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Screening and detection of perinatal depression by non-physician primary healthcare workers in Nigeria

Bibilola D. Oladeji[1,2*], Olatunde O. Ayinde[1], Toyin Bello[2], Lola Kola[2], Phyllis Zelkowitz[3], Soraya Seedat[4] and Oye Gureje[1,2,4]

Abstract

Background Detection of perinatal depression by healthcare providers remain an important barrier to receiving treatment. This study reports on the detection of perinatal depression by frontline non-physician primary healthcare workers (PHCWs) as well as the feasibility, effectiveness and acceptability of routine screening using the 2-item patient health questionnaire (PHQ-2) during antenatal care.

Method Twenty-seven primary healthcare facilities were assigned to screening ($n=11$) and non-screening ($n=16$) arms. All PHCWs in both arms were trained to diagnose and treat perinatal depression using the WHO mental health gap action intervention guide (mhGAP-IG) while those in the screening arm were trained to routinely screen with PHQ-2 first to determine need for further mhGAP-IG assessment. Perceived usefulness, feasibility and acceptability of routine screening for perinatal depression was explored in key informant interviews on a purposive sample of PHCWs ($n=20$) and study participants ($n=22$).

Results In the first 6-months following training, the detection rate of perinatal depression was 4.6% at the clinics where PHCW were not routinely screening with the PHQ-2 compared to 11% at the screening clinics. Over the next six months, with refresher training for PHCW in the screening arm and the introduction of monthly supportive supervision for PHCW in both arms, detection rates increased from 4.6 to 7.6% at non-screening clinics and from 11 to 40% at the screening clinics. Over the entire study period only 81 (15.7%) out of the 517 cases of perinatal depression were detected by the PHCWs. Detection of depression by PHCWs was associated with the severity of depression symptoms and routine screening with PHQ-2. The introduction of routine screening was acceptable to both PHCWs and perinatal women. PHCWs reported that the PHQ-2 was useful, easy to administer and feasible for routine use.

Conclusions Improving detection and subsequently the treatment gap for perinatal depression require not just training of frontline healthcare workers but the introduction of additional measures such as universal screening along with supportive supervision.

Trial Registration Number The main study from which the data for this report was extracted was retrospectively registered 03 December 2019. Registration number: ISRCTN 94,230,307.

*Correspondence:
Bibilola D. Oladeji
bibideji@yahoo.com

Full list of author information is available at the end of the article

Keywords Perinatal depression, Primary healthcare, Low- and middle-income country, Detection, Implementation research

Introduction

The excess burden of perinatal depression in women in low- and middle-income countries (LMIC) compared to high income countries (HIC) is well documented [1, 2]. A recent systematic review and meta-analysis of data from 589 eligible studies from across 51 LMIC, reported a pooled prevalence of perinatal depression of 24.7% [3]. Perinatal depression has considerable negative impacts on both the mother and her infant [4–6]. Women with perinatal depression are at increased risk for peripartum haemorrhage, preterm birth, stillbirth, and suicide; with suicide becoming one of the leading causes of maternal mortality in high-income countries where other common obstetric causes of maternal mortality are largely controlled [7]. Adverse infant outcomes associated with perinatal depression in LMICs include earlier cessation of breastfeeding, and elevated occurrence of common infant illnesses and malnutrition [4, 8].

Studies have demonstrated the effectiveness of simple interventions in alleviating the symptoms of perinatal depression and protecting against its adverse consequences, even when those interventions are delivered by trained non-specialist healthcare workers [9]. While the evidence supporting the effectiveness of interventions for common perinatal mental disorders is well documented, many women with this condition do not receive any [10]. This treatment-gap can be attributed to both patient and provider factors. Many women do not recognize that their symptoms could be indicative of a mental health problem and most clinicians at the forefront of delivering care for women in the perinatal period often fail to identify the condition [10]. Even in well-resourced settings where women are attended to by physicians or obstetricians, detection rates are low. In a longitudinal study exploring the identification, treatment, and referral of women with common mental disorders by obstetrics providers in the US, only 41% of women who screened positive had any documentation of psychiatric symptoms or diagnoses, and only 15% had mental health treatment documented in their electronic medical records [11]. In another study of general practitioners (GPs) in the UK, only 9.5% documented a common mental disorder in the patient records during pregnancy while a review of 28-item general health questionnaire (GHQ-28) screening scores from the same cohort of women suggested that between 31.3% and 46.8% of cases were missed [12].

Screening has been identified as a potential way to close both the detection and treatment gap for perinatal mental disorders [13]. This has led to recommendations for routine screening for perinatal mental disorders in several developed countries [14]. There is evidence that screening for perinatal depression reduces depression risk and leads to early referral for treatment [14, 15]. However, the timing of screening, frequency, appropriate screening tool, the health care provider responsible for screening, and the appropriate follow-up and referral pathways differ across guidelines [14]. Many guidelines recommend using the Edinburg Postnatal Depression Scale (EPDS) for screening for perinatal depression [16]; some suggest the use of the 9-item Patient Health Questionnaire (PHQ-9), while other guidelines recommend asking two depression identification questions first, followed by another screening tool (e.g. EPDS or PHQ-9) if a woman responds positively to either question [14]. Even where there are guidelines for routine screening [17], in practice, only 40% of women are screened for perinatal depression compared to 96% for gestational diabetes [18].

In almost every country of the world, women access routine antenatal services. Thus, antenatal clinic visits present an opportunity to identify women with common perinatal mental disorders in need of intervention. In addition, there is evidence suggesting that screening is more effective when it is accompanied by confirmatory diagnostic assessment and access to treatment [19]. However, few studies have examined the feasibility of perinatal depression screening and its acceptability by women and the frontline providers who provide routine perinatal services during pregnancy and in the postpartum period. Most of the available studies are from high income countries [20, 21] with very little evidence to support the feasibility of routine screening in LMICs where the primary healthcare providers are non-specialist and fewer in number [22].

In many LMICs, many women access antenatal services at primary healthcare centres that are typically staffed by non-physician primary healthcare workers (PHCWs). Antenatal care guidelines in Nigeria, for example are based on the World Health Organization (WHO) recommendation of a minimum of 8 contacts and provide a good opportunity to screen women for common mental disorders. While earlier studies have provided evidence that non-physician providers are able to deliver effective interventions to women with perinatal depression [9, 23], their ability to identify women in need of treatment as well as the utility of tools that might assist them in identifying persons in need of care are largely unexplored. Specifically, evidence is needed about PHCW's ability to identify cases and the feasibility and impact of incorporating routine screening for depression symptoms in the

context of the typical busy clinical schedule. This study is designed to provide such evidence.

Methods

Data for this report are derived from the SPECTRA study- a hybrid type II implementation study that explored the barriers and facilitators for scaling-up care for perinatal depression in primary healthcare in Nigