

A wide awaking of Gravida for medical canvass through SMS/Voice call

J.Sudha, Dr.A.Sumithra, Dr.R.Perumalraja, Dr.S.Gavaskar

Abstract— A way to increase the condition of confidence in the health system among communities in rural India for accessing health advices for maternal, new-born, and child from the community volunteers have been proposed. It was addressed by the Accredited Social Health Activists (ASHAs) in their community level as a health educators and promoters for providing first contact care to people mainly for pregnant women and child care. In this proposed system, the ASHA in health center is responsible for registering patient details with necessary information including the mobile numbers of the family members and address into the database using a computer with Internet connectivity in the specified website. The patient records, Doctors details and text messages as a remainder to the patients are hosted in a cloud database. Using SMS technology the timely reminder alerts are sent to the patient on the day of scheduled follow-ups. The in-build algorithm 'Noval Risk Filtering Algorithm' calculates the risk of the patient through the health services and filters the record based on risk. The high risk patients report will be forwarded to the Doctor's smart phone which contains the application to access it. This application contains the 'Risk Prioritizing Calculator Algorithm' to prioritize the risk level of patients and alert them by SMS/Voice call based on their risk by the Doctor. The main aim of this proposed system is to enrich the caregiver's service to women for guidance and institutional delivery to reduce the maternal deaths, chronic ill health, neo natal deaths.

Index Terms— ASHA(Accredited Social Health Activists),Chronic ill health, Community volunteers, Maternal deaths,Neo natal deaths.

1 INTRODUCTION

According to World Health Organization(WHO), Maternal mortality is too high in rural and low income community areas in India[1]. About 800 women die due to pregnancy or childbirth-related complications in every day around the world. Also neonatal deaths are also high but these deaths can be prevented by taking simple measures like better prenatal care by health workers by providing awareness among the womens.

The National Rural Health Mission (NRHM) is a process initiated by the Government of India to meet the needs of health related activities for underserved rural areas. Each and every village in the country was provided. The National Urban Health Mission (NUHM) was started as a sub-mission under National Health Mission (NHM), with National Rural Health Mission (NRHM).The National Health Mission (NHM) initiates in every village in the country with a trained female community health activist volunteers called Accredited Social Health Activists (ASHAs).

ASHA act as a link between the particular community and the health system. ASHA must primarily be a woman resident of the village mainly focuses on the maternal and newborn healthcare. ASHA takes the pregnant women to the rural

health sub-center for vaccination purpose. They undergo some medical training as well as visit each pregnant woman, recent mother and children under their supervision regularly to provide health advice, record data cards and refer in case of emergencies. Holds village level meetings for health awareness. Manages records for her work status. So the better care is made by them can reduce the maternal mortality ratio. The mortality ratio is higher is rural as well as low income communities. The main objective of this project is to enrich the health services of caregivers in rural areas and to improve their patient cares by timely follow-ups by tracking the pregnant women based on their risk. Since these workers face a lot of problems like maintaining current medical register and also recovering the past history. Medically these workers are semi-skilled in their field. Also the existing health care system is expensive to deliver the health system.[1] To overcome such difficulties certain recent methodology is implemented to enrich the work of Health worker as well as to decrease the maternal death ratio by providing continuum of care.

2 FUNCTION DESIGN

Inthis section it focus on the function design of the proposed system. The system has the following concepts involved.

2.1 Data collecting

The data collecting function is designed to collect and transfer pregnant women's physical signs[3]. Accurate data should be collect timely for both women as well as child of 0-5 age. The data collected be based on Ante Natal Check(ANC) or Post Natal Check(PNC), pregnancy history, drugs usage, etc. Since collecting details is the major thing to categorize the patient. The long term storage should be considered. The medical reports of the pregnant women have to be collected con-

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tinuously from the starting to end of the whole process of pregnancy. Efficient way for dealing large data should be developed for long usage and for retrieval of information to get previous pregnancy details and health services provided.

2.2 Data processing

The usage of raw data should be somewhat make problem to the Doctors. The patient may have various diseases like pregnancy-induced hypertension, abnormal heart rate, gestational diabetes. These raw data should be processed based on risk before delivered to Doctor. This data processing function is mainly designed to process the collected raw data.[1]Data processing function contains the set of algorithms to categorize and identify the risk and sort using risk is managed by 'Novel Risk Filtering Algorithm' and 'Risk Prioritizing Algorithm'.

