


COVID-19 Pandemic and Stepped Care Model for Perinatal Depression in Rural India: Lessons Learned and the Way Forward

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In low- and middle-income countries (LMICs) such as India, the treatment gap for common mental disorders (CMDs) is 76% to 85%.¹ Factors such as the insufficient coverage of mental health services, stigma, the lack of trained human resources, and the unavailability of a replicable and scalable model of care are some of the major reasons for this large treatment gap.^{2,3} The situation could be worse in the rural and remote regions of the country and among the marginalized people.⁴ Access to mental health care in a rural region is often limited because of issues such as stigma, sociocultural beliefs, poor coverage of national mental health programs (NMHP), non-availability of tertiary care hospitals/medical colleges, and lack of psychiatrists.⁵ Moreover,

Asian countries, including India, are also more prone to infectious disease outbreaks and natural and human-made disasters.⁶ These conditions have an analogous impact on mental health in terms of an increase in the burden of mental health disorders and interruption of routine health care services,



which often leads to further widening of the treatment gap for CMDs during and after such conditions.^{7,8}

To reduce the treatment gap for CMDs, the government of India has taken initiatives such as an increase in the number of training institutes for psychiatry and allied courses and also postgraduate seats.^{9,9} Besides, the stepped care models may be used to improve the delivery of mental health services in the rural and inaccessible regions, with a primary focus on cost-effectiveness, accessibility, and sustainability.¹⁰

Globally, COVID-19 affected almost every aspect of health care because of the implementation of public health measures to control the spread of infection, the COVID-19-specific mortalities and

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morbidities, and the fear of infection.¹¹ Published literature has focused on the impact of the COVID-19 pandemic on health care systems,¹² but not on alternative models (e.g., stepped care models or matched care models). However, exploring these issues is important as these models are one of the potential strategies to address the mental health needs of the population living in the rural regions under NMHP.

Stepped Care Model of Care

Stepped care models involve collaboration among primary health care workers (HCWs, e.g., nurses) and specialized providers (e.g., psychiatrists) to improve the delivery of services.¹³⁻¹⁵ These models aim to reduce the treatment gap, increase the efficiency of service provision through the adoption of brief interventions, and enhance cost-effectiveness and are sustainable across different settings.^{14,16} Although the evidence for the effectiveness of stepped care models is mainly from the western countries,¹⁷ a few studies have also been attempted in LMICs, including India.¹⁸⁻²⁰ These models are often considered for implementation under the NMHP of LMICs.¹⁰ Ideally, during any public health emergency, the mitigation and preparedness measures must go hand in hand for an effective, sustainable, and accessible delivery of health services. Understanding the effects of a pandemic and intersecting factors/barriers could help improve these models in terms of sustainability and accessibility during disaster or pandemic settings. In this article, we attempted to share our experiences and observations about the effect of the COVID-19 pandemic on our stepped care model for perinatal depression (brief psychological intervention for perinatal depression: BIND-P model).

Case Study

BIND-P Model

Considering the poor availability and accessibility of perinatal mental health services (PMHS) in India, we had developed and implemented a stepped care model (BIND-P model) in the rural region of Maharashtra, India.^{13,21} The model involves collaboration among auxiliary nurse midwives (ANMs) and

psychiatric services to improve access to PMHS. It also attempts to address some barriers of implementation (e.g., stigma, inadequate or lack of training) through training of nurses and conducting awareness sessions among the general population. ANMs provide screening, brief psychological intervention for mild to moderate depression [patient health questionnaire (PHQ-2 \geq 3, PHQ-9: 5-19)], and referral services to the perinatal women.^{21,22} More details about the model of care, steps, and interventions that formed the basis for the BIND-P model are published elsewhere.^{21,22}

How has the COVID-19 Pandemic Affect the BIND-P Model?

