Original Article

Overview of e-Health initiatives in Rajasthan: An exploratory study

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Abstract

Background: Government of Rajasthan has undertaken a series of e-Health initiatives, especially under various programs of National Health Mission in the past few years. There is a paucity of studies which document and provide appraisal of these initiatives in Rajasthan. **Aim:** To document ongoing e-Health Initiatives based on technologies and approaches used, coverage by the region and population, services provided and scope. **Materials and Methods:** Primary data collection in form of key-informant interviews while secondary data collection in form of internet-based search of peer and non-peer reviewed literature was conducted to achieve the study objectives. Appropriate documents, records, and reports were reviewed to ensure that all necessary information was obtained. **Results:** A total of 13 e-Health initiatives were included in the study. The e-Health programs were classified with the use of WHO's classification of Digital Health Interventions v1.0. Most of the initiatives perceived in the study were found to be beneficial to the community, covering the entire population targeted. Supporting agencies, technologies used, and challenges faced during the implementation were identified and documented. Lack of trained manpower, technical and software glitches and deficiency of awareness activities were few obstacles that were found consistent across all user groups. **Conclusions:** The overview from this study augmented the knowledge about further scopes and sustainability of these initiatives. Deploying dedicated professionals may improve the functioning of these initiatives. Since e-Health interventions significantly influence healthcare systems, further scale-up of such studies with appropriate evaluation should be planned to guide policy decisions.

Keywords: Digital health Intervention, e-health initiatives, information and communication technology, programmes, Rajasthan

Introduction

WHO defines e-Health as the use of information and communication technologies for health. In broader sense, e-Health is about improving the flow of information through electronic means to support the delivery of healthcare services and the management of health system. The primary healthcare providers are repeatedly urged to adopt new and innovative ways of working through incorporation of e-Health and such initiatives encompass a diverse set of informatics tools and processes that are designed with the view of improving public health and primary health care.[1-3]

e-Health is broadly demarcated as the use of information and communication technology (ICT) in health system. Ministry of Health and Family Welfare (MoHFW), Government of India (GoI) has started many e-health initiatives using ICT for improving efficiency and effectiveness of the public health care system. The e-Health initiatives have a vision to deliver better health outcomes in term of access, quality, affordability,

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lowering of disease burden, and efficient monitoring of health entitlements of citizens.[4]

The Government of Rajasthan (GoR) has undertaken a series of such e-Health initiatives especially under various programmes of National Health Mission (NHM) in the past few years. However, there is a paucity of study and documents that can comprehensively provide an appraisal of these initiatives in Rajasthan. Therefore, this exploratory study was conducted as first of its kind to document ongoing e-Health initiatives in Rajasthan based on technologies and approaches used, and provide an understanding of success, challenges, services provided, scope and coverage by the region and population.

Materials and Methods

Study Design: This is an exploratory study to provide an overview of e-Health Initiatives in Rajasthan in context to their coverage, technologies used, services provided, their scope and potential challenges.

Inclusion Criteria: Currently ongoing initiatives by the GoR, under NHM that comply with the definition of e-Health operational as on December 2019.

Data Collection: This study focuses on gathering important information regarding the status of e-Health initiatives across Rajasthan region under the National Health Mission. The study was guided by WHO methodology for performing an assessment of e-health initiatives or programs.[5]

After due permissions from the Institutional Ethical Committee (IEC) of AIIMS Jodhpur, key informants were identified as those directly involved with the functioning of the e-initiatives namely, data entry operators, pharmacists, laboratory technicians, inventory managers and nodal officers, along with health worker beneficiaries such as ASHA workers and ambulance operators. The primary data was collected using telephone and face to face interviews of these key informants, while secondary data was gathered using internet-based search of peer and non-peer reviewed literature. Because of the paucity of available literature, the search was further extended to online portals for e-Health, newspaper articles, profit and not-for-profit organizations' websites, relevant government documents, server-based records of the initiatives and available reports to ensure that all necessary information was gathered.

