International Journal of Community Medicine and Public Health
Babu KV et al. Int J Community Med Public Health. 2024 Nov;11(11):4466-4470
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20243311

Short Communication

ASARA-A technology-driven maternal and child healthcare model of Araku

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Received: 09 August 2024
Revised: 22 September 2024
Accepted: 23 September 2024

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ABSTRACT

Tribal populations form 8.6% of total India's population. The health indicators of tribal populations lag behind their non-tribal counterparts. Limited access to healthcare services, poor transportation facilities, increased out-of-pocket expenditures for health, distinct cultural practices and remote settlement among many others contribute to the poor health status of the tribal populations. However, to achieve sustainable development goals by 2030, it is extremely important to address the healthcare needs of the tribal population. The current paper is the first part of the model of care working paper series that discusses the components of the ASARA project to highlight the impacts of the decade long efforts towards improving maternal and child care in the region.

Keywords: Tribes, Maternal health, Telemedicine, Tribal population, Pregnant women

INTRODUCTION

With 8.6% of total India's population, tribals form a major group of the population in India. Alike their non-tribal counterparts, tribals too suffer from quadruple burden of diseases, communicable, non-communicable, malnutrition, mental health issues including addictions.[1] Furthermore, the challenges related to health among tribal populations are accelerated by their geographical isolation, language disparities, limited access to healthcare professionals, socio-economic disparities, cultural sensitivity and traditional practices.[2]

The tribal populations of Andhra Pradesh account for 7% of state's population.[3] Furthermore, Vishakhapatnam district has around 14.55% of district's tribal population[4] with Araku valley having 91.5% of the scheduled tribe (ST) population.[5] The high concentration of tribal population in the Vishakhapatnam district reported in the tribal sub-plan area of Paderu area are mainly distributed in the tribal mandals of Arakuvalley, Ananthagiri, Dumbriguda, Hukumpeta, Paderu, Pedabayalu, Munchingiput, Gangaraju Madugula, Chinthapalli, Gudem Kothaveedhi and Koyyuru.[6] The predominant tribes in Visakhapatnam are Bagata, Konda Dora, Nuka Dora, Kammara, Gadaba, Kotia, Khond,Mali, Porja, Valmiki, Goud, Kulia and Konda Kapu. Among these tribes, Gadaba, Porja and Khonds are particularly vulnerable tribal groups (PVTGs).[7]

The tribes of Visakhapatnam suffer from nutritional challenges like underweight greatly than their non-tribal counterparts.[8] Maternal and child undernutrition have also been significantly reported in previous studies.[8,9] Infant and child mortalities are also greatly reported in these regions, which particularly are high in PVTGs than other tribal groups of Vishakhapatnam.[9] NFHS-3 reported 54 deaths per 1000 live population in Andhra Pradesh during 2006-08.[10] Maternal mortality in the region of Araku was reportedly 400 per 100,000 live births which was more than double the national average of around 178 in the year 2010 (Special Bulletin on Maternal Mortality in

India 2010-12). During 2005-06, 72.7% of home deliveries were reported among tribal women of Andhra Pradesh.[11]

Coupled with the distinct cultural beliefs, practices and remote settlement, tribal populations often encounter difficult access to healthcare facilities. Besides, the healthcare facilities in the tribal areas are also limited which is also highlighted in the expert committee report on tribal health during 2018. The healthcare services in Araku valley till date are fragmented with a huge doctor-to-population ratio. One male reportedly must treat 4,582 persons (1:4582 persons) and one female doctor must treat 5836.2 persons (1:5836.2 persons) which are further worsened in other sub-blocks/mandals of Araku.[12] The distance of health facilities in Vishakhapatnam sub-districts varies from 5 to 20kms which also adds to the burden of tribal population accessing healthcare services.[12]

Efforts to address these healthcare access challenges through technology have been discussed and piloted by both government and non-government sector organisations. Telemedicine is one cost-effective technology-driven intervention that can be used to facilitate the provision of specialist care at patient's doorsteps reaching remote corners of India.[13] It helps overcome the challenges of inadequate infrastructure and human resources currently being experienced in rural and tribal areas.[11]

This paper presents a technology-driven healthcare model on maternal care, ASARA, piloted by Piramal Swasthya management research institute (PSMRI) in the tribal communities of 140 habitations in the Araku Valley, Andhra Pradesh. The current paper is the first part of the model of care working paper series that discusses the components of the ASARA project to highlight the impacts of the decade long efforts towards improving maternal and child care in the region.

Description of ASARA program

To build the aforementioned maternal and child health gaps, project ASARA was introduced by PSMRI in collaboration with Mc Arthur foundation in the year 2010. The project was initially implemented in 140 habitations with 34,000 population which was later scaled up to 950 habitations with 2.5 lakh population in 2020, phase-wise. The project aimed to reduce malnutrition, and bring maternal and infant mortalities to zero through free maternal and child care services by strengthening the community outreach program and specialist video consultation in collaboration with the health department and integrated child development services.