Like other health care systems, the COVID-19 pandemic and mitigation efforts have affected the various components of the BIND-P model, namely screening, intervention, referrals, and training. Many intersecting barriers emerged during the different phases of the pandemic (we categorized them into four phases: Table 1).²³ The effect of these factors on the ANM-based stepped care model (BIND-P model) was assessed using the WHO toolkit²⁴ and described under subheadings, namely “effect

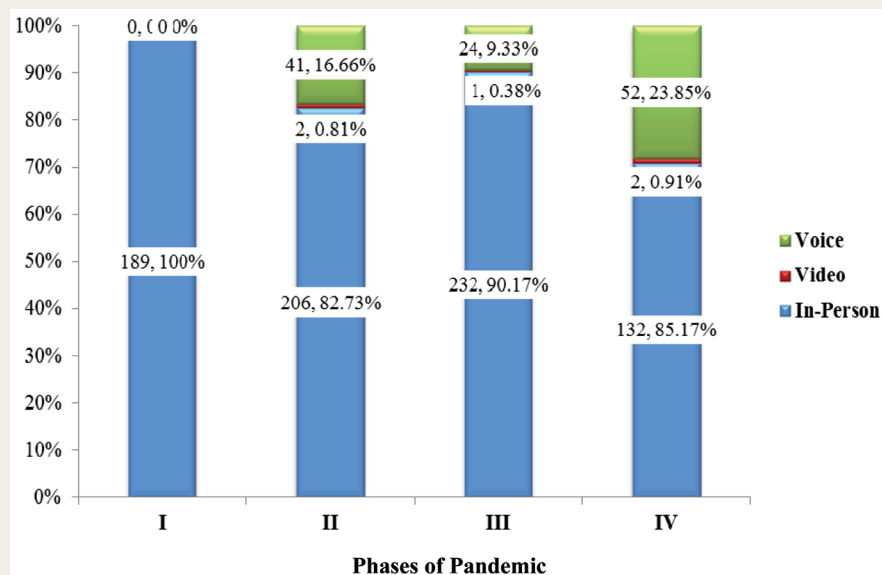
on existing services” and “addressing COVID-19 mental health issues.”

Impact on Existing Services Screening

During the lockdown period (phase II), there was an abrupt increase in the number of women who screened for perinatal depression ($n = 292$) compared to the pre-lockdown period ($n = 240$; Table 1). The increase in the number of new and follow-up screenings persisted during phase III ($n = 285$) of the pandemic. In phase IV, there was a decline in the total number of women ($n = 218$) screened for depression. Also, there was a substantial increase in telephonic consultations and a reduction in the number of perinatal women who did not avail the facility for screening during phase II and phase III (Figure 1). The reasons for non-screening were assessed during subsequent follow-ups, telephonic consultations, and home visits by a project staff (junior research fellow, JRF). The most common reasons for non-screening during phases II, III, and IV were fear of COVID-19 infection and travel difficulties among those perinatal women who were screened during their in-person visits (Table 1). For others, limited access to mobile phones (for being women)

FIGURE 1.

Perinatal Women ($n, \%$) Screened for Depression and Screening Approaches During the Pandemic



Note: Denominator, number of perinatal women completed screening for depression.

and poor telephonic network were the common reasons (Table 1).

Interventions and Referral Services

The proportion of perinatal women who screened positive for depression decreased in phase II, i.e., lockdown period (9.63%), compared to phase I, i.e., prelockdown period (12.16%; Table 2). Subsequently, there was an increase in the proportion of women who screened positive, in phases III (11.57%) and IV (18.80%). Similarly, there was an increase in the number of women receiving the ANM-based brief psychological

intervention (BIND-P intervention) and referral services ($n = 4$; Table 2). The BIND-P intervention components include exercise, sleep hygiene, dietary recommendations, and monitoring sheets (published elsewhere).^{21,22} These dietary recommendations are directed towards preventing common nutritional deficiencies (e.g., iron deficiency anemia, vitamin B12 deficiency). During the follow-up visits, the women were expected to submit the self-recorded dietary intake in the chart provided. In the COVID-19 pandemic, the women faced difficulties in following the recommended diet because of movement restrictions (e.g., closure of the weekly market and food

transportation services) and unemployment.

