

Technology Empowerment of ASHA Workers Using E-Health Initiatives in Rural Rajasthan

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Abstract:

Introduction: Electronic health (e-health) initiatives grant the tools and knowledge to improve health care, benefiting not only patients but also healthcare professionals and institutions. **Objectives:** To empower ASHA (Accredited Social Health Activist) technically in terms of using e-health initiatives and to assess feasibility and usefulness of such initiatives; to enhance digital health literacy and to observe the effect of training and skill development of grass root level healthcare workers engaged in primary care. **Method:** A prospective observational cohort study, in which ASHA's were recruited in two selected villages of Rajasthan. They were trained to use a web-based application, developed for use on portable device (tablet) to screen, diagnose and provide health education on non-communicable diseases. In-depth interviews and group discussions were done with ASHAs to know their views about the tablet and application use. **Results:** There was 19.3%, 29.3% and 40% improvement in ASHAs' ability to measure haemoglobin, blood sugar and blood pressure, respectively and also an improvement of 86.5% in tablet and application operation was observed. This improvement in ability of ASHAs was highly significant for all above four parameters (p-value <0.001). ASHAs agreed that the app was useful and helped them connect to the people and explain things more properly. They reported the beneficiaries understood more clearly through pop-up videos which also proved beneficial in increasing compliance. **Conclusion:** Training ASHA worker in e-health technology is feasible and can assist in screening and management of non-communicable diseases.


Keywords: ASHA, E-health, Health app, Non-communicable diseases, Rural

Introduction:

As we are moving towards a digitally advanced society, we are constantly being equipped with information and communication technologies that grant us the tools and knowledge to improve healthcare, benefiting not only patients but also healthcare professionals and institutions.^[1] E-health relates to the usage of communication and

information technology within healthcare environments.^[2] It can serve as a vehicle for transforming health conditions in the developing world, particularly for those living in rural and remote areas.^[1]

India too is marching towards its excellence in the field of e-Health, we tried to contribute by developing an application (app) namely the Health

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Smart app, made with the concept of facilitation of data entry and its usage. This initiative is a way forward to empower and improve the performance of healthcare systems by linking various systems.

With the introduction of the cadre of accredited social health activists (ASHAs), who are village-based community healthcare workers and females, community healthcare lies mainly with women in rural areas in India.^[3]

Primary health care, to a great extent, depends on the involvement of women, explicitly in health education. It entitles them to aid and thereby uplift their communities by improving the health of women and their families and by priming them both as caregivers and health educators. Decision-making and cumulative reflection make women feel more entitled.^[3] Women health workers working in rural areas have shown they can improve the health status of their community if they receive encouragement to learn healthcare skills.^[4,5]

The strategic objectives of this study were to empower ASHA (Accredited Social Health Activist) technically in terms of using e-health initiatives and to assess feasibility and usefulness of such initiatives; to enhance digital health literacy and to observe the effect of training and skill development of grass root level healthcare workers engaged in primary care.

This initiative of adopting digital methods is also a step forward to save the paper and thereby preserve the environment.^[6]

Method:

The study was a prospective cohort, approved by Institutional Ethics Committee conducted after obtaining written informed consent from participants.

Two villages were identified which were hard to reach and lacked satisfactory health facilities. A total of 825 families covering 3853 people were included in the study. From each of the identified village, two ASHAs were recognized, who consented and were willing to work in the project. Study was completed in one year.

Work plan of ASHA: Authors developed a training module for ASHA, who were the key worker for this project. Training was given to them on different aspects for two weeks. In the subsequent process researchers made them friendly with Health Smart Android Application. The cardinal features were GPS, Skype and 3G enabled. This helped in live data accumulation and visibility of data at central location. Distinctive characteristic of the application was automatic transfer of data and formation of report at central location.