The project particularly focuses on tribal communities of Araku valley, Vishakhapatnam. The tribal communities of this area encounter challenge in accessing health services at any designated health facility. A minimum distance of 5 km has to be covered to reach the then nearest health facility as the region on one side is covered by eastern ghats which accounts for tough access. Given the challenges of providing health services in these regions, PSMRI collaborated with multiple government (Department of women and child development) and non-government stakeholders and private stakeholders (Mc Arthur foundation, society for elimination of rural poverty) to provide health services as the project was scaled in the later stages of project implementation.

Journey of ASARA program

The model was created based on a situation analysis of the Araku Valley for developing a targeted and customised intervention that was aligned with the specific problems of the area. The situational analysis included a thorough review of the health indicators and maternal mortality rate, state of health infrastructure and services, level of awareness and knowledge of the residents, assessment of connectivity within and without the targeted 140 habitations.

Initially, it was kickstarted in Araku and later extended to 6 blocks of ITDA-Integrated Tribal Development Authority Paderu division in 2018.

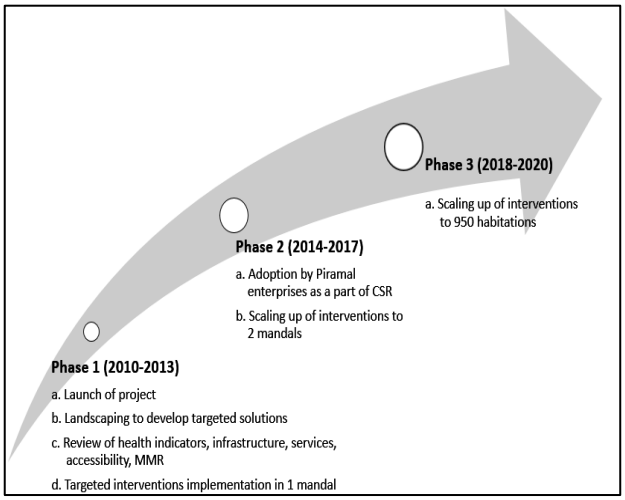

Figure 1: Phase-wise evolution of ASARA project.

METHODS

Project description

The project was initiated in the year 2010 and is ongoing.

Project ASARA has 3 components: Outreach activities, tele-medicine unit (TMU), and tele-medicine specialty centre (TSC).

Outreach activities

Auxiliary nurse midwives (ANM) and outreach workers were hired, trained and deployed by PSMRI. The team

comprising of ANM and outreach worker visited every household in every habitation of Araku valley. The team covered areas on motorcycles with road accessible and on foot at inaccessible roads ranging from 5-15 km. Household visits were fixed on a day, every month to screen the prospective mothers and to provide antenatal care.

In each visit, urine pregnancy test was administered to every woman suggesting amenorrhea to confirm pregnancy. Upon confirmation of pregnancy, the women were registered for providing antenatal care and further investigations were performed: hemoglobin estimation (by tallquist method), urine test for albumin and sugar and rapid antigen test for malaria.

TMU

The Telemedicine system (TS) consists of an interface between hardware, software and a communication channel to eventually bridge two geographical locations to exchange information and enable tele-consultancy between the two locations. TMU has 1 qualified MBBS doctor, 1 General Nursing and Midwife, GNM, 2 technicians, 1 pharmacist and TSC has 3 qualified Gynaecologists. TMU is equipped with laboratory, pharmacy and an ultrasound unit (Only at Araku Center) with an ultrasonography technician. All services including the telemedicine facilities, medicines, laboratory services and transportation to Araku TMU along with nutritional meal were provided free of cost by PSMRI.

The primary doctor, GNM, laboratory technician and pharmacist are trained in using telemedicine technology. They are also trained and re-trained by gynaecologists to update their knowledge every four months. The accredited social health activists (ASHA workers instituted by the ministry of health and family welfare, government of India) are also involved in ASARA activities for identifying pregnant women and counselling them about antenatal care.

An electronic medical record (EMR) with a unique photo identity and a unique number is generated for each pregnant mother. Each consultation transaction is appended to the record of the beneficiary thereby creating a case history for future referral purposes, a print of which is also used as the case summary when referred for delivery to the government facilities.

Activities performed at TMU AND TSC

Following registration, the GNM interacts with pregnant women and collects all relevant and detailed medical history. The doctor then examines the woman and suggests relevant investigations for the patient on the EMR and the same is transmitted to the adjoining laboratory, where the technician tracks the request. The woman is later sent to the laboratory located within the premises of the TMU for investigations and the reports are entered into the woman's EMR. When the woman comes back to the doctor, an interactive call is made to the TSC. A qualified gynecologist is available at the TSC throughout the working hours of the TMU who examines the results of the pregnant woman attending TMU.

The laboratory investigations and history of pregnant woman can be viewed by the specialist who can also interact with the pregnant woman for any required additional information. The gynaecologist after careful review of all reports and details, defines a pregnancy as 'high risk' depending on its nature. Upon confirmation of high risk, early medical intervention or referral to tertiary centre for specialised care are provided depending on the type of high risk pregnancy.

