Perspectives of Health Service Providers on Barriers to Accessing Perinatal Mental Health Services in Karnataka, India: A Qualitative Study

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**Perspectives of health service providers on barriers to accessing
perinatal mental health services in Karnataka, India: a qualitative
study**

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Abstract

Background: Poor maternal mental health is a major public health concern since it adversely impacts both maternal and child health outcomes. This study aimed to document the barriers to utilizing perinatal mental health services in Karnataka, India, and to determine its relationship with risk factors of poor maternal mental health in this context.

Methods: Qualitative research methods using in-depth interviews were conducted on twenty-one local stakeholders who represented health service providers in various capacities: mental health specialists (n = 4), gynaecologists (n = 2), government officials from the Department of Health and Family Welfare (n = 2), and Department of Women and Child Development (n = 2), senior state consultant to United Nations Children's Fund (n = 1), and frontline workers (n = 10). Data were analysed using a thematic framework analysis approach.

Results: We identified multiple barriers to service utilization operating at the levels of the health system, community, family, and the individual. Health-system level barriers included lack of a universal screening mechanism, poor infrastructure, poor training of frontline workers on mental health issues, and inadequate time for counselling and treatment. Community-level barriers included stigma and misconceptions, leading to a lack of social support. Family and individual level barriers included the financial burden of availing services, lack of family and partner support, and lack of empowerment and motivation in the woman to seek services. Family and individual level barriers interacted with risk factors of poor maternal mental health. Based on this evidence and drawing from the literature, we propose a contextualised, stepped-care model for universal screening, detection, referral, and treatment of women with perinatal mental health conditions for Karnataka that is integrated with the reproductive, maternal, and child health (RMNCH) program in primary care settings.

39 **Conclusions:** The framework developed in this study suggests that addressing the identified
40 barriers would potentially increase uptake of available services, create awareness about and
41 demand for high-quality mental health services, reduce the risk factors of poor maternal mental
42 health, and eventually improve our understanding of its true burden in the state of Karnataka.
43 This is essential for proper implementation, monitoring, and evaluation of programs relevant to
44 perinatal mental health.

45 **Keywords:** perinatal depression, mental health, anxiety, health system, *Manochaitanya*, task
46 shifting, stepped-care, scalable, Low and middle-income country, India

Background

The health and development of a child are intrinsically linked to their mother's physical and mental well-being (1,2). Poor maternal mental health can adversely impact a range of pregnancy, birth, and child outcomes (3–5) such as higher risks of obstetric complications, preterm labour, fetal growth restrictions, low birth weight of the baby, delayed initiation of breastfeeding, and low quality of responsive caregiving (5). These, in turn, can lead to heightened irritability in the child and reduced ability for emotion regulation (6), as well as impaired cognitive, motor, and social development in the long term (7–9).

12% of women globally, and around 19% in developing countries, experience depression, and anxiety in the perinatal period (10). According to recent studies, the prevalence of prenatal depressive symptoms in Karnataka, the region of focus in this study, is an alarming 36.8% (11), with similar trends being reported for the capital city of Bengaluru (12). Given the current burden and its adverse consequences on both mother and child, prevention, early detection, and treatment are essential first steps towards achieving the Sustainable Development Goals (SDGs) related to improving maternal and child health outcomes (13).

Although the need for maternal mental health services is high, the availability and accessibility of these services severely fall short of the need, especially in low-resource settings (14). Multiple factors are responsible for these lacunae. At the health-system level, important barriers include the lack of trained manpower, poor infrastructure towards providing mental healthcare in primary care settings, unlinked services leading to poor continuity of care, poorly defined referral pathways, and resistance to decentralize services (15,16). Similarly, provider-level barriers such as the lack of training and supervision of medical staff on mental healthcare, a baby-centered approach in perinatal care, and time constraints in providing quality service have

70 been reported (15–17). Together, these factors have led to a failure to diagnose and treat upwards
71 of 90% of those who need mental healthcare in low- and middle-income countries (LMICS) (18–
72 20).

73 On the other hand, demand-side barriers including the lack of awareness about mental illnesses
74 and their potential for treatment, lack of family or partner support to seek care, the complicated
75 logistics of getting and attending an appointment, the financial burden of availing treatment, fear
76 and stigma associated with a diagnosis of a mental health condition, and the disadvantaged
77 position of women in communities, prevent women from seeking services even when they are
78 available (16,21). Low demand for services reduces the prioritization of service provision in
79 primary care settings (22,23), leading to poor resource allocation towards mental healthcare
80 across decades (24,25).

81 To address these multilevel barriers, a holistic approach is required to meet the end-goal of
82 providing universal, effective, and high-quality mental health services (26). Some countries have
83 taken a first step towards integrating perinatal mental health in primary care settings, providing
84 templates for the operationalization of this goal worldwide (27). To address system and provider-
85 level barriers, most of these templates follow a stepped-care approach, with mild to moderate
86 cases being counseled or treated by minimally trained non-specialists and only severe cases
87 being referred to specialists (28).

88 In India, Kerala was among the first states to launch a stepped-care approach to maternal mental
89 health through a program called "*Amma Manasu*" (mother's mind), which integrated mental
90 health screening and interventions within routine perinatal health programs (29). Similarly,
91 Karnataka's ambitious *Manochaithanya* ("empowering the mind") program, although not
92 exclusive to perinatal mental health, aims to provide mental healthcare services in primary care

settings (30). With 100% coverage in all districts, this "near to home service" has largely bridged the availability and accessibility issues (31). A few additional initiatives specifically designed to promote and protect perinatal mental health is in the pipeline (32,33) – making Karnataka one of the frontrunners in designing universal programs for comprehensive care of perinatal mental health across all districts in the state.