The e-Health programmes were classified with the use of WHO's classification of Digital Health Interventions v1.0[6] which categorizes different ways in which digital and mobile technologies into the following groups based on the targeted primary user:

1. Interventions for clients
2. Interventions for healthcare providers
3. Interventions for health system or resource managers
4. Interventions for data services.

The data gathered was consolidated, examined for relevance and then categorized into specific areas of e-health implementation program. It was then summarized to obtain the study objectives.

Results

A total of 18 such initiatives were found to be currently operational under the GoR, out of which 13 were included in the study considering the inclusion criteria.[7]

Based on the target primary user, OJAS was found to fall under Client oriented interventions for Client Financial Transactions (1.7). Four initiatives fell under Healthcare providers oriented interventions for Client Health Records (2.2) (e-Sushrut and PCTS), Telemedicine (2.4) (Telemedicine services project), Laboratory and Diagnostic Imaging Management (2.10) (MNJY). Seven initiatives fell under Health system managers oriented interventions for Human Resource Management (3.1) (CHRIS, IMPACT and ASHA Soft), Supply Chain Management (3.2) (MNDY) Health Financing (3.5) (ASHA Soft, IASPMS and BSBY) and Equipment and Asset Management (3.6) (e-Upkaran). ECTS fell under Data services oriented intervention for Data Collection, Management and Use (4.1) [Table 1].

Further, the programmes covered a large cohort of population ranging from pregnant females and female child (OJAS, PCTS) and bhamashah holders for financial aids, to health department employees for work and performance tracking and salaries/incentives (ASHA Soft, CHRIS). Programmes were deployed for inventory management and equipment management (MNDY, MNJY e-upkaran) along with monitoring and surveillance purposes (IMPACT, ECTS) and service provision (MNJY, IASPMS). (Coverage, technologies, services and implementing agencies summarized in Table 2).

Other e-Health programmes such as Family Planning – Logistics Management Information System (FP-LMIS), NIKSHAY, Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA), and Non-Communicable Diseases programme (NCD) launched by the Central Government are also being implemented by the Rajasthan State Government, but do not fulfil the inclusion criteria for this study.

In addition, to get fairly comprehensive details of the scope and challenges of e-Health initiatives and to cover all the potential aspects, interviews were conducted with relevant key stakeholders who were engaged in e-Health programs at various level and capacity. Categorization and charting of right stakeholders as managers/contributors and end users/consumers was done on the basis of their ability to influence the program.

Clients

OJAS (1.7-Client Financial Transactions) is included in this group.

General Perspective: The perspective was positive among the stakeholders with a view that the programme was *"running*

Table 1: Classification of the various ongoing e-Health initiatives in Rajasthan based on WHO classification of Digital Health Interventions v1.0

