Study to Understand Acceptability and Use of ANMOL Application Among ANMs in Madhya Pradesh

By

Amit Jain

Dissertation submitted for the partial fulfillment of the
MBA Hospital and Health Management

Academic year, 2016-2018

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INSTITUTE OF HEALTH
MANAGEMENT RESEARCH
(WHO Collaborating Centre for District Health System Based on Primary Health Care)

IIHMR UNIVERSITY

TO WHOMSOEVER MAY CONCERN

This is to certify thatAmit Jain student of MBA Hospital and Health Management from The IIHMR University, Jaipur has undergone internship training at Sahaj Sansthan, Jodhpur from 24th February 2018 to 3rd April 2018 and National Health Mission Madhya Pradeshfrom 5th April 2018 to 22nd May 2018.

The Candidate has successfully carried out the study designated to himduring internship training and his approach to the study has been sincere, scientific and analytical.
The Internship is in fulfillment of the course requirements.

I wish him all success in all his future endeavors.

Dr. Ashok Kaushik

Dean, Academics and Student Affairs
The IIHMR University, Jaipur

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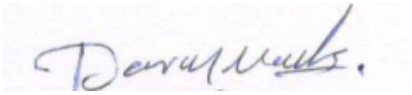
16 April 2018

Internship completion certificate

To whomever it may concern

It is to certify that Amit Jain, a student of MBA-Health & Hospital Management, IIHMR University, Jaipur, India has successfully completed internship at Sahaj Sansthan from 24 February 2018 to 3 April 2018. During the period of his training program with us he was found punctual, hardworking and inquisitive.

We wish him every success in life.



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Director-Sahaj Sansthan

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THE IIHMR UNIVERSITY, JAIPUR

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled A **Study on Acceptability and Use of ANMOL Application by ANMs** and submitted by **Amit Jain** Enrollment No. **IIHMR-U/01/2016-18/0383** under the supervision of **Dr. P.R. Sodani** for award of **MBA in Hospital and Health Management**of the University carried out during the period from **24thFeb 2018 to 3rd April 2018** embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other institute or other similar institution of higher learning.

Signature

Amit Jain
MBA-HM21-0383

Abstract

Madhya Pradesh lack of operators led to shifting of data entering tasks to auxiliary nurse midwives (ANMs). However, the limited training and supportive supervision ANMs receive compromise the quality of their services. To improve their performance, government of Madhya Pradesh implemented an project named ANMOL Application in 14 district in 2017, providing mobile tablet to ANMs with an application consisting of electronic patient registration "ANMOL". As it was Madhya Pradesh first point-of-care ANMOL Application project, the study's objective was to explore whether AMWs would accept and use the ANMOL Application and tablet.

In a qualitative explorative design, perceptions of all ANMs participating in the study (n=55) were explored through focus groups. The study was analysed on basis of responses given by ANMs.The study was guided by a conceptual framework based on technology acceptance theories that claim that acceptance predicts use. The framework's premise is that AMWs will accept ANMOL Application if they are perceived as easy to use, as useful. However, barriers and facilitators in the implementation context are expected to influence the use of ANMOL Application tools directly.

Our study suggests that acceptance of ANMOL Application by ANMs in Sehore and Bhopal was high but some technical issues discourages them to work on it. ANMO Application generally perceived as easy to use, useful. However, ANMs admitted needing ongoing training, technical support, and supervisory support. Internet network problems represented the key contextual barrier. This study especially highlights, however, that acceptance and use of ANMOL Application by ANMs in Madhya Pradesh were notably determined by their belief in ANMOL Application and their public-spirited professionalism, which were in turn reinforced by an ethos of service and support by ANMs. Despite the barriers they encountered, ANMs were determined to embrace ANMOL Application.

Keywords : ANMOL Application, Acceptance, Use, Mobile tablet, auxiliary nurse midwives, technology acceptance theories, Sehore, Bhopal, Madhya pradesh.

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PREFACE

Any knowledge is incomplete without first-hand experience about it**.** In the health sector especially getting in to rub of the things is extremely essential as its problems are complex and deep rooted**.** To manage the problems in the health sector **'**MBA student of health and hospital management **'**need to know the functioning of the different organizations be it private or public, for this purpose Dissertation of 3 months is scheduled enclosed to 2nd year**.**

For the purpose of Dissertation, I am thankful that I got opportunity to work under NHM Madhya Pradesh as I thought I would get to know the functioning of various government schemes in state of Madhya Pradesh

In the NHM Madhya Pradesh complete discretion was given to us for opting of programmes of our choice to study upon and I opted for the Anmol Software with special focus on working of ANM under the Program**.**

Acknowledgment

I am using this opportunity to express my gratitude to everyone who supported me throughout the course of this MBA project. I am thankful for their aspiring guidance, invaluably constructive criticism and friendly advice during the project work. I am sincerely grateful to them for sharing their truthful and illuminating views on a number of issues related to the project.

First of all, I would like to thank Secretary Govt. of Madhya Pradesh cum MD NHM Mr. S. Vishwanthan for providing me opportunity to work in public health system. I express my warm thanks to Dr. Rajeev (Deputy director of HMIS), Mr. Neeraj Shrivastav (Advisor HMIS) for their support and guidance at [NHM Madhya Pradesh]

I would also like to thank my project to the people who provided me with the facilities being required and conductive conditions for my MBA project. I would also like to thank **Dr. P.R. Sodani** IIHMR University, my mentor for providing me a support in my project a successfully

List of acronyms

S. No.	ACRONYMS	FULL FORM
1.	NRHM	National Rural Health mission
2.	NHM	National Health mission
3.	NUHM	National Urban Health Mission
4	ANMOL	ANM online
5	ANM	Auxiliary Nurse Midwife
6	APP	Application
7	LMIC	Low middle income country
8	HMIS	Health Management Information system
9	RCH	Reproductive Child health
10.	ASHA	Accredited Social Health Activist
11.	PNC	Post natal care
12	TAM	Technology Acceptance model
13	UTAUT	Unified theory of Acceptance and Use of Technology
14	mHealth	Mobile health
15	MoHFW	Ministry of Health and Family Welfare
16	RCH	Reproductive Child Health
17	EG	Eligible couple
18	FP	Family planning
19	FGD	Focused Group Disscussion
20	BEO	Block Education officer

Purpose of Dissertation

Dissertation is an integral part of the MBA curriculum. As a part of the course, students of Second year are required to undergo at any reputed organization to get in depth exposure of various departments in the organization and better understanding of the health care delivery system and its functions.

The major objectives of the summer training programme are as follows:

To better understand the existing health delivery system including public and private sectors.

To observe the implementation of various national health components at national/state/district levels.

To understand various functions of health system by interactions with key stakeholders, policy makers, programme managers, academicians and researchers.

To work on the project/task assigned by summer training organization.

During our training period, we had an overview of various components undertaken in National Health Mission, Madhya Pradesh including the current status of the components and our observations regarding the same. I also carried out a small study on the different topics assigned to me.