While these novel initiatives are being rolled out, it is imperative to take stock of potential barriers that may be specific to this region for the uptake of these services. This forward-looking approach will help ensure that these factors are addressed from the outset and proposed solutions to be integrated within the program's design. To this end, this study aimed to identify potential barriers to the effective utilization of perinatal mental health services in the state of Karnataka, India, from the perspective of a wide range of healthcare providers (mental health professionals, government officials leading maternal and child health programs, gynecologists, and frontline workers such as the Accredited Social Health Activists (ASHA), Anganwadi workers (AWW), and Auxiliary Nurse & Midwives (ANM)). Qualitative research methods with a framework analysis approach were used to identify barriers at the health system, community, family, and individual level. Additionally, since family-level factors such as domestic violence, lack of partner support, and financial insecurity are known risk factors for poor maternal mental health (34), the second aim was to document the common causes of poor perinatal mental health to uncover any potential interactions between the identified barriers to service utilization and the causes of poor mental health. Based on this evidence, the third aim was to develop and propose an improved maternal mental health service delivery model in Karnataka's primary care settings. The two important outputs of this manuscript would be an evidence-based framework that describes the barriers to maternal mental health service utilization in Karnataka, India and its

116 potential interactions with the common causes of poor perinatal mental health; and the
117 development of an integrated model for universal screening, detection, diagnosis and treatment
118 of mental health conditions in perinatal women that is incorporated within antenatal and
119 postnatal care in primary settings.

Methods

Setting and Participants

In-depth interviews (IDIs) were conducted from August 2019 to April 2020 in Bangalore, Karnataka, to understand the perspectives of a range of local stakeholders relevant to maternal mental health (Table 1). Participants were recruited through a purposive sampling technique to capture the maximum diversity in views. They were four mental health experts (two practicing psychiatrists, one clinical psychologist involved in diagnosing and treating mental health disorders in women during the perinatal period, and one expert in mental health epidemiology). We also interviewed two gynecologists involved in antenatal care in public hospitals of Bengaluru, two officers each from the Directorate of Health and Family Welfare Services, Government of Karnataka (GoK) and Department of Women and Child Development, GoK, one senior state consultant to United Nations Children's Fund (UNICEF), and ten frontline workers (four AWWs, four ASHAs, and two ANMs) from Bengaluru, Karnataka. All frontline workers were females with an average age of 40.7 years (range: 24-57 years) and at least secondary education levels. Among the eleven specialists, five were females. The minimum qualification of the specialist group was a master's degree.

Ethical Considerations

Ethical approval for this study was granted by the institutional ethics committee of the Indian Institute of Public Health-Hyderabad, Bengaluru campus (IIPH-B). Participants were approached directly or through email with a request for an in-person or telephonic (out-of-station participants) interview, which was expected to be completed within one hour. The objectives of the study were described to the participants at this stage, and voluntary informed consent, which

specifically requested an audio recording of the interview for later transcription, translation, and analysis, was obtained. All interviews were conducted at a time and language convenient to the participant and in a location that maintained the privacy of the conversation. Data from these interviews were strictly used for research purposes only. Confidentiality was ensured by handling audio recordings by key research personnel only, storage in password-protected files, and removing personal identifying information from interview transcripts before sharing data with the larger analysis team.

Data Collection

An initial draft of the semi-structured interview guide was prepared by the research team. Pre-specified probes were included to encourage discussion of relevant ideas that may be missed in the initial response. Based on the participant's preferences, interviews were conducted either in English or Kannada by a multilingual, trained research staff. The interview began by collecting basic demographic details, followed by open-ended semi-structured questions to elicit elaborated responses. The topic guide included questions related to stakeholders' professional experiences and contact with women during the perinatal period, causes and impact of perinatal depression on mother, child, and the family, and the availability, access, and utilization of mental health services in public health facilities in Karnataka. The bulk of the interview was geared towards discussing stakeholder perceptions on the barriers to the utilization of available and upcoming services related to maternal mental health in the state of Karnataka. Data was collected and analyzed iteratively until saturation was reached. During this process, the interview guide was modified as necessary for subsequent interviews to clarify questions and add probes based on feedback from previous interviews.

Data Analysis

165 Data analysis followed a thematic approach using the framework analysis method. This involved
166 the following steps:

167 Transcription: Audio-recorded interviews were transcribed in the same language as the
168 interview. Kannada transcripts were further translated into English and referred to for
169 clarifications as needed. Interviews conducted in English were directly transcribed in English.
170 Independent quality checks were done by the research team members to ensure error-free
171 transcription and translation by listening back to random segments of the audio recordings and
172 reading the transcripts simultaneously.

173 Familiarization with the data: Members of the research team thoroughly read and re-read each
174 transcript to familiarize themselves with the whole data set and independently develop an
175 understanding of the initial themes that emerged from participant responses.

176 Developing a working analytical framework: As a first step, the interview guide and familiarity
177 with the data were used to generate an initial list of codes that were mutually agreed upon by the
178 research team. Interviews were coded to extract data on two main themes – what are the barriers
179 to accessing mental health services in Karnataka, and what are the most common causes of poor
180 maternal mental health in the state. Additional notes were taken of evidence demonstrating an
181 interaction between these two broad themes. This initial list was used to code a small set of
182 transcripts and generate new codes where necessary. This exercise was done independently by
183 each member of the analysis team and then discussed in the presence of the whole team to update
184 the initial code list and finalize the definitions for each included code. This formed the initial
185 working analytical framework. NS, MK, and DJ then collectively coded all the remaining
186 transcripts using the initial framework. New emerging themes and codes were noted and
187 discussed during regular team meetings before including them within the framework. Codes

188 were grouped into themes and sub-themes relevant to the research questions as analysis
189 progressed.