Group	Program/System	Program Priorities	System Category
1.0 Clients	OJAS Online JSY And Shubhlaxmi Payment System	-Ensure seamless and timely online payments to JSY and Shubhlaxmi Yojana beneficiaries. -Monitor performance of each delivery (including female child every day/month.[8]	1.7 Client Financial Transactions
2.0 Healthcare Providers	e-Sushrut*(HMIS) Arogya Online Health Management and Information System	-Computerisation of OPD Registration, Emergency Registration, IPD Registration -IPD Management, Cash Collection, lab Management, Cash Collection, Transportation and User Management -Computerisation of Clinical Modules for better monitoring, management and decision making -Management of Electronic Health Records of patients (using unique CR No.) to support big data analytics for health outcomes and decision support system.[9]	2.2 Client Health Records
	PCTS (HMIS) Pregnancy, Child Tracking and Health Services Management System Software	-Facilitate an integrated system for HMIS and Pregnant women and child tracking -Health Surveillance -Monitoring of Immunisation, Institutional delivery -Identification of cases of sterilisation -Online directory and management of health institutions -SMS alerts to citizens and health workers (Swasthya Sandesh Seva).[10]	2.2 Client Health Records
	Telemedicine Services Project in Rajasthan	-Provision of specialist healthcare in rural and remote areas -Healthcare in emergency situations when patient movement is undesirable or unfeasible -Elimination of distance barrier and better access to quality health -Share best practices and capacity building of doctors.[11]	2.4 Telemedicine
	MNJY*(e-Aushadhi) Mukhyamantri Nishulk Jaanch Yojana	-Strengthen existing lab and diagnostic facilities and provide the essential diagnostic services free of cost to all patients visiting government hospitals -Meet gaps and equip quality diagnostic services at various levels of healthcare.[12]	2.10 Laboratory and Diagnostic Imaging Management
3.0 Health system managers	CHRIS Computerized Human Resource Information System	-Integrated streamlined system to keep the employee data and manage data about movement of human resources in the organisation.[13]	3.1 Human Resource Management
	IMPACT (HMIS) Integrated System for Monitoring of PCPNDT ACT	-Tracking individual cases of ultra-sonographies undertaken at any health institution (government or private) to strengthen the implementation of PCPNDT Act.[14]	3.1 Human Resource Management
	ASHA-Soft	-Online payment to ASHA directly to their bank accounts -Capture beneficiary wise details of services given by ASHA to community -Generate reports to monitor program progress.[15]	3.1 Human Resource Management 3.5 Health Financing
	MNDY*(e-Aushadhi) Mukhyamantri Nishulk Dava Yojana	-Manage drug inventory through e-aushadhi at public healthcare facilities.[16]	3.2 Supply Chain Management
	IASPMS Integrated Ambulance Service Payment Monitoring System	-Monitoring invoices. payments, penalties under "Dial-An-Ambulance Service Project" -Better delivery of ambulance services through 104, 108 and base ambulances -Reduction in response time -Computerisation of payment and report modules for better monitoring, management, planning and decision making.[17]	3.5 Health Financing
	BSBY Bhamashah Swasth Bima Yojna	-Cashless facility to IPD patients of families identified under National Food Security Act -Provide financial security against illness by avoiding out of pocket expenditure, thus improve the health status of the state -Create a data base which could be used to make policy level changes in Healthcare.[18]	3.5 Health Financing
	e-Upkaran	-Effective centralised inventory management system to improve access to government facilities -Know status of equipment/instrument on given point of time thus reducing downtime -Rational use of unused assets -Ascertain demand of new equipment and instruments.[19]	3.6 Equipment and Asset Management
4.0 Data services	ECTS Eligible Couple Tracking System	-Track and manage data of eligible couples in reproductive age group.[20]	4.1 Data Collection, Management and Use

*MNDY and MNJY programmes running under e-Aushadhi have been classified into two different groups based on the primary target user . *e-Sushrut Arogya Online Health Management and Information System, IMPACT and PCTS together constitute the Health Management & Information System (HMIS) of the state and have been accordingly classified into different groups based on primary target user

successfully" and *"adequately covering all three programmes under this initiative"*. Tracking the Janani Suraksha Yojana (JSY), Rajshree Yojana and Shubhlaxmi Yojana (SLY) beneficiaries and payments have become much easier with this software.

Table 2: Ongoing e-Health programmes of Rajasthan with their coverage, population catered, technologies used and services provided

