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Health Informatics for Maternal Health in South 24 Paraganas District, West Bengal

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ABSTRACT
In West Bengal rural area ranks very low in terms of maternal health indicators mainly due to lack of utilization of maternal care services. Based on an extensive literature review and supported by fieldwork, we contend that maternal health conditions in West Bengal could be improved if health education is disseminated among women. Health Informatics tools, such as mobile phones, could be used for channelizing health education and initiate positive changes. Mobile phones and information share have the ability to assist people anywhere, at any time, and that too at lower cost. Hence, the main objective of this paper is to explore the role of mobile phones as health informatics tool for improving maternal health conditions in South 24 Parganas district, West Bengal. The findings reiterate that there is lack of information available to women on maternal health so they have to rely on their immediate family members for suggestions and advice. Service providers also acknowledged the essential role of maternal health education to improve maternal health status and agreed that it could be more effective if generated through media tools, such as, mobile phones.

Keywords: *Maternal Health, Health Information, Health Services, Education, Mobile Health, Telemedicine, Wireless Telemedicine, Village Anganwadi Center.*

Introduction
Maternal health, defined as health of women during pregnancy, child birth, and postpartum period16 is an important pillar of public health. Social determinants of health (SDOH) directly influence maternal health seeking behavior of women. In India, caste and gender are two important SDOH affecting maternal health. Studies indicate that mainly lower caste women are unable to receive maternal health care services, including antenatal checkups, iron and folic acid supplements, and institutional delivery. Even if they go to the health institutions for availing these facilities, ill treatment by health professionals aggravates their pain and adversely impacts their satisfaction. Gender too, plays a key role in determining women's maternal health status. [1]

Gender based discrimination has always been a typical feature of developing countries where women are denied equal access to education and proper medical care. Gendered power relations are very critical in structuring maternal health care including the health care practices. Thus, the inequalities based on caste and gender roles directly shape health seeking behavior of women exposing them to high health risks. Maternal mortality is one such health risks and is high among Indian women. The scenario is worse off in the underdeveloped provinces like Bihar where caste and gender have stronger connotations. Despite various governmental interventions and cash incentive schemes such as Jannani Suraksha Yojana, the overall maternal health status of women in Bihar is not improving much owing to the unavailability of doctors, de-motivation of the health workers, and unawareness of women regarding good maternal health care practice. [2]

Maternal health is the most important factor of integrity of communities, societies and nations. Well-being of all the men, women, boys and girls depend upon healthy women and mother member of the family. Maternal health is considered and compared with the basic need of life like air, water and food. But in most of the villages of rural India the health of women is neglected at many conditions. Similar conditions had been observed at Baruipur subdivision of South 24 PGS of West Bengal. [3]

Information is a very important and crucial commodity for any persons or group persons and its use in making decisions. Though everyone needs information, women access to information often limited due to cultural religious and sometimes sociological factors, but particularly need information

on issue affecting their health that of their babies during and after pregnancy. [4]

In developing countries like India due to low socioeconomic status, multiparty, improper antenatal care, less inter pregnancy interval lead because of in proper time do not get information. This study helps through mobile phone is a important for mothers. [5]

This study identified that through primary health care reducing expenses of rural community at the maternal and child health care considerably, so this maternal health study through phone could find out the growth and development of our society. [6]

Hence the study it is an eye opener for the people at the connotation, administrators, policy makers and people who want to bring development. This study is a basis for social harmony and economic productivity. Proper health service reduces costs of unnecessary medical emergency and burdens to families, communities, and the society. [7]

Health informatics is the efficient relevance of Information and Communication Technology Tools (ICT) in public health apply, research, and learning with huge prospective to improve the health information systems across nations. With the arrival of globalization and improvement in technology, the applicability and accessibility of ICT in health sector is being recognized for promoting health by educating people, even in developing nations like India. There are five major health informatics tools that help in promoting public health among masses and these tools are: Geographical Information System (GIS), Electronic Health Records (EHR), Mobile Health (mHealth), Internet Based Information System (e-Health), and Telemedicine. All these tools are to be utilized as per the socio-demographic profile of the end users. [8]

It is argument that with low rates of literacy, mHealth, which is the systematic use of mobile phone in the delivery of healthcare services, is the most viable option for improving maternal health in west Bengal. It is an adapted, interactive service aiming at providing health access to anyone over mobile platform without any type of inequity. As a wireless telemedicine, it involves the use of mobile telecommunications and multimedia technologies integrated with mobile healthcare delivery systems. [9]