190 Creation of the final framework matrix: NVIVO 12 software (QSR International Pty Ltd) was
191 used to digitally code, compile and chart data within the final framework developed in the
192 previous step. The outcome was a matrix that cross-tabulated the raw data (as quotes) for each
193 code and the participants. This matrix was used to summarize and interpret the data for each
194 theme. Relationships between themes were identified, which informed the interactions between
195 the barriers to accessing perinatal mental health services in Karnataka, the causes of poor
196 maternal mental health, and its impact on the mother, child, and family.

197 This evidence-based framework, along with evidence from the literature on successful maternal
198 mental health service delivery platforms in other countries, was then used to develop and
199 propose an improved model for maternal mental health service delivery for Karnataka. This
200 improved model aimed to address the common perceived barriers summarized in the framework
201 and integrate universal screening of poor maternal mental health in public health facilities by
202 non-specialists to identify women who could benefit from the above services.

Results

A synthesis of the study's findings is presented as a framework in Fig. 1 and described below. Please refer to Table 2 for illustrative examples of quotes for each category, theme, and subthemes listed in the framework.

As demonstrated in Fig. 1, common barriers to perinatal mental health service utilization could be categorized into the following three levels: Health System, Community, and the Family and Individual.

Health-system level barriers

Lack of screening services: There is no mechanism to systematically screen every woman for mental health conditions during the perinatal period, even though this phase marks a period when women proactively make multiple contacts with the health system. Antenatal and postnatal visits are child-centric and largely overlook mental health issues. An unfortunate consequence of the absence of a systematic screening facility is the lack of understanding of the true burden of perinatal mental health problems in the state, as highlighted in Fig.1. Without an accurate estimate of the burden, the design and implementation of effective perinatal mental health service delivery platforms would be hard to achieve.

In terms of the format for screening, some stakeholders were of the opinion that mental health screening should involve open-ended conversations by trained providers that indirectly probe the mental health status and associated risk factors during the perinatal period, rather than standardized questionnaires that solely require "ticking boxes."

Lack of adequate infrastructure: The quality of the health system is not uniform across the state. Women in rural areas are particularly vulnerable since the availability of even the most basic

225 maternal and child health services are far from optimal. Mental health services take a backseat
226 when more elementary services are hard to access, although they are likely to add to the stresses
227 associated with pregnancy and childbirth.

228 Lack of sensitization and training of frontline workers: Although frontline workers are poised to
229 identify signs of poor mental health and their associated risk factors since they make multiple
230 contacts with perinatal women over extended periods of time, they typically overlook or avoid
231 conversations around mental health since they are not sensitized or trained to screen, monitor and
232 refer women with mental health conditions to appropriate facilities. This poses a major barrier
233 towards identifying mothers with mental health issues and placing them on a referral pathway
234 when needed. However, counselling support for mental health is starting to be included as a topic
235 during ASHA trainings (see quote 1.1.4 in Table 2). However, it is yet to receive the same level
236 of emphasis as common physical disorders during pregnancy. This lack of training was
237 highlighted by several misconceptions among frontline workers about mental health conditions
238 during pregnancy. For example, many considered anxiety and depression as mental states that
239 could be voluntarily controlled and no need for any counselling or treatment support.

240 Time constraints due to heavy caseloads: Heavy caseloads of health professionals, especially in
241 remote areas, present a major barrier to dedicating adequate time to assess mental health or to
242 counsel women on common causes and risk factors of depression, stress, or anxiety. Frontline
243 workers also expressed their concerns about managing multiple programs that often went beyond
244 women and child health, which left them with limited time to attend to and solve for every
245 woman who came to seek their help. This is particularly important for mental health issues such
246 as depression. The frontline worker may have to proactively reach out to mothers who refuse to
247 engage and spend adequate time building a rapport and trust before treatment and counselling

248 facilities can be discussed.

249 **Community-level barriers**

250 Stigma is associated with a mental health disorder: Stigma is one of the most significant and
251 complex barriers that prevent women and their families from seeking support when the mother is
252 mentally unwell, to avoid discussions and gossip amongst community members about the
253 family's mental health issues.

254 Lack of awareness about the need for and potential of treatment: The level of awareness about
255 mental health issues was perceived to be very poor in the general population, which likely
256 contributed to the stigma surrounding the issue. Mental health experts opined that the general
257 public often wrongly assume that mood swings or feeling sad is part of life, even if experienced
258 for extended periods or those which impact daily functioning. Concerns were raised about family
259 perceptions of perinatal depression and anxiety being considered a consequence of physiological
260 changes brought about by pregnancy and, therefore, not needing any follow-up diagnosis or
261 treatment. This poses a major barrier to seeking support, even if services are available.

262 Lack of awareness about service availability and access: Even if mental health issues are
263 identified, and the family is willing to access services, there is a general lack of awareness about
264 local availability of mental health services and how to access them.

265 Lack of social support: As a result of the stigma, the lack of acknowledgment that mental health
266 problems require treatment, and the lack of awareness about available services, there are often
267 low levels of support and encouragement from community members for women to seek mental
268 health treatment actively. In a patriarchal society, women have limited decision-making abilities
269 and typically need the approval of their husbands and elders before seeking medical attention. In

270 turn, the family's decisions are strongly influenced by community standards, perceptions, and
271 beliefs, making it extremely difficult for a woman to seek treatment when needed.