CHAPTER

I

ABOUT AREA OF STUDY

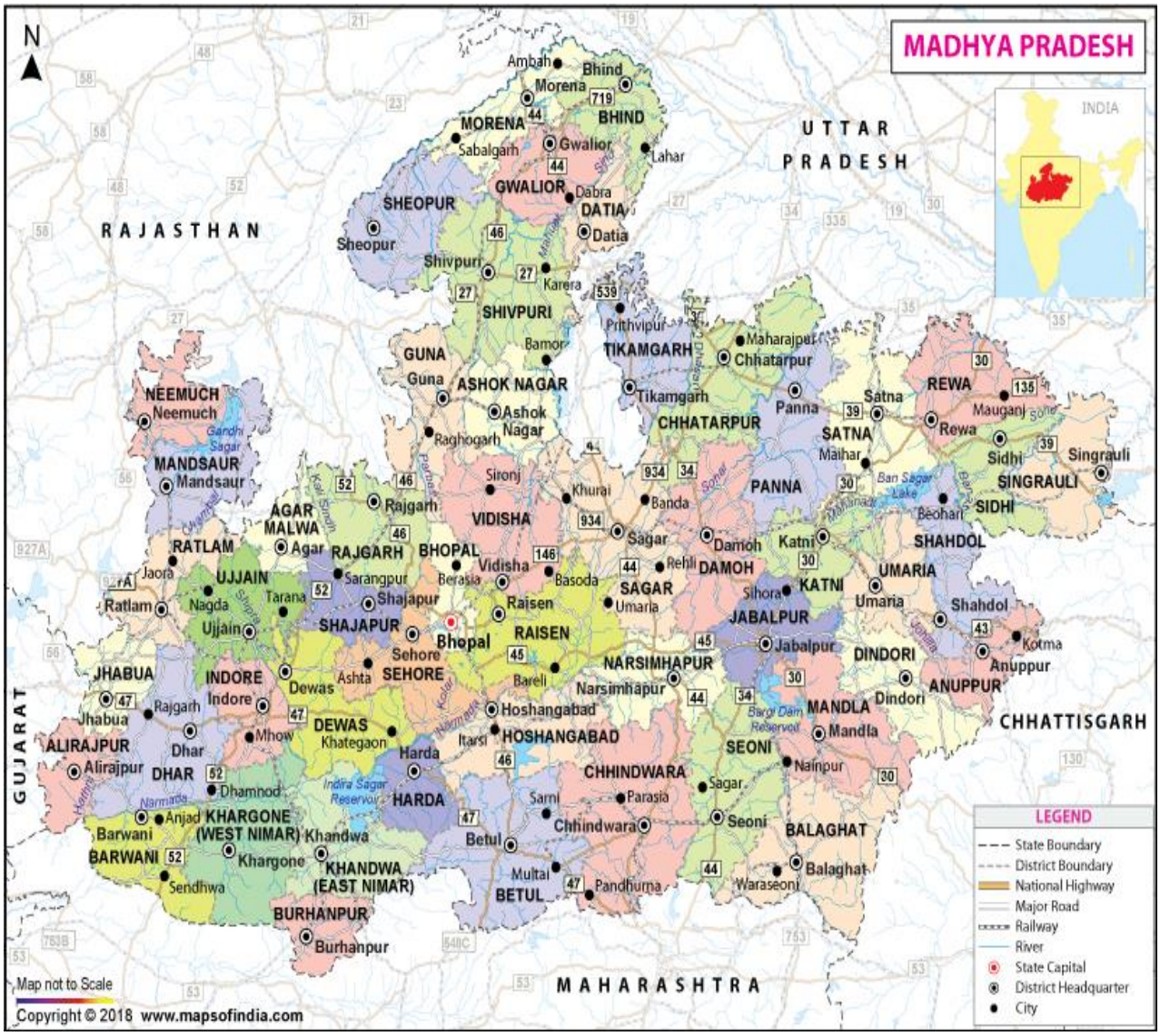


Fig.1 Madhya Pradesh Map

About Madhya Pradesh: -

Area- 308,252 square km

Area rank- 2

Population- 7.27 crores)census 2011(

Population rank- 5th

Capital- Bhopal

Largest city- Indore

District-51

Government

Governor- Anandiben Patel

Chief minister- Shivraj Singh Chouhan)BJP)

Health minister- Shri Rustam Singh

Legislature-Unicameral)230 seats(

Parliamentary constituency-25

High court- Madhya Pradesh High Court

Indicators	Year	Unit	Madhya Pradesh	India
Geographical Area	2011	Lakh Sq. Km.	3.08	32.87
Population	2011	Crore	7.27	121.09
Decadal Growth Rate	2001-2011	Percentage	20.35	17.7
Population Density	2011	Population Per Sq. Km	200	382
Urban population to total Population	2011	Percentage	27.63	31.1
Sex Ratio	2011	Female Per 1,000 Male	931	943
Child Sex Ratio)0-6 Year(	2011	Female Children Per 1,000 Male children	918	919
Literacy Rate	2011	Percentage	69.32	73.0
Birth Rate	2015*	/1,000 Population		20.8
Death Rate	2015*	/1,000 Population	6.3	6.5
Infant Mortality Rate	2015*	/1,000 Live Birth	43	37
Maternal Mortality Ratio	2011-13*	Per Lakh Live Birth	244	167
Life Expectancy at Birth	2010-14*	Year	67.7	67.9

Fig.2 **COMPARISON BETWEEN HEALTH INDICATORS OF MADHYA PRADESH AND INDIA**

*NFHS-4: National Family Health Survey

**SRS bulletin: Office of Registrar General of India

From comparison between India and Madhya Pradesh it is evident that on health indicators that Madhya pradesh lags behind the country and it is one of the state under "Empowered Action Group States)Bihar, Jharkhand, Uttar Pradesh, Uttarakhand, Madhya Pradesh, Chattisgarh, Odisha, Rajasthan(previously known as BIMARU States.")source- economic review 2016-17 of Madhya Pradesh(.

CHAPTER

II

ABOUT NATIONAL HEALTH MISSION

INTRODUCTION

The National health mission (NHM) encompasses its two sub-missions, the National Rural Health Mission (NRHM) and National Urban Health Mission (NUHM). The main programmatic components include Health system strengthening in rural and Urban areas- Reproductive-Maternal-Neonatal-Child and Adolescent Health (RMNCH+A), and Communicable and Non-Communicable diseases. The NHM envisages achievement of universal access to equitable, affordable & quality health services that are accountable and responsive to people's needs.

National Rural Health Mission (NRHM)

The National Rural Health Mission (NRHM) was launched by the Hon'ble Prime Minister on 12th April 2005, to provide accessible, affordable and quality health care to the rural population, especially the vulnerable groups. The Union Cabinet vide its decision dated 1st May 2013, has approved the launch of National Urban Health Mission (NUHM) as a Sub-mission of an over-arching National Health Mission (NHM), with National Rural Health Mission (NRHM) being the other Sub-mission of National Health Mission.

NRHM seeks to provide equitable, affordable and quality health care to the rural population, especially the vulnerable groups. Under the NRHM, the Empowered Action Group (EAG) States as well as North Eastern States, Jammu and Kashmir and Himachal Pradesh have been given special focus. The thrust of the mission is on establishing a fully functional, community owned, decentralized health delivery system with inter-sectoral convergence at all levels, to ensure simultaneous action on a wide range of determinants of health such as water, sanitation, education, nutrition, social and gender equality. Institutional integration within the fragmented health sector was expected to provide a focus on outcomes, measured against Indian Public Health Standards for all health facilities.

NATIONAL URBAN HEALTH MISSION

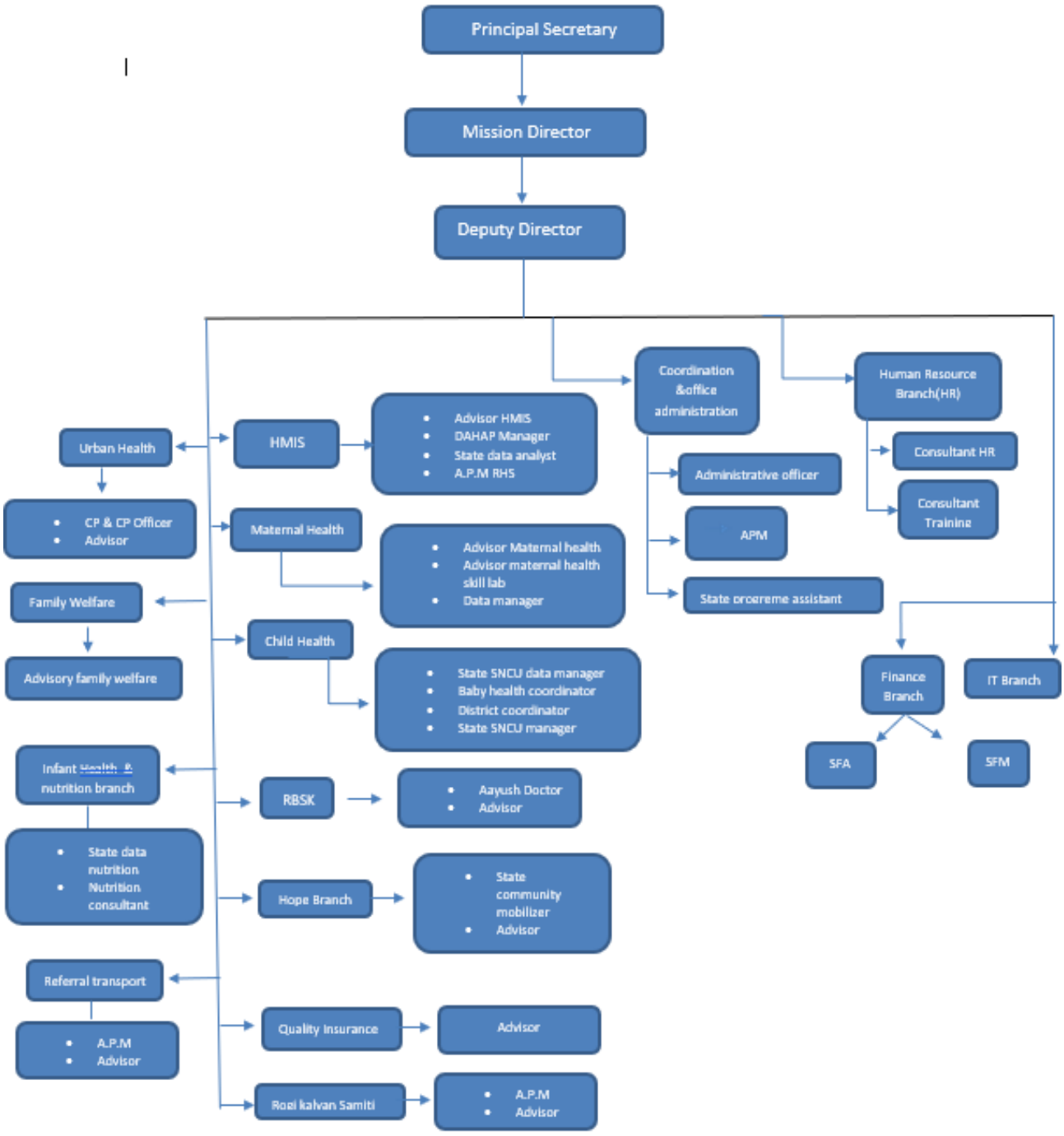
The National Urban Health Mission (NUHM) as a sub-mission of National Health Mission (NHM) has been approved by the Cabinet on 1st May 2013.

NUHM envisages to meet health care needs of the urban population with the focus on urban poor, by making available to them essential primary health care services and reducing their out of pocket expenses for treatment. This will be achieved by strengthening the existing health care service delivery system, targeting the people living in slums and converging with various schemes relating to wider determinants of health like drinking water, sanitation, school education, etc. implemented by the Ministries of Urban Development, Housing & Urban Poverty Alleviation, Human Resource Development and Women & Child Development.

NUHM would cover all State capitals, district headquarters and cities/towns with a population of more than 50000. It would primarily focus on slum dwellers and other marginalized groups like rickshaw pullers, street vendors, railway and bus station coolies, homeless people, street children, construction site workers.

The goals of NHM are shown below: -

- Reduction in Infant Mortality Rate and Maternal Mortality Ratio by at least 50% from existing levels in next seven years
- Universalize access to public health services for Women's health, Child health, water, hygiene, sanitation and nutrition
- Prevention and control of communicable and non-communicable diseases, including locally endemic diseases
- Access to integrated comprehensive primary healthcare
- Ensuring population stabilization, gender and demographic balance.
- Revitalize local health traditions and mainstream AYUSH
- Promotion of healthy life styles.



Organogram of NHM Madhya Pradesh

CHAPTER

III

ABOUT ANM

Introduction

Auxiliary nurse midwife, commonly known as **ANM**, is a village-level female health worker in India who is known as the first contact person between the community and the health services. ANMs are regarded as the grass-roots workers in the health organisation pyramid. Their services are considered important to provide safe and effective care to village communities. The role may help communities achieve the targets of national health programmes. In 2005, the National Rural Health Mission (NRHM) was launched, which focused on improvising primary health care in villages and further increased the importance of the ANM as a link between health services and the community.

ROLE of Auxiliary Nurse Midwives (ANM)

- Holding weekly / fortnightly meeting with ASHA to discuss the activities undertaken during the week/fortnight.
- Acting as a resource person, along with Anganwadi Worker (AWW), for the training of ASHA.
- Informing ASHA about date and time of the outreach session and also guiding her to bring the prospective beneficiaries to the outreach session.
- Participating and guiding in organising Health Days at Anganwadi Centre.
- Taking help of ASHA in updating eligible couples register of the village concerned.
- Utilising ASHA in motivating the pregnant women for coming to Sub-Centre for initial check-ups.
- ASHA helps ANMs in bringing married couples to Sub-Centres for adopting family planning.
- Guiding ASHA in motivating pregnant women for taking full course of iron folic acid (IFA) tablets and TT injections, etc.
- Orienting ASHA on the dose schedule and side effects of oral pills.
- Educating ASHA on danger signs of pregnancy and labour so that she can timely identify and help beneficiary in getting further treatment.
- Informing ASHA about date, time and place for initial and periodic training schedule. ANM would also ensure that during the training ASHA gets the compensation for performance and also TA/DA for attending the training.

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Auxiliary Nurse midwife (ANM) at PHC and SC

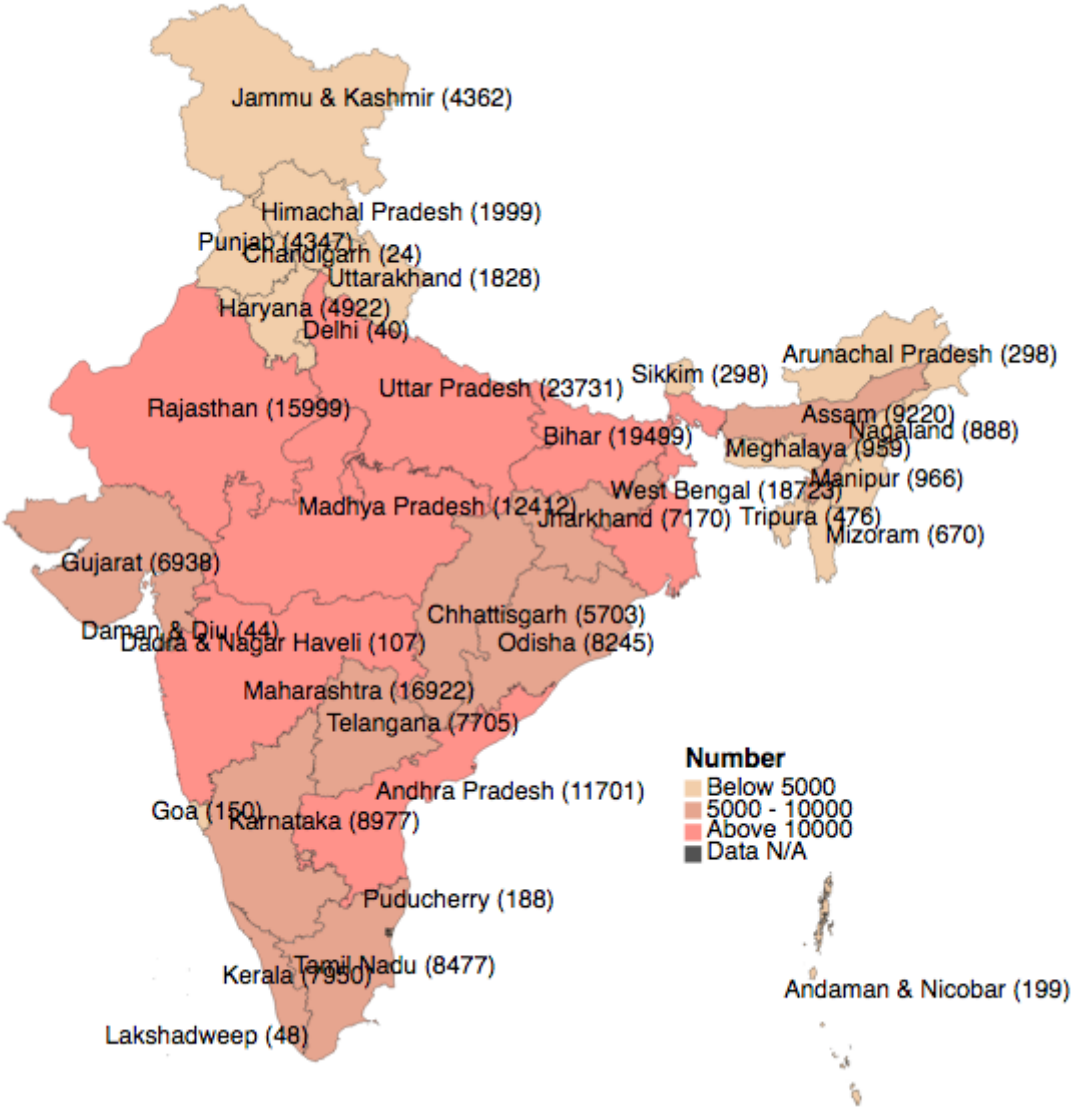

FIG.3 The number of ANM at PHC and SC in Madhya Pradesh Was 12412 in March 2015

Source: Department of health and Family Welfare, Ministry of health and family Welfare

CHAPTER

III

ABOUT ANMOL

Background

By taking into the account the issues faced by ANMs and to improve the overall standards of maternal health service and child provision in India and related data collection, the (MoHFW) ministry of health and family welfare, government of India, with support from UNICEF, has introduced an android based tablet based application ANMOL. An ANM usually caters to a population of 3,000-5,000 and her work primarily involves providing primary health services around maternal and child health, family planning, nutrition and immunisation programmes. Collecting health care data is an extremely important part of their job and an ANM captures various indicators related to health, nutrition and immunisation of pregnant women, mothers and new born children in their hard-bound paper registers. ANMOL ends drudgery for ANMs by making their work paperless. The tablet allows them to enter and update the service records of beneficiaries on real time basis, which ensures prompt entry and updating of data. Since it is a completely digitalized process, the high quality of the data and accountability is maintained.

Introduction

ANMOL (Auxiliary Nurse Midwife Online) or ANM online is a solution which aims to bring better healthcare services and better consultation to millions of pregnant women, mothers and new born in INDIA.

ANMOL is an android based application, developed to facilitate seamless work of ANMs as well as to ensure collection of good quality data & its digitalisation at its source. This is developed for the Ministry of Health and Family welfare and is synchronised with web based RCH portal. This works offline and can also be synchronised with the web portal as automatically when connected with internet and also on user request.

ANMOL will also facilitate in identification and tracking of high risk pregnancies and children with low birth weight. ANMOL woks offline so dependency on the internet connectivity is very limited and ANMs need to worry about the network and electricity connectivity.

An ANM may handles more than one village, and on an average, carries 12-15 separate registers to record key data indicators to provide information to her supervisors while on the go. “The work of manually copying the data from one register to another also takes up a lot of time.
Moreover, the manual updating of the data, carries a risk of being data entered incorrectly and getting corrupted.

Why ANMOL Application required?

- Effective and timely delivery of services of quality, specially to rural population, to ensure better healthcare.
- Bringing awareness to the remotest urban population, urban slums and unserved community through images, videos and educating them about Government initiatives on health, maintenance of good hygiene, basic health care & precautions.
- Establish better communication of ANMs with beneficiaries and Doctors tough remote assistance which will improve the quality of services.

Strategies behind launching ANMOL Application: -

- The ANMOL has facilitated in ensuring timely quality service delivery, ensuring universal immunization and helps in positive impact on important health indicators like Infant Mortality Rate (IMR) and Maternal Mortality Rate (MMR).
- ANMOL acts as a job aid to the ANMs by providing them with readily available information such as due list, dashboard and guidance based on data entered etc. Videos / audios on subjects like high risk pregnancy, immunization, family planning etc. are also available in the application for use by ANMs

Implementation in NHM Madhya Pradesh: -

State government of Madhya Pradesh launched a mobile application as named Anmol App. The ANMOL Tab will be distributed to all the 4,900 ANMs who are working in various parts of the state. This app will be helpful to keeping track online immunization of infants & pregnant mother. User can find all details of immunization through this app. Anmol app will notify vaccination details of infants & Pregnant women till 24 Month.
Anmol App was launched under the banner of "National Health Mission"

To success this works, project will be start for 14 Districts in first phase.

Name of Districts: -

*Badwani**,** Bhopal, Sihor, Muraina, Khandwa, Gwalior, Katni, Mandla, Sivni, Dhaar, Jhabua, Alirajpur, Umaria, Bhind.""*

ADVANTAGES: -

ANMOL has provided 5 major advantages to ANM i.e.

- Dashboard of the sub centre with different parameters.
- Digital integrated RCH register.
- Village Health & Nutrition Day(VHND) due list and logistics arrangement.
- Video counselling facility to the beneficiary on different health issues.
- Work plan on different parameters for daily basis & weekly basis.

KEY PERFORMANCE INDICATORS

- **Age at Marriage**

  From ANMOL, we can get village wise information of Age at Marriage, so as to take up the area specific awareness campaign on Age at Marriage to improve the Mean Age at Marriage.

- **In Mother care**

  Data on HB%, weight of Mother is being recorded in ANMOL from the date of registration and to the date of delivery. This data can be utilised by both ANM & AWW in monitoring the Anaemic status of the Mother. Provision is incorporated in the portal to give Alerts to the ANM and Mother, if Mother, is identified as Anaemic at any status of Pregnancy.

- **In Infant Care**

  The weight of infant is being recorded in ANMOL during all the 7 PNC visits of Infant. This information can be utilised for growth monitoring of the Infant by the both ANM & AWW Immunization status of both Mother and Infant can effectively monitored by the ANM & AWW using the RCH Portal, if the Convergence of ANM & AWW is done.”””””””

Rationale of study

Since last few years Government of India is more focusing to get every small detail regarding various National Health programmes on online platforms the role of IT is increased at rapid pace as it helps to improve the health indicators and tracking everything so easily. Maintaining the standards and quality of data helps in providing better care to patients and improving the health indicators of country. mHealth Application exist in large numbers today, but oftentimes, health workers do not continue to use them after a brief period of initial usage, are averse toward using them at all, or are unaware that such apps even exist and reduced their work load to an extent. The number of operators reduced for compensate this the need of ANMOL Application came up as in this daily updation of data is there. The purpose of our study was to examine and qualitatively determine the design and content elements of Mobile health application that facilitate or impede usage from the health workers' Knowledge, perceptive, Experience.

Hence it is required to carry out this study to assess the information regarding why it is performing so different in different districts so that some action can be carried out for the improvement the data quality, empowerment of ANM and to resolve the problems ANM.

Structure

I first review the literature on Knowledge, acceptance ,Perception and use of this kind of applications and present the conceptual framework that I use for my analysis. This is followed by a description of the methodology. The results chapter is presented in article form in which I report and discuss major findings and limitations of the study. The discussion chapter offers an overview of interpretation and analysis of findings.

After the conclusion and references, annexes are found for the interview guide, the thematic coding framework, the AMW characteristics, the Journey of ANMOL Application, a visual presentation of the ANMOL application (English version).

Literature review

Introduction

To learn whether ANMs in Madhya Pradesh would accepted and use furtherly the Anmol Application, I first reviewed the literature on this kind of data entering tool in general. I subsequently go through theories and frameworks about acceptance and use of new technology, as using existing theory can help to focus on studies that would be particularly relevant for my study, while providing for a framework to make sense of what I would see (Maxwell, 2012). Before I report my search strategy and review of more detailed substantive findings, I briefly address the theories on acceptability and use of technology we used for our literature review.

Theories on the acceptability level and use of technology

User acceptance theories assume that decision-making is based on the assumption that rational individuals consciously make choices in their best self-interest (Scott, 2000). According to Fishbein and Ajzen's Theory of Reasoned Action (TRA) (M. Fishbein, 1975), acceptance is behavioural intention to use. Davis's Technology Acceptance Model (TAM) (Davis, 1989) is an adaptation of the TRA, tailored to fit the context of information systems (Hillmer et al., 2008). The original TAM consists of two constructs that determine behavioural intention to use: perceived ease of use and perceived usefulness (Davis, 1989). In an elaboration of the TAM, Venkatesh et al. developed the Unified Theory of Acceptance and Use of Technology (UTAUT). The UTAUT-model is based on a metanalysis of eight technology acceptance models. It demonstrates that, on top of the two TAM constructs, acceptance is determined by social influence (Venkatesh, Morris, Davis, & Davis, 2003). Moreover, the UTAUT demonstrates that factors in the implementation context predict use but not acceptance (Venkatesh et al., 2003). Informed by the TAM and UTAUT, I reviewed the literature for acceptance and use of data entering tools, focusing specifically on above-mentioned constructs.

For online data entering tools to be accepted, they need to be perceived as easy to use and useful, and others in the social context of the user need to encourage their use. For ease of use, the literature shows that although this kind of tools may be easy to learn and use, efforts need to be made to facilitate a sustained use of online data entering tool Anmol. In addition, these kind of Application tools need to be adapted to the prospective user and local context. Perceived time efficiencies and cost savings are pervasive facilitators for acceptability. These kind of tools can contribute to more effective and efficient data sharing, improved data quality, and improved quality of care, but their use may lead to an increase in consultation time. In terms of social influence, client, community, and peer influence seem to be mainly positive, with users enjoying increased self-esteem, self-efficacy, and improved social status in their communities. However, supervisors do not always support the use of online data entering tools. Supervisor functionalities in the application and support from higher-level officials may encourage a more positive supervisor influence.

Regarding the use of online data input tools, factors in the implementation context may facilitate or impede their use. Infrastructural elements such as connectivity and access to electricity can pose

significant barriers, as do problems with hard- and software. Technical support and training are therefore essential elements in these kind of projects. Last, the reduction of telecommunications costs and political leadership and support seem to be key enablers to the use of Anmol kind of tools.

The literature suggests that acceptability by end users of these kind of online entering data technology is key for effective uptake, and that many different elements in the user, the data entering tools, and the implementation context determine the acceptability and use of these technology. Technology acceptance theories may help guide qualitative exploration of barriers and facilitators to acceptance and use of online data entering tools.

Conceptual Framework

Maxwell (2012) states that "the most productive conceptual frameworks are often those that bring ideas from outside the traditionally defined field of study" (Maxwell, 2012) p. 40. Existing technology acceptance theories could provide modules to be used in our research (Becker 2007, cited in (Maxwell, 2012) explaining the key concepts to be studied and "the presumed relationships among them" (Miles and Huberman 1994, cited in (Maxwell, 2012), p. 39. We therefore develop a conceptual framework using the TAM and UTAUT theoretical models to guide this study. We use the TAM constructs of 'perceived ease of use' and 'perceived usefulness'.

I made some changes in the UTAUT construct of 'contextual facilitators' to 'contextual facilitators and barriers'. The UTAUT focused specifically on the introduction of technological innovations within an organizational context. Implementation of innovative projects in developing countries requires a broader interpretation of context, and infrastructural, socioeconomic kind of factors need to be taken into account as well. We therefore include 'barriers', being the opposite of facilitators, into the construct of 'contextual facilitators and barriers'. Although the UTAUT claims that the context related construct influences use, but not behavioural intention to use (acceptance), our literature review shows that contextual factors seem to be closely connected to constructs that influence acceptance directly as well. For example, it seems that initial and refresher training influence the ease with which users learn how to use the innovation as well as the ease to remember how to continue using the technology. While we use the UTAUT premise of the contextual construct influencing use directly, we will keep this association in mind. However, we have chosen to depict the constructs as they were represented in the theoretical frameworks of the TAM and UTAUT to start our exploration on the basis of tested models. According to Maxwell (2012) concept maps can be used to make the existing theory, its key concepts and presumed relationships, visible and explicit (Maxwell, 2012). The conceptual framework will assist making our study coherent and facilitate communicating the relevance of findings to readers (Green, 2014). Moreover the role of the conceptual framework in qualitative research, according to Polit and Tatano Beck (2004), is "to make research findings meaningful and generalizable" cited in (Green, 2014) p. 37. However, interpretations and insights should not be made to fit the framework (Maxwell, 2012) and we aim to keep a critical perspective and to challenge the framework with emerging findings or different relationships. The latter is visualized by the circling of the constructs representing their eventual

adjustment or adaptation to the specific context of the ANMs in Madhya Pradesh, which can be attained through the qualitative approach adopted by the present study".

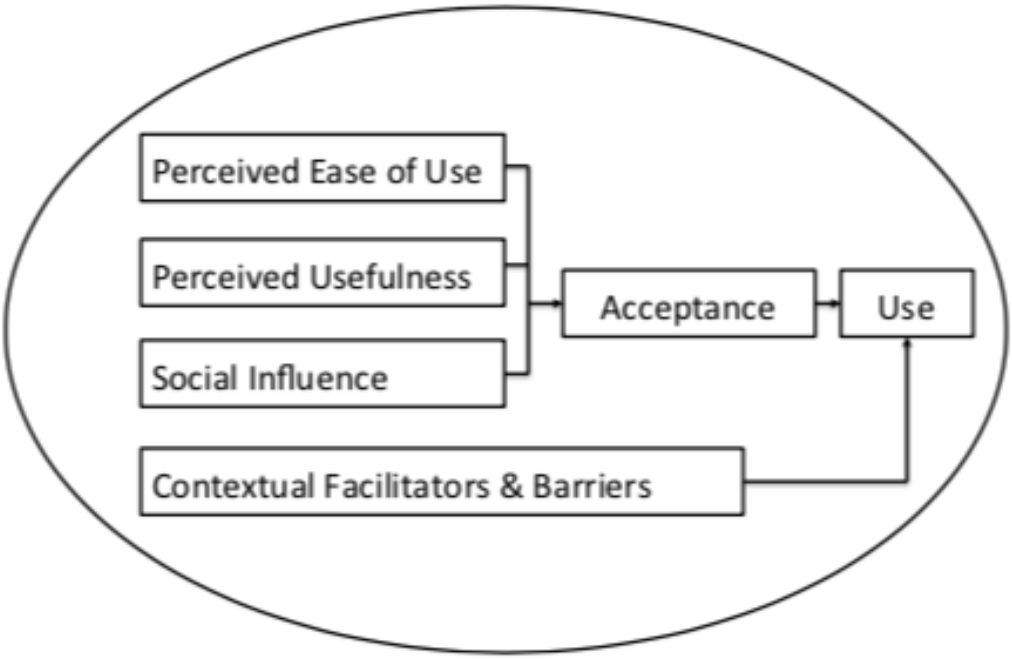

Fig. 4: Conceptual Framework for technology acceptance based on TAM and UTAUT (Davis 1989, Venkatesh et al. 2003) The definition of these constructs derived from TAM (Davis, 1989) and UTAUT (Venkatesh et al., 2003) will be:

Perceived Ease of Use: the degree to which the ANMs believes that using the ANMOL Application would be free of effort;

Perceived Usefulness: the degree to which the ANMs believes the ANMOL Application would enhance her job performance, improve her knowledge, self-efficacy, or may be useful for others;

Social Influence: the degree to which the ANMs perceives that important others, such as family, patients, peers and supervisors believe that she should use the ANMOL Application;

Contextual Facilitators and Barriers to Use: the degree to which the ANMs believes that infrastructural, organizational, socioeconomic and any other related factors in the implementation context facilitate or impede use of ANMOL Application. Guided by this conceptual framework we will assess whether ANM perceive ANMOL tools as easy to use, useful, and whether important others in their social environment encourage their use, in which case we assume that ANMs accept ANMOL Application. Furthermore, we will explore what barriers and facilitators they perceive in the implementation context, which may impede or facilitate the actual use of ANMOL Application

''Acceptability'' refers to the ANMs' perception on whether the application is satisfying and suitable for their work.

Aim and Objectives of the study

The study aims at promoting use of ANMOL application in order to inform current and future interventions for increased access to health care service & decision making The overall objective of the present study is to explore factors that facilitate or impede acceptance and use of ANMOL Application by ANMs who participate in the study. The objectives of the study are:

1. To study the knowledge of ANMs about ANMOL Application
2. To study the perceptions of ANMs about ANMOL Application.
3. To study the experience of ANMs about ANMOL Application
4. To provide recommendations to improve Anmol Application furtherly.

Research Questions

Based on our conceptual framework, our specific research questions are: -

1. What factors facilitate or impede ANMs perception of ease of use and are likely to lead to their acceptance and use of ANMOL Application ?

2. What factors facilitate or impede ANMs perception of usefulness and are likely lead to their acceptance and use of ANMOL Application

3. Are ANMs comfortable in using ANMOL Application?

4. What factors in the implementation context (infrastructural, organizational) do ANMs in Madhya Pradesh perceive that may facilitate or impede their use of ANMOL Application?

Methodology

This chapter describes the study design, setting, the sampling, and the process of data collection and analysis.

Study design

A qualitative exploratory approach is deemed appropriate to answer these study's research questions, as qualitative research allows capturing the lived experience of the ANMs, while taking into account the complexity of interactions with both others and the implementation context (Marshall & Rossman, 2011). The study is exploratory in nature as it aims to discover the personal contexts of the ANMs, and to understand how their personal views are embedded within these contexts, So a **cross sectional descriptive study** is undertaken to complete this study.

Study setting

Bhopal (Phanda block)
Sehore (Shyampur, Ashta block)

Sampling strategy

Inclusion criteria ANMs whom Anmol Application are provided are accepted to take part in this study.

Exclusion criteria ANMs who are working at facilities and at Urban area.

Description of the sample population

Auxiliary nurse midwife, commonly known as **ANM**, is a village-level female health worker in India who is known as the first contact person between the community and the health services. ANMs are regarded as the grass-roots workers in the health organisation pyramid. Their services are considered important to provide safe and effective care to village communities. The role may help communities achieve the targets of national health programmes

Data Collection

Data were collected in the month of May. Eleven focus groups discussion were held for data collection.

Sample	ANMs (Auxiliary Nurse midwives)
Phenomenon of **I**nterest	ANMs Perceptions, Experiences, Barriers regarding their use of ANMOL Application to provide and support primary healthcare services.
Design	Data collection methods will include but may not be limited to: • interviews, focus group discussions, document analysis and observations Data analysis methods will include but may not be limited to: • thematic analysis
Evaluation	Knowledge, Acceptability, Experiences , perceptions
Research type	Qualitative

Fig .5 Methodology Framework

Focus group discussions

55 ANMs participated in the focus group discussions that were organized during the week of data collection. Fifteen (5 participants each) were held in the Bhopal and Sehore district. In Bhopal three FGD held at Phanda block and 9 FGD were organized at Sehore district ,four FGD were organized at Shyampur block and Five FGD were held at Ashta block and lasted 40-45 minutes each. The focus group discussions allowed for a refinement of perceptions, barriers both through the interaction with other participants and because ANMs would have had time to reflect on their individual interview.

DATA ANALYSIS

The qualitative data from the interviews were audio recorded and common responses were grouped and coded and analysed separately also. The codes were then categorized and grouped into content or themes. Discussion around the resulted theme provides the basis for the recommendations and conclusions surrounding perceptions, experience, barriers of ANMs about the "ANMOL Application.

Observations on ANMOL Application

Finding

Description of research participants

Auxiliary nurse midwife, commonly known as **ANM**, is a village-level female health worker in India who is known as the first contact person between the community and the health services. ANMs are regarded as the grass-roots workers in the health organisation pyramid. Their services are considered important to provide safe and effective care to village communities. The role may help communities achieve the targets of national health programmes

ANMs Characteristics

a) Knowledge regarding ANMOL Application

The knowledge of ANMs regarding ANMOL Application was found satisfactory. When asked to describe the role of ANMOL Application & it's working ,ANMs showed up adequate knowledge about the Application.

P: Anmol Application is data entry tool which works same as RCH registers but works online.

Q: Anmol Application is data entry tool for high risk pregnancy, immunization, family planning etc

R: Anmol Application used for entering details regarding Tracking of Family Planning Services, Pregnant Women, ANC Services, Delivery details, PNC Services, Child Tracking of Immunization Services, Child, Medical, Dashboard, Registration Family Planning NC Services Delivery Outcome, NC Car, Immunization.

b) Ease of use

Nearly all ANMs perceived the online entry tool as easy to use in the starting. Most ANMs reported that the application is easy to use as well. The few AMWs who reported that the application was not easy to use were older and some of them were covering large population. Many of young ANMs even completed the pending cases on their portal, and still some of them using it very efficiently. Some reported that the application was difficult to use even in the beginning as some of them not attend the training regarding ANMOL Application. Never having been exposed to something like this before, some felt intimidated by the application. Only one older ANM reported having difficulty as never use

any phone itself before and complained about difficulties with reading the text, manipulating the device, and accidentally touching the wrong buttons.

Despite the reported ease of use, most ANMs experienced some technical problem with the application, of which quite a few experienced many technical problems. These were often related to basic things such as forgetting passwords or not knowing how to Install the application, how to select the preferred language.

A: When I first started using it I had difficulties to reset my password. I was shown how to do it, but when I was back I forgot how to do it and how to install the application by myself.

B: In case the Application crash once work on Application stopped and until I went to monthly meeting to the office and there supervisor help to install it again.

C; After making two or three entries the Application hangs a lot and them I have to entry the data manually in registers.

E: I received the tablet a year ago but don't have the ANM ID.

F: I and other ANM share same village as there is not clearly defined which ANM register which beneficiaries as details of that village is showing same under both ANM

G I am unable to locate my village in ANMOL Application so entry of that village not done and filled by data operator.

H. I am unable to fetch details of every ASHA undermine and new ASHA are not even registered.

I: The pending cases are still not able to find clearly on Anmol Application as the list not come village wise.

J: My work has become much easier when I start using ANMOL Application

ANMs were using Mobile tablet for multipurpose work including calling, storing music, pictures, gaming and videos which caused the ANMOL Application to crash, after which many ANMs were unable to use the application efficiently.

K: My daughter sometimes uses the tablet as I don't know to put security lock on tablet.

These findings reflect that the ANMOL Application was easy to use, although many admitted having problems entering their user names, passwords. To ensure that ANMs truly feel at ease using the ANMOL Application, refresher training may need to focus more at regular intervals regarding using of both Mobile tablet and ANMOL application.

C) Usefulness

Some of ANMs perceived the data entry in ANMOL Application useful but not the Mobile tablet every has same perception about it almost everyone is facing the problems related Mobile tablet which includes the overheating of tablet, low battery backup, Slow speed and hanging problem, Charging problem, insensitive touch. Synchronisation problem not availability of spare parts and technical staff regarding tablets results of which large number of tablets are put off and not used again and no action taken further regarding them.

AMWs appreciated the portability of the ANMOL Application, which allows them to access beneficiary information whenever and wherever they need to consult beneficiary data.

AA : I can easily find out every details of any person of village under me on fingertips

BB: I can easily find out the every entry done up to now without looking in to all registers.

Another advantage of the application was found in the easy data sharing with supervisors and helpful to other people in working staff.

CC: As data is entered by myself the work load of data operators reduced to extent a lot in starting months of using ANMOL Application.

DD: Double burden was there before ANMOL Application as first I have to entry the details in registers than go to operators when he was free to entry every details online in which lot of time was wasted

EE: In the past, we have to do every work on paper form. Now with this application every things comes online. It is convenient and fast.

FF: Manually carrying of data the fills online to operator carry extra risk of information may entered wrong

There are many faults in ANMOL Application which include typo error, Short batter life even the application works offline but still to proceed to next stage of entry or other case registration net connectivity is required. As some places there is no such net connectivity available because of which data entry is not happening. Many ANMs point out some negative aspects about ANMOL Application and mobile tablets.

FF: As net connectivity is not there at some places so data input on ANMOL Application is not happening many times.

GG: When i input data on ANMOL Application some times in between the tablet hanged and then again data is entered offline in registers.

HH: Because I already faced the hanging problem in between data input so I entered details first in registers and then later on fills the data on ANMOL Application.

KK: As the battery backup is low and there is no charging and battery backup option available so I entered the details in registers than later on ANMOL Application.

LL: Until I have completed the first case and update that case it not forward to other case.

When compared with the paper system, most ANMs preferred the electronic system, as it was considered to be more comprehensive than the paper forms and allowed for more efficient data sharing. Some AMWs reported to even having stopped using the paper forms. On the other hand, an important advantage of the paper system was found in its flexibility, as skipping questions and making corrections were considered to be easier in the paper system. With regard to the reliability of the two systems, opinions were divided. Some felt that the electronic system was more reliable as paper records could be easily lost, destroyed, or get wet in the rainy season. Others trusted the paper system more, as they feared information loss because of connectivity issues, technical problems with the application, or accidentally pressing the wrong button.

D) Contextual Facilitators and Barriers

Factors in the implementation context may facilitate or impede the use of ANMOL application by ANMs in Sehore and Bhopal. I therefore report whether infrastructural factors, such as connectivity and electricity issues, hampered the use of ANMOL Application or not, whether organizational support provided or not.

Infrastructural factors: Internet connectivity, cell phone coverage, and access to electricity

Many studies in LMIC demonstrate that Internet connectivity is a key challenge for the use of kind of this tools. Similarly, in my study, connectivity problems were identified as the main barrier to use the Smartphone application, with respondents complaining about limited connectivity causing prolonged delays in data transmission to the central server. ANMs had to send data at inconvenient times, some sending it late at night or very early in the morning, or they had walk to a place where the reception was better.

AA: The connection often fails and I cannot update the data while working at field so we record the data in registers first then after went to home later night we entry and update the data.

BB: We live in the field and the some places in village does not have electricity at time of working so we are unable to continue further work as tablet battery switched off once .

Organizational factors: training, technical support, material and financial support

ANMs received one day initial training in the use of the application and regular training and help regarding ANMOL Application is provided by M & D officer and respective persons. Whereas this had been not sufficient for some of ANMs, quite a few expressed needing refresher training. Some suggested a different training format, in smaller groups for improved learning and focused on specific topics, such as how to make every entry and how to fixing errors. Several ANMs wants that the MPWs should also be trained along with them.

AA: It has been explained well to us... but it would be better if we got more training at regular intervals and after every new update and training about fixing minor technical problems must be provided.

BB: We need refresher training at regular intervals, but large number in a room is not convenient. We should be grouped and trained, like 3or 5 persons per group... we could understand more.

Although quite a few ANMs were satisfied with the technical support they received, many reported that technical assistance could be improved. Many ANMs had to travel for several hours to receive technical support and many tablets were not repaired till now they had to resort to working with paper forms again. They therefore suggested including a trouble shooting function in the application to guide their independent problem solving and the tablets must be repaired or replaced.

CC: They suggested government could have thought of an alternative solution, such as the development of a user manual regarding working of ANMOL Application.

The M & D officer managed many of the minor repairs, but some AMWs wish to have more professional technical support. This suggests that more practical support by the IT officer could be beneficial. It is difficult to find technical support staff in Sehore.

DD: It would be better to have someone who know about Application and tablets professionally. To repair when ANMOL Application is not working... they take them and not forwarded again.

Almost all ANMs had problems with the hardware. The Mobile tablets heats up and the battery empties quickly and the tablets hangs a lot while entering the data.

EE: The tablet becomes hot . When I charge my tablet I unplug it after 30 minutes to cool down and then I plug it in again.

FF: The tablet takes a large time to get charged and not even last for 3 hours.

E) Acceptability

Despite the fact that the ANMs (Auxiliary Nurse Midwives) not so friendly about this kind of technology in their work or private life, they easily got used to the Mobile tablets and Anmol Application. The electronic forms forced the ANMs to do a step-by-step assessment and ask all the relevant questions whenever they visited a Beneficiary. This was difficult with the existing paper forms. Although the work mode of Anmol Application is available in both Hindi and English as per the preference, but data input is available in English only, I observed that some of ANMs prefers to input the data in Hindi also. ANMs appreciated the fact that Anmol reduces the time of entering details which increases their overall performance. It motivated them to use the Anmol application.

F) Practicality

I assessed the practicality of implementing the Anmol application in the primary health care settings from technical and nontechnical perspectives. Short battery lifetime of the Mobile tablets, insensitivity of the Mobile tablets' touch screens with time, overheating, Charging and poor mobile network connectivity in the study areas were technical bottlenecks. The battery lifetime got shorter when Internet connection and Calling of the phones were used simultaneously. The screens of many Mobile tablets got insensitive and needed to be replaced. As a solution to this extra, spare part can be made available to them.

This study identified lack of a unique and consistent identification of ANM to verify her hierarchy , Village and ASHA list which are one of nontechnical challenges.

G) Integration

The challenge of integrating the application into daily and real practices was there and were in both technical and non-technical form. Correct and appropriate utilization of the application seemed dependent on the knowledge, competency, motivation, and commitment of the ANMs. Working relationship between RCH portal and ANMOL Application was not clearly defined and was seen virtually nonexistent.

H) The Public-spirited professionalism and belief in ANMOL Application

I found that acceptability and contextual factors were not the only constructs influencing the use of ANMOL Application. ANMs seemed to be deeply motivated by the best interest of their community and the health system in general. Combined with an ethos of service, this may have been a reason why they embraced the ANMOL Application despite the challenges they encountered. This sense of public-spirited professionalism seems to be reinforced by positive reaction. The latter seems to contribute to the belief that ANMOL Application will be the future norms which showed that it can be easily implement in other districts but with better connectivity and good quality tablets provision. ANMs was happy to participate in this study, as it provides them opportunity to speak up about their problems and benefits they were facing while using ANMOL Application which help them to empowered and may have reduced their workload and problems encountered.

FF: Everything like this coming online. We can learn about regarding it because we have it. Otherwise we would know nothing.

In addition, as the electronic system is perceived as superior to the paper system, because of time efficiencies, improved sharing of information with others, and improved quality of care, ANMs appear to feel a professional duty to accept and use ANMOL Application. We therefore added the emerging construct of 'public-spirited professionalism and belief in'

This emerging construct seems to be reflected as well in the intention of most ANMs to continue using ANMOL Application if good quality tablets and if not spare parts should be made available to them so that they feel motivated to continuation work on ANMOL Application.

HH: If this application can be installed on any other tablet, I would buy and use it, because it is much easier to do work on ANMOL Application and reduces the workload and time wasted during data entry by data operators.

Nonetheless, the determination of ANMs to accept and use of ANMOL Application was evident. Despite the fact that they admitted struggling with the application, lacking technical or supervisory support, or feeling discouraged because of lack of Internet connectivity, they kept stressing that the were in their community's best interest, good for their health system, and therefore felt a professional duty to accept and use the application.

Major Key Findings

Total 55 ANMs participated in the studyin which 15 of them belongs to Bhopal,16 of them from Shyampur block (Sehore) and 24 are from Ashta Block (Sehore).Total tablets distributed in Bhopal were 28 which belongs to 28 ANMs but only 15 able to make their presence in study. Number of tablets distributed in Shyampur block were 57 but only 16 of them able to participate in study and in ashta block 34 tablets distributed only 24 able to make their presence to participate in study. Almost all of them provided tablets one year ago.

- 55 ANMs Participated for FGD in which only a few are currently working on ANMOL Application.
- Around 50 % of them stopped working on ANMOL Application in the month of January 2018.
- Nearly all ANMs are facing village mapping problem as the number of villages under them are not clearly defined.
- Most of ANMs are unable to locate their village on ANMOL Application.
- Around 20 ANMs which share same village under them are unable to fetch which beneficiaries are registered by herself.
- The list of ASHAs are not clearly defined as the mapping of ASHA in ANMOL are not correct because of which ANMs are unable to fetch the details of ASHA under them.
- In many cases the entry done by ANMs are not visible on RCH Portal.
- Many ANMs don't even know how to reset password and don't bother to ask someone regarding it and happily continuation of work in registers.
- The Application runs offline but after filling one entry for jumping to next Internet connectivity is required without internet the form is not submitted and it will go further for next entry.
- Tablets are not in use still ANMs have them and not used by them
- The tablet is used for multipurpose work(for gaming and calling) which further reduces the battery backup.
- ANMOL Application launched to reduce the workload of ANMs but it double the workload of ANMs as ANMs still entry the details in registers and then entry done on ANMOL or by operators in most of cases.
- As previous ANMs leave or transferred to other place the work due by her is get pended and new ANMs unable to locate previous entry .

- Loss and missing data even ANMs entered the data in ANMOL Application.