Those who failed to attend the in-person consultation for screening and intervention were approached via phone by the ANMs. The video consultation for both screening and intervention failed because of the lack of access to the internet, the lack of telephonic network, the low quality of phones, and the mobile phone being with the husband (Tables 1 and 2). Therefore, the voice call was attempted to screen or deliver the intervention. Most women were not comfortable discussing their mental health issues on the telephone at home, in the presence of their in-laws or

TABLE 1.

ANM-Based Stepped Care Model (BIND-P Model): Screening Component

Phase		Phase I Prelockdown Period	Phase II Lockdown Period	Phase III Unlock Period: 1	Phase IV Unlock Period: 2
Period		January 17, 2020 to March 24, 2020	March 25, 2020 to May 31, 2020 [#]	June 1, 2020 to August 7, 2020	August 8, 2020 to October 14, 2020
Screening*	Total perinatal women enrolled	240	292	285	218
	New screening	46 (19.16%)	65 (22.26%)	74 (25.96%)	21 (9.63%)
	Follow-up screening	143 (59.58%)	184 (63.01%)	183 (64.21%)	165 (75.68%)
	Total screened	189 (78.75%)	249 (85.27%)	257 (90.17%)	186 (85.32%)
	Not screened	51 (21.25%)	43 (14.72%)	28 (9.82%)	32 (14.67%)
Reasons for nonscreening [§]	No mobile/telephone/network	NA	20 (46.51%)	10 (35.71%)	12 (37.50%)
	Mobile phone mainly with husband	NA	4 (9.30%)	5 (17.85%)	6 (18.75%)
	Travel-related issues	2 (3.92%)	9 (20.93%)	6 (21.42%)	3 (9.37%)
	Fear of COVID-19 infection	NA	5 (11.62%)	4 (14.28%)	3 (9.37%)
	Follow-up consultations in other hospitals	26 (50.98%) (only in-person screening)	1 (2.32%) (mixed)	1 (3.57%)	2 (6.25%)
	Failed to contact with perinatal women	23 (45.09%) (only in-person screening)	4 (9.30%)	4 (14.28%)	6 (18.75%)

Note: *, ANMs screened the perinatal women using PHQ-2; §, JRF assessed the reasons for nonscreening; #, Duration of each phase: 68 days (lockdown period was considered as a reference value).

Abbreviations: NA, not assessed.

TABLE 2.

ANM-Based Stepped Care Model (BIND-P Model): Intervention and Referral Component

Phase		Phase I	Phase II	Phase III	Phase IV
Screened positive (PHQ-2 \geq 3) and considered for intervention		23 (12.16%)	24 (9.63%)	33 (11.57%)	41 (18.80%)
Delivery of intervention*	In-person	20 (86.95%)	16 (66.66%)	23 (69.69%)	16 (39.02%)
	Video	NA	NA	NA	NA
	Voice (telephonic)	NA	3 (12.5%)	1 (3.30%)	11 (26.82%) [§]
	Mixed (in-person + voice)	NA	1 (4.16%)	5 (15.15%)	7 (17.07%) [§]
Drop out#		3 (1.30%)	4 (16.66%)	4 (12.12%)	7 (17.07%)
Reasons for dropout#	No telephone or mobile network	2 (66.66%)	1 (25.00%)	1 (25.00%)	3 (42.85%)
	Mobile phone accessible to husband	1 (33.33%)	1 (25.00%)	2 (50.00%)	2 (28.57%)
	Travel-related issues or fear of COVID-19 infection	NA	1 (25.00%)	1 (25.00%)	2 (28.57%)

Note: *, ANMs delivered the intervention; #, JRFs conducted the assessments; §, migration during the unlock period.

Abbreviations: NA, not assessed.

husbands. These issues were reported to the ANMs during face-to-face or phone consultations.