272 *Myths and misconceptions:* Participants highlighted that communities often have grave
273 misunderstandings about how common mental health disorders present themselves and when
274 treatment or counselling should be sought. In many cases, women hesitate or fail to seek
275 treatment since they believe their condition is not severe enough to warrant further attention.
276 Myths and misconceptions also arise from false belief systems that the community associates
277 itself with. For example, in rural Karnataka, delivering a baby through C-section is looked down
278 upon and attributed to the mother being 'abnormal.' Others misconceptions include the birthing
279 mother being possessed by ghosts if complications were to arise during the intrapartum period.
280 Additionally, while there is a general acceptance of the notion that maternal mental health
281 impacts the baby, there are no active steps taken by the community to promote mental health,
282 probably due to the misconception that the mother can automatically exert control over her
283 negative emotions for the sake of her baby without any active interventions.

284 **Family and individual level barriers**

285 Family and individual-level factors include the financial burden of availing mental health
286 services, time constraints due to competing interests and commitments, lack of partner and
287 family support, which adversely affects how empowered the woman feels about seeking mental
288 healthcare, as well as her motivation to attend to her own mental and physical health needs.

289 *Financial burden related to availing treatment services:* Mental health services are perceived to
290 be expensive and expected to impose a heavy financial burden. The perceived burden includes
291 finances for direct payment for services, cost of travel and accommodation in distant urban

locations where services are typically concentrated, and the loss of income arising from being absent from work. Lack of awareness about low-cost services offered by the *Manochaitanya* program adds to this faulty perception.

Lack of support from the partner or family: In a patriarchal society, women's health is often considered to be less important compared to other members in the family. Therefore, they fear a backlash from family members if they seek support for their mental health. This aspect is further exacerbated in women who experience domestic violence since poor interpersonal relationships further reduce the likelihood of being supported to seek treatment. Also, familial conflicts reduce how empowered women may feel to seek out services on their own. In many cases, when perinatal women perceive their families not to support them seeking mental healthcare, they discourage any help they would have otherwise received from supportive frontline workers for fear of abandonment or aggressive family reactions.

Lack of time due to multiple competing commitments: During the perinatal period, women face the double burden of household chores and demanding child-care. They often do not have the necessary support at home to take over their duties when they need to dedicate themselves to attending mental health services. This prevents them from utilizing services, even if they are available.

Lack of motivation for self-care: The participants perceived women to be less motivated about seeking services for their health. The other family members' needs and conflict avoidance within the family were almost always prioritized over their own.

Risk factors for poor maternal mental health

Participants cited several risk factors that contributed to poor maternal mental health in

Karnataka. Stressors related to domestic violence, husband's alcohol dependence, and financial insecurity were most commonly cited. The woman's lack of empowerment and social support in the household and her community, particularly her inability to make important decisions for herself or her baby, was also highlighted as being common causes for feelings of anxiety and helplessness that many mothers face in day-to-day lives. Poor economic conditions that necessitated mothers to supplement the family's income while simultaneously taking care of an infant or food insecurity that impacted lactation sufficiency were cited as common risk factors for impoverished families. Another important area of concern relates to a preference for a boy child, especially in cases where previous pregnancies led to a girl child being born. This puts undue pressure and is a cause for anxiety during the entire antenatal period. The birth of a girl child often leads to reduced social support within the family, affecting the mother's mental health and reducing her feelings of empowerment within the family.

In some cases, poor maternal mental health outcomes result from gross misconduct and ill-treatment of the mother by health professionals while delivering the child, especially in public health facilities. At a time when institutional delivery is encouraged, the experience in some mothers leaves them scarred. Such harsh behavior further exacerbates their vulnerability.

Interactions between barriers to service utilization and risk factors of poor maternal mental health

Our analysis revealed several factors that pose barriers to utilizing mental health services are also strongly related to the risk factors perceived to contribute to poor maternal mental health. In essence, risk factors of poor mental health increase the barriers to service utilization that operate at the family and the individual level. For example, women who are not empowered to make their own choices about seeking mental healthcare typically also experience domestic violence at

home, particularly from in-laws and alcoholic husbands. Alcoholism in the husband was, in turn, perceived to be related to financial insecurity in the household, which in turn adversely affected the family's decision to seek mental health services, which they perceived as expensive. Women who needed to take on additional work to supplement household income were further disadvantaged since it imposed heavily on their time available to seek services.

Women were expected to continue with their regular household activities during the perinatal period, which is more demanding at this time due to pregnancy or child-rearing related exhaustion. This constant exhaustion state further limited the time and motivation required to seek mental health support when required. This was often compounded by unreasonable expectations from family members who did not support their own mental health during their perinatal period. Therefore, they saw no reason why any specialized treatment or counselling would be required in the first place.

Perceived impact of poor maternal mental health on the mother, child, and the family

Majority of the participants were of the opinion that maternal depression is a public health concern and that it adversely affects the mother, child, and family. Specifically, poor maternal mental health was perceived to adversely impact a mother's self-care practices, mother-child bonding, and her relationship with the rest of the family. It was also broadly acknowledged that these adverse impacts would ultimately lead to poorer child development outcomes.

Overall, our framework (Fig. 1) suggests that multiple levels of barriers to service utilization decrease access to available services and impedes our ability to understand the true burden of perinatal mental health conditions in the state. Therefore, all participants unanimously voiced their concerns over the poor state of affairs in dealing with poor maternal mental health in

Karnataka, specifically - limited mental health services available to them, the lack of awareness about those that existed, and the several barriers that women faced in being able to access those services.

On the flip side, the framework also suggests that a multi-pronged strategy to address these barriers would improve the uptake of services and have several positive downstream effects. Better utilization of services would reduce the adverse impacts of poor maternal mental health on the mother, child, and family relationships and prioritize integrating perinatal mental health services in primary care settings and increasing demand for more high-quality services. Over time, this would help overcome the dearth of data that impedes the effective implementation, monitoring and evaluation of perinatal mental health programs in the state of Karnataka.