All pregnant women are counselled to make at least 4 antenatal visits during the pregnancy period and on the importance of institutional delivery. The pregnant women are guided to visit PHC/CHC to receive tetanus toxoid vaccination and iron and folic acid supplementation according to the standard national guidelines.

The pharmacist dispenses other medicines as directed by the gynaecologist. All cases are followed up till the expected date of delivery (EDD) and are referred to the nearest healthcare facility for delivery accompanied by ANM/GNM with a printed case summary. In the absence of a government vehicle (like 108 ambulance service), transportation to reach the facility is also provided by PSMRI. Followings are some of the additional interventions provided under project ASARA: Training to Dai (midwife) on the safe and hygienic delivery process, baby kits for mothers, awareness on infant and young child feeding (IYCF) practices and nutritional counselling by specialist

Identifying the major reason for home deliveries in the region, that is, failing to track EDD, pre-conception care was introduced later during 2021 as a part of ASARA program. As a part of this activity, the program identified newly married and multi-gravida women to conduct basic health check-ups. Further, necessary measures to correct identified patients with anaemia or any other high risks (bad previous history) beneficiaries were undertaken. They were provided with medications and kitchen gardens concept was introduced to prepare them for healthy pregnancy and avoid any complications. CMAM concept was piloted in G Madugula and Munchingput blocks during 2021 to address the burden of acute mal-nutrition among young children using case-finding and triage methods. Early detection of undernutrition, outpatient therapeutic program (OTP), supplementary feeding program and Interpersonal counselling and care interventions were implemented as a part of CMAM pilot.

RESULTS

ASARA project from 2011 to 2016, the model is successful in increasing institutional deliveries among

pregnant women from 18.86% to a remarkable 68%. ANM visits to pregnant women increased significantly from 44.6% to 75.06% while specialist consultations also witnessed a considerable rise from 32.8% to 78%. ASARA also helped in reducing registration of pregnancy in the third trimester from 32.06% to 10.24% while sharply increasing pregnancy registration of women within the first trimester from 18.47% to 19.95%.

By 2019, the project was successful in bringing down maternal mortality incidences in the region to zero while institutional deliveries rose to 83% at the time. The increased institutional deliveries also aided in reducing neonatal mortality, bringing to down from 37 to 10 per 100,000 live births. The region covered under ASARA, from 2017 to 2020, has not had any reported cases of maternal mortality, a significant progress for a region that accounted for maternal mortality double the national average just a decade ago.

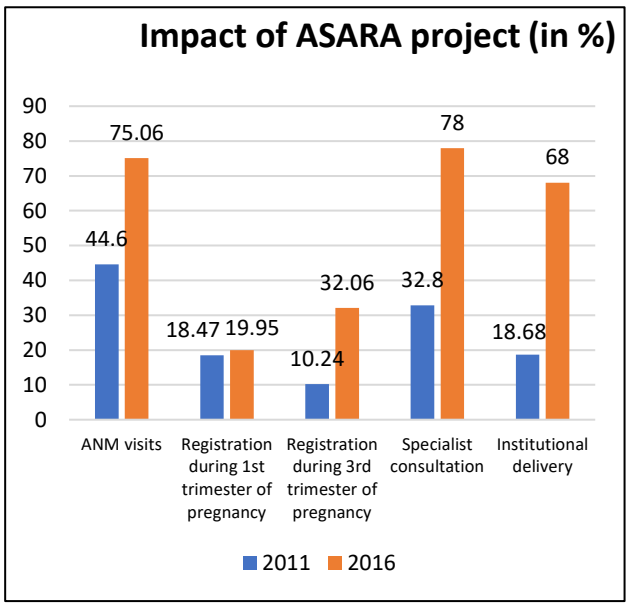

Figure 2: Impact of ASARA project in intervention areas.

CONCLUSION

The fruitful journey with the high impact of the ASARA program in the Araku Valley can be primarily attributed to its community-centric approach, tailored technology-driven interventions, and comprehensive healthcare strategies. ASARA consisted of customized interventions that effectively addressed the barriers arising from limited resources, remote settlement, and lack of accessibility to health facilities. The services of dedicated individuals with extensive knowledge of the language, culture, beliefs and practices of the people, helped built trust of community towards to the program.

ASARA model has effectively demonstrated that the challenges of accessing healthcare services among tribal and marginalised communities can be tackled through community-based, technology driven interventions. Furthermore, these interventions are tailored according to the needs and priorities of these communities which has led to the wide acceptance of program by the community. The model has the potential to be replicated and scaled for implementation to provide healthcare services to tribal and marginalised communities.

Funding: We thank Piramal Foundation for taking over the project and supporting it
Conflict of interest: None declared
Ethical approval: Not required

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Cite this article as: Babu KV, Ravi S, Turlapathi S, Bhaskar K. ASARA-A technology-driven maternal and child healthcare model of Araku. Int J Community Med Public Health 2024;11:4466-70.