Service Providers

Before the lockdown period (phase I), a total of five ANMs were providing services for screening and intervention through the BIND-P model. At the beginning of the lockdown period, two were redeployed in COVID-19 care settings and one for community-based surveys. Further, although we approached to train new ANMs ($n = 17$) for perinatal depression screening and intervention, only one was trained from March 25, 2020 to October 14, 2020. The COVID-19-related responsibilities (e.g., screening, household survey), the lack of prior experience with video conferencing, and the non-availability of the internet were the reasons cited by the ANMs.

Addressing COVID-19 Mental Health Issues

During regular screening and intervention, the ANMs noticed that some women were not aware of precautionary measures and specific care related to COVID-19. Myths and misinformation (e.g., skepticism about breastfeeding and considering the option of formula milk) were also circulating among them. Illiterate women and those who did not have a mobile phone or access to the internet were protected from such infodemic.

But, issues such as the scarcity of perinatal mental health experts in India, lack of time, rapidly changing COVID-19-specific policies, unavailability of ANMs for training, and human resource constraints at the rural level (redeployment of existing ANMs for COVID-19 purposes) prevented us from preparing and addressing the COVID-19-specific mental health issues through appropriate and specific interventions.

However, considering this complex, unpredictable pandemic that has affected people living in the rural and remote regions and the vulnerable population, we have made a few efforts to address some COVID-19-related mental health issues. The ANMs, under the supervision of project staff (e.g., JRFs), made several attempts to reach the perinatal women registered with us. A WhatsApp group was formed to disseminate COVID-19-related information. The group had

176, 184, and 210 members at the end of phases II, III, and IV, respectively. The ANMs disseminated COVID-19-related information and education material (e.g., etiology, transmission, and safety measures) published daily by the Ministry of Health and Family Welfare, India, on their Twitter handle. We were not able to assess whether this information reached the participants and whether or not they benefited from this. But, creating awareness among perinatal women about COVID-19 through the available resources was considered a priority. Besides, ANMs also provided virtual and telephone support consisting of reassurance, evaluation of mood symptoms, and education of breastfeeding practices to all the women as and when required.

Discussion

Although the COVID-19 pandemic and mitigation efforts have affected our BIND-P model, perinatal women's periodic screening with brief standardized screening tools (e.g., PHQ-2, PHQ-9) was found to be useful to identify and monitor depression and to provide first-level interventions along with referral services. In the presence of many hurdles such as the paucity of organizations, lack of preparation, increase in the number of service users, and human resource constraints, we attempted to overcome some barriers and provided sustainable and efficient services. The abrupt rise in the number of service users was mainly because of the migration of perinatal women from metropolitan cities (Mumbai and Pune) to their hometowns (Konkan), i.e., rural regions, and an increase in the pregnancy rate during the lockdown period.²⁵ The migration of perinatal women was mainly because of fear of getting COVID-19, unemployment, and food insecurity (because of the closure of markets and food transportation services).²⁵

The in-person consultations were not much affected, maybe because of the relatively low number of COVID-19 cases, a few alternative options for perinatal care, and a decreased impact of infodemic (because of digital illiteracy, poor telephonic network) in the rural regions. But, the safety precautions or measures (e.g., masks) compromised communication, the establishment of rapport,

enabling environment for breastfeeding, and delivery of the psychological intervention, as in other reports.²⁶ Also, video consultation was not feasible and acceptable in rural regions, for both service providers and service users. This was because of the poor quality of internet connectivity (variable from village to village), low technological literacy, disrupted telephonic network, sex-based access to a phone (mainly husband has access to a mobile phone), illiteracy or lower education, poverty, high internet costs, and confidentiality and privacy concerns. Further, telephonic (voice) screening and intervention were preferred to video consultations, and there was a gradual increase in the number of users (voice) across the different phases.

The decline in the proportion of women with perinatal depression during the lockdown period (phase II) could be because of increased family time and support during the early lockdown period and the heroic, honeymoon phase of a pandemic.²⁷ In contrast, the subsequent increase in women found to have perinatal depression (phases III and IV) is indicative of the catastrophic impact of the COVID-19 pandemic and mitigation efforts. But these findings should be interpreted cautiously because of the relatively small sample size. Despite the availability of newly developed screening tools (e.g., fear of COVID-19, coronavirus anxiety scales),²⁸ the lack of availability of ANMs for in-person or virtual training affected the screening of these women for COVID-19-specific mental health issues. Some women canceled their visits because of fear of infection in the hospital settings either from other patients or HCWs, public health advisory for pregnant women, and lack of transport facilities, particularly during the lockdown period. Misconceptions, such as being skeptical about breastfeeding and considering the option of formula milk, were circulating among perinatal women, as reported previously.^{29,30}

During the pandemic, policymakers, psychiatrists, and researchers focused more on telepsychiatry services or virtual training.^{31,32} No doubt, these services are valuable to reduce the treatment gap for people with mental illness. But our experience suggests that direct service-user-based telepsychiatry may not be a feasible choice in rural settings

because of the reasons listed above. Also, the Government of India tried to assist the people by developing help-lines and telepsychiatry care during the pandemic.³³ However, such an initiative was not accessible to women living in rural or remote areas. On the contrary, the ANMs, being the grass-roots health workers, played a vital role in delivering services during the pandemic. For these women, the ANMs were one of the few accessible health care providers during the pandemic. This model has provided an opportunity for rural perinatal women to interact with either the nurse or mental health professionals as and when required and obtain authentic information.

In the future, the primary health care worker (e.g., ANM) based stepped care model could be beneficial for communication, coordination, and collaboration among different stakeholders and mental health professionals for CMDs in complex settings of pandemics or disasters.^{10,34} In the presence of constraints like interruption of services, loss of support, and virtual connectivity, stepped care models could sustain the mental health services in the rural and remote regions.²¹ Also, these models could be more helpful if HCWs receive regular training. To the best of our knowledge, this is the first report to discuss the challenges with stepped care models adopted for mental health. Unfortunately, barriers like complexities involved in a pandemic and rapidly changing situations, being the most vulnerable population (perinatal women and infants), and limited research capacity for mental health in the rural regions prevented us from conducting well-organized research.

Way Forward

To a certain extent, the ANM-based stepped care model was sustainable, effective, acceptable, and feasible in the remote and rural regions of India during the pandemic. However, the following measures should be considered to improve these models.

- **Infrastructure:** Provision of internet, mobile network, electricity, and mobile phones at concessional rates to marginalized populations could be an ideal option. But for the time being, services can be provided through ANMs and a network of HCWs. India has the advantage of a

well-established network of HCWs like accredited social health activists, anganwadi workers, and ANMs, which would help to facilitate cost-effective and sustainable delivery of mental health services.^{10,35}

- **Primary Mental Health Interventions Protocol Under the Stepped Care Model:** The inclusion of primary mental health interventions in public health emergencies or disaster protocol may improve the screening and provision of psychological first aid under these models. Researchers and policymakers should empower these HCWs through appropriate training and networking them with specialists, as in the BIND-P model.
- **Specific Arrangement for Mental Health:** Maternal and child health services are a priority area for the government of India.³⁶ Therefore, it is important to consider the stepped care model for the delivery of perinatal mental health care under the National Health Mission in the future.
- **Capacity Building and Research:** Research on stepped care models in routine care, disaster, or public emergency settings is limited. Therefore, further research should focus on developing, implementing, and evaluating promising and effective interventions through these models to provide high-quality, first-level, and periodic screening for CMDs. Also, efforts should be directed toward increasing the health care capacity through training, coordination, support, and adequate funding.

Conclusion

Despite many challenges, the stepped care model was found to be sustainable, effective, and feasible for providing mental health services in the remote and rural regions of India. Some efforts with limited success were also made to address the COVID-19-specific mental health issues. Addressing challenges and barriers experienced during a pandemic can improve mental health services during public health emergencies and disasters in the future.

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Ethical Statement

Ethical approvals were obtained from the BKL Walawalkar Rural Medical College, Maharashtra; Lady Hardinge Medical College, New Delhi; and Yenepoya Medical College, Karnataka and Dharwad Institute of Mental Health and Neurosciences (DIMHANS), Karnataka.

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