Recommended model for universal identification, referral, and treatment of perinatal mental health conditions in India

Based on this evidence, and drawing from the literature describing successful perinatal mental health programs for low resource settings, we recommend the following model for integrating perinatal mental healthcare in primary care settings in Karnataka (Fig. 2). First, we propose a robust integration of perinatal mental health services with maternal and child health programs, operationalized through screening for common mental health disorders during each antenatal visit, during the postnatal period when the mother brings the child for immunizations, and by ASHA workers during scheduled home visits as part of the Home Based Neonatal Care (HBNC) program (35). Screening could be led by frontline workers such as ASHA's, Anganwadi workers, ANMs, and staff nurses in district and taluk hospitals, Community Health Centers (CHCs), and Primary Health Centers (PHCs). Two different screening approaches could be piloted to test acceptability, feasibility, and efficacy – one questionnaire-based. The other using a structured

interview format – both probed into the levels of stress, anxiety, and depressive symptoms experienced by the mother. As outlined in a World Health Organization (WHO) report on maternal mental health (27), these interactions between frontline workers and mothers should be sensitive, respectful, courteous and non-judgmental, to build a relationship of trust and openness. If the symptoms are mild, the same frontline workers will provide basic counselling and support, which could include active assistance with social and marital problems, connecting women to appropriate agencies that focus on specific areas such as domestic violence or financial aid, and introduce them to peer, support groups, when available. Records would be maintained to ensure follow-up counselling and check-ins during subsequent check-ups. Women with moderate symptoms would be referred to the PHC medical officer for follow-up assessment and referrals as needed. Women who report persistent moderate-to-severe symptoms would be referred directly to the *Manochaitanya* clinic or the district hospital for evaluation and treatment by a specialist.

A novel initiative named the Digital Nerve Center (DiNC) is currently being piloted in two districts of Karnataka. By harnessing technology, it aims to improve access by providing personalized information about available healthcare services and coordinating visits (32). Screening and referrals from the Digital Nerve Centre (DiNC) would also feed into this pipeline following the same logic model (see Fig. 2). Regular refresher training and supervision of all frontline staff would be undertaken to ensure continued delivery of high-quality services and to provide psychological support to staff when needed.

Finally, as a preventive and promotive measure, and to improve awareness and reduce stigma, topics on maternal mental health and its common determinants would be discussed in existing platforms related to maternal and child health, integrated with themes known to cause stress

405 anxiety perinatal period. For example, discussions related to breastfeeding could also include
406 topics on how lactation failure could potentially cause stress, along with a list of action points to
407 follow in such scenarios. Some examples of relevant platforms that could host these discussions
408 include mother's support group meetings led by ASHA's in the pregnancy and postpartum
409 periods, village health and nutrition days (VHNDs), and village health, nutrition, and sanitation
410 committee (VHNC) meetings.

Discussion

The framework developed in this study (Fig. 1) highlights three key points regarding perinatal mental health service in the state of Karnataka, India, from the perspective of a wide range of local stakeholders who are involved in maternal and child health in various capacities. First, it comprehensively lays out the common barriers to service utilization that operate at multiple levels – the health system, community, family, and the individual. Second, it highlights the inter-relatedness between the above barriers and the risk factors of poor maternal mental health. Finally, the framework posits that addressing these barriers, particularly those related to the family and individual factors, would have several positive downstream effects (highlighted as blue boxes in the framework). It would help counter the risk factors of poor perinatal mental health and its adverse impacts on the mother, child, and family, create awareness about and demand for high-quality mental health services, and enable building a sizeable database to help quantify the true burden of poor maternal mental health in the state. These points are elaborated below.

Identification of those who need interventions is the first step to efficient utilization of any health service. Therefore, concerted efforts should be directed towards universal and systematic screening of perinatal women for mental health conditions. A systematic review of screening instruments to assess depression during the perinatal period identified seven commonly used tools in low-resource settings (36). Among them, the Edinburgh Postnatal Depression Scale (EPDS) emerged as the most accurate and sensitive across settings.

The institution of a universal screening mechanism needs to go hand-in-hand with training and sensitization of healthcare staff on the use of these instruments. Most health professionals, especially in remote areas, have limited training and time to identify and refer women to

434 appropriate channels for diagnosis and treatment or provide basic mental health counselling in
435 the absence of available specialist services. These barriers are not unique to India since LMICs,
436 in general, are plagued by inadequate screening and referral mechanisms and shortages of trained
437 health staff, which eventually lead to a huge treatment gap for all mental health conditions,
438 including common perinatal mental health disorders such as depression and anxiety (37,38). The
439 dearth of trained workforce and heavy workload of existing specialist staff may be addressed by
440 combining task-sharing and a stepped-care approach. Several countries that are aiming to
441 integrate mental health in primary care have broadly adopted this strategy with local adaptations
442 (27) such as the National Prenatal Depression Initiative (NPDI) in Australia (39), the Perinatal
443 Mental Health Project in South Africa (37) as well as smaller scale district-level pilot projects in
444 South America, Middle-east and Africa (27). Task-sharing entails training and supporting
445 frontline workers on basic screening and counselling techniques and establishing a clear
446 responsibility and referral pathway for severe and complex cases. This serves the dual purpose of
447 building capacity for mental health treatment at different levels within the health system while
448 freeing up specialist time to focus exclusively on difficult cases (37,40,41).