She was acquainted with different forms of the questionnaire and the entries to be made on the tablet itself. She was trained through training modules and real time demonstrations to take different anthropometric measurements like height, weight; blood pressure through digital blood pressure instrument, blood sugar through glucometer, hemoglobin estimation through color scale. She was trained to screen the diseases in their early stage and provide education and awareness about them.

Written consent was taken from the head of all the families followed by recruitment of all the villagers along with elaborative baseline evaluation by the app. Collection of baseline data by ASHAs was done in 3 months after which follow-up was done monthly for 8 months. Periodic and standardized collection of data was done by ASHAs which helped them to track modification in lifestyle, presence of any risk factor and screening of non communicable diseases. Health education was provided to participants through pop-up videos in the Model based application which would spring up the instant it detects any health risk e.g. smoking, alcoholism, high risk pregnancy, incomplete immunization, high BMI (obesity), high blood pressure, high blood sugar (diabetes), and for those diagnosed anaemic or known cases of hypertension, diabetes or anaemia, also related to family planning and sanitation. Dismissal of misbeliefs was done by the ASHAs. Participants were enlightened about the necessity of

treatment compliance which was further tracked by the ASHAs.

ASHA made referral of patients to first referral unit. The participants were provided with visits by specialist monthly in the village itself. ASHAs were trained to track the newly diagnosed patients for treatment compliance as well as follow up. For all anaemic subjects above 6 month of age, 3 month of Iron Folic Acid was given and their haemoglobin estimation was done after 1 month of completion of the course to see the effect. ASHAs reported any new event in the family e.g. birth, morbidity or mortality on a daily basis. Coordinating team used to supervise and monitor ASHA weekly.

In order to uplift ASHA financially an honorarium was paid to them per family.

The ASHAs were regularly supervised and trained for the work they were assigned. Their performance was being checked randomly, regularly every month in terms of how they were operating the tablets and application, doing haemoglobin estimation and measuring blood pressure and blood sugar levels.

Five sessions of 30 minutes each were conducted consisting of one in-depth interview with each ASHA and one group discussion in involving all

four ASHAs to know their views about the tablet and application use, what were the difficulties they faced and advantages they felt while using it. Also, how it affected their working and outcome was inquired during these discussions.

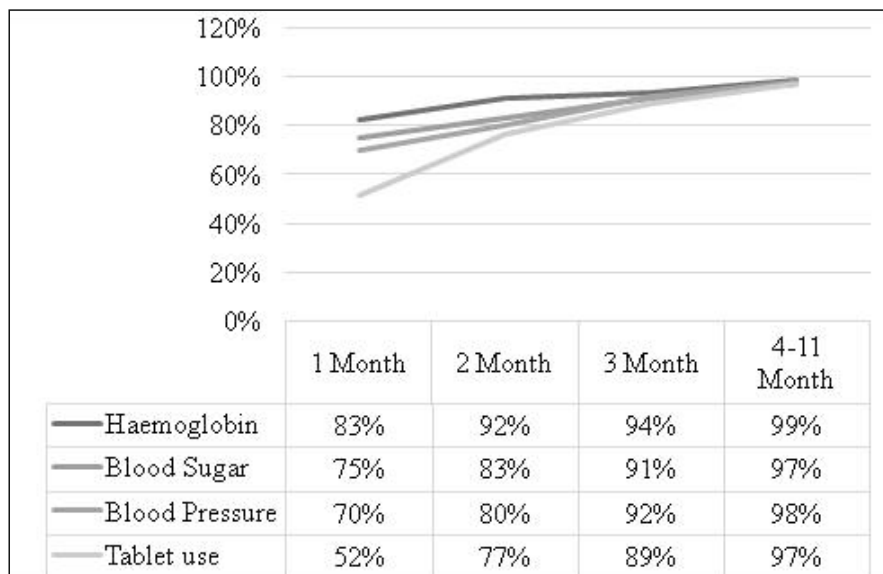
Statistical analysis: MS Excel was used for analysis. Quantitative data was entered in the form of percentage. Test for statistical significance was applied. A p-value of 0.05 was regarded as significant and <0.001 was regarded as highly significant. Thematic analysis was done for qualitative data.

