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Examining the Feasibility and Acceptability of Mobile Based Interactive Voice Response System for Delivering Reproductive Health Messages in Rural India

Sumitra Dhal Samanta*, Anjum Saheen, Jagannath Behera, Sunil Mehra

Abstract

Background: Use of mobile-based technology in public health is rapidly expanding for dissemination of information and service monitoring. Present study examines the feasibility and acceptability of mobile based Interactive Voice Response System (IVRS) on delivering reproductive health information among young married women (YMW) through ASHA.

Methodology: Two Indian blocks selected for intervention due to their low reproductive health indicators. IVRS covered 220 ASHAs and around 1000 YMWs. The study analyses quantitative study among ASHA and YMW, 20 focus group discussions conducted after six months of intervention among ASHAs, YMW, pregnant women and lactating mothers. Additionally, MIS data findings also added. The data collected during 2016-2017 and analysis and manuscript writing conducted during 2018 and 2019.

Results: All ASHAs (82) interviewed revealed that IVRS enhanced their existing knowledge and work efficiency on reproductive health. They reported that families of YMW rely more on them than before, as families equally access IVRS facility for their queries. Mostly YMW (25) showed their initial hesitation, as they were not accustomed with IVRS technology before, got habituated with the support of ASHA. MIS data suggest that the call rate increased more than 6 times from its launch during 15 months intervention period. It was witnessed that ASHAs mostly opted for pregnancy & delivery section where as YMW mostly opted for pre-conception care section. It was reported that information through entertainment section had five times more listener than general information sharing section. Women narrated the ease of getting information regarding contraceptive methods, menstruation issues and care during pregnancy along with the care for children through IVRS. Nearly all the participants indicated that IVRS is of great use as it's free of cost, available all the time and easily accessible

Keywords: IVRS; M-Health, Reproductive health; Young married women; Preconception care

List of Abbreviations: IVRS: Interactive Voice Response System; YMW: Young Married Women; MIS: Management of Information System; ASHA: Female Frontline Health Worker; GoI: Government of India; RMNCH+A: Reproductive, Maternal, Newborn, Child and Adolescent Health; MDG: Millennium Development Goal; FLW: Frontline Worker; CoC: Continuum of Care; PCC: Pre Conception Care; OBC: Other Backward Clases; ANC: Antenatal care; PNC: Postnatal Care

Introduction

Access to health care services is essential for each individual. But, globally, women are deprived of accessing quality reproductive health care and there is no exception for young rural women in India [1,2]. Rural India often faces inadequate skilled and motivated healthcare provider, poor infrastructure and suitable medium to reach the young women for their reproductive needs [3]. Though in the past decade, Government of India (GoI) has introduced multiple programs for improving maternal and child health under RMNCH+A (Reproductive, Maternal, Newborn, Child and Adolescent Health) strategy, still, India missed to achieve the MDG goals by 2015 [4]. Further, lack of awareness for accessing available public health facilities is the biggest hindrance for young women [5].

In recent years use of technology become key to fight with global health burden. With the rapid growth in use of mobile technology in India [6], mobile considered as useful tool for client education and behavior change communication. In the context of shortage of qualified healthcare providers, mobile have a capacity to have an impact on community health services. Evidences suggest that capacitating the community frontline workers (FLWs) by integrating mobile-based interactive technology into the existing maternal health services can lead to significant outcomes by widening the reach to inaccessible areas [7,8]. Few systematic reviews indicate the benefits of technology thus recommended [9]. Most of studies are either piloted or intervention for a small period without scale-up, so, globally the efficacy and effectiveness of M-Health is little known. GoI emphasizes the need for leveraging and integrating mobile technologies within the existing public health framework and related technology has been tested in few states including Bihar & Jharkhand [10,11].

Use of mobile technology for strengthening continuum of care (CoC), especially for Young Married Women (YMW) is hardly found in India. Connecting women to health system is critical, due to early/child marriage, low education and poor negotiation skills. India has high global burden of maternal death as nearly 25% of the female population (15-24 years) get married before 18 years mostly belonging to economically marginalized communities. Although reproductive health of YMW is a priority area, yet feasible and effective interventions for improving reproductive health choices are still a cause of concern as there is veryfew

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evidence that shows its use in resource-limited settings. Looking into the literatures and the need of CoC approach with focus on pre-conception care (PCC) for improved maternal and child health outcomes, MAMTA Health Institute Mother and Child (MAMTA) introduced Interactive Voice Response System (IVRS), an innovative mobile application to improve knowledge and skill of ASHA-a frontline female health worker and reproductive health awareness of YMW. The main objective of paper is to examine the feasibility & acceptability of IVRS among ASHAs & YMW and improved service delivery by ASHAs.