- In some cases data were entered but ANMs still not able to fetch that filled data as it not updated on ANMOL itself.
- In many cases eligible couple entry was an issue as ANMOL unable to proceed their data input and create unusual errors.
- Application crash in between most of times not responding.
- Synchronization issues are there as the data are not automatically updated
- There is no evidence of reference videos for maternal and child care.
- There is no technical staff there to help ANMs regarding their Mobile tablets and ANMOL Application.
- RCH id not generated in some cases.
- Data is not updating even if net connectivity is there
- Duplicacy of RCH ID as in some cases same ID is not able to use again if same women pregnant again.
- In some cases the details of 2nd ANC not filling as it unable fetch details of 1st ANC.
- In some cases if a mother who undergo abortion and pregnant again within same year the ANC is not created for her.

- Data validation problem is there as ANMs are unable to use application they handover to someone else to entry the data through ANMOL Application.
- In some cases ANMOL Application is working good but ANM not entry data on it as they not remember the password and unable to recover it and don't even tell the supervisor regarding it.
- In some cases ANMs are not able to track the previous entries as all entries are not updated.
- In some cases the MPWs are doing work of ANMs.
- As the entries done by previous ANM are not filled properly the work load get doubled. Not easily tracking of previous entries
- As proper not given ANMs don't. know where to find previous cases.
- Some ANMs are not doing their work as they are unaware that it works n both Hindi and English

- There are not so many charging points even available if training conducted for large amount of population.

- Most Mobile tablets are unrepaired become burden than convivence.
- Records of ANMOL application are vary with RCH Portal as the entries done on ANMOL Application not shown on RCH portal.
- No availability of spare parts of Tablets in case any Anmol tablet crashed.
- In starting it was easier to do entry in tablets in compare to register as it more easy to handle.
- It easy to bring tablets at time of monthly meetings.
- Hardware issues are the most as many ANMs already return their ANMOL tablets as they are not working, some of them crashed, some have overheating issue, some have charging issue, Some have screen touch issues, In some cases the keyboard not working.
- As the entries done by previous ANMs are not filled properly the load of work gets doubled as it is not easy to track the previous cases easily.
- There is no auto updation of ASHA in ANMOL Application.
- Acceptance of ANMOL is there but the quality of tablets is low.
- ANMs are afraid of tablet sustainability that they still carry registers with them.
- Details of beneficiary are not deleted even after their death.
- Not aware about ID generation for twin baby.

Key Observations (from ANMOL Application): -

- ANMOL also facilitate in identification of High risk pregnancies and children with LBW (Low Birth Weight).
- ANMOL also facilitate in follow up of High risk pregnancies and children with LBW (Low Birth Weight).
- ANMOL contains the details of Couples, Pregnant Women and Children who are registered through Anmol.
- Information regarding Family Planning and its four parameters are available on ANMOL application.
- Information regarding number of all ANC visits of Pregnant women can be easily find out.
- Details regarding Delivery outcomes and places where it is conducted can be easily find out.
- Details regarding PNC services can be find out.
- Coverage report of Immunization under that ANM can be easily find out with help of ANMOL Application.
- Reporting Details of Maternal and Child deaths under the area of that ANM can be find out.
- Severe Anaemia rate under the area of that ANM can be carry out.

Recommendations

- Mapping should be done correctly for those villages which were not showing under particular ANMs .
- Mapping of ASHAs under each ANM should be correctly done.
- Data must be shown immediately on RCH portal as the ANM complete entry of one case.
- The list of various beneficiaries must be happened as per to VILLAGE WISE SO that population of each village can be segregated.
- Auto updation of ASHA option can be there and ANM can be allowed to update the details of new ASHA workers in their village.
- The work of ANMs who share same village must be defined clearly.
- The amount of pending work load is high ;ANMs are unable to fetch details of every beneficiary by name in this case the name of people can be sorted as per village wise.
- Village wise list of people must be there as it is not easy to find the name of every person from huge list.
- As burden of work increases as ANM first make entries in registers than on ANMOL there can be provision of extra battery back-up so that their work load reduces on filed and spare parts of tablets must be made available to ANMs as it discourages them to work on ANMOL.
- As if no spare parts there the crashed tablets of ANMs can be exchanged with other tablets available by which the motivational level of ANMs regarding working on ANMOL not low down
- A team can be formed separately for resolving the various problems of ASHA WORKERS and OPERATORS.
- Provision of training at regular intervals helps and motivate them to use ANMOL Application.
- The Play store can be locked and a link of software download send to them through message and also for further updates as they not at all aware of this.

Features of Anmol App

- ANMOL is an android based application.
- This app will show all details of immunization of Mother & infants.
- Data entry will be submitted of vaccination in this app.
- Application runs effectively only on Android based Tablets only.
- ANMOL is a Tablet Based version of RCH portal which tracks EC, PW & Children.
- Application can be easily download from Google play store.
- User can even receive the link to download the application & its further updates through email.
- Application works on offline mode.
- Application is Aadhar enabled, it will help in authentication of records of field workers & beneficiaries.
- Data can directly download at central server.
- Data get automatically updated as ANMOL application comes in network and hence directly updated on RCH Portal.
- Data on ANMOL Application can be stored up to 8 years as it is cloud based.
- This app will be helpful to ANMs and Anganwadis to play their responsibilities with awareness.
- App will be helpful to provide awareness for pregnant ladies to protection their child.
- App will be play main role to bring transparency in the health sector of Madhya pradesh
- Efficient feature of Data search is there in ANMOL by which previous entry regarding aspects can be traced so easily.
- Preferred language option for entering the details is available on home screen of application.
- Software starts by entering ANM ID provided by Department.
- It automatically fetches the details of ANM from server as ANM enter the ANM ID.
- This is a password protected system & run by authorized user only.
- Existing &New ANM using –No new HR hired
- Utility of HMIS, RCH Portal which in turn strengthens entry regime.
- Transparency in data source.
- No need to compile information manually.
- Single and simplified payment channel.
- It's easy to monitor the performance level of ANM.
- Assessment of health services provided at community level get easier.
- Effective, transparent, seamless and timely data entry and registration module.
- Duplicacy won't be possible, hence quality of data would be of excellent standard.
- To monitor the performance level
- It's easy to calculate the number of ANM who stopped performing.
- It's easy to know to the educational level, marital status, Experience level of ANM through ANMOL application.
- To identify gap area & need assessment for rendering better services at community level.
- Work plan option is also there in ANMOL through which ANM can own generate their workplan as per situation and need.

- Video counselling option are also there which empowered ANM to use multiple channels of communication, in which videos are available in their local language also.
- The Profile of village wise is also available in Application.
- Strengthening of grievance redresses mechanism.
- Has a potential link regarding to the performance of ANM basis of critical indicators so performance linked incentives can be pay-out.
- This app will be helpful to ANMs and Anganwadis to play their responsibilities with awareness.
- App will be helpful to provide awareness for pregnant ladies to protection their child.
- App will be play main role to bring transparency in the health sector of Madhya Pradesh.
- Support centre with URL: http//anmolapp.co.in has been established for direct posting of issues/ bugs raised by ANMs during the usage of ANMOL.

Strengths and Limitations

The study was conducted in Bhopal and Sehore which is quite peri-urban setting and the contextual finding may not be transferable to strictly rural contexts. Data were collected within 1 month, which might have limited findings of acceptability, for example with ANMs who worked for just one month and less than one month can't able to provide appropriate finding for this study. Because of many defective Mobile tablets not all ANMs could be observed in how they used the application and what might be their experience of working on ANMOL Application clearly defined. Morever the study would have been further enriched if the data of all ANMs regarding their work on ANMOL Application was made available. Last the positive findings of study may have been affected by social desirability bias although I stressed confidentiality, included observations and encouraged participants to describe real experiences.

Two common disadvantages of focus groups are groupthink and accuracy. Those with strong influence, such as the moderator and vocal group members, can sway the conversation and make it seem one-dimensional or quash feedback from less vocal participants.

Response accuracy is a concern because when participants know they are involved in research for a particular brand or company, they may feel less comfortable speaking out against that brand in front of the moderator and company on-looker

Strengths of this study can be found in its foundation in technology acceptance by ANMs and the inclusion of Maximum from entire population of ANMs that participated in study. For future research the reported and actual use of ANMOL Application by ANMs themselves need to be investigated and perspectives of their supervisors needs to be explored. Finally a Quantative follow up of this study might contribute to a new technology acceptance model.

Conclusion

This qualitative research with the participants extended previous research on challenges and opportunities of mobile health application. The findings provide researchers, app designers, and health care providers insights on how to develop and evaluate mobile health apps from the users' perspective. technology adoption by frontline workers can positively impact the quality and experience of care they provide. Individual characteristics, especially literacy and age, can be important elements affecting technology adoption and the way users leverage the technology for their work. Our formative study provides informed hypotheses and methods for further research.

- ANMs were happy as the work come online but the system is not working up to the mark that they feel less motivated to do such load of works on ANMOL for this continuation and best improvements must be done on ANMOL Application
- This data entering tool is convenient as its details directly update to the central server so it's a transparent system.
- The implementing organization could have thought of an alternative solution, such as the development of a user manual.
- The application allowed for more dynamic data collection; maintained data integrity; supported data transmission and storage; facilitated data organization and processing; and provided greater reliability in the analysis of results.
- Reduction in time in long data entry procedure.
- Huge reduction in time which earlier required during data validation, Data compilation, Data analyses and Report dissemination.
- Chances of error are still there as they fill some wrong details during the whole process.
- Unacceptability regarding new technology among some ANM can be a problem for more better performance of ANMOL Application.
- Performance of Block/ PHC Health Supervisors has been improved.
- Traceability of high risk pregnancy in ANMs Sub-centre area can be easily done.
- ANM doesn't required to go to operators for data entry and updation.
- ANMs acceptability and demand for an Anmol application and electronic forms are high if technical issues sorted.
- Nontechnical challenges are also difficult to solve when introducing an ANMOL application to ANMs for primary health care.