System Category	e-Health Programs	Coverage by region and population	Technology used and services provided
1.7	Online JSY And Shubhlaxmi Payment System (OJAS)	Pregnant women, parents of female child, female children born by institutional deliveries at CHC, SDH and DH.[8]	-Seamless and transparent payments to beneficiaries of JSY, Rajshree Yojna & Shubhlaxmi Yojana. -Identification of gaps, needs assessment for betterment of facilities.[8] Agencies: NHM and NIC Rajasthan Software Version: 7.1.2.19
2.2	e-Sushrut Arogya Online Health Management and Information System	62 registered hospitals and over 2000 bhamashah holder registrations with a data of nearly 7.5 crore OPD and 62 lakh IPD patients.[21]	-Electronic management of health information to facilitate transition of paper-based clinical record keeping to electronic means for better information exchange. -Streamlining workflow operations, creating platform for information exchange, end-to-end supply chain management, enhancing operational flexibility and enhancing quality care for the patients.[22] Agency: DMHFW, GoR and CDAC, Noida Software Version: 1.0
2.2	Pregnancy, Child Tracking & Health Services Management System (PCTS)	Pregnant women and infants (children up to 12 months of age), for ANC-PNC check-ups and immunization monitoring.[10]	-Online software for data maintenance to integrate HMIS and Pregnant woman and child tracking from 13,000+ government health institutions in state. -Health surveillance, monitoring of immunization program and institutional deliveries and identification of cases of sterilization and SMS alerts "*Swasthya Sandesh Seva*". -Reporting of live births, mortality, immunization, sterilization, missing deliveries and ANC & PNC services.[10] Agencies: NIC, NHM and DMHFW, Jaipur Software Version: 10.1.2.19
2.4	Telemedicine Services Project in Rajasthan	Patients visiting healthcare facilities in rural and remote areas along with rural practitioners.[11]	-Implemented at 100 remote sites: DH (30), SDH (17), SH (4) and CHC (49) and One Central Site (Jaipur) -To improving patients' clinical health status via electronic communication and technology, where there is limited availability of specialist doctors (Ob-gyn, Oncologist, Gastroenterologist, Skin & VD, Orthopedician, Cardiologist, Urologist, Endocrinologist, Paediatrician, Neurologist, Nephrologist and PMR). -Real-time counselling, remote medical procedures and examinations via video conferencing. -Emergency management and capacity building of doctors.[11] Agencies: NHM and DMHFW, Jaipur Software Version: Not Applicable
2.10	Mukhya Mantri Nishulk Jaanch Yojana (MNJY)	Ensuring seamless availability of lab facilities for patients visiting public healthcare facilities.[12]	-Availability of free basic diagnostic services at public healthcare facilities.[23] Agencies: RMSC Rajasthan and CDAC Noida Software Version: 2.0
3.1	Computerized Human Resource Information System (CHRIS)	Employees of Health and related departments.[24]	-Human resource management, generation of salary slip, Employ directory.[24] Agencies: NHM and DMHFW Jaipur Software Version (mobile app): 1.0.0.3
3.1	Integrated System for Monitoring of PCPNDT ACT (IMPACT)	Pregnant females, to reduce female feticide. Government, for creating policies regarding skewed gender ratio.[14]	-Monitoring of sonography under PCPNDT Act to eliminate sex determination, digital maintenance of data.[14] Agencies: NHM, DMHFW, Jaipur Software Version: 1.0.4.14
3.1 3.5	ASHA Soft	Rajasthan and More than 48,000 ASHAs.[15]	-Seamless and Transparent payment to ASHAs, Verification of ASHA claim, online data entry, generation of reports.[25] Agencies: NIC Rajasthan, Bank of Baroda Software Version: 8.1.6.19
3.2	Mukhya Mantri Nishulk Dava Yojana (MNDY)	Patients visiting healthcare facilities, to ensure unhindered supply of essential medicines.[22]	-Management of stocks and supply of various drugs, sutures and surgical items to district drug warehouses and medical institutes.[26,27] Agencies: RMSC Rajasthan and CDAC Noida Software Version: 2.0
3.5	Integrated Ambulance Services Payment Monitoring System (IASPMS)	Service providers of 108 ambulances, 104 Janani Express and Base Ambulances.[17]	-Monitor online payments, invoices, & penalties to ambulance service providers. -Reduction in response time and enhancement of quality during patient transportation.[17] Agencies: NHM, DMHFW, Jaipur Software Version: Not Available

Contd...

Table 2: Contd...