Methodology

Study design

A quasi experiential cross sectional, mixed method design with pre-post survey was undertaken to find out the effect of intervention.

Program design

IVRS launched in 2016, for fifteen months (May 2016 to July 2017) in two blocks. Module and operational plan developed in consultation with health officials. IVRS had three segments: Frequently asked questions, Infotainment and Tips for counselling for ASHAs. Key messages included all stages relating to CoC approach starting from adolescents to till menopause. Related content, hand-outs and brochures were developed based on Indian RMNCH+A guideline. A two days training was conducted for ASHAs with pre-tested IVRS technology on use of toll free number, listening to different segments, re-play and recording feedback/queries for expert advises.

Operationalization

A toll free number was provided to ASHAs to listen the content; who in-turn delivered the counseling and referral services to YMW during their routine home visits and also making them hear on their own. Further, IVRS provided platform for ASHAs and YMW to record feedback and ask questions. The voice call recordings stored at central server and maintained in Management Information System (MIS). The indicators generated: Total call times, episode heard, average call duration, number of callers providing feedbacks, number of times query received and answer given and duration of a particular segment listened. This data was obtained regularly.

Sample Size

IVRS implementation is being carried out with 220 ASHAs, (110 from each block, Churu-Rajasthan and Purkaji-Uttar Pradesh, India). Two semi-structured, quantitative survey questionnaire, which are pre-tested and validated for data collection is used for baseline and end line data collection with 220 ASHAs and 200 YMW beneficiaries (15-24 age group). The baseline and end-line survey was conducted in May, 2016 and in August, 2017 respectively. The study used purposive sampling technique.

20 focus group discussions (group of 8-12) were conducted among 82 ASHAs, 34 YMW, 36 pregnant women and 34 lactating women. The total universe of ASHAs of two blocks were taken for project whereas, equal numbers of interested YMW were involved for study. Information gathered during both the surveys focused on exposure and utilization of IVRS, knowledge on CoC/PCC, ASHA's skill development, service delivery, its feasibility and acceptability by ASHA and YMW.

The study protocol, consent forms and questionnaires were developed by research and program team and approved by the MAMTA Ethics Review Board followed by 3 days practical training of field investigators. The interviews were conducted in regional language after taking consent from respondent.

Data Analysis:

Analysis of quantitative data was carried out on SPSS-22.0. Results demonstrated through frequency, proportions and cross-tabulation analysis. Qualitative data were analyzed manually. Data analysis and manuscript writing conducted during 2018-2019.

Results

Quantitative findings

MIS data over 15 months of IVRS intervention shows 6.3 times increase in call with total 24,267 calls. During first 6 months only 16% (3815) calls received which increased to 44% (10654) in last 6 months of the implementation period. Of all three segments of IVRS, the infotainment segment was mostly used by the listeners with over four times to that of FAQ section 4,670 and 1,074 calls respectively (Figure 1,2).

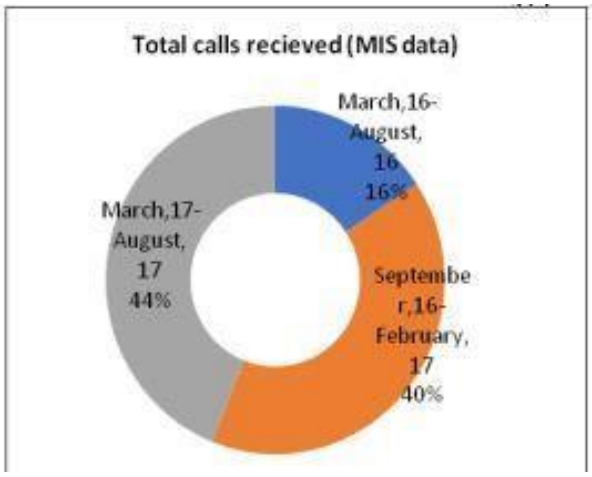

Figure 1: Total calls received.