449 The dedicated perinatal mental health program poised to be launched by the Karnataka
450 government (*Mathruchaitanya*) will follow a task-sharing, stepped-care approach, thereby
451 promising to address the health system level barriers described above. However, the additional
452 burden of implementing these new mental health programs on already overburdened frontline
453 workers and primary physicians (42) will further impinge on their time and availability. A
454 potential solution may be the continued incentivizing of private partners to provide mental
455 healthcare services in public settings as initiated through the public-private partnership model in
456 the *Manochaitanya* program (30), or the training of community volunteers who could take on

some of the responsibilities of frontline health workers such as identifying, referring and monitoring individuals with mental health issues in the community. There is a large body of evidence demonstrating the feasibility and efficacy of providing quality mental health services for common mental health disorders by non-specialist community health workers and volunteers. An excellent example is the Thinking Healthy Program and its various local adaptations that were adopted by the WHO as an evidence-based, cost-effective, non-specialist led, community-based intervention for perinatal mental health (43–46).

While it is possible to address health system-level barriers through strategic local adaptations of the stepped-care model, the specific barriers that operate at the level of the community, family, and the individual will need more contextual and innovative solutions since biases against mental health disorders are long-standing and deep-seated. Stigma, often arising from significant gaps in knowledge about mental health conditions in the community and extant misconceptions regarding how they present, emerged as an important community-level barrier for women to access services. Stigma also resulted in community and family members failing to provide the necessary social support desperately needed by perinatal women to seek services. Recent systematic reviews list stigma as an important barrier to accessing services even in developed nations like the UK (26,47), and a meta-analytic review of 56 articles (48) reported a moderate negative association (-0.27) between stigma and help-seeking behavior, highlighting it as one of the key deterrents to service utilization that needs addressing across the board.

One way to counter barriers related to stigma is by increasing awareness about mental health conditions in the community, the potential for their cost-effective treatment, training community leaders on communication strategies that build sympathetic narratives about mental health conditions, and avoiding misconceptions about their presentation (49). Additionally, increased

480 awareness about the *risk factors* for poor maternal mental health such as domestic violence and
481 stressors related to voicing a preference for a boy child may further help the family to avoid
482 stressful behaviors that are known to impact the mother's mental health adversely, thereby acting
483 as a preventive measure. The Indian government's schemes that support the girl child such as the
484 "*Beti bachao, beti padhao*" (Save the girl child, educate the girl child) and "*Sukanya Samriddhi*
485 *Yojana*" (Girl child prosperity scheme) will further bolster such efforts.

486 Several experts thought that increased visibility of the *Manochaitanya* program, as is evident
487 from the dramatic increase in its uptake in the past six years (31), would greatly help generate the
488 necessary awareness about mental health disorders in the community. Continued sensitization
489 and capacity building of frontline workers on mental health disorders would build credibility for
490 the program within the community as they get exposed to more knowledge about different
491 mental health conditions and their determinants on the one hand, and the support they receive for
492 affordable and accessible specialist healthcare on the other. Finally, the provision of universal
493 screening for maternal mental health with well-planned and efficient care pathways may go a
494 long way to counter stigma-related barriers to accessing services. Together, these may lead to
495 shifts in community perspectives about mental health and increase mental health-seeking
496 behaviours. These measures will also help address some of the family and individual level
497 barriers, including misconceptions regarding mental health treatment being prohibitively
498 expensive and time-intensive, and empower women to voice their need for mental health
499 treatment in a more accepting society.

500 An interesting outcome of our analysis was the interaction between factors that were perceived
501 as barriers to service utilization and the causes of poor maternal mental health. Based on this
502 observed interaction, we propose that solving for these common underlying factors may reap the

503 dual benefit of improving service utilization and reduce the risk of poor mental health. There is
504 evidence to show that improving mental health literacy at the community and family levels
505 improves mental health outcomes, partly by promoting help-seeking behavior (50). Specifically,
506 in the Karnataka context, women are expected to continue with usual household duties through
507 the perinatal period with little support from the family. They may also experience domestic
508 violence and have poor decision-making abilities in the family. This lack of social support and
509 increased stress are both risk factors for poor mental health and barriers to seeking treatment.
510 Therefore, solving for these common underlying factors through increased awareness about the
511 negative consequences of maternal stress on child health and development may simultaneously
512 spur improved attitudes towards providing social support to seek mental healthcare when needed,
513 as well as provide increased support to help reduce maternal stress in the immediate postpartum
514 period. Similarly, interventions to address physical, verbal, or emotional abuse, lack of partner or
515 family support, and financial insecurity may have spin-off effects on both fronts.

516 Based on our findings and available evidence in the literature, we have proposed a model that
517 combines task-sharing and a stepped-care approach for perinatal mental health in Karnataka,
518 which can unify the several mental health programs that have been recently been launched or are
519 in the pipeline. We believe that this unified model holds promise since similar models have
520 successfully been implemented at varying levels of scale in other low-resource settings such as
521 South Africa, Uganda, and Kerala, India (29,37,38,51,52). An important component is
522 integrating perinatal mental health delivery in existing maternal and child health programs and
523 largely led by trained non-specialist frontline workers. Successful implementation of this model
524 may lead to increased uptake of mental health services, thereby providing the necessary demand-
525 driven impetus to strengthen the Indian mental health infrastructure further, ensure increased

accessibility, a broader range of available services, and the appointment of dedicated care providers for the provision of mental health services in the future.

Limitations of the study

First, certain barriers to mental health service utilization may have been overlooked, especially those specific to the most remote areas in Karnataka, since this manuscript documents the perceptions and opinions of participants largely based in urban areas. Second, data was only collected through in-depth interviews, which does not allow for the emergence of group consensus on topics of interest as is possible through focused-group discussions. Finally, a major limitation of the proposed model is the addition of yet another program to an already overburdened health system. However, the proposed solutions and the socio-economic benefits it will potentially accrue, would likely encourage the system to sustain and further strengthen mental healthcare delivery in primary care settings.