System Category	e-Health Programs	Coverage by region and population	Technology used and services provided
3.5	Bhamashah Swasthya Beema Yojana (BSBY)	Patients holding Bhamashah card and registered under NFSA database.[28]	-Cashless payments up to INR 3 lakh, for treatment of registered beneficiaries at all government healthcare institutions and 774 empaneled private hospitals for 1,401 diseases.[28] -The online software can be accessed through Emitra SSO Portal→BSBY app.[29] Agencies: Rajasthan State Health Assurance Agency & DMHFW, Jaipur Software Version: 13.2
3.6	e-Upkaran	Patients visiting healthcare facilities up to PHC level for diagnostic and investigatory services. 2,971 healthcare facilities (PHC, CHC, DH).[19]	-Centralized monitoring, tracking, repair and maintenance of bio-medical equipment and instruments -Reduction in duplication of resources and break-down of services ensuring unhindered availability of services.[19,30] Agencies: CDAC Noida Software Version: 2.0
4.1	Eligible Couple Tracking System (ECTS)	Married couple between age group of 15-49 years (excluding unmarried, widowed and divorced individuals).[20]	-Web based software in developing phase (data collection phase at root level) to track and manage data of eligible couples in reproductive age group. -10% of the total eligible population to be considered and recorded as sample size. -Future objectives include family planning and vaccination tracking.[20] Agencies: DMHFW and NIC, Jaipur Software version: 5.0.7.17

Further continuation/Scope: All the stakeholders believed that the programmes should be definitely continued since they were facing many technically problems, they needed *"some flexibility for the process of payment and other actions."*

Challenges: Some challenges that were recorded during the interview were lack of technically expert professionals at district levels, lack of manpower at ground level and technical difficulties while using the software:

"We need a technically expert person at district level because we are facing many issues in managing district level data in OJAS. The resolution of complains is time consuming from the state level experts. Another challenge is lack of dedicated work force at ground level since health facilities are overcrowded with patients."

Healthcare providers

e-Sushrut Arogya Online Health Management and Information System, PCTS (2.2-Client Health Records), Telemedicine Services Project (2.4-Telemedicine) and MNJY (2.10-Laboratory and Diagnostic Imaging Management) are included in this group.

General Perspective: General perspective about most of the program was good among the stakeholders. While e-Sushrut Arogya Online Health Management and Information System was found in the process of implementation and on its way of achieving the planned objectives, PCTS, Telemedicine, and MNJY were found to be well ahead and working seamlessly *"as a successful program in all over Rajasthan"* during the interviews.

"Being part of HMIS, not much objectives have yet been achieved by e-Sushrut Arogya online in record maintenance of OPD data including OPD ticket generation, number of OPD, disease wise data etc., since it is implemented in only a few healthcare facilities."

"PCTS is a master software linked to all payment portals such as ASHA Soft and OJAS, working seamlessly since more than past 10 years. Since 2008, data is recorded at institute level and then data updated to district level every month on 10th. The data from PCTS is then utilized by the state for the OJAS payments. This program also facilitates the line listing of maternal and child health services."

"We have achieved mostly all objectives and restricted the unnecessary referral of cases. Telemedicine project is benefitting in three aspects: economic, time saving, and improving the health status of community. This program is very helpful for the rural community."

Further continuation/Scope: The future continuation of these programmes was deemed to be highly beneficial to the community, as it minimizes the out-of-pocket expenditure of the beneficiaries:

"Rural community at CHC level often has no need to go to higher healthcare facility for the specialized opinion because of Telemedicine. We have more than 500 medicine at CHC level and in case prescribed medicine is not available, we arrange or raise demand to Rajasthan Medical Services Corporation Limited (RMSC) for them."

Though it was mentioned that e-Sushrut Arogya online HMIS "*should be continued and implemented in all public healthcare facilities"* for a widespread coverage and better data maintenance.