The key problems in health information services create gaps in development of rural women use and urban women life. Maternity health, without access to new modern technologies and other sources are neglected and unattended, even available remains non-accessed. Information needs of rural women ascertained for providing their information services in their day-to-day activities. [10]

Review of Literature:

The term "health" refers to the absence of sickness and a person's subjective experience of well-being (Sturmberg et al., 2019). Preventing and treating disease and maintaining one's mental and physical health are the primary goals of healthcare, which are carried out by medical, nursing, and allied health professionals. Many different types of interventions can promote good health, and the World Health Organization (WHO) define them all as part of this umbrella term. [11]

Universal Health Coverage means the maximum accessibility of health resources for the people of the country, which means people and communities can use the promotive, preventive, curative, rehabilitative and palliative health services they need, in sufficient quality. This also ensures that the use of these services does not expose the user to financial hardship. Accessibility to Maternal and Child Health Services can be viewed as the ability to access and get benefit from such services provided by the health system of a country. The concept focuses on enabling access for mothers and children i.e., the vulnerable section of the society, or special needs, through the use of assistive technology. Ultimately, development in accessibility brings benefits to everyone. In this study, accessibility was seen as a multidimensional process of interaction between the health system and individuals, households and communities influenced by diverse factors. (WHO, 2015) [12]

The barriers in accessibility may be of two types, financial barriers and non-financial barriers. Now, poor economic condition is an important contributor of barrier to accessibility, however it is important to note that non-financial barriers constitute significant constraints to the equitable and full range of health services included under national UHC policies. The dimensions of access comprise of affordability, availability and acceptability of services. All ultimately represent a set of complex factors that describe the relationship of the health system to its target population and that determine access to effective healthcare. (Universal Health Coverage for India, 2011) [13]

(Bose M, 2015) In West Bengal, though the rate of utilization of government hospitals is quite high, however, different services like doctor, diagnostic tests and medicine are mostly purchased from outside of government setup. This leads to increase in OOP expenditure. Moreover, the public subsidies are mostly enjoyed by the relatively higher socioeconomic classes. There is a gender discrimination observed in access and benefit from public subsidies in the state. The health sector in India is at crossroads as a result of global development the overall health status of India has improved through the OOP expenditure still remain high. Access to maternal and child health services in the remote part are still not satisfactory due to inability to meet the need of community [14]

Objective:

- To find out informatics sources of health information use by the rural and urban maternal women of Baruipur Subdivision.
- Potential of Health Informatics for Improving Maternal Health.
- Maternal women using mobile phone in Bauipur Subdivision of South 24 Parganas.

Research Methodology:

A cross-sectional observational study was conducted in Baruipur subdivision of district south twenty-four paraganas. Samples were collected from Baruipur subdivision using simple random sampling. Data was collected using a pre-designed, semi-structured questionnaire and analyzed. This section contextualizes our study at the ground level based on our data analysis. At the onset, the socio-demographic profile of the respondents is discussed for a better understanding of influencing maternal health conditions and affecting knowledge dissemination as well as utilization of available information

A display group study was conducted in a rural primary health center, at Baruipur subdivision of South 24 PGS of West Bengal. Basic demographic details were obtained from the health record at the center and women were followed up till they delivered. A primary health center is located in the centre of the village which provides comprehensive health care services to the community. The primary health centre is adequately staffed with ASHA and ANM'S to provide village outreach services. Regular home visits and priority visits to the houses of pregnant women ensure health record maintenance and quality of data collected.

Data was collected on facilities in hospitals and health centers, perceptions of women, and perception, knowledge, and skills of care providers. Trained midwifery and public health staff made observations and conducted focus group discussions and interviews. For facility assessment, a checklist was prepared after discussion and inputs from ANM and public health experts for facility assessment of the 18 PHCs providing 24-hour service and 9 CHCs. The skill-management exercise was conducted for staff nurses, Auxiliary nurse midwives (ANMs), and medical officers in these facilities on key areas of the maternal and child health checklist. Focus group discussions were conducted with health professionals. Separate guidelines were followed for different medical professionals, ANMs, and staff nurses.