Results:

The results of the study were classified as quantitative and qualitative.

In order to create technology empowered ASHA workers, authors trained, retrained and monitored them. Performance of each ASHA was observed by the investigators at each point of time ,i.e., at the end of 1st, 2nd, 3rd and 11th month and every parameter was observed randomly 25 times for each ASHA, making it to 100 observations for each parameter at each point of time, in terms of haemoglobin (Hb) estimation by Hb color scale, blood sugar estimation by glucometer, blood pressure estimation by digital BP instrument and tablet usage for survey in form of filling the entries, increasing awareness among

Figure 1 : Technical Empowerment of ASHA Workers between First and Eleventh Month



surveyed population through videos on e-health application.

The technology empowerment of ASHAs could be visibly seen between first and eleventh month. The ASHA were checked for their ability to perform above mentioned tasks. In the first month only 83% (83/100) times ASHAs were able to measure and read haemoglobin level correctly, 75% (75/100) times could measure blood sugar levels, 70% (70/100) times could measure blood pressure and 52% (52/100) times could operate the tablet correctly using the installed application. By the end that is eleventh month, 99%,97% , 98% and 97% ASHAs were capable of measuring haemoglobin, blood sugar, blood pressure and operating the tablet and application correctly, respectively. Considering feasibility authors measured 100 observations in total(25 for each ASHA) for each parameter at each point of time. (Figure 1)

Cochran-Q test was applied to detect change in the level of technological empowerment of ASHAs over time duration that is first to eleventh month, regarding the four parameters that are haemoglobin, blood sugar and blood pressure measurement, as well as tablet and Application use. According to which there was highly significant change for all the abovementioned parameters (p value <0.001).

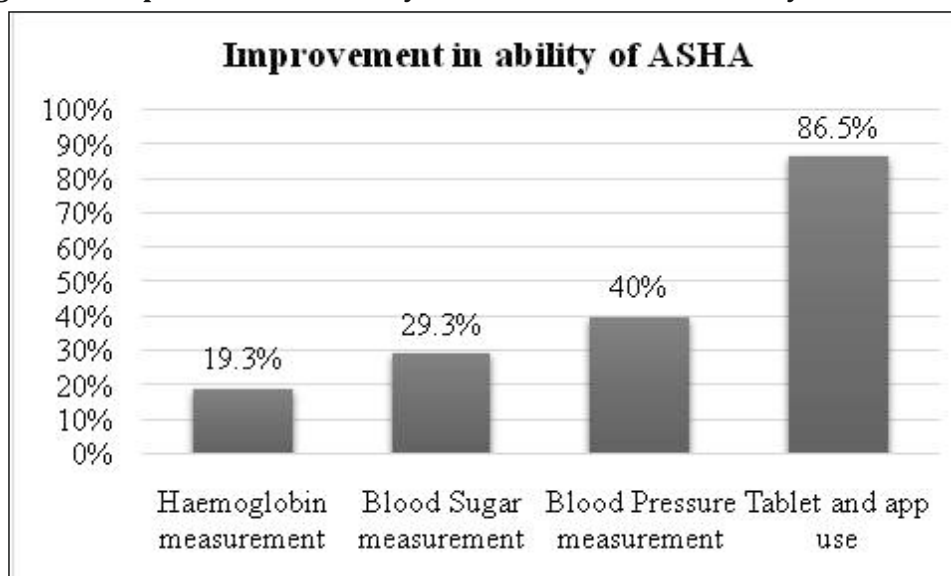
This improvement in the ability of ASHAs is also reflective in terms of percentage improvement from first to end day. There was 19.3%improvement in their ability to measure haemoglobin,29.3% and 40 % improvement in measuring blood sugar and blood pressure respectively. An improvement of 86.5% in tablet and application operation was also observed. (Figure 2)

The interventions provided by ASHAs lead to increased coverage of health services in both the villages. All ASHAs were found to possess sufficient competency to use the application. None of the ASHA stopped using the application on tablet throughout the project.