Conclusion

We identified multiple barriers to the effective utilization of mental health services in Karnataka, ranging across the health system, community, family, and individual levels. Based on our results and drawing examples from the literature, we have proposed a stepped-care model that integrates all the existing relevant programs in Karnataka into a universal perinatal mental health program to realize the goal of making mental health services available and accessible to all women during this critical period of their lives. In turn, this may reduce the risk of adverse neonatal, infant, and child health and development outcomes and have additional spillover benefits of increased awareness about mental health conditions in the community, reduced stigma, and eventually lead to improved healthcare-seeking behavior in the community. Needless to say, although

548 contextualized for Karnataka, India, similar models would also be applicable to the rest of the
549 country and other low-resource settings across the globe. However, important limitations related
550 to heavy caseloads in remote locations with limited specialist support must be seriously
551 considered during the iterative refinement of these programs in the future since time constraints
552 of the existing overburdened healthcare staff would overturn any attempts to implement any of
553 these programs effectively. Therefore, relevant stakeholders must continue to track
554 implementation challenges across different contexts and keep innovating to address common
555 barriers to help transform these ambitious but fledgling programs into effective well-oiled
556 machinery. Once empirically tested and refined, components of the optimized mental health
557 service delivery model can inform policy formulation in India and other LMICs.

558 **List of abbreviations**

559 LMICs (Low and middle-income countries); ASHAs (Accredited Social Health Activists);
560 AWW (Anganwadi Workers); ANM (Auxillary Nurse Midwife); PPP (Public-private
561 partnership); RMNCH (Reproductive, maternal and child health)

562 **Declarations**

563 **Ethics approval and consent to participate**

564 All procedures contributing to this work comply with the ethical standards of the relevant
565 national and institutional committees on human experimentation and with the Helsinki
566 declaration of 1975, as revised in 2008. Ethical approval for the study was obtained from the
567 Indian Institute of Public Health-Bengaluru campus Ethics Committee (Approval No: IIPHHB/
568 TRCIEC/146/2019). Informed consent was obtained from all participants prior to data collection.

569 **Consent for publication**

570 Not applicable

571 **Availability of data and materials**

572 The datasets used and analyzed in the current study are available from the corresponding author
573 on reasonable request.

574 **Competing interests**

575 The authors declare they have no competing interests.

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583 **Author's contributions**

584 DM and GRB conceptualised and designed the study. DM, SAG, ND, MK, and DAJ carried out
585 data collection, analysis and interpretation. DM, ND, DAJ wrote the first draft of the manuscript.
586 All authors reviewed the first and subsequent drafts of the manuscript and approved the final
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<http://www.ncbi.nlm.nih.gov/pubmed/20180979>

763 **Figures and Tables**

764 **Table 1:** Types and number of health service providers interviewed for this study

S No	Level of expertise	Profession	N
1	Mental health specialists	Psychiatrists	2
2		Clinical Psychologist	1
4		Mental health epidemiologist	1
6	Women's health specialist	Gynecologist	2
5	Health systems policy, administration and implementation	Directorate of Health and Family Welfare (RCH) [#] , Govt of Karnataka	2
8		Department of Women and Child Development, Govt of Karnataka	1
7		UNICEF State Consultant	2
9	Non-specialist health providers / frontline workers	Auxiliary Nurse-Midwife (ANM)	2
10		Anganwadi Worker (AWW)	4
11		Accredited Social Health Activist (ASHA) worker	4
	Total		21

765 [#]RCH: Reproductive and Child Health

766 **Table 2: Categories, themes, subthemes and illustrative quotes from qualitative interviews**

Sr No.	Category	Theme	Sub-theme	Illustrative quote
1	Barriers to service utilization	1.1 Health-System level barriers	1.1.1 Lack of screening services	<i>"There is no early detection of mental health problems. The main problem with mental health is its detection and the skills required for its detection. These skills should improve."</i>
			1.1.2 Format of screening questionnaire	<i>"Someone needs to ask the mother, "are you feeling okay" instead of asking a structured questionnaire. If we ask, she may feel comfortable and may say things that are happening to her. She may tell the reasons also. Later, we can arrange for follow-up check-ups and treatments."</i>
			1.1.3 Lack of adequate infrastructure	<i>"Many times, the doctors are not available at the PHCs (primary health centers). There are facilities, but what about accessibility? We see women deliver at home because of the non-availability of ambulance services on time. When the condition is so, how can we expect support for mental health?"</i>
			1.1.4 Lack of adequate training of frontline workers	<i>"We have the satellite-based training for ASHA workers ... around four thousand ASHA workers are trained every day. We add these mental health training modules in that. It may not occupy the same time and place as preventing hypertensive disorders or the correction of anaemia. However, we have initiated this to introduce the concept of mental disorders during pregnancy and the necessity to address"</i> <i>"Some people get very tensed and upset; They should remain calm." <misconceptions among frontline workers due to lack of training></i>
			1.1.5 Time constraints due to heavy caseloads	<i>"The biggest challenge is that the gynaecologist has a huge number to cover. If he/she asks one question, how are you? the <perinatal> woman will keep talking. My husband is a problem, I have financial problems, my child has this, then I am worried whether I will have a baby boy or not. Here time is the constraint. I think that is the biggest barrier. Otherwise, every gynaecologist, every paediatrician, every mental</i>

Sr No.	Category	Theme	Sub-theme	Illustrative quote
				<p><i>health professional, would want to cater to them."</i></p> <p><i>"We <frontline workers> have many schemes running and cannot pay individual attention to each woman. You know our tension; sometimes, even if women come to speak, we do not have ample time to spend with them."</i></p>
		1.2 Community level barriers	1.2.1 Stigma associated with diagnosis of a mental health condition	<p><i>"They feel awkward about everyone starting to discuss the issue, so they behave like all is good in their life when they are in a group. They do not come forward due to the fear of society. People fear society."</i></p> <p><i>"Whenever a female child is born the mother receives a sympathetic look. A woman is never given the place she deserves when she achieves something; we aren't ready to accept it."</i></p>
			1.2.2 Lack of awareness about the need for and potential of treatment	<p><i>"We don't speak about mental health. That is the main barrier."</i></p> <p><i>"Women ignore the problem and continue to stay in the misconception that some things are common in such situations."</i></p> <p><i>"We refer women to the psychiatrist, but they will not be ready to go anywhere. We tell her to go to the office meant for domestic violence, but she refuses to go and says this is the story of every household, and she always hesitates to move forward."</i></p>
			1.2.3 Lack of awareness about service availability	<p><i>"We are blessed in Karnataka to have psychiatrists and psychologists in all districts in Karnataka, along with teams in district hospitals and medical colleges."</i></p> <p><i>"We have counselling facilities, the government has provided many, but we don't know how much people have understood it."</i></p>
			1.2.4 Lack of social support	<p><i>"Just after six or seven months, they have to go to work and take care of kids. These are some physical challenges. Those below the poverty line and people who work at the grass root level face more of these issues as they have to handle many things at the</i></p>

Sr No.	Category	Theme	Sub-theme	Illustrative quote
				<i>same time. Problems like taking care of kids, not eating nutritious food, not getting adequate rest, as they go out for work."</i>
			1.2.5 Myths and misconceptions	<p><i>"Mental illness doesn't mean that a person has to tear his clothes and roam around with shabby hair, but we consider it in that way. Any person who looks absolutely normal may be suffering from stress or depression, but it is not understood."</i></p> <p><i>"When a woman shows some irregular symptoms after delivery, they identify them as "Bananti Sunni (the local terminology to describe being possessed by ghosts)" and try to treat her for ghosts instead of looking out for <medical> facilities."</i></p> <p><i>"The family will tell the woman not to cry as the baby would be cranky too. However, they do not address <the cause for her sadness> or show any concern about her and fail to keep her happy."</i></p>
		1.3 Family and individual level barriers	1.3.1 Financial burden related to availing treatment	<i>"They tell us about their problems like there is no money to even pay for the bus or auto, or there was no one to accompany them to the hospital."</i>
			1.3.2 Lack of family or partner support	<p><i>"They need to seek permission from their in-laws before stepping out. If the doctor asks her to visit again, the family members do not allow it. They discourage her by saying that you had been to the hospital just yesterday, why should you visit again today? Mothers-in-law speak ill and asks if the hospital is only place on earth left to go? So, women can't make it <seek treatment>"</i></p> <p><i>"Sometimes, the woman may feel that the family will abandon her if they come to know about the disease and treat her as a 'mental' patient. "</i></p> <p><i>"If we <frontline workers> make them sit for an hour for a meeting, they start</i></p>

Sr No.	Category	Theme	Sub-theme	Illustrative quote
				<i>complaining and say that if we spend our time here, then who will cook for our husbands? Or if we sit here, our in-laws will scold us."</i>
			1.3.3 Lack of time due to other competing commitments	<i>"On some days they visit <the hospital> after the consultation time is over and say we were busy with our household chores so could not come earlier. They have to finish their routine work. These lags are because the family members do not allow the woman to visit hospitals."</i>
			1.3.4 Lack of motivation for self-care	<i>"It is difficult to help them <perinatal women> if they don't show any interest." "Some women don't express <their need for help> even if they have some problem; they think that they will end up quarrelling with the husband in the presence of kids, so they quietly tolerate and go on." "Some women don't care and move on, thinking that it is their destiny."</i>
2	Risk factors of poor maternal mental health	<ul style="list-style-type: none"> - Preference for a boy child - Lack of empowerment 		<i>"Some people say they have a feeling of fear before delivery. When probed, they talk about the pressure from the family regarding having a baby boy and that she will not be allowed to go back home if she happens to deliver a girl. They even complain about the family not taking proper care, not allowing them to go outdoors, not even to their parental house."</i>
		<ul style="list-style-type: none"> - Domestic violence - Lack of partner and family support - Financial hardships 		<i>"Some husbands drink and don't bother at all about their wives. They never bring them to the hospital at any point of time. Never bring a single thing home. Mothers-in-law complain that she doesn't work and only breastfeeds. These women don't have enough food to eat and continuously worry that this will lead to low milk production. She has to spend sleepless nights, and on top of that they blame for her for the girl child."</i>

Sr No.	Category	Theme	Sub-theme	Illustrative quote
		Ill-treatment by health professionals during the intra-partum period		<i>"Women have faced difficulty during delivery, sometimes they are tortured by staff in the government hospitals and they end up saying they don't want a child due to the ill-treatment. Girls who are 18 years of age suffer a lot during delivery and feel that this was unnecessary at this point in time."</i>
3	Impact of poor maternal mental health	Impact on - child - mother-baby bonding - family relationships		<i>"They are disinterested in eating, doing their work, and all other things. They don't even bother to eat, bathe, or keep themselves healthy. They do not even think about the newborn, and no bonding is built between the child and the mother."</i>

768 **Figure 1:** Framework to describe the various levels at which barriers to maternal mental health service utilization operate, their
 769 interaction with perceived causes of poor perinatal mental health, and its impact on the mother, child, and the family

771 **Figure 2:** Recommended model to integrate perinatal mental health in primary care settings in Karnataka

Figures

Figure 1

Framework to describe the various levels at which barriers to maternal mental health service utilization operate, their interaction with perceived causes of poor perinatal mental health, and its impact on the mother, child, and the family

Figure 2

Recommended model to integrate perinatal mental health in primary care settings in Karnataka