884 villages or clusters were selected randomly. From each selected village or cluster, seven eligible infants were included in the study to complete the sample size of 1400. A list of eligible infants was identified by ASHA of that village or the village Anganwadi centre from the record of females who delivered at government health facilities. The houses of these selected infants were then visited and information was collected through their mother's interview directly. Data collection: data was collected by means of a pre-designed, semi-structured questionnaire. The questionnaire consisted of details about the sickness of eligible infants during the neonatal period and utilization of OPD, diagnostic, drugs, blood, and transport services during treatment of illnesses along with expenditure incurred on various services, if any. [15]

Result and Discussion:

Out of the total women interviewed, 36 percent belonged to the age group of 20-25 years and 21 percent to 26-30 years. Though 9 percent women were pregnant at the time of the study, only one of them was pregnant with her first child. For others it was second or third birth order. Only 10 percent of the respondents were illiterate. It was noted that 88 percent of women interviewed belonged to other rural and only 12 percent of them belonged to urban areas depicting the effect of domicile-based variations on maternal health-seeking behavior of women. The majority of women came from rural settings, while only 12 percent belonged to rural and semi-rural backgrounds and had come to nearby Kolkata to avail healthcare facilities.

While 86 percent of the respondents admitted that earlier also, they had institutional deliveries, 92 percent of them disclosed that the choice of delivery was chosen by their husbands. It was found that 46 percent of the respondents were not aware of postnatal care, even those who had institutional deliveries and this group of women had no knowledge about breastfeeding also. Respondents were ignorant about the importance of a nutritious diet for both mother and child. Though 86 percent of the respondents preferred institutional delivery, interestingly none of them had ever visited hospitals for receiving antenatal or postnatal care. [16]

One of the main focuses of the study was to determine the perception of women regarding media and health. When enquired about the sources of receiving maternal health-related information, 71 percent of the respondents emphasized relying on their immediate family members, 25 percent admitted depending upon health workers, and only the remaining 10 percent showed trust in local health clinics. The increasing importance of mobile phones was also acknowledged by 62 percent of the respondents. 12 percent of the respondents had no access to any of the media tools. Though 62 percent of the respondents had mobile phones in their homes only 26 percent of the respondents had access to it. Their accessibility to mobile phones was largely determined by the performance of their gender roles deeply rooted in their socialization patterns. Performatively in a socially constructed repeated set of acts performed by women. In the course of performing these socially constructed roles, women inculcate the social order of subordination within themselves hindering their overall development.

Almost 62 percent of respondents used mobile phones once in a while. Thus, it became essential to investigate which specific tool respondents would prefer for receiving maternal health-related information in the future on their mobile phones. Interestingly as shown in below table and figure the answers varied from mothers. [17]

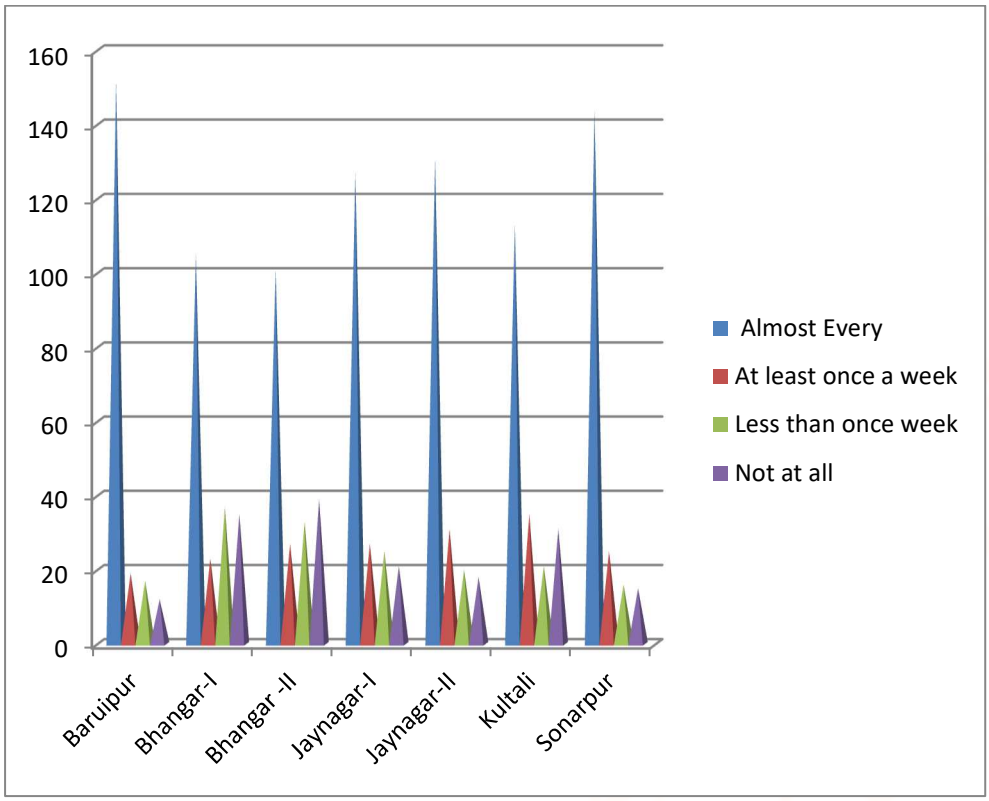
Maternal women using mobile phone in Bauipur Subdivision of South 24 Parganas. Table 1:

Using social media	Baruipur	Bhangar -I	Bhangar -II	Jaynagar -I	Jaynagar -II	Kultali	Sonarpur	Total
Almost Every	152 (76%)	105 (53%)	101 (51%)	127 (64%)	131 (66%)	113 (57%)	144 (72%)	873 (62%)
At least once a week	19 (10%)	23 (11%)	27 (13%)	27 (14%)	31 (15%)	35 (17%)	25 (12%)	187 (14%)
Less than once week	17 (8%)	37 (18%)	33 (16%)	25 (12%)	20 (10%)	21 (10%)	16 (8%)	169 (12%)
Not at all	12 (6%)	35 (18%)	39 (20%)	21 (10%)	18 (9%)	31 (16%)	15 (8%)	171 (12%)
Total	200	200	200	200	200	200	200	1400 (100 %)

The observed relationship between maternal health services and respondents' exposure to electronic media was presented in this Table. The result of this table supports the researcher's assumption, as the proportion of use of each maternal health service in all blocks should be positively associated with respondents' use of mobile phone. It was also found to be a significant positive factor influencing the use of maternal health services.

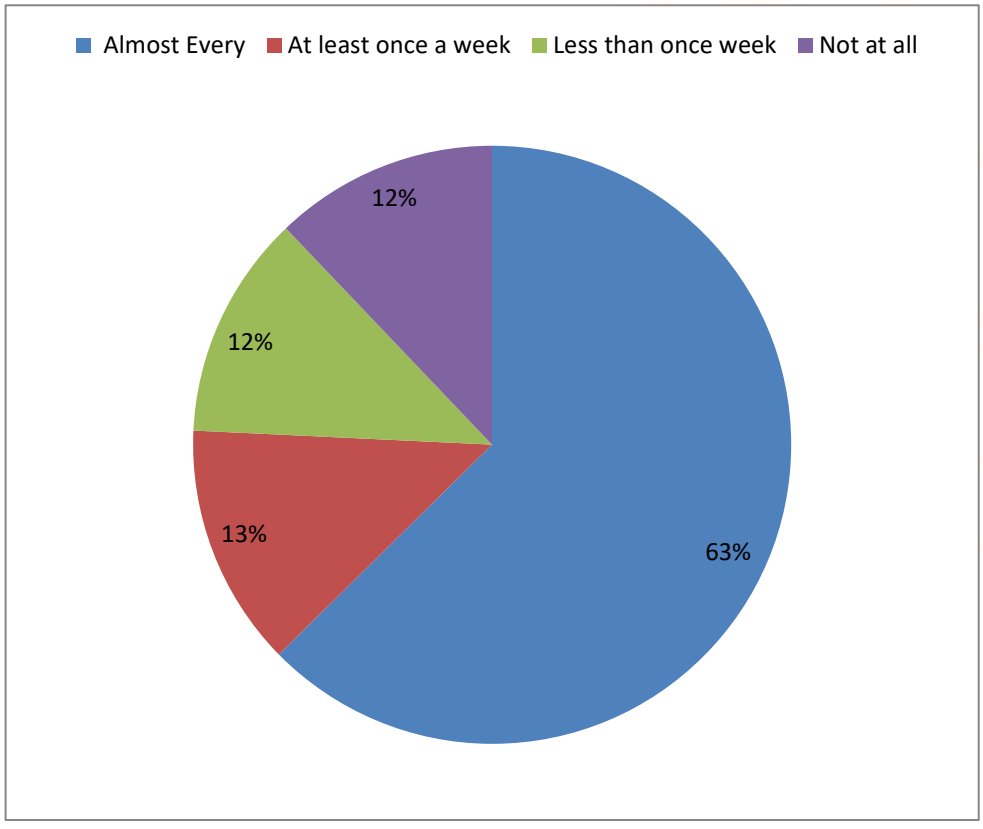
The majority of the 873 (62%) mothers exposed to mobile phone used phone at almost every, while 169 (12%) mothers used phone less than once per week and 171 (12%) mothers did not use phone at all. [18]

