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The impact of perinatal mental health training on knowledge and practice of primary care physicians: a systems strengthening initiative in Telangana, India

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Abstract

Background In India, despite the high prevalence of perinatal mental health (PMH) conditions most primary care physicians (PCPs) have inadequate knowledge and skills to identify and provide appropriate interventions. The Health and Family Welfare Department of Telangana, India, partnered with the United Nations Children's Fund (UNICEF) and the Perinatal Mental Health service of the National Institute of Mental Health and Neurosciences to address this gap. The initial step in integrating PMH into the Maternal and child health (MCH) program involved training PCPs. This study aimed to outline the knowledge improvements regarding PMH among PCPs after the training.

Methods The training, conducted from June to January 2023–2024 across 30 districts, employed various interactive and reflective educational methods. Pre and post-training assessments evaluated knowledge enhancement and skill development, focusing on identifying perinatal anxiety and depression, assessing severity, recognizing risk factors, identifying the need for referrals, and rational psychopharmacology. This study aimed to assess the impact of training on improving knowledge and skills among PCPs which would influence perinatal mental health service delivery in Telangana.

Results Out of 863 PCPs in the 30 districts, 465 (53.8%) were able to complete the one-day training. Valid pre and post-training responses were available for 374 PCPs. A comparison of pre and post-training scores showed improvement in knowledge in a mean number of risk factors identified (pre: 3.05, post: 5.4; $p < 0.001$), ability to recognize depression (pre: 2.75, post: 4.33; $p < 0.001$) and anxiety symptoms (pre: 4.16, post: 6.08; $p < 0.001$), assess the severity of depression (pre: 0.46, post: 0.85; $p < 0.001$) and anxiety (pre: 0.57, post: 0.98, $p < 0.001$), safe medication use during pregnancy (pre: 0.89, post: 2.18;$p < 0.001$), and during breastfeeding (pre: 1.07, post: 2.13; $p < 0.001$) and identifying the need for referral to a psychiatrist (pre: 1.90, post: 3.13; $p = 0.003$).

Conclusion The one-day training for PCPs enhanced knowledge across various PMH domains. However, studies with follow-up data are necessary to assess the retention of this knowledge and skills related to case identification and referrals. Such studies will provide a more comprehensive evaluation of the effectiveness of the training program.

Keywords Perinatal Mental Health, Primary Care, Training, LMIC, Postpartum depression

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Introduction

Maternal mental health has been recognized as a global public health priority and significantly contributes to maternal mortality and morbidity [1]. Perinatal Mood and Anxiety Disorders and the less prevalent severe mental health conditions both have a significant impact on women and their families and affect the physical, emotional, and psychosocial development of their children [2, 3]. Psychosocial factors such as socioeconomic deprivation, poor support systems, and intimate partner violence contribute to the development of perinatal mental health conditions in many women [4]. The prevalence of common mental health conditions during the perinatal period is 18.6% in low- and middle-income countries. In India, based on a meta-analysis the prevalence of CMDs during pregnancy has been estimated to be 21.8%, while postpartum depression was estimated to be 22% [4–6].

The extent of the problem and its impact underscores the need to develop adequate systems of identification, support, treatment, and referral for maternal mental health conditions. Several studies have found that health professionals (including doctors, nurses, and midwives) have inadequate knowledge about perinatal mental health and often do not feel confident about managing these conditions [7]. A survey in Sri Lanka among healthcare providers including nursing staff, midwives, and medical officers revealed inadequate knowledge about the risk factors, symptoms, and consequences of mental health problems during pregnancy and postpartum [8]. Among primary care doctors in the UK, only 7% of doctors felt confident in diagnosing perinatal depression, while 71% believed they lacked sufficient training in perinatal mental health to manage mental health issues effectively. This study highlighted the need for more training for healthcare professionals [9]. In North India, among the obstetricians and primary healthcare professionals assessed for ' knowledge, attitudes, and practices regarding peripartum depression, 89% mentioned that they do not routinely screen mothers for mental health issues but 90% agreed that it was important and that all health professionals should have skills in recognizing and managing perinatal depression. Less than 50% had heard of any screening questionnaire for perinatal depression or anxiety [10].

Primary care physicians (PCPs) also called Medical Officers (MOs) in India play a crucial role in reducing the treatment gap by providing comprehensive (obstetric, medical, and surgical) services in primary care [11]. In addition to providing care, they are also expected to train other professionals such as community health workers, nurses, and midwives. It is therefore critical that as part of systems strengthening, these medical officers are trained in perinatal mental health. The WHO in its guide "Integration of Perinatal Mental Health in Maternal and Child Health Services" has also emphasized the importance of training all health professionals who might meet a woman in the perinatal period, starting from the community health worker who may do the initial screening or identification, the primary care physician who will make a diagnosis and initiate management and the mental health professional who may need to step-in for severe cases or a crisis [12], the success of these 'task sharing' activities depends on the training, handholding, and supervision of non-specialist providers who are at the forefront of delivering care [13].

Several studies from low and middle-income countries have demonstrated the benefits of training physicians in PMH. Such training, along with handholding and ongoing supervision, enables primary healthcare providers to effectively identify common perinatal mental health conditions and deliver appropriate interventions [5, 7, 13, 14]. Cascade training programs are particularly useful in this regard. A cascade training program, such as the one done in Nigeria, involves training a small group of senior primary care providers to become trainers who can then impart the knowledge and skills to their peers. This approach seems to be a more practical and sustainable option. The study's findings suggest that using a cascade training model can be a viable alternative for training many frontline primary healthcare providers in low-resource settings where specialists are scarce. This model has the potential to quickly enhance the skills of the workforce [15].

A systematic review of the different training programs for health professionals in perinatal mental health found that most studies included community health workers or nurses. Very few studies included doctors and highlighted the need for further research comparing diverse educational and professional development approaches to identify the most effective educational strategies in perinatal mental health care [16]. Research on mental health training highlights effective adult learning strategies. Garg et al. and Bairy et al. [17, 18] emphasized the value of blended learning, combining online and face-to-face sessions. Other valuable methods include a psychologically informed approach [19], a web-based course focused on evidence-based interventions for emotional distress [20], and the ANEW program [21], which emphasizes practical, adaptable learning, while the psychological assessment training [22] equipped healthcare providers with essential screening skills for early detection. Additionally, two-day workshops, which combine e-learning with face-to-face interaction, promoted active engagement and collaboration among multidisciplinary teams

[23]. Finally, a manual-based approach for auxiliary nurse midwives ensures standardized, effective care across different healthcare settings [24].

In India, there has been an attempt to integrate perinatal mental health into routine antenatal care only in a few states. The Government of Telangana (a state in South India) in association with the United Nations Children's Fund (UNICEF) integrated perinatal mental health into the MCH nutrition program with the technical support of the National Institute of Mental Health and Neurological Sciences (NIMHANS). This collaborative program used the World Health Organization (WHO) framework to integrate perinatal mental health into the existing maternal nutrition and high-risk obstetric protocols [12]. An algorithm was developed to screen, identify, and refer women with perinatal mental health conditions using a stepped-care approach with clear referral pathways. This includes screening for anxiety, depression, and psychosocial risk using simple tools and first-level interventions by frontline workers like Auxiliary Nurse Midwives, case identification and treatment by medical officers, and subsequent referral to specialist care if required (for severe mental illness or suicidal risk).

As a first step of Systems strengthening for integration of PMH into the MCH program medical officers are equipped with skills in identifying risk factors, signs and symptoms, and managing perinatal mental health problems. They were also trained to become lead trainers and handle subsequent training for community health workers and nurses. The present study on System strengthening describes the changes in knowledge about the one-day PMH training program for primary care physicians about the following- risk factors for perinatal mental health conditions, signs and symptoms of perinatal anxiety, depression, and psychosis, and management of these conditions including decision-making about referrals to specialist care.

Materials and methods

Setting

Telangana, with a population of 38 million and approximately 30,000 deliveries per month, has achieved substantial progress in development and health, comparable to middle-income countries. The state has surpassed the Sustainable Development Goal (SDG) target for Maternal Mortality Rate (MMR), achieving a rate of 43 per 100,000 live births in 2023. Additionally, Telangana shows positive trends in other socioeconomic indicators, including government hospital deliveries, mental healthcare access, economic equity, educational attainment, and nutritional support [25, 26].

The Department of Health and Family Welfare invited primary care physicians from 30 districts working in the Telangana government sector to attend training in PMH. The District Medical Health Officer (DMHO) covered travel and lunch expenses, though no further incentives were offered. At least one physician from each of the 887 primary health centers statewide was designated to attend the sessions, which were conducted at the district headquarters (https://dphfw.telangana.gov.in/content1.php?U=11) Table 1 shows entire modules used for training PCPs on PMH.

Adult learning and participatory methodologies made the training sessions interactive and engaging. A variety of adult learning formats such as group discussions, reflective learning, role play, and structured case discussions were used along with didactic talks. The talks were pre-recorded by experts to ensure uniformity for all groups. Each didactic session was followed by a reflective and problem-solving exercise using standard case vignettes. Two psychiatrists trained in perinatal psychiatry facilitated the training program. A table showing the complete content of the PMH training module has been included as a supplement for further reference (Supplementary material 1).

The pre-assessment and post-assessment questionnaires included multiple-choice questions based on case vignettes. These questionnaires were distributed in a

Table 1 PMH training program overview

Module	Session	Duration	Content
Module 1	Session 1	40 min	Mental well-being and distress during pregnancy and postpartum
	Session 2	50 min	Small group discussion on mental well-being
Module 2	Session 1	40 min	Assessing anxiety and depression during pregnancy and postpartum
	Session 2	50 min	Hands-on training using PHQ-9 and GAD-7 screening tools
Module 3	Session 1	30 min	Psychological interventions in perinatal mental health, featuring a pre-recorded talk and reflective learning
Module 4	Session 1	40 min	Safe use of psychotropic drugs, risk assessment, and referrals
	Session 2	50 min	Case-based group discussions on postpartum anxiety and psychosis, feedback and a discussion moderated by project coordinators

blended format, primarily on paper, while participants who were not able to use paper had the option to complete them via Google Forms on their mobile devices. The case vignettes included scenarios they would encounter in their routine practice as a primary care physician such as depression and anxiety. These questions and case vignettes were developed by two psychiatrists for this particular program, trained in perinatal psychiatry (RA, NK) and validated by three perinatal mental health experts (PSC, SG, VAS). Adequate time was provided so that participants could read the questions carefully and respond. The facilitator ensured that there was no discussion among the participants regarding the responses. A post-training assessment was done using the same questionnaire which has been provided as a supplement for reference (Supplementary material 2).

Data analysis

Data were entered into SPSS version 29 to assess the impact of the training program on PCP's knowledge across various domains and to account for within-subject variations of the outcome variables, a Pillai's trace effect was utilized in a Repeated Measures Analysis of Variance (RMANOVA). A p-value of < 0.05 was considered statistically significant .

Results

From June 2023 to January 2024, thirty out of thirty-three districts in Telangana organized a one-day training program on PMH. During this training period, 863 PCPs worked under the Department of Health and Family Welfare across the state, all of whom were medical graduates qualified with an MBBS degree, the standard medical qualification for practitioners. 465 physicians completed the training, comprising 255 females and 210 males. The pre-and post-training questionnaires were filled out by 439 p, 94% of the participants. After excluding invalid responses—where participants marked all available options as correct,374 forms (85%) were considered valid for data analysis. Out of 374 PCPs, 242 provided valid responses for age and years of experience while 132 responses were missing. The mean age of PCPs was 28.81 years, and the mean years of experience of PCPs was 5.81 years. Among these valid responses, 215 were female and 159 were male PCPs. Most of the PCPs spoke Telugu as their vernacular language. The pre and post-training assessment questionnaire broadly assessed 1) their knowledge related to the identification of depressive and anxiety symptoms, 2) their knowledge related to identifying risk factors for perinatal mental health issues 3) their skills to categorize the severity of depressive and anxiety symptoms 4) their knowledge on pharmacological management 5) their knowledge about when to refer to a psychiatrist. The RMANOVA analysis revealed significant improvements in all domains after the training program ($p < 0.001$ for all). Physicians showed increased knowledge in areas such as risk factor assessment, depression and anxiety symptoms, and the management of medications during pregnancy and lactation. Notable improvements were observed with large effect sizes (Partial Eta Squared ranging from 0.345 to 0.588) and high observed power (1.000) across all domains. The training significantly enhanced primary care physicians' understanding of perinatal mental health, including the need for psychiatric referrals (Table 2). Based on the RMANOVA results, there is no significant gender-based difference in how physicians responded to the training across the various domains. Both males and females showed similar improvements or maintained similar levels of knowledge post-training. Although structured feedback was not collected after all the training sessions, we received some oral feedback following a few. The first participant noted, "After the training, our understanding of perinatal mental health has significantly improved, particularly in identification and management." The second participant remarked, "Most notably, we now have a greater awareness of pharmacological management during pregnancy and lactation, areas where we previously lacked knowledge and confidence." The third participant stated, "We have enhanced our ability to manage cases in primary health centers and identify when to refer them to higher-level care".

Discussion

The first step in strengthening the primary healthcare system is to enhance the capacity of PCPs. This study demonstrated the effectiveness of structured training programs for perinatal mental health. It highlighted the government's readiness to provide financial support and allocate time for such initiatives, addressing critical gaps in the current ANC program.

These programs aim to improve the ability of PCPs to identify risk factors for maternal mental health, recognize symptoms and severity of anxiety and depression, safely administer psychotropic medications during pregnancy and lactation, and determine when to refer a mother to a psychiatrist. To our knowledge, this is the first time in India that PCPs are being trained in perinatal mental health as part of the Maternal and Child Health program. We used the WHO's Guide for Integration of Perinatal Mental Health in Maternal and Child Health Services to create the curriculum for the PCPs. The training included adult learning principles such as participatory learning methodologies, group discussions, reflective learning, role play, and structured case discussions alongside standard didactics. The study results provide valuable

Table 2 Pre and post-test change in scores (RMANOVA)

S.NO	Question	Pre-test Mean (SD)	Post-test Mean (SD)	*P* Value	Minimum and maximum score	Effect value	F -Value	Significance	Partial ETA Squared	Observed power
1	Risk factor assessment	3.05(1.47)	5.4 (2.03)	<0.001	0-6	Pillai's trace	498.03	<0.001	0.572	1
2	Symptoms of depression	2.75(1.21)	4.33(1.503)	<0.001	0-5	Pillai's trace	334.9	<0.001	0.474	1
3	Severity of depression	0.46(0.499)	0.85(0.355)	<0.001	0-1	Pillai's trace	196.3	<0.001	0.345	1
4	Symptoms of anxiety	4.16(2.014)	6.08(1.288)	<0.001	0-7	Pillai's trace	317.3	<0.001	0.46	1
5	Severity of anxiety	0.57(0.496)	0.98(0.145)	<0.001	0-1	Pillai's Trace	255.9	<0.001	0.408	1
6	Medications that are harmful during pregnancy	1.49(0.831)	2.43(0.813)	<0.001	0-3	Pillai's trace	353	<0.001	0.487	1
7	Medications that are harmful during lactation	1.02(0.649)	2.05(0.915)	<0.001	0-3	Pillai's trace	352	<0.001	0.487	1
8	Medications that are safe during pregnancy	0.89(0.782)	2.18(0.870)	<0.001	0-3	Pillai's trace	530.76	<0.001	0.588	1
9	Medications that are safe during lactation	1.07(0.790)	2.13(0.789)	<0.001	0-3	Pillai's trace	398.7	<0.001	0.517	1
10	Knowledge about the comprehensive management of perinatal mental health conditions.	1.01(0.68)	2.06(0.99)	<0.001	0-3	Pillai's trace	313.7	<0.001	0.458	1
11	Need for referral to a psychiatrist	1.90(1.30)	3.13(1.22)	0.003	0-4	Pillai's trace	222.6	<0.001	0.375	1

insights into the effectiveness of a day-long training program designed to enhance PCPs' understanding and management of PMH issues. The findings suggest that didactic teaching and case-based discussions are effective in improving PCPs' knowledge of common mental disorders(CMDs) as shown in studies [17, 18, 27].

Most of the educational and professional development strategies to improve the knowledge and skills in perinatal mental health [19–23, 28, 29] have focused on training midwives, health visitors, nurses, and maternity unit staff. It is worth noting that all these studies were carried out in high-income countries with their unique healthcare systems. In India, PCPs are mainly responsible for providing medical, surgical, and obstetric care, as well as training frontline health workers like accredited social health activists (ASHAs) and auxiliary nurse midwives (ANMs). It is essential first to educate PCPs about perinatal mental health so that they can then pass on their knowledge and skills to the ASHAs and ANMs working under them.

In Nigeria, which has a health system similar to India, a cascade training program on perinatal depression was conducted using the training of trainers (ToT) model. Initially, 40 master trainers (5 doctors, 22 nurses/midwives, 7 community health officers, and 6 senior community health extension workers) were trained by 2 psychiatrists. However, at the time of the cascade training, only 11 master trainers were available. These master trainers then trained approximately 198 frontline health workers. The cascade training resulted in a significant improvement in their knowledge of depression both immediately after the training and six months later [15]. In our study, as part of strengthening the system, we first trained the PCPs on perinatal mental health. We assessed their ability to recognize risk factors for poor mental health during the perinatal period, identify and assess the severity of anxiety and depressive symptoms, understand the safe use of psychotropics during pregnancy and lactation, and know when to refer patients to a psychiatrist as part of a stepped care approach.

The course content of PMH training has varied from a brief curriculum on depression to slightly longer courses covering both common mental disorders and severe mental illness. A systemic review [16] revealed that most studies cover a wide range of conditions including severe mental illness and their treatment.

Our study strengthens the evidence supporting the efficacy of educational interventions in improving PMH outcomes. The significance of these findings lies in their implications for primary care practice. PCPs play a crucial role in providing mental health services to pregnant and postpartum mothers, making it imperative to equip them with the necessary knowledge and skills to address PMH issues effectively. This aligns with similar studies that have utilized reflective learning, group work, and a didactic approach as teaching methodologies [17, 18, 27].

The study has several strengths. The sample size is large and includes physicians from 33 districts of Telangana (rural, urban, coastal, and tribal areas). The results are hence more generalizable. A detailed pre- and post-assessment method was used for assessing knowledge with questions based on clinical situations hence focusing on applied knowledge. The training program also employed diverse pedagogical methods such as reflective exercises and experience sharing to promote active engagement and enhance the learning experience.

However, the study has several limitations, such as the inability to obtain complete demographic data, including age and years in practice, because some participants did not complete this information. The training program focused on common PMH conditions like anxiety and depression while neglecting other crucial perinatal mental health conditions like obsessive–compulsive disorder, somatization disorder, and post-traumatic stress disorder. This could leave healthcare providers ill-equipped to address the full range of patient needs. Additionally, the program or assessment did not have a practical component to assess the providers' ability to apply their learning effectively in real-world settings.

Furthermore, the program's coverage is limited; we could not cover all the 984 PCPs in the state and it excludes the quality of training for community health workers (CHWs) and nurses, limiting its reach and potential impact. Therefore, there is a need to broaden the program's scope, integrate practical skill assessments, and expand the training model to include CHWs and nurses. Doing so can improve access to comprehensive mental health services and enhance patient care outcomes.

Conclusion

A one-day perinatal mental health training program for primary care physicians in Telangana State led to substantial improvements in their knowledge and skills regarding perinatal mental health issues. The program enhanced their ability to identify risk factors, recognize symptoms of depression and anxiety, assess symptom severity, and safely manage pharmacological interventions during pregnancy and lactation. Additionally, the program positively impacted their understanding of the referral pathways, which we hope will lead to more comprehensive and timely help for mental health needs during the perinatal period. The training program's overall impact highlights its importance in improving the quality of care provided to pregnant and postpartum mothers. The way forward involves integrating PMH training into

standard education for PCPs and other health professionals, alongside increased funding for initial and ongoing training. This will address gaps in the program and improve maternal and child well-being ultimately contributing to better maternal and child health outcomes in Telangana. This will serve as a model for other settings in LMIC.

Abbreviations

PCP	Primary care physicians
PMH	Perinatal mental health
CMD	Common mental disorders
LMIC	Low and middle-income countries.
CHW	Community health workers
ASHA	Accredited social health activists
ANM	Auxiliary nurse midwives

Supplementary Information

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Supplementary Material 1.

Supplementary Material 2.

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Authors' contributions
R.A: Involved in designing and implementing of the study protocol, and study tool participated in data collection, conducted data analysis, and wrote the final research draft and manuscript. P.C: Conceived the study, designed and implemented the study protocol and study tool. Supervised the field implementation process of the research and all the data management processes. Reviewed different versions of this paper and proofreading of the final manuscript. S.G: Designed and implemented the study protocol and study tool. Supervised the field implementation process of the research and all the data management processes. Participated in editing and proofreading of the final manuscript. V.S: Designed and implemented the study protocol and study tool. Reviewed and edited the final manuscript. N.K: Participated in the study design and assisted in data collection and data analysis. K.T: Participated in editing and proofreading of the final manuscript S.M: Participated in the data collection Process. P.S: Reviewed and edited the final manuscript. All the authors provided feedback on the draft and approved the final manuscript submitted.

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Data availability
The data that support the findings of this study are available from the Department of Health and Family Welfare, Government of Telangana but restrictions apply to the availability of these data, Datasets are not publicly available. Data are available from the corresponding author upon reasonable request and with permission of the Department of Health and Family Welfare, Government of Telangana.

Declarations

Ethics approval and consent to participate
The study has been approved by the Ethics Committee of the National Institute of Mental Health and Neurological Sciences, Behavioural Sciences division in Bengaluru, India(Number: NIMHANS/34th IEC(BEH.SC.DIV.)2022). The study was performed following the Declaration of Helsinki. Informed consent was obtained from all the participants. We confirm that every human participant consented to participate in the study.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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