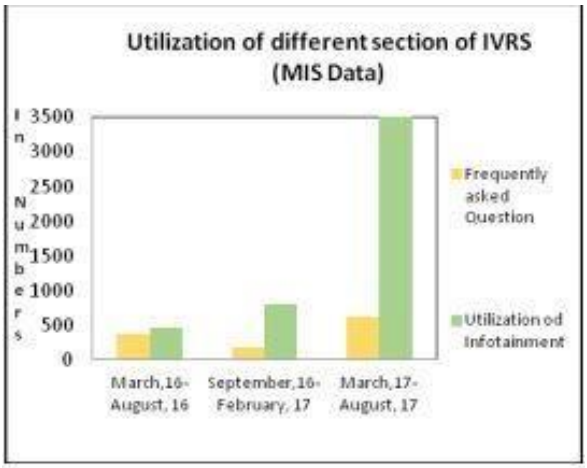

Figure 2: Utilization of different section of IVRS.

Evaluation of the study (baseline and end line) was conducted to mea-

sure the feasibility and acceptability of IVRS in the implementation area. The mean age of ASHAs was 34(+3.6) and, 22.3(+2.5) for YMW with lower limit reaching to 18 years. Educational category shows that three fourth ASHAs belongs to 6th to 10th standard. Mean age of work experience was reported 8.0 years. Majority of the YMW fall in to groups having education up to 5th standard (33.4%) and 6th-10th standard (33.2%). A larger proportion of YMW belonged to OBC-other backward classes categories (38.0%) and schedule caste (35.5%). More than two fifth of the YMW had not given any live birth (42.3%) and almost similar percent had given two live births (43.9%).

Feasibility and acceptability

Almost all ASHAs had mobile phones and they use it; out of which 79% used mobile for health purpose. All ASHAs accepted that mobile phone can be used for better dissemi-nation of healthmessages and reported that they use IVRS for better service delivery. The use of mobile phone among YMW has increased more than 20% post-baseline survey (76.8%). When asked for their view to use mobile phone for getting health messages 97.7% agreed to it and 76.4% used their mobile for such service. Nearly all (98.6%) of them knew about the mobile phone based application to access health information on IVRS. All ASHAs revealed that IVRS was beneficial to them along with YMW (98.2%). The content was simple understood. ASHAs considered this service as user friendly to common women. When asked for key thematic area of IVRS, nine tenth of ASHAs knewthem. When the educational attainment of the ASHAs was compared with the call made it was found that respondents with lesser educationallevel used IVRS more frequently than their counterpart (Figure 3).

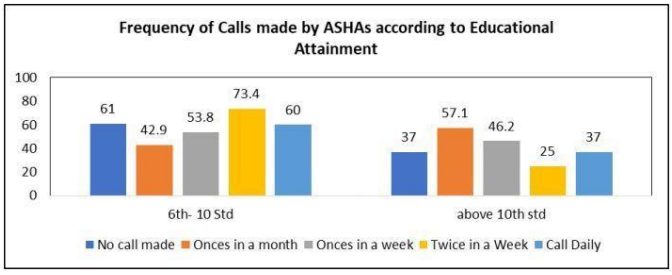

Figure 3: Frequency of calls in attainment.

ASHAs with 9-11 years of experience were found to be in 6th-10th 194 standard educational categories and called mostly twice a week (35.3%). Daily call was made highly by ASHAs with 6-8 years of experiences (25.0%) (Figure 4).

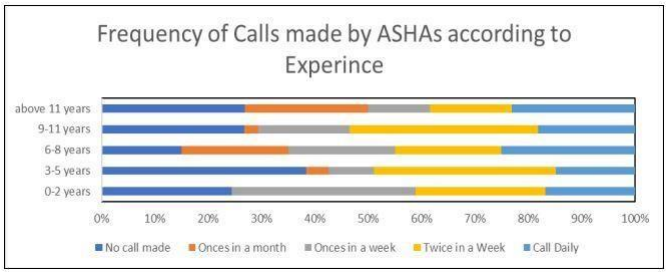

Figure 4: Frequency of calls in experince.

Looking at the call rates study found that maximum people calling daily belonging to schedule caste category; people belonging to general category called mostly twice a week; similarly, women calling once a week belonged to OBC category mostly (Figure 5).