Graph 1: Distribution of maternal women using mobile phone at the seven blocks in Bauipur Subdivision of South 24 Parganas



In this study found that majority mothers of all blocks reported that the social media used mobile phone at least almost every compared to others all blocks.

Graphical representation of maternal women using mobile phone at the seven blocks in Bauipur Subdivision of South 24 Parganas [19]



The above Graph shows that out of the 1400 mothers, most mothers, (12%) mothers used phone less than once per week and 171 (12%) mothers did not use phone at all.

Women living in domestic in which the decision to seek health care was generally made by other family members were the smallest amount likely to seek care. Interestingly, women were extensively more likely to seek care when their husbands alone made the decision to do so rather than when the decision was made jointly with their husband. After adjusting for other factors, the probability of not seeking information in households where the woman or her husband had no say in the decision to seek health care to 70 percent where the woman decided by herself to seek care.

Although the differences in choice of provider by degree of women's autonomy were statistically significant, they were not substantial. The majority of women required information from mobile phone regardless of the degree of independence they had in making decisions concerning health.

Problems and Barriers Problems were found by officers of antenatal class pregnancy is the presence of pregnant women who are illiterate. Then, the obstacles perceived some health centers in rural area in the conduct of is too far away access to a class implementation so that the antenatal class pregnancy started late. The next obstacle faced is the lack of funding for transportation from the executor of classroom activities for pregnant women. Another obstacle is still the lack of participation of the husband/ family member faced by several health centers Husband/family is the one which of target antenatal class pregnancy implementation.

Improving maternal health in South Twenty-Four Paraganas A mobile maternal health service is improving maternal and child care in conflict-affected, where the maternal mortality ratio in some parts caused by conflict, forced labour, human rights abuses, lack of knowledge and dangerous traditional practices. Community-based maternal and child health workers from conflict-affected areas were trained in preventive and basic maternal health and family planning services. These workers then trained village health workers and traditional birth attendants and provided.

Mobile phone text reminders to reduce healthy problem and aims to reduce maternal and newborn deaths during the first seven days after delivery. The tool consists of a simple checklist given to the mother before discharge from the health centre, a text or recorded message sent to the woman's chosen mobile phone number for four alternate days reminding her to perform a safety check and a system to enable the woman or someone with her to call for immediate care or emergency transport where needed.

Discussion according to knowledge, it is one of the prepared studies to assess the role of maternal literacy on verbal outcomes. The telecommunication supports the findings of this study. In result, maternal literacy was directly proportional to mothers' health status. To assess the outcome a proper clinical examination was done. The study has a mobile public health implication as well. It provides a baseline for designing interventions of improving knowledge, behaviors and literacy regarding oral health. It also gives opportunities to improve communication between mother and healthcare provider which ultimately improves maternal health.

Conclusions:

In Baruipur subdivision of women to receive health-related information daily on mobile phones through information. It is impossible for health workers to disseminate such information to women daily and mobile phones could be instrumental. Through mobile phones, women can easily receive medical information, treatment, diagnosis, and counseling from health professionals in less time. Additionally, it can effectively assist women during their pregnancy and the postpartum period. For instance, it can send reminders to women for prenatal visits. Even during pregnancy, health can assist women to access health facilities and help them to avail personalized assistance from the health workers. During the postpartum period health services can send immunization reminders and updates about child nutrition.

Nevertheless, the biggest challenge is making mobile phones accessible to women by dismantling the governmentality generated. Therefore, we contend that there is a need to understand the association between women 's health, culture, and society through a postmodernist lens before developing any mobile initiative. If these concerns are considered, then in the Baruipur subdivision health can have an empowering role in capacitating women to avail antenatal checkups, institutional deliveries, and postnatal care at

the right time and bring positive changes in maternal health sector by functioning as a tool of social change.

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