile phones were not even used for simple tasks like keeping reminders for health check-ups or taking tablets. Surprisingly, there were no text messages from health workers, directly or through MCTS (Mother and Child Tracking System). This may be due to health workers like ASHAs who are technologically nascent, who prefer doing personal house visits rather than sending texts. Also, the program keeps changing and the MCTS works more as the database rather than an information disperser. In our discussion with one of the Auxiliary Nurse Midwife (ANM), she said that they stopped sending text messages through MCTS.

The average TV viewing time in our study was 3 hours as compared to US women (3 hours) and Australian women (2 hours 45 minutes) as reported by a study (11). The average TV and mobile phone usage among pregnant women in Japan are 2 hours 20 minutes

and 2 hours 15 minutes per day respectively. This is comparable with our study which has TV and mobile usage as 3 hours and 2 hours a day respectively. On the health-related mobile phone and TV usage, even though lack of awareness is a glaring concern, question also arises regarding the interest of the people. How curious they are in seeking health from their hands and the willingness to adopt and adapt to the newer technologies.

The essential obstetric care components in our study which are health sector responsibility like early registration, four visits to doctor, TT injections, IFA tablets and USG scan are all more than 90% coverage portraying the reach of health care and the utilization. These numbers are higher than the national proportions<sup>3</sup> where early registration (64.5%), four antenatal check-ups (45.4%), complete Tetanus toxoid dose (89.8%), 100 days Iron and folic acid tablets (33.6%) and institutional delivery (78.7%). But the subjective components of decision-making needs drastic improvements through education with IEC materials, especially deciding the transport and hospital, to avoid the three Delays (12) of emergency care.

Few of the limitations of the study was assessing the Standard of Living Index (SLI) in the OPD rather than house visits and including antenatal women more than 28 weeks because not everyone would have made decisions on place of delivery or blood donor. Sharing the mobile phone itself maybe a reason for not accessing the health information freely among these women. With all the advantages of mobile phones in healthcare, there is a downside of false information and wrong data. In this age of technological development leading to a shrinking world and erosion of borders, any news can travel anywhere in the world. Care should be taken when advising people about where to seek health information.

## Conclusion

The rural women in this study had poor utilization of mobile phones in obstetric care despite the presence of mobiles and smartphones at home. Efforts must be taken to incorporate the mobile phone in antenatal care which will go a long way in solving the issue of maternal mortality in India. Mobile phone is an easily available and accessible technology, which can be used for targeted interventions to improve essential obstetric care among rural mothers.

## Recommendation

We should promote mobile phone usage in the obstetric care for MCTS and the applications. Educate people and create awareness on the decision-making regarding place of delivery, blood donor and danger signs in pregnancy.

## Limitation of the study

The prevalence of shared mobile phones which may lead to under utilization of phones in obstetric services was not explored in detail in the present study.

## Authors Contribution

AS: Concepts, design, literature search, analysis, manuscript writing and editing. ARJ: Concepts, design, intellectual content, manuscript editing and review. Others have contributed in the data collection.

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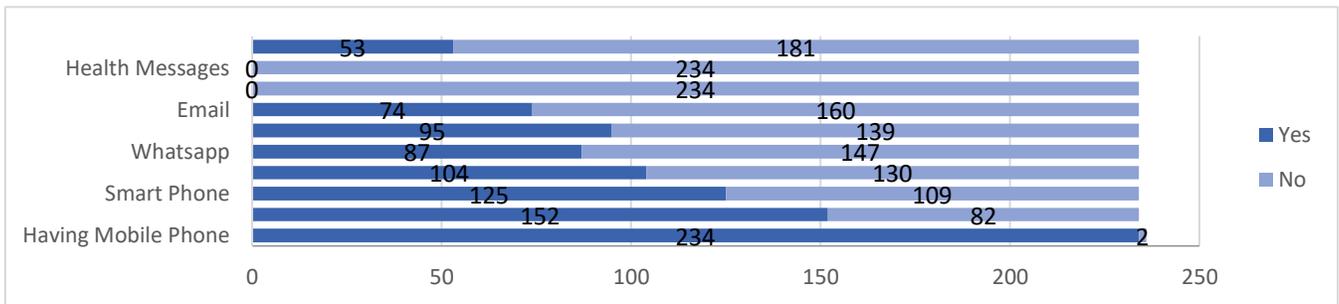
**Tables**

**TABLE 1 ASSOCIATION BETWEEN BIRTH PREPAREDNESS & MOBILE PHONE/TELEVISION USAGE**

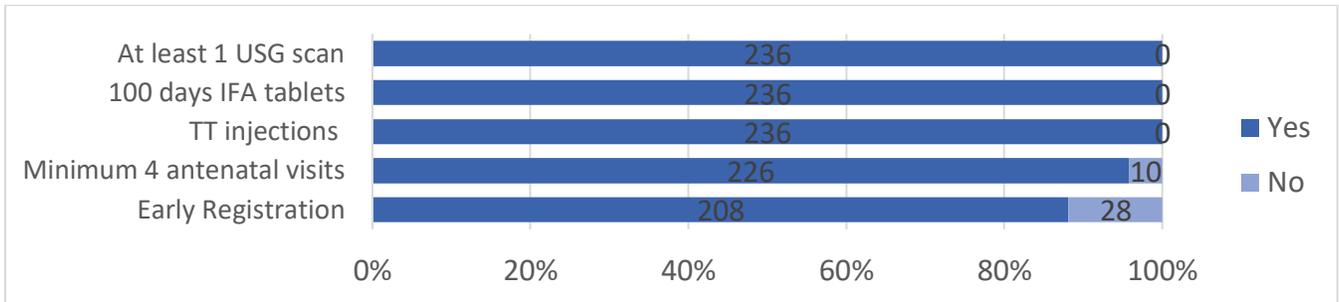
Blood Donor Decision				
		Yes	No	
Health Related Mobile Phone Usage	Yes	4 (7.5%)	49 (92.5%)	p < 0.05
	No	3 (1.6%)	180 (98.4%)	
	Total	7	229	
Hospital Decision				
Health Related TV Usage	Yes	113 (95%)	6 (5%)	p < 0.001
	No	85 (72.6%)	32 (27.4%)	
	Total	198	38	
Knowledge about danger signs				
Health Related TV Usage	Yes	86 (72.3%)	33 (27.7%)	p < 0.01
	No	65 (55.6%)	52 (44.4%)	
	Total	151	85	

**Figures**

**FIGURE 1 MOBILE PHONE OWNERSHIP AND USAGE**



**FIGURE 2 USAGE OF ESSENTIAL OBSTETRIC CARE**



**FIGURE 3 BIRTH PREPAREDNESS (N= 236)**