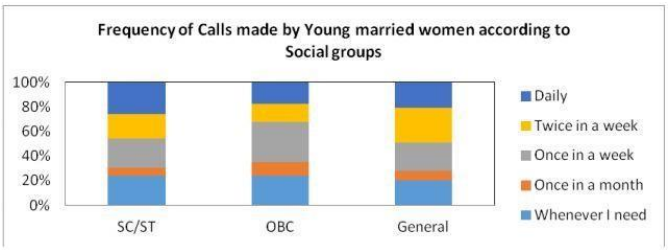

Figure 5: Frequency of calls in socialgroups.

Women calling daily mostly had informal education (36.7%). Women having educational level from 6th-10th standard called on IVRS toll free number twice a week (46.3%) (Figure 6).

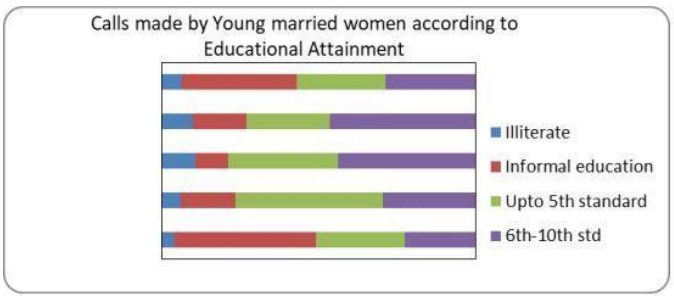

Figure 6: Calls by married women according to education attainment.

Qualitative findings

The analysis of FGD showed that majority of YMW were initially hesitant to use IVRS, as they were not accustomed with this technology before, however gradually got habituated with support of ASHAs. "Initially, listing to IVRS was scary as we did not know who was talking from other end, and then my husband and family members listen to it. Then only we understood that this is for our benefit and continued listening." (YMW women, Purkaji) "Mobile taught us on how to take care of adolescent and preconception stage, that would lead to healthy mother and child as these stages are like unbaked pot." (ASHA, Churu) "I do not have my own mobile phone but as it's a toll free number, I can listen from other's phone, they readily agreed" (YMW women, Churu) Women narrated the ease of getting information regarding contraceptive methods, menstruation issues, care during pregnancy and care for children through IVRS. Nearly all the participants indicated that IVRS is of great use as it's free of cost, available all the time and easily accessible. "know about nutrition, health care, check-ups, after delivery baby should bathed after 7 days and exclusive breast feeding for six months. Where to go when any problem arise and what to do then." (ANC Women, Purkaji) "It is important for us …we get information….at times when ASHA is not there we consult on this toll free num- ber…… they tell even the things which our family do not know." (PNC women, Churu) "We can hear it any time…. from any corner without anyone knowing about my problem…. And it's free of cost." (YMW, Purkaji))ASHAs reported about the use of IVRS by family member ofwomen. "Now male are also listening to this for their problem". (ASHA,Churu) "Have shared this toll free number with my

sister-in-law… sheis pregnant. She did not have much knowledge. I want her to know …so have shared" (PNC women, Purkaji).

Enhancement in existing Knowledge and Skill

In total 99% of ASHA revealed that their counselling and knowledge on reproductive health improved with IVRS. This helped 99% of them clarify YMW's queries in a better way than before either completely or partially. On an av- erage 94% of them revealed that IVRS was beneficial to women underreproductive group. FGDs with ASHAs revealed that IVRS enhanced their work efficiency while dealing with YMW. Prior to IVRS, 42% ofASHAs found it difficult to advise YMW on delaying first pregnancy."If I am unable to make the women understand my words, I call this no. and make them listen they can listen even when we are not there" (ASHA, Churu) "We are also benefitted when women listen to it. We also get to know the matter without going anywhere and consulting any book……" (ASHA, Purkaji) "Medical officer in charge asked me to give training to fellow frontline workers in the monthly meeting by using IVRS. I need to put less effort as this was self-explanatory" (ASHA, Churu) Among YMW, knowledge related to right age of preg-nancy increased 24.5% (65.5% vs. 90.5%). Use any method of family planning for spacing/delaying pregnancy showed rise by 8.3% (63.6% vs. 71.7%). YMW's family rely more on ASHA's suggestions than ever before hence, made their job easy "I used to tell them the same but they never listened. With this technology, now they have trust in my words as the same thing is being told there by experts." (ASHA, Purkaji) "Ear-lier my mother in law was hesitant for ANC check-ups as she thinks the pregnancy issues are normal and elders can deal with it. But with ASHA's counselling through mobile, now she allows for ANC (Women, Purkaji) "It should be continued and replicated in other blocks, should not be stopped" (ASHA, Churu). "Today I am getting benefit for my health; it should be there for my next pregnancy, younger sister and for my child when she gets pregnant" (Women, Purkaji)