Challenges: Server errors and lack of dedicated manpower were a common challenge observed in all the programmes but these issues are more prominent in PCTS as error in data entry causes subsequent errors or delays in payments to the beneficiaries.

"There are 2 types of challenges in PCTS, server down and lack of manpower for work overload, leading to inaccurate data entry. These types of common errors cause payment problems to beneficiaries."

"Telemedicine program faces 3 kinds of challenges. Doctors or specialist consultants do not have much time due to overcrowded OPD/IPD services and lack of dedicated staff, network and connectivity issues in the rural area and lack of periodical skilled training, and community not being aware about this program due to lake of promotional activity by the government."

"MNJY has no particular challenges, but one we repeatedly face is the lack of Manpower"

Health system managers

CHRIS, IMPACT (3.1-Human Resource Management), ASHA Soft (3.1-Human Resource Management and 3.5-Health Financing), MNDY (3.2-Supply Chain Management), IASPMS, BSBY (3.5-Health Financing) and e-Upkaran (3.6-Equipment and Asset Management) are included in this group.

General Perspective: Overall, a positive perspective amongst stakeholders regarding all the programmes was recorded:

"IMPACT conveniently keeps record of all pregnant women and making it easy to take follow-up, including delivery, infant health and immunization status.

"It has become easy to make payments to ASHA for their work and easier to track their work records with the help of ASHA Soft."

"MNDY is a supply chain system and maintains all records of patient diagnosis, prescription and quantity of medicine available of all healthcare facilities."

"Currently IASPMS program is running successfully. Under this program, 3 types Ambulance services are being provided for the community: 108 for General Patients; 104 for Maternal and Child Health; and Base ambulance - available at the healthcare facility."

"BSBY is Ongoing successfully all over the state due to awareness activities, IEC, poster and other activities."

"With e-Upkaran, it is now easy to maintain and manage equipment and instruments, and raise complaints in case of equipment breakdown thus reducing the downtime."

Further continuation/Scope: Perception about further of all the programmes was positive among the stakeholders since the programmes are significantly improving the health data maintenance, employee data management, drug availability and reducing equipment downtime, thus aiding in better health outcomes while minimizing out-of-pocket expenses.

"The e-initiatives are beneficial to the community, responsible for betterment of health, providing timely emergency services and reducing out-of-pocket expenditures of people."

Challenges: Major challenges included lack of trained manpower, demotivation because of salaries not matching the workload and reporting formats that are difficult to comprehend.

"The CHRIS software maintains all the records of medical, paramedical, and NHM staff, but the report is not available in usable format. Reports are not regularly updated and lack comprehensiveness and completeness."

"We have too much crowd of OPD patients and Data Entry Operators are demotivated because of low salary for their work which results in incomplete data entry and errors."

Technical issues in BSBY were those of non-registration in NFSA resulting in rejection of claims and fraudulent claims being reported repeatedly. These are expected to be *"resolved in subsequent software upgrades"*. Telemedicine staff faced issues of *"poor network availability"* in rural areas and lack of awareness amongst rural communities due to *"lack of IEC and awareness activities"*, as well as unavailability of specialized doctors as *"they are overworked to give time for video conferencing."*

"We need a trained operator at district level and healthcare facility level for e-Upkaran software. Because there are so many e-Health programs at the same time, we are not able to manage all programs."

"We require a Data analysist from IT sector who can manage all data at district level."

"Server down and network issues are major problems in IASPMS. The Base ambulances are not in use due to lack of manpower. Larger sized ambulances are needed in rural areas of western Rajasthan due to poor connectivity via roads."

Data operators using ASHA Soft listed certain technical difficulties, such as difficulty in updating data when an ASHA shifted to another Anganwadi Centre (AGW):

"When an ASHA gets transferred to another Anganwadi Centre, revision of details take time from central servers, as a result, work done by the ASHA is not updated on ASHA Soft. This results in inaccuracy while making payment."