ASHAs were given monthly honorarium as per the number of families surveyed and follow up of the beneficiaries conducted by them. This helped in boosting them up to conduct their work and be a part of this study throughout the study period. Along with this it also empowered them financially.

Qualitative results were reported on the basis of interviews conducted with the ASHAs .All the four ASHAs agreed, “The application was useful for them and helped them connect to the people and explain things more properly”. The ASHAs reported, “The beneficiaries understood more clearly through pop-

Figure 2 : Improvement in Ability of ASHA Observed From Day One to End Day



up videos". This also proved beneficial in increasing compliance towards the advice provided by the ASHA regarding management of their health condition. The beneficiaries were found to seek care and follow advice from ASHAs. This proves increase of confidence in ASHAs by the beneficiaries. Follow-ups were made more systematic and regular. The application had a feature of reminder about tasks to be performed on due dates which lead to streamlining of work and helped ASHAs. They consented "The application made us more punctual in regards of the tasks by giving us reminders through messages on application." ASHAs appreciated "The frequent training, retraining, supervision and monitoring provided by the team were very helpful." They reported "It not only enhanced our knowledge but also helped us gain confidence."

Discussion:

The current study has stressed the utility of e-health by grassroot health care workers in rural India along with focus on women empowerment, technology upgradation and a step towards environment conservation through saving paper.

The question that how empowerment of grassroot women is to be affected, has always been a point of debate in our country. The quantity and quality of womens development and equality has been talked about since a very long time. There has always been a general agreement for the need of empowerment of grassroot women, especially in rural India such need is felt more acutely.^[3]

Digital technology has been found to be better for the training and supervision of community health workers and helping health care delivery in low and middle income countries.^[7-10] Recent researchers show digital technology can increase efficiency in training, communication and coverage of health services by health workers.^[7-9]

Similar to of current study results, other studies have also reported increased acceptability of e-health interventions among the community health workers.^[7,11-15]

In the current study, all the ASHAs appreciated the frequent training by the team. However, it was observed in some other studies that a few ASHAs did not appreciate the same and said that it consumed a lot of their time and caused hurdle in their routine tasks.^[9] Muke SS et al in their respective studies reported participants to have low engagement with the training content but when additional learning activities (like case vignettes and quizzes) were included ASHAs appeared more engaged.^[7] Although the importance of training of ASHAs has been reflected upon in various studies also.^[16]

There were a few studies in which in spite of agreeing to use digital technology, the community health workers actually did not use them. This may be due to absence of encouragement by the study team.^[12] In agreement to of this study results, a systematic review along with a number of other studies observed digital platforms to help health care workers to follow treatment protocols leading to increase in outcome and satisfaction of the patients.^[7,17-20]

The choice of correct device considering battery life, network and internet connectivity are also to be emphasized upon.^[7,10,13] In this study internet connectivity was an issue in the villages initially so authors shifted to another internet source which had better connectivity in those villages.

Limitations:

In this study only two villages and their ASHAs were covered. Similar types of initiatives in other rural as well as urban areas are call of the time.

Conclusion:

This study concludes that capacity building and digital empowerment benefits ASHA, the grass root level healthcare workers engaged in primary care in rural India. It proves feasibility and usefulness of digital technology. It can provide a step towards empowering women with technology, expanding new horizons of their capabilities and contributing a bit towards their financial growth too. Apart from

this, it also emphasises towards paper preservation thereby leading to environment conservation by moving towards digitally advanced society.

Recommendation:

Primary health workers should be technically empowered with special focus on digital technology which will uplift their capabilities as well as help serve the community better.

Declaration:

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Conflict of Interest: Nil

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