- With the current context of the Madhya Pradesh health care, a smartphone-based ANMOL application and electronic forms can be used for routine collection of health and epidemiologic data and transfer at large scale.
- For a successful and sustainable implementation of an ANMOL application and electronic forms at primary health care settings in Madhya Pradesh at a larger scale, implementing a system of assigning unique and consistent patient identifier, standardization of health services and workflows, minimizing high turnover of health workers, and improving mobile network coverage would be prerequisites.
- The application intensified data collection and facilitated data recording and storage; data transmission; and data organization and processing; and ensured greater reliability in the analysis of results, maintaining data integrity in all these steps. Data transmission and extraction were performed on a daily basis

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Annex I: Interview Guide

Q.1 What do you know about ANMOL Application?

Q.2 What do you think what is the purpose behind launching ANMOL Application?

Q.3 What are the barriers that you were facing before ANMOL application?

Q.4 What are the benefits of using ANMOL Application?

Q.5 What is your experience of using ANMOL application?

Q.6 What do you think what improvements can be done regarding ANMOL Application?

Q.7 Is there anything else you'd like to say about the Anmol Application?

अनुलग्नक **I:** साक्षात्कार गाइड

प्रश्न 1. अनमोल एप्लिकेशन के बारे में आप क्या जानते हैं?

प्रश्न 2. अनमोल एप्लिकेशन लॉन्च करने के पीछे क्या उद्देश्य है आपको क्या लगता है?

प्रश्न 3. अनमोल एप्लिकेशन का उपयोग करने से पहले आप किस बाधाओं का सामना कर रहे थे?

प्रश्न 4. अनमोल एप्लिकेशन का उपयोग करने के क्या फायदे हैं?

प्रश्न 5. अनमोल एप्लिकेशन का उपयोग करने का आपका अनुभव कैसा है?

प्रश्न 6 आपको क्या लगता है कि अनमोल एप्लिकेशन के संबंध में क्या सुधार किए जा सकते हैं?

प्रश्न 10 क्या आप अनमोल एप्लिकेशन के बारे में कुछ और कहना चाहते हैं?

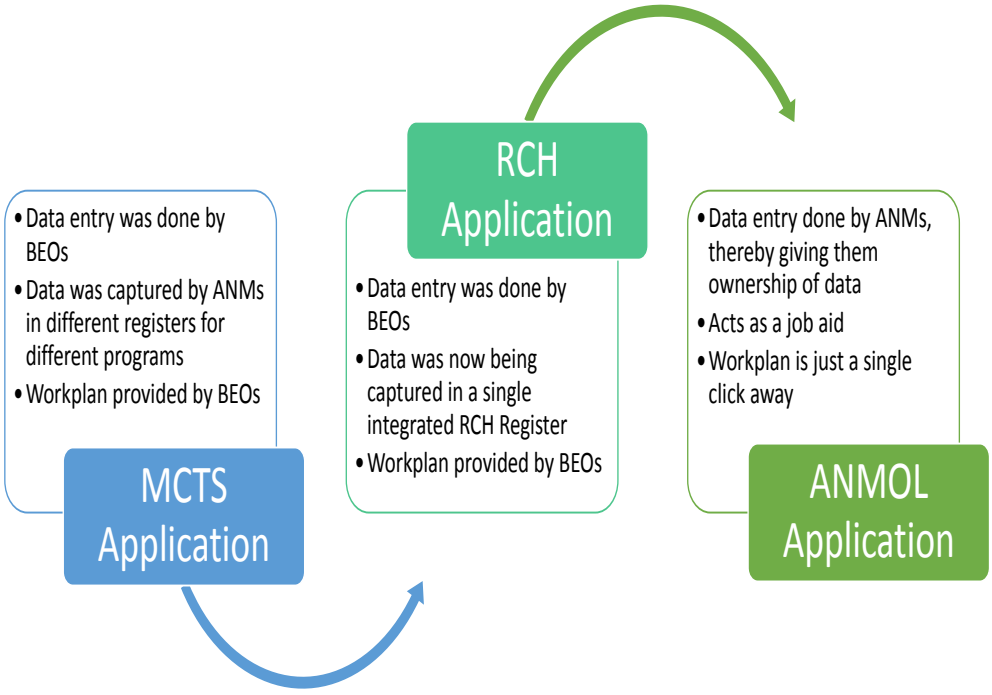
Annex ii: ANMs characteristics

s.no	Name of ANM	Area District	Age	Educational qualification	year of experience on ANMOL (approx)
1	ranjana verma	CHC gandhinagar , Bhopal	48	12th	1 year
2	poonam	SHC Bhopal	59	11th	1 year
3	MAnju MArkande	CHC gandhinagar , Bhopal	49	12th	1 year
4	samta shrivastava	CHC gandhinagar , Bhopal	58	B.A Final	1 year
5	sriMAti bachalla	CHC gandhinagar , Bhopal	45	12th	1 year
6	krishna prajapati	CHC gandhinagar , Bhopal	33	11th	1 year
7	premlata MAlviya	CHC gandhinagar , Bhopal	53	11th	1 year
8	p.c MArglatta	SHC admpur	55	12th	1 year
9	kaanti devi	Sarana	51	11th	1 year
10	jyoti soniyal	Kolam	30	12th	1 year
11	anita sharMA	Kolam	51	B.A Final	1 year
12	ratna	CHC gandhinagar , Bhopal	55	12th	1 year
13	kmin	Kolam	45	12th	1 year
14	leela banawat	Gandhinagar	57	12th	1 year
15	shalini	Kolar	34	MA	1 year
16	kiran sharMA	Ashta	34	B.A Final	1 year
17	radha thakur	Ashta	28	B.A Final	1 year
18	kusum solanki	Ashta	32	B.A Final	1 year
19	shakuntala MAlviya	Ashta	35	B.A Final	1 year
20	preeti baghel	Ashta	30	12th	1 year
21	sonu yadav	Ashta	28	12th	1 year
22	aasha baghel	Ashta	28	B.A Final	1 year
23	yashoda verMA	Ashta	50	11th	1 year

24	kamleshkushwaha	Ashta	28	12th	1 year
25	shehar baano kureshi	Ashta	44	B.A Final	1 year
26	suMAn	Ashta	44	12th	1 year
27	laxmi baghel	Ashta	29	B.A Final	1 year
28	MAnju rajput	Ashta	36	b.com	1 year
29	bhiMA rajouriya	Ashta	26	12th	1 year
30	sharda barrrde	Ashta	30	10th	1 year
31	seeMA solanki	Ashta	32	12th	1 year
32	saroj saalve	Ashta	29	11th	1 year
33	uMA saahu	Ashta	53	11th	1 year
34	suMAn baghel	Mehatwada	35	10th	1 year
35	MAaadhuri shukala	Mehatwada	56	11th	1 year
36	aanand rajput	pagariya haat	42	MA	1 year
37	raajkuMAri sharMA	pagariya haat	55	12th	1 year
38	raajMAni bhilana	shyam pu	40	12th	1 year
39	sunita patel	Sehore	45	B.A Final	1 year
40	MAaya vyas	Sehore	38	B.A Final	1 year
41	sangeeta rathore	Sehore	39	MA	1 year
42	krishna rathore	Sehore	31	12th	1 year
43	shobha yadav	Sehore	51	B.A Final	1 year
44	rekha MAlviya	Sehore	40	12th	1 year
45	sarita rathore	Sehore	48	12th	1 year
46	muni MAalviya	Sehore	50	11th	1 year
47	vasu dhra sharMA	Sehore	44	12th	1 year
48	dev kanya	Sehore	53	12th	1 year
49	suMAn bagehel	Sehore	35	12th	1 year
50	seeMA jain	Sehore	51	12th	1 year
51	kavita pwara	shyaam pur	25	12th	1 year
52	seeta viMAl	barkheda hasan	27	12th	1 year
53	rekha shrivas	Bansiya	30	12th	1 year
54	pinki viMAl	chandbad jaagir	28	B.A Final	1 year

55	sunita devi	Dobra	29	B.A Final	1 year

Annex iii : Journey to ANMOL Application



Annex iv : Key Modules in ANMOL

- **Eligible Couple**
  - Registration
  - Tracking of Family Planning Services
- **Pregnant Women**
  - Registration
  - ANC Services
  - Delivery details
  - PNC Services
- **Child**
  - Registration
  - Tracking of Immunization Services
  - Child Medical

- **Dashboard**
  - Registration
  - Family Planning
  - ANC Services
  - Delivery Outcome
  - PNC Care
  - Immunization
  - Critical Indicator
  - KPI Factsheet
- **Counseling**
  - Video
  - Audio
  - eBooks
  - eTutorials
  - User Manual

- **Workplan**
  - Sub Centre wise
  - Village wise
  - Service wise
  - ANM wise
  - ASHA wise
  - Beneficiary wise
  - High Risk Pregnant Women
  - Low Birth Weight Children
- **VHND**
  - Due List
  - Logistic Planning
  - Logistic Used

Annex v: Homepage

ANM Details

Hierarchy details of the ANM

Syncs data on the server

Annex vi : ANMOL Application Menu list