The interviewees additionally enlisted few issues regarding payment rejection, reporting, and data verification in ASHA Soft, such as:

"Payment Rejection is difficult to track and a separate listing is needed where all rejected payments can be seen."

"All ASHAs reports are not available in one place; they have to be obtained from different tabs."

"Data verification reminders keep popping up even after comments have been placed."

Data services

ECTS (4.1-Data Collection, Management and Use) is included in this group.

General Perspective: This group consists of a software still in its developmental stages – ECTS, gathering data from root level. General perception regarding ECTS held a mixed response due to frequent technical issues encountered because of its developmental phases:

"Under ECTS program, eligible couples (married couples, between 15 and 49 years aged) are line listed. This program is under process right now and we are collecting data (10% population of district) from the root level."

Further continuation/Scope: ECTS which is looked upon to provide such master records in the future has a longer path ahead, with analysis and quality check of the recorded data still undergoing.

"Analysis, qualitative and quantitative checking of the data is necessary for the further measures of population control and we are keeping all the record as per the RCH guidelines in ECTS."

Challenges: Technical issues in the software and lack of trained manpower constitute most of the challenges faced by the stakeholders.

"Session time-out occurs very frequently in ECTS. Data coverage is dependent on PCTS database but PCTS does not provide line-listing/ mapping for the ECTS. Another major challenge is lack of trained manpower."

Discussion

Through the extensive reviews and data collection, it was found that Rajasthan is among the first states in the country to successfully implement numerous e-Health initiatives to improve health services. The state's efforts are recognized in India as well as globally and can be reciprocated in other states of our country.[14,15,31] Two recent studies conducted in Rajasthan to assess ASHA Soft, using varied methodologies also inferred that this e-health initiative is beneficial and is being adapted by other states.[3,32]

This study provided an understanding of the success and challenges of e-Health initiatives in Rajasthan. Certain basic challenges were found to be repetitive in nature, such as lack of trained manpower, over worked data entry operators, deficiency of dedicated personnel and issues arising because of poor network coverage. Similar findings were illustrated in a study conducted by Jarosławski and Saberwal (2014) which focussed on e-health programs in India suggested that there is a need to invest in human resources to overcome the shortage of dedicated personnel.[33]

It is to be acknowledged that in spite of challenges of having a huge landmass and highly remote areas within the state, the needs of citizens of each and every cadre truly seems to be considered and is attempted to be integrated into these initiatives to make the programmes as effective as possible. Furthermore, during the current pandemic, digital platforms have been refined and utilised in form of Mission LiSa for contact tracing and healthcare provision to elderly and vulnerable citizens; E-Sanjeevani telemedicine platform for self-reporting of COVID-19 symptoms, pregnancy status and pre-existing conditions; and RajCOVIDInfo mobile application for self-reporting of daily symptoms and state specific COVID-19 information.[34]

Conclusions

The overview from this study provided a novel understanding regarding the functioning, challenges, and good practices of the e-Health initiatives operational in Rajasthan. The documentation from this study augmented the knowledge about further scopes and sustainability of these initiatives where there was a scarcity of available literature. Some of the key points that were recorded from the study highlighted that bringing in trained personnel (or training the existing personnel) and employing additional data entry persons along with dedicated professionals may prove to be a game changer in improving the functioning of these initiatives in manifolds thus setting an example not only in the nation, but also globally. Since e-Health interventions play a significant role in influencing health care systems, a further scale up of such studies with appropriate evaluation of ongoing e-Health Initiatives should be planned.

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Declaration of patient consent

The authors certify that they have obtained all appropriate participant consent forms. In the form the participant(s) has/have given his/her/their consent for the information provided by them to be reported in the journal. The participants understand that their names and initials will not be published and due efforts will be made to conceal their identity.

Key Messages

Trained personnel and employing additional data entry persons along with dedicated professionals may prove to be a game changer in improving the coverage of these initiatives, thus setting an example not only in the nation, but also globally.

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Conflicts of interest

There are no conflicts of interest.

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