Discussion

The pilot intervention on IVRS aimed to find out whether the mobile based job aid is helpful for ASHAs to improve their knowledge and disseminating information to YMW on reproductive health issues. It is also focused on whether the IVRS is feasible to intervene in hardto reach areas and how far this is accept- able among ASHAs and YMW of rural India. The findings highlight the wide reach while fulfilling its prime objective of making the technol- ogy accessible to vulnerable population of the society. More number of less educated and experienced ASHAs are frequent caller who took the help this technology in guiding women during their counseling process. Among YMW, it was observed that women with little better education accepted the technology readily than other. IVRS technol- ogy was built for ASHAs who acted as adaptors and spread this inno- vation among YMW. Empowering ASHAs and YMW on health issuesusing mobile technology was readily acceptable in the community as it's simple, easy to use, having toll free number with dynamic con- tents that can be easily adapted within the public health system. This is particularly for those sections of community where maternal health considered least important. Further, confidentiality and ease of getting unreached information independently at door step anytime were the main reasons for its acceptability among the ASHA and YMW. The in- tervention is largely successful. The significant increase in call rate by beneficiary indicates acceptance. As per ASHAs, IVRS helped them in improved service delivery, better acceptance among beneficiaries, en- hanced knowledge helped in clarifying queries better than before.

42% ASHAs hesitant to discuss on PCC and delay in first pregnancy but after using IVRS they are able to do so. On the other hand, YMW are very much comfortable in getting information for own reproductive health matter by using mobile without any cost to them and can call from anywhere and anytime. The acceptance of the IVRS is mostly due to its local language and delivery of messages through entertainer manner. Interestingly, lower caste women were frequent callers. Mostly women improved the knowledge on right age/delaying first pregnancy and spacing methods. Project also experienced that there was initial hesitation among YMW to use IVRS format and gradually they build confidence. The application bridge gaps between the health system and outreached women and able to support women with much needed reproductive health information. The community where IVRS technology was implemented is very much culturally and socially bounded with high maternal and child mortality rate to that of national average. There are very few studies available in public domain relating to the operation of mobile based IVRS and its findings addressing reproductive health for YMW by ASHAs in public health system in India. On the other hand, most of the mobile based applications are used for fitness, self-monitoring, patient survey and many are on paid basis [12,13]. In a clinical setup, IVRS may prove as cost-effective, but in a community setup like this study this can't be an out of pocket expenditure from health worker, also for rural women in a resource constraint settings, rather this only successful with Government and external support. No doubt, IVRS is promising in public health domain but study shows that this required careful selection of geography specific issue, end user and on how to evaluate its effectiveness [14]. The present paper fulfills these aspects to a great extent and found interesting results, but the scalability and sustainability is a concern with limited funds. A recent m-health assessment report strongly recommends for the intermediary role of health worker for disseminating health messages through their own phone where community members does not have access to mobile even. Further, it is envisaged that mobile based technology could be helpful for reaching universal health coverage and a combined effort from Government, telecom companies and service providers in this direction is highly essential.

Conclusion

IVRS has proved as an effective job aid for FLWs and a supportive tool for women. This is beneficiary friendly, reduces burden on FLWs, can generate evidence, so, promising. Technology could be easily implemented in larger scale due to its wide reach and acceptability. Based on results, there is a need to scale up of IVRS strategy in the difficult areas, with limited health workforce. IVRS could be utilized dynamically for various community concerns with constant resource flow which in turn empower rural community to get basic preventive and curative measures.

Declarations

Ethical considerations:

The study protocol, informed consent and assent forms and questionnaires were developed by research and program team and approved by the MAMTA Ethics Review Board.

Consent for publication:

All authors hereby declare consent for publication of this implementation research work.

Competing interest:

This is declared that there is no conflict of inter- est Funding 17 The pilot implementation project was funded by Ma- cArthur Foundation and BARR Foundation for 15 months period. No further funding received for the research work, manuscript preparation and publication.

Author's Contribution

SDS carried out the project intervention, conceptualization, literature review, drafting and revising, AS involved in statistical analysis and in- terpretation of the data, JB and SM contributed in project design and conceptualization. SDS, AS & JB involved in intervention, tool develop- ment, data acquisition and drafting of manuscript.

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