

The systematic medical appraisal, referral and treatment (SMART) mental health programme: Formative research informing a cluster randomized controlled trial

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ABSTRACT

Background: Gaps exist between prevalence and treatment options for mental disorders in India. Limited awareness, poor help-seeking, scarcity of trained mental health professionals, limited mental health services and stigma are few examples of reasons contributing to treatment gap.

Aims: This paper highlights findings from formative research of a primary mental healthcare model comprising of a preliminary feasibility testing of the Electronic Decision Support System (EDSS) to provide care using mobile based applications, perceptions of the community towards mental health and incorporating cultural adaptations for pre-existing anti-stigma campaign materials.

Methods: A cross-sectional mixed methods approach tested the user acceptability of the electronic decision support system EDSS for accredited social health activists (ASHAs) and Primary Health Centre (PHC) doctors using tablets in two villages and two PHCs in rural Haryana (Northern India). Five focus groups and six in-depth interviews along with non-participant observations were used to ascertain community perceptions about various aspects related to mental health. Findings of the study were analyzed and interpreted against the key themes of Andersen's model.

Results: Out of a total of 553 individuals screened for common mental disorders, 51 (9.2%) were screened positive and 32 visited PHC doctors for treatment. There was limited knowledge about common mental disorders amongst community; need to train primary health workers to identify and treat mental disorders; and incorporate cultural adaptation of anti-stigma awareness materials.

Conclusions: The EDSS was found to be acceptable and feasible by primary and community health workers. The findings guided refining of the intervention prior to implementation of a large-scale cluster randomized controlled trial.

1. Introduction

Mental disorders, behavioural disorders and self-harm account for 8.5% of all disability-adjusted life-years worldwide (G. B. D. [GBD 2013](#)

[DALYs and HALE Collaborators et al., 2015](#)). The National Mental Health Survey (NMHS) estimated that mental disorders affect about 15% Indian adults and nearly 150 million Indians need treatment for mental disorders ([Gururaj et al., 2016](#)). The treatment gap is 75–85% in low and middle-income countries (LMICs) such as India and around 4% of people

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Abbreviations

NMHS	National Mental Health Survey
LMICs	low and middle-income countries
SMART	Systematic Medical Appraisal Referral and Treatment
cRCT	cluster randomized controlled trial
CMDs	common mental disorders
EDSS	electronic decision support system
PHCs	Primary Health Centres
ASHAs	accredited social health activists
PHQ9	Patient Health Questionnaire-9 Item
GAD7	Generalized Anxiety Disorder-7 Item
mhGAP-IG	mental health Gap Action Programme-Intervention Guide
FGDs	Focus Group Discussions
IDIs	In-depth Interview

with major depressive disorders receive adequate care (Gururaj et al., 2016; Demyttenaere et al., 2004; Thornicroft et al., 2017). The reasons for this treatment gap are multifactorial, which include affordability of care (Patel et al., 2018), limited awareness and identification of individuals with mental illness (Armstrong et al., 2011; WHO, 2001); stigma and negative perceptions about mental health and help seeking (Patel et al., 2018; WHO, 2001; Thornicroft et al., 2009); lack of trained mental health professionals and services (Patel et al., 2018; WHO, 2001; Saraceno, 2004; WHO, 2018); These problems are particularly pronounced in rural regions (WHO, 2001; Maulik et al., 2020). Mobile technologies can be leveraged to provide access to mental health services in communities with limited mental health resources (Naslund et al., 2017; Daniel et al., 2021). There is evidence to indicate the feasibility and acceptability of digital technology in LMICs, but evidence of effectiveness per se and cost-effectiveness is scarce (Naslund et al., 2017).

India has a three-tiered system of primary health care delivery model within the government sector. At the bottom of the pyramid is the sub-centre, which caters to 3000–5000 population and is staffed by a nurse and paramedical staff. Above that level is the primary health centre (PHC), which caters to 20 000–30 000 population and is staffed by nurses, paramedical staffs and one trained physician. It is equipped to provide basic health care and is often the focal point for most rural public health projects. Above that is the community health centre, which caters to 80 000–120 000 population. The community health centre has some specialised health care facilities and is staffed by doctors, nurses, and paramedical staff. In addition, the government contracts accredited social health activists (ASHAs) in each village to cater to a population of about 1000 individuals. ASHAs are recruited by the local village-level government (Panchayat) and are women residents of the village who are generally educated to grade 8–10 level. They are provided basic training in health services delivery and their primary role is to support the government programme around maternal and child health on a part-time contractual basis. They do so by making regular household visits and ensuring that the mothers and their children receive government approved care. A key role is to identify pregnant women and ensure institution-based delivery at the PHCs, for which they are incentivised. They generally work for 2–3 h per day and use their remaining time to do their personal work.

Since 2014, George Institute for Global Health India has implemented a large mental health project Systematic Medical Appraisal Referral and Treatment (SMART) Mental Health Project (SMART Mental Health) across 42 villages and covering about 50000 population in rural Andhra Pradesh, in South India. The project involved three core components – a technology-enabled mental health services delivery for depression, anxiety and increased suicide risk, an anti-stigma campaign

to raise awareness about those mental health conditions, and training of primary health workers to identify and manage individuals suffering from such conditions (Maulik et al., 2015, 2017, 2020; Maulik et al., 2016). The SMART Mental Health Project was implemented as a large pilot project in Southern India between 2014 and 19, and the results showed that the intervention led to significant increase in accessing mental health services (from 3% to more than 80% over a one-year period) by those suffering from depression, anxiety or increased suicide risk. There was significant reduction in anxiety and depression, and reduction in stigma related to mental health (Maulik et al., 2015, 2017, 2020; Maulik et al., 2016). The current project scales up that pilot project across Faridabad and Palwal districts of Haryana in north and West Godavari district of Andhra Pradesh in the south, using a cluster randomized controlled trial (cRCT) (Daniel et al., 2021). The aim of the trial is to evaluate the feasibility, clinical effectiveness and cost-effectiveness of a multifaceted primary healthcare worker intervention that improves the identification and management of individuals aged ≥ 18 years with common mental disorders (CMDs) such as depression, suicidal intent/self-harm, and other stress-related emotional or medically unexplained complaints. It involves implementing an anti-stigma campaign related to mental health and delivering mental health services through primary health workers using an electronic decision support system (EDSS).

Though the basic elements of the intervention in the trial are similar to the pilot study, there were differences which warranted formative research in Northern India. First, the current EDSS underwent enhancements which needed to be tested for feasibility. Secondly, the mental health awareness and stigma perceptions related to mental health needed to be investigated given the cultural and linguistic differences with south India. Finally, though both districts in Haryana were quite similar culturally, the state of Haryana per se, had a different health system (as in India health is governed by states) and health care delivery model compared to Andhra Pradesh. The District Mental Health Programme while operational was not implemented uniformly in the two districts in Haryana. Compared to West Godavari district in the south, both Palwal and Faridabad had psychotropic medications at the Primary Health Centres (PHCs). Faridabad had access to All India Institute of Medical Sciences' outreach clinic and Faridabad district hospital, both of which had mental health professionals. Palwal had no such access. The psychiatrist from Faridabad district hospital visited Palwal once/week. West Godavari on the other hand had a well-functioning psychiatry unit in the district hospital and primary care doctors referred patients to the hospital when needed, in addition to a well-known private clinic which was often accessed by patients.

The formative research had the following objectives: (a) to identify perceptions of the community towards mental health and cultural or linguistic adaptations to the existing anti-stigma campaign materials, and (b) to test initial feasibility and acceptability of the EDSS for Accredited Social Health Activists (ASHA) and PHC doctors, and understand barriers and facilitators affecting access to mental health services. Given that there is a lack of information on mental health stigma and interventions related to it in northern India (Haldar et al., 2017; Kaur et al., 2021), we considered the first objective to address the demand side aspects of provisioning community mental health services. To test feasibility of the EDSS, we expected primary health care workers to be able to screen, diagnose and manage those at high risk of CMDs, which would address supply side aspects of delivering quality mental health services. The rationale of combining these two objectives was to test the feasibility of a primary mental healthcare model, comprising of mhealth and anti-stigma components in a culturally and linguistically different setting such as rural Haryana.

2. Materials and method

The formative research used mixed methods approaches conducted between March–May 2019. Ethics approval was obtained from the

Independent Ethics Committee of the George Institute of India (Ref. no. 009/2018) and All India Institute of Medical Sciences, New Delhi (Ref. no. IEC-315/01.06.2018). Written informed consent was taken from all the participants. The study obtained Health Ministry Screening Committee approval from Indian Council of Medical Research. Approvals were sought from different administrative levels in the state, district and villages.

2.1. Study site

The study was conducted in two villages Garkhera and Panehrakurd in Faridabad District of Haryana which were geographically within 4 km of their respective PHCs (Dayalpur and Panehrakurd). PHC Dayalpur was part of AIIMS outreach community services and had access to one visiting psychiatrist (once a week) and psychotropic medications. The other PHC had mental health facilities like the rest of the PHCs including those in Palwal district. The villages were purposively selected based on doctor and ASHA availability, population size, and proximity to the PHC. The village leaders and both state and local administrative bodies were informed about the purpose of the study, and prior permission was

sought from them.

As part of feasibility testing of the EDSS, PHC doctors and ASHAs were trained on it who then implemented it. This was done by ASHAs screening individuals and referring them to the PHC doctors, who in turn assessed and provided necessary treatment for CMDs. Community perceptions of mental health and CMDs and knowledge about existing mental health services were gathered from community members and stakeholders.

2.2. Field testing of EDSS for ASHAs and PHC doctors

The EDSS software developed on an Android platform, optimised for 7-inch tablets is a screening tool based on the Patient Health Questionnaire-9 Item (PHQ9) (Pfizer, 2013a; Pfizer, 2013b) and Generalized Anxiety Disorder-7 Item (GAD7) instruments (Pfizer, 2013b, 2013c). Those with a score ≥ 10 on either scale or a score of ≥ 2 on the question about self-harm on the PHQ9 were considered as screen positive and were referred to the PHC doctor (Fig. 1). Both these scales had been validated among Indian population and the Hindi versions were used (Kochhar et al., 2007). The doctors used the mental health

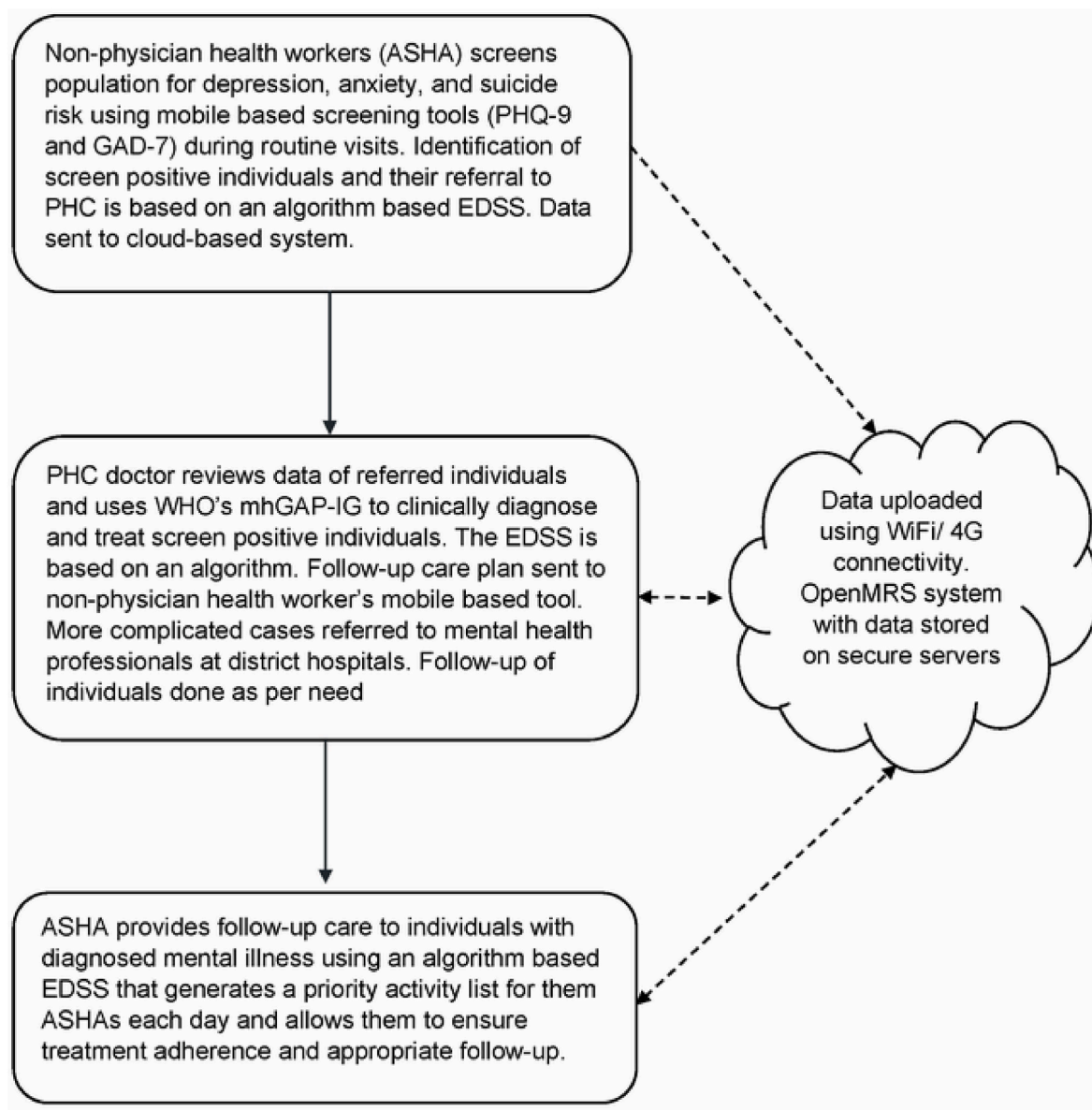


Fig. 1. Electronic decision support tools used at different stages of the intervention.

Gap Action Programme – Intervention Guide (mhGAP-IG) (WHO, 2021) (that was developed into an Android based application for the pilot study). The current application incorporated the following changes in the EDSS which were specifically tested:

1. Compared to the pilot study, the algorithm for identifying screen positive cases was slightly different in that the pilot had a cut off score of ≥ 10 on the PHQ9/GAD7 and/or a score of ≥ 1 on the suicide related question on PHQ9.
2. The algorithm-based traffic-light system of alerting the ASHAs about the screen-positive individual's treatment status with inbuilt follow-up questions which ensured treatment adherence, also needed to be tested in the new setting in Haryana.
3. The EDSS application was enhanced with the ability to connect with the mental health specialist for symptoms, diagnosis and treatment clarification using WhatsApp/Skype.

2.2.1. Training of primary health workers

All seven ASHAs from both the villages were trained for five days on mental health knowledge, and symptoms of depression, anxiety and identifying suicide risk. Two doctors were trained for half a day with additional handholding on application usage by the research team. The doctors were trained using the depression, suicide and emotional stress modules of the mhGAP-IG (Maulik et al., 2016).

2.2.2. Delivering the EDSS (Fig. 1)

Each ASHA was randomly allotted 100 individuals to screen and refer screen positive individuals to the PHC doctor. The PHC doctor used the mhGAP-IG application to diagnose referred individuals and provide appropriate treatment. Screen positive individuals visited the PHC outpatient clinic on a specified day and time of the week as indicated by the doctor. The work of both the ASHAs and the doctor were monitored by the research staff, and their time was financially compensated at the rates comparable to the government.

2.2.3. Assessment of EDSS and feasibility of its delivery

Analytics from the EDSS helped identify the number of individuals screened by each ASHA, number of screenings done per day by ASHAs, and time taken for each assessment. Service usage data was tracked to identify proportion of screen positive individuals who accessed care from the PHC doctor, types of diagnoses, and treatment provided. Analytics helped identify if the ASHAs were: (i) following up on screen positive individuals, (ii) enquiring about the health status, and (iii) asking relevant questions.

3. Perceptions of mental health and CMDs and knowledge about existing mental health services

Andersen's Modified Behavioural Model of Health Services Use framework to discuss the findings of the study. We thought that this would provide us a coherent framework to present our findings too. As Haryana was a new site for us, we examined the socio-cultural context under the Population characteristics-predisposing characteristics, enabling factors, needs. We also believe that understanding the socio-cultural context in relation to mental health and illness was important as the scale up study included an anti-stigma component. Focus Group Discussions (FGDs) and In-depth Interview (IDIs) were conducted in both villages to gather information about mental health awareness, knowledge about mental health symptoms related to CMDs, and mental health care.

3.1. Engaging with stakeholders

Key stakeholders such as, Sarpanch (village leader), socially active respectable members of the villages, PHC doctors, ASHAs and

community members were identified, informed, and involved since the start of the study. The compensation for ASHAs was finalized after detailed negotiations with ASHAs and their administrators.

3.2. Assessment

As this was a formative research, a total of five FGDs were conducted - two each with male and female community members, and one with the project staff. Six IDIs were conducted-two each with ASHAs and community leaders of the villages, one each with PHC doctor and psychiatrist. Purposive sampling was used for the recruitment of participants from the community to ensure participation of different socio-economic status, age groups and gender. Behavioural observations were noted in a field diary.

Two team members-one moderator (explained purpose and procedure) and one note-taker (audiotaping, consent and note-taking)- conducted the FGDs and IDIs in Hindi (local language) at a scheduled time and place within the village. The qualitative interviews were guided by specific open-ended questions and interjected by prompts. The questions sought responses about knowledge of CMDs and their treatment; beliefs and practices related to mental health per se and CMDs in particular; opinions on social inclusion of people with mental disorders and suggestions about how to increase mental health awareness and reduce stigma related to mental health.

4. Data management and analyses

All data from the EDSS were automatically uploaded into secure electronic data bases from where de-identified data was downloaded to conduct the analyses. Descriptive analyses were undertaken to provide an understanding about the ability of both the ASHA and doctor EDSS to identify screen positive individuals and diagnose them clinically. Socio-demographic correlates were also analyzed. STATA 16 (StataCorp, 2019) was used for the analyses.

The FGDs and IDIs data were digitally recorded, and de-identified before the analysis. The audio tapes were transcribed and then translated to English. Thematic Analysis with the help of N-Vivo 12 (© QSR international) was undertaken. The research team familiarised with the response by going through the data repeatedly. All transcripts were independently reviewed by two researchers (AK and AM) to identify recurrent codes across individuals and groups. A coding scheme was formulated. Any additional codes were added to the existing coding scheme. After coding the entire data set, both researchers (AK & AM) reviewed the codes to identify broad thematic areas using an inductive approach. Findings of the study were then organised under the key themes of Andersen's model (Andersen, 1995), where the sub-themes have considerable overlap.

5. Results

Quantitative data from backend analytics of EDSS applications were collated and is presented under relevant theme as additional information. Qualitative data was obtained from five FGDs and six IDIs with different stakeholders. Each FGD took about 45 min and the IDIs between 20 and 30 min. Forty-three community members (23 males aged 19–71 years; 20 females aged 21–60 years) and 10 project field staff (8 males; 2 females; age 28–42 years) participated in the FGDs. Some of the community members were illiterate or had primary and secondary level education while few had a bachelor's degree. More than half of male participants worked as farmers or farm labourers with additional jobs as small storekeepers, or other small businesses while about a fourth had government jobs. More than half of the female participants were housewives or engaged in farming, childcare and about a third in teaching.

5.1. Environment: healthcare system, external system

5.1.1. Health system constraints

There is a common perception in the community that medical care at the PHC was not adequate. Several participants in FGDs reported that doctors at the PHC gave insufficient time to patients. Many reported that free medicines were not always available. PHC Dayalpur had access to psychotropic medications because its functioning was regulated by AIIMS, compared to PHC Panehrakhurd that did not have any psychotropic medicines.

The psychiatrist discussed limited availability of mental health specialists as a challenge, “We need a social worker and we need a nurse, a trained nurse ... at least the minimum required staff.” [Psychiatrist].

The PHC doctor mentioned that availability of psychotropic medicines was an issue, as was their ability to diagnose mental disorders and prescribe psychotropics,

“So typically for mental problems or psychiatric problems the medicines are available very rarely at the PHC level. Also, second thing is that we should not diagnose them incorrectly and we shouldn’t prescribe the wrong medicines to them. So, we are a little careful about that”. [PHC Doctor]

There are only two public hospitals (Faridabad District hospital and AIIMS Ballabgarh) in the region which provided psychiatric care. The psychiatrist at District Hospital Faridabad conducts out-patient clinics at both Faridabad (four days a week) and Palwal district (one day a week) apart from providing services in a prison in Faridabad. This leads to high patient load and limited time per patient. The psychiatrist pointed out that around 50–80 patients visit the outpatient services every day.

“It takes around 10 minutes the first time. You can put an average of 10 minutes the first time ... In follow up if patient is fine then it takes three to four minutes; if the patient has lot of problems, it can take six to eight minutes”. [Psychiatrist]

Psychotropic medicines are not consistently available even in tertiary care settings as the psychiatrist says:

“Yes, medicines are available sometimes and sometimes they are not. It is not certain. We don’t get all the medicines”. [Psychiatrist]

As a result, patients are expected to buy medicines on their own leading to poor treatment adherence.

5.1.2. Training and involving primary health workers

A PHC doctor expressed a clear need for additional training for identifying patients with CMDs,

“We have been told about everything such as Malaria, TB etc. But we have not been given any orientation on mental health. So that is why we fear giving any medicines as we are not trained to prescribe the right dose.” [PHC Doctor]

The doctor also mentioned that patients whom they thought had mental illness were referred to the psychiatrist, because they were not equipped to deal with such patients.

ASHAs were expected to play a key role in the project in identifying and referring persons with CMDs to the health facility. There was largely a positive perception about the role that the ASHAs could play in the project.

“ASHAs do penetrate the houses and societies where we cannot go. All the patients who were brought in, were brought by the ASHA workers. And they did their job well. The screening process was good. That is how the patients were able to come and all of them had some problem or the other.” [PHC Doctor]

The psychiatrist and community members also felt that the ASHA is an important contact person to get access to the community. The project staff also acknowledged that having the ASHA screen patients

with CMDs was helpful in gaining access to the community in general and specially reaching out to women.

5.1.3. EDSS use by ASHAs and PHC doctors

A PHC doctor mentioned that the training had equipped him well to use the technology with ease. ASHAs also considered using tablet devices as beneficial and said that it provided them an opportunity to learn something new. ASHAs, indicated that carrying a tablet helped them to gain respect in the community and “create an impression”. A PHC doctor expressed that,

“I didn’t face any problem in this (EDSS) ... initially once or twice it is a little difficult but otherwise I feel it is easy.” [PHC Doctor]

Information of community members who were screened and those who visited PHC doctors are shown in Table 1 and Fig. 2. Additional information on the number of individuals screened by each ASHAs and the number of screenings performed by ASHAs per day are outlined in Table 2. Out of the 700 individuals assigned to screen, ASHAs could not screen 147 individuals because of participants being unavailable, refusing to participate, having shifted residence, and being ill. Among the six persons who had moderate depression, one was prescribed medication by the PHC doctor, and the remaining were referred to a psychiatrist. Six persons had features of bereavement. Three persons had bipolar disorder and 13 had psychotic features for which they were referred to a psychiatrist. Five individuals had increased suicide risk and four had alcohol and substance use disorder and were also referred to a psychiatrist.

Technical challenges in using the tablets were highlighted by the project field staff. Data were not saved appropriately at times on the server and needed to be uploaded more than once, and in one instance the device stopped functioning. One ASHA pointed out that it was difficult to find respondents with the similar names. It was suggested that additional information like the spouse’s name could be added to identify respondents. These challenges and suggestions were taken on board to improve functionality of the tablets.

5.1.4. Interactive voice response system (IVRS)

Suggestions were also sought for use of IVRS for motivating people to seek treatment. It was pointed out that younger people and men were more likely to have access to mobile phones. Women had limited access to mobile phones and generally depended on a family member’s phone. Educated women, and younger women were more likely to own a personal mobile phone than older and less educated women. One participant commented,

“We don’t have an individual phone”; “We have a common phone at home”; “My husband takes the phone with him, so it is rarely at home.” [Female community members]

Table 1
Characteristics of screen population, screen positive and negative individuals, those visited PHC doctor.

N screened by ASHA	Mean (SD) age in years	Age Range in years	Male/Female
553	34.5 (12.0)	18–60	287 (51.9%)/266 (48.1)
Screen positive (%)			
51 (9.2%)	41.5 (11.8) *	18–60	14 (27.5%)/37 (72.5%)**
Screen negative (%)			
502 (90.8%)	33.7 (11.8)	18–60	252 (50.2%)/250 (49.8%)
PHC doctor visited			
32 (62.7%)	43.5 (12.7)	18–60	8 (25%)/24 (75%)

*p < .000, **p < .003.

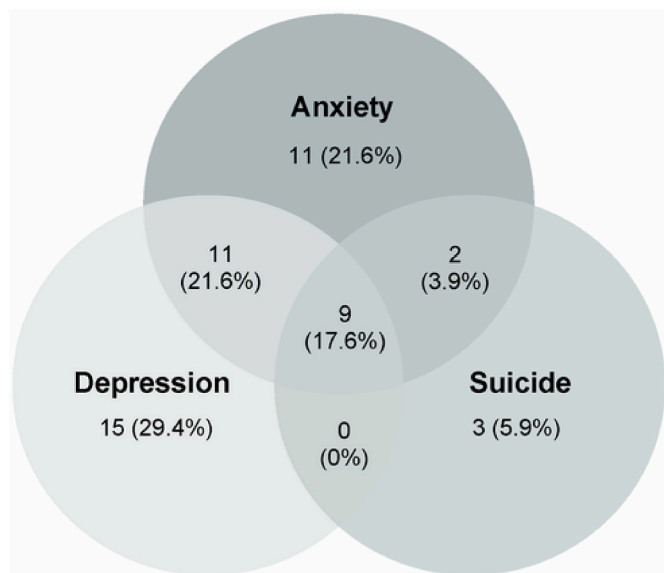


Fig. 2. Common mental disorders among screen positive individuals (N = 51).

Table 2
Information on number of screenings and screenings per day by ASHAs.

ASHA No.	No. of screenings	Screenings per day (Range, Mean)
ASHA 1	79	2-14, 7.18
ASHA 2	78	2-14, 7.09
ASHA 3	86	1-12, 7.82
ASHA 4	76	5-17, 9.50
ASHA 5	78	2-12, 7.80
ASHA 6	81	6-25, 11.57
ASHA 7	75	3-14, 7.50
Total	553	1-25, 8.27

5.2. Population characteristics-predisposing characteristics, enabling factors, needs

5.2.1. Socio-cultural context-

During our field work and field visits, caste-based marginalisation was observed in communities. Women from lower caste communities were not comfortable attending FGDs in a locality belonging to higher castes, and higher caste women were also unwilling to attend any event in localities inhabited by lower castes. Although persons belonging to all castes sat together during the FGDs, those who belonged to lower caste were expected to show respect to those belonging to higher caste. Gender-based and age-related cultural practices were present too. Women were expected to pay respect to men, and younger persons to older people.

5.2.2. Mental health awareness and perception about stigma

Knowledge about CMDs was limited in the community. People often used the term ‘tension’ to describe any kind of stress and stressors. Women were able to recognise that there was stress or ‘tension’ in their lives. They were able to relate to experiences of people who suffered from mental illness and had sought treatment at a tertiary hospital. Similarly, men mentioned if the person was indulging in socially unacceptable behaviour, fought continuously or neglected his family, that person had mental illness. Negative thoughts towards others were also considered as signs of mental illness as a participant said,

“They (mentally ill) also start living a stressful life. And then the person gets stuck in his tense life. Taking the wrong step of dying by suicide is also part of stress” [Male community members]

Misconceptions about causes for mental disorders existed. One

community leader felt that mental disorders was due to improper diet. Another participant shared,

“If one doesn’t have self-control then it leads to mental illness” [Male community members]

In one FGD, a project field staff from a neighbouring community shared,

“They (community member) feel that someone has done black magic and they have been possessed.” [Field Staff]

Stigma perceptions about persons with mental disorders being dangerous, and concerns about neighbours becoming aware about one’s mental disorder was highlighted in the FGDs with both women and men community members.

“There is so much of mental tension that everyone is undergoing stress. But people don’t discuss about it. They keep it under wraps due to their self-respect”. [Female community members]

“They will pretend to be fine because otherwise they will be ridiculed”. [Male community members]

Most participants expressed the need to create greater awareness about mental health issues. One ASHA expressed that the programme would assist in spreading awareness and motivate individuals to seek care,

“... at least this will create awareness and people will come to know that such an illness exists ...”. [ASHA]

5.2.3. Cultural adaptation of IEC materials

There was relatively less acceptance for printed materials like pamphlets and brochures in the community as a male FGD participant said,

“They will see the pamphlet and throw it away as majority of the community members are not interested in reading”. [Male community members]

ASHAs also suggested that these materials may not be read by many villagers. Instead, they suggested to include more pictures and less text in the print materials. The content for the proposed print materials was shared with the ASHAs and community members to get their feedback. They gave valuable feedback on culturally appropriate language and illustrations. They were able to point out several words in Hindi which villagers may find difficult to comprehend. While preparing the awareness materials changes were made to the dresses of ASHAs to make them culturally appropriate for the rural Northern India site, such as covering their head and carrying a bag.

5.2.4. Increasing coverage of anti-stigma campaign

Organising community meetings in the village was identified as a good platform to share printed material and spread awareness. There were suggestions to involve local village administration and school-teachers for mobilising villagers. A proper announcement in the village was seen as a strategy to mobilise people. Possible challenges in organising such meetings were also mentioned. For example, women may find it difficult to attend if the meetings were organised at places far from their home. Organising meetings in multiple places in the village was suggested like school grounds, community halls, and panchayat grounds. It was pointed out that during sowing and harvesting season, from March to April and from July to November, community members may not find time to participate in the anti-stigma campaign.

A male participant suggested on the possible strategy of the anti-stigma campaign by saying that,

“If people are able to see something happening practically then it will have a better effect because they will associate themselves with the performer.” [Community leader]

It was also suggested that including people with lived experiences of CMDs may be useful. However, an ASHAs pointed out that it may be difficult to get consent from a such a person to share his/her experience publicly. Print and videos materials used in the pilot study were discussed with community members to identify cultural and linguistic adaptations specific to the local north Indian context. Using existing social contact videos and dubbing them in local language were suggested as a better option by most participants.

Community members suggested that project field staff could seek help of key persons in the villages like Panchayat members, school-teachers, Anganwadi workers, religious leaders, youth groups and community leaders to reach out to the community.

5.3. Health behaviour: personal health practices, use of health services

5.3.1. Help seeking behaviours

Community members and a field staff from the same region opined that it was a common practice in the community to visit traditional healers or ‘vaid’s who give herbal remedies or non-medicinal substances, which are generally ineffective.

“Normally they go to a traditional healer and get something done and they feel that they will get cured with that.” [Field Staff]

Conversely, the medical model which also influences the way community members expect treatment from a psychiatrist was pointed out by the psychiatrist,

“Many a times the patient says that get all my scans and tests done and only then I will undergo the treatment.” [Psychiatrist]

5.3.2. Barriers to accessing mental health services

A doctor said that there was stigma associated with seeking care from a psychiatrist.

“Most of the people, instead of going to a psychiatrist they go to neurologist or to a neuro-surgeon” [PHC Doctor]

One ASHA reported that individuals in the community refused to be screened for their mental health status by the ASHA saying,

“Are we mad that you are asking us such things?”. [ASHA]

As mental health services were not available at the PHC, most patients needing care were referred to the tertiary level hospital. Care provided by the private sector was non-existent. This created further problems. Lack of proper public transport prevented those in need of care from seeking care due to distances of the villages from the health facilities. A field staff who had referred a patient to the PHC narrated that,

“Over there (PHC) they told her to go to BK (district hospital) and she didn’t even have any money to go there”. [Field staff]

6. Discussion

This aim of the study was to identify mental health perceptions and cultural adaptations to the existing anti-stigma campaign materials; and to test feasibility of the EDSS for ASHAs and PHC doctors. Findings vis-à-vis the objectives of the study using mixed methods (Table 3) revealed that health system constraints prevent communities from accessing health and mental health services. Primary health workers were not suitably trained in identifying and treating mental disorders, but ASHAs and doctors were trained as part of the project in using EDSS in providing mental health services. At the larger population level, caste-based differentiation among community members were seen to be present. Communities had limited knowledge and misconceptions about causes of mental disorders, and stigma related to help-seeking was high

Table 3
Quantitative and qualitative findings vis-a-vis study objectives.

Objectives	Qualitative findings	Quantitative findings
Mental health perceptions	<ul style="list-style-type: none"> Poor knowledge about CMDs in the community Misconceptions about causes for mental disorders Traditional healers are first point of contact for help seeking People perceive persons with mental disorders as dangerous Huge stigma and feared discrimination regarding seeking care from a psychiatrist More awareness about mental health needed 	
Adaptation to anti-stigma materials	<ul style="list-style-type: none"> Less receptivity for reading materials like pamphlets and brochures Demand of pictures in print materials for better reach Feedback on culturally appropriate language and illustrations 	
Test feasibility of EDSS for doctors	<ul style="list-style-type: none"> Training equipped to use technology with ease 	<ul style="list-style-type: none"> 32 (62.7%) visited PHC 11 (21.6%) had only anxiety 15 (29.4%) had only depression 3 (5.9%) had suicide risk only Among 6 with moderate depression, 1 prescribed medication
Test feasibility of EDSS for ASHAs	<ul style="list-style-type: none"> Considered using tablet devices beneficial Opportunity to learn something new Carrying tablet helped to gain respect in the community 	<ul style="list-style-type: none"> 553 screened by ASHAs 51 (9.2%) screen positive 1–25 individual were screened per day by an ASHA On an average 8 individuals were screened per day by an ASHA

and many sought care for mental health symptoms from traditional healers. There was a need for creating awareness on mental health and CMDs. Community members provided valuable inputs in making the anti-stigma materials culturally appropriate.

6.1. Mental health perceptions and adaptations to anti-stigma materials

Local beliefs and knowledge about mental health in general, causes attributed to mental disorders and their treatment acted as a major barrier to seek mental health services. Evidence indicates that lack of awareness about mental health leads to stigma related to mental health and affects help-seeking (Thornicroft, 2008). Subsequent to the formative research, organising mental health awareness as part of the multi-pronged anti-stigma campaign should improve knowledge, attitude and behaviour related to mental health and reduce stigma perception related to help seeking among the community. Studies on creating awareness and delivering mental health services in developed countries show that community-based programmes, with involvement of local communities were effective, and emphasised on public education to increase mental health awareness and influencing help seeking behaviour (Maulik et al., 2017; Jorm, 2000). Based on feedback received during the formative research anti-stigma materials for the larger trial will be modified to incorporate culturally relevant language and illustrations.

6.2. Feasibility and acceptability of the EDSS for doctors and ASHAs

PHC doctors used an evidence-based algorithm driven EDSS which assisted them to diagnose and manage CMDs. Enhancing the capacity of primary healthcare workers to identify and treat people with CMDs complements the efforts underlined in the National Mental Health Programme (DGHS, 2020), National Mental Health Policy and World

Health Organization’s Mental Health Action Plan 2013–2020 (MoHFW, 2014; WHO, 2013). Findings from an earlier study conducted in Faridabad opined that providing psychiatric care at the secondary level was not enough to address the growing burden of CMDs at primary health-care settings (Haldar et al., 2017). Task-sharing is essential to alleviate the burden of mental disorders in the country (India State-Level Disease Burden Initiative Mental Disorders Collaborators, 2020; Joshi et al.,

Table 4
Strategies used to address barriers and facilitate mental health services use based on Andersen’s modified Behavioural model of Health Services Use.

Key component from Andersen’s model	Barriers/Facilitators	Actions taken to address barriers prior to formative research or subsequently	Anticipated outcome
<i>Environmental</i> Healthcare system	<ul style="list-style-type: none"> • The PHCs were not oriented towards providing mental health services • Structural stigma where PHC doctors used stigmatising terminologies for people with mental disorders • The primary health workers–ASHAs and doctors—were not suitably trained in identifying and treating mental disorders • Availability of psychiatrist at district level 	<p>Action taken prior to the formative research</p> <ul style="list-style-type: none"> • Developing a collaborative network with the government to enable their staff to work on the project <p>Action taken subsequent to formative research</p> <ul style="list-style-type: none"> • Using an EDSS to screen and diagnose individuals for CMDs • Training ASHAs to screen people in their community and remunerating their services • Motivating doctors by providing them training and remunerating them accordingly • Linking PHC doctors with specialist through online platforms • Seeking government support to ensure availability of free anti-depressants in the PHC 	<ul style="list-style-type: none"> •The delivery of mental health services at PHC level will be facilitated and evidence-based care will be provided
<i>Population characteristics</i> Predisposing characteristics	<ul style="list-style-type: none"> • Beliefs about causality for mental disorders and their treatment were inadequate 	<p>Action taken subsequent to formative research</p> <ul style="list-style-type: none"> • Organising mental health awareness as part of anti-stigma campaign during intervention 	<ul style="list-style-type: none"> •Belief and knowledge about mental health will improve leading to increased service use
Enabling resources	<ul style="list-style-type: none"> • Key stakeholders needed to be informed about the study and involved to enable better coordination • Poor accessibility to PHC due to distances from villages 	<p>Action taken prior to the formative research</p> <ul style="list-style-type: none"> • Discussions were held with <i>Sarpanch</i>, i.e. village leaders which helped them understand the need for the project and receive local administration’s support for the programme <p>Action taken subsequent to formative research</p> <ul style="list-style-type: none"> • Discussions were held with community members, ASHAs, and PHC doctors to provide accessible and affordable mental health services • Camps would be organised in villages to ensure increased follow-up with doctors such that villagers need not spend time and money to travel to PHCs 	<ul style="list-style-type: none"> •This will facilitate increased uptake of mental health services by streamlining service use
Need	<ul style="list-style-type: none"> • Perceived need for seeking mental health services was low because of lack of awareness • Primary health workers including PHC doctors were less oriented towards identifying mental disorders 	<p>Action taken subsequent to formative research</p> <ul style="list-style-type: none"> • Modifying mental health awareness materials by incorporating few culturally relevant language and illustrations to discuss them more openly • Use of evidence-based algorithm driven EDSS enhanced primary health workers including doctors to identify and manage CMDs 	<ul style="list-style-type: none"> •With increased perceived and evaluative need, identification of CMD and uptake of services will improve
<i>Health Behaviour</i> Personal health practises	<ul style="list-style-type: none"> • The community did not have adequate knowledgeable about mental health symptoms or the need to seek care when stressed or feeling low, or the kind of services available • Widespread stigma against people with mental illness prevent community to seek treatment for mental disorders 	<p>Action taken subsequent to formative research</p> <ul style="list-style-type: none"> • Modifying beliefs about mental health and changing perceptions about accessing mental health services through a mental health awareness programme that talks about stress, mental health symptoms and how one may benefit from using one’s social support and accessing mental health services 	<ul style="list-style-type: none"> •We hoped that with increased awareness the need for mental health services will also increase
Use of health services	<ul style="list-style-type: none"> • Follow-up of screen positive individuals was a major problem and was affecting service utilisation • Low motivation for the screen positive individuals to visit PHC doctor 	<p>Action taken subsequent to formative research</p> <ul style="list-style-type: none"> • The EDSS was seen as facilitating more efficient care • Developing a system to share information between the ASHA and doctors such that continuity of care and treatment adherence could be ensured more effectively • Developing an IVR system to complement the EDSS to inform ASHAs and community members about mental health services and treatment that needs to be followed • The doctors were trained to not only use the EDSS but first to use their clinical skills in elucidating symptoms. This would reduce time taken to screen each individual. This was suggested as an alternative to asking each question in sequential order by reading them out from the application 	<ul style="list-style-type: none"> •These strategies will be able to streamline follow-up of screen positive individuals and ensure better treatment adherence •The IVRS will complement the system of providing care by providing an additional personalised mechanism to enhance care

2014). The EDSS used by ASHAs and PHC doctors to screen, diagnose, and treat people with CMDs, and ensuring availability of anti-depressants in the PHCs helped in enhancing mental health services. Community members and other stakeholders felt that such a project would greatly benefit the villages and districts by providing mental health services. There are studies that indicate the perceived positive effect of mobile technology enabled EDSS (Souza et al., 2011; Kawamoto et al., 2005). As there was a psychiatrist at the district level, linking the PHC doctor with the psychiatrist through WhatsApp provided additional support to primary care doctors in treating CMDs, and reflected the results obtained in the pilot study (Maulik et al., 2020).

6.3. Strategies to enhance mental health service use

As this formative work is part of an implementation science research and informs a larger cluster randomized controlled trial, we used the Andersen's Modified Behavioural Model of Health Services Use framework to organise and describe strategies to address barriers and facilitate mental health services use (Table 4). This model was used in our pilot study and worked well (Tewari et al., 2021). Health behaviour and personal health practices of the community were affected by lack of knowledge about mental health and perceived stigma. Many preferred visiting traditional or faith healers for their mental health problems instead of visiting a specialist and this could be a potential barrier to receiving evidence-based care in the PHCs. Previous research has shown that culturally determined beliefs act as a major barrier in seeking professional help for psychological problems (Sheikh and Furnham, 2000). The anti-stigma campaign of the larger trial will include information on mental health symptoms and how one may benefit from one's social support network and aims at modifying mental health beliefs and perceptions on accessing mental health services.

A key barrier of how existing resources are structured were poor accessibility to primary health centres for villagers. After consultations with community members and primary healthcare workers and based on prior experience from the pilot study (Maulik et al., 2020), health camps will be organised in villages to increase access to mental health care provided by the PHC doctors. Our pilot study showed that both expenses and extended travel time to seek care from primary healthcare facilities were key barriers in rural areas (Tewari et al., 2021).

Another factor affecting treatment adherence was low motivation among screen positive individuals to seek care or adhere to advice provided by health workers. The technology enabled EDSS being used by ASHAs and doctors were found to enable that process and enhance the capacity of health workers to increase treatment adherence by providing feedback to the individuals based on their health status as indicated on their tablets. The EDSS allowed sharing treatment information between the ASHA and doctors and an algorithm-based traffic-light system alerted ASHAs to follow-up with them as per need. The feedback provided by health workers acknowledged that the EDSS helped facilitate care provision, but they also highlighted the importance of appropriate training including monitoring.

7. Limitations

The formative research was not powered to test any hypothesis and the PHCs were chosen purposively. The aim was to contextualize the findings from the pilot study to this new setting and to demonstrate that the process worked well. The study did not collect information on the socio-demographic characteristics of ASHAs and doctors, so cross tabulation of the screening information with it was not possible. This would have provided a better understanding of their experience of using the EDSS. Information on ease of using the EDSS and the tablet was not included in the qualitative interviews (IDIs) of doctors and ASHAs. We presumed that analytics from the EDSS as a quantitative assessment method would have informed any changes or modifications to make it more user friendly.

Author contributions

MD, AK and PKM designed the study. MD, AK and AT collected the data. AB led the quantitative data analysis with inputs from MD, PKM and DP. AK, AM and AT did the qualitative data analysis with inputs from MD and PKM. MD and AK wrote the first draft of the manuscript. MD, AK, AM, AB, AT, RS, SK, DP and PKM contributed to the interpretation of the findings and commented on the drafted manuscript and all revisions. All authors read and approved the final manuscript.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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