The classify functions monitors chronic ill in the long run. It judge the extend of diseases and provide the long term health care program for pregnant women.

2.3 Data Mining

Data mining process helps the administrator and the Doctor to fetch the pregnant women based on their age, past pregnancies chronic ill. Data mining fetches the result and integrate as a separate dataset based on the type of disease. Since this function is also useful to send the SMS to those who needs the reminders will categorize according to the date they have registered. It makes the sending of timely SMS on due date to the patient cell phone.

3 PROPOSED MATERNAL HEALTHCARE SYSTEM

All the patients who requires health services from rural health center through ASHA will approach the nearest health center because people in rural India not travel long distance for availing medical facilities at high cost is impossible. The proposed system overcomes this problem by gathering the details of patient and is maintained by ASHA through website and the data is stored in cloud database.

For regular check-ups, Vaccination, medication reminders and daily tips based on pregnancy health will send to the patient cell phone through the stored data on the backend server. The risk filtering algorithm filters the patient record according to the risk level. High risk patient details will forwarded to Doctors Android mobile operating system for clarification. It contains the Novel Risk Priority Calculator, to categorize the priority based on levels of risk. For any emergency Doctor will contact patient through SMS/Voice call. The most of women in rural areas can't able to read SMS so if we provide the alert through voice call it will be reached quickly and get a good response from them by undertaking the treatment. Then the accessing for treatment is also increased. This new system provides the full management of the medical staff and other medical resources. The doctor, nurses and administrator can view the patient profile that contains family history, patient pregnant history, chronic ill etc. The administrator can update patient's, Doctor's profile in central server hosted on cloud through website maintained by the ASHA.

The system developed and described in this paper undergoes the health treatment by automating the following modules.

- Registering details in website
- Retrieving patient data from cloud database
- Sending default SMS as remainder for check-ups
- Filtering patient details by risk level
- Mobile application for Doctor to access patient details
- Alerting patient through SMS/Voice call

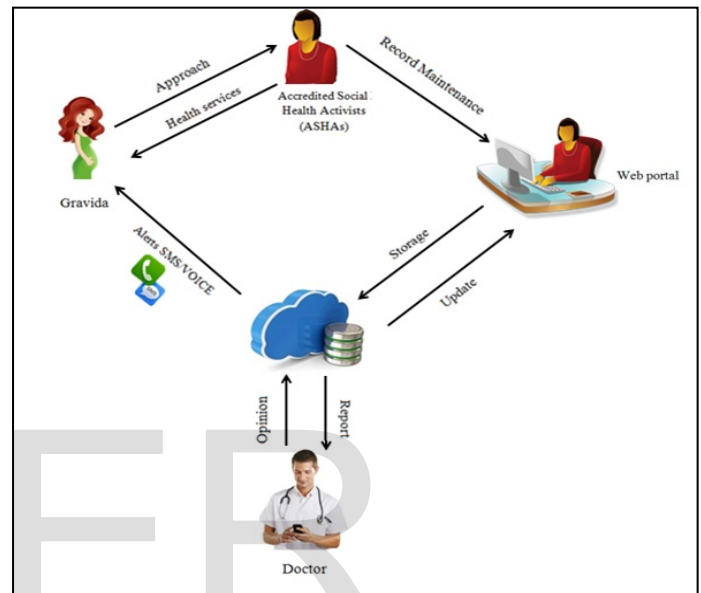


Fig.1. System Architecture

3.1 Creation of website maintained by ASHAs

The web application maintained by the ASHAs to register the patient details for providing health services for during both Ante Natal Checks(ANC) and Post Natal Checks(PNC) for the Immunization and regular care. The created website uses the detailed explanation of day by day and month by month development of both mother and child. It was designed as the user friendly because the administrator of this website is ASHA since she has not well educated also they are semi-skilled in medical approaches. So using this they can easily convey the patient regarding the child birth preparedness and educate the people for institutional delivery.

3.2 Registering pregnancy women's details

The web portal contains the registration process to gather the patient details mainly including the phone number of the patient for further stage of insisting them for regular checkups and medication. [4]The date of registering is noted and the centralized calendar will updates the date of vaccination and upcoming tests to be taken. The patient can view their details of medical reports and their visits are uploaded in patient log-in page. This report will be uploaded by ASHAs on their page. All the files are hosted in the cloud database.

3.4 Retrieving patient data from cloud database

The registered patient details can be viewed by patient at any time using the phone number, age and pin code to retrieve the correct patient details from the cloud database and the reports can be viewed. Cloud data can store for free access but upto a limit. But for more accessing then the 'pay as you go' status. This was done best using A

3.5 Sending default SMS as reminder for check-ups

Subscribers receive automated tips and reminders through SMS messages directly to their registered phones on a weekly basis. These messages are personalized for women based on their week of pregnancy or the child's age to improve maternal and child survival.

3.6 Filtering patient details by risk level

The subscriber's page will be uploaded with their medical report. Hence it contains the algorithm 'Novel Risk Filtering Algorithm' for filtering the reports based on the risk for High-Risk, Moderate-Risk, No-Risk[1]. Based on the risk factors High-Risk patient needs much care. So these patient's details will forward to the Doctors for additional care to overcome the risk.

3.7 Mobile application for Doctors to access Patient details

The high risk patient details are send to the Doctors account for medical clarification. Using the smart phone mobile application the details of patient can be accessed through cloud database. Hence the application contains the algorithm named as 'Risk Prioritizing Algorithm' to sort the risk based on the patient who is needed for immediate treatment.

3.8 Alerting patient through SMS/Voice call

The Gravidas status will be identified by the Doctor via smart phone and he alerts the patient through SMS/Voice call to take necessary remedy. It's a real-time alert to the concern patient.

4 RESULTS AND DISCUSSION

This chapter presents the results and discussions of the project carried out. The main objective of this project is to reduce the maternal deaths and neonatal deaths by providing continuous care on pregnant women and newly born child. Health workers registers pregnancy women to take care throughout their pregnancy and child birth by a healthcare monitoring system through website using cloud storage and GSM Technology to send SMS etc. Continuous healthcare monitoring is seen as an effective method of providing immediate care as it allows for emergency transmission of patient information to the Doctor. These new technologies enable us to monitor patients on a regular basis, replacing the need to frequently visit the local doctor for a recurring illness. The main aim of this project is to continuously monitor the patient to reduce the maternal mortality and neonatal deaths. In present years, different type of Health systems is developed and they are providing the remote monitoring of the patient but some problems are occurred. In order to overcome the prob-

lem, to develop a system and designed with integrated patient monitoring device mainly used to continuously monitor the patient health condition, for effectively and accurately measuring the patient physiological risk parameter. By using risk generating algorithm is created for the identification of serious risks of both mother and child. This will able to reduce the maternal and neonatal deaths by regular attention to take care by the health workers and the Doctors.

5 TECHNOLOGY SUPPORT

The following are the technological challenges in designing of the web portal and mobile application involves:[6]

- Designing the user application which can be used by semi-literate health workers.
- In-build training and guideline will improve the knowledge of ASHA to deliver good service.
- Data storing in cloud makes the data safer as well as for long usage.
- Mobile application provides the way of monitoring patient details in remote area.
- People in rural areas are not well in understanding SMS hence they are alert by voice call is the best way

6 BENEFITS OF THE PROPOSED SYSTEM

Monitoring of pregnant women, mother, neo natal is proposed in this paper through a continuous care by the health worker in rural areas. Since the system provides the following benefits through:

- Improving the efficiency of ASHA worker.[6]
- Reduces maternal and neonatal deaths by supervising continuously will help on their emergencies.
- In-build application contains various tips for healthy pregnancy makes an aware among the women.
- Institutional delivery will be increased with a skilled birth attendant and aware of family planning also improved.

7 CONCLUSION

The healthcare monitoring is for ASHAs and the Doctors is very efficient to provide alert to concern women is improved. During the healthcare monitoring if any patient health condition is critical, then send an emergency notification message to the patient by using GSM technology[5]. Filtering of risk is efficiently used to sort the patient because the heavy data to the Doctors mobile is reduced for scrutiny over particular set of patients. The cloud storage improves the long and secure data over network by 'pay as you go' service will make cost estimation on usage. The IVR service makes the people to response and access service through health center is increased. This system develops and maintains the record of patient over cloud can be viewed by Doctors mobile is convenient to provide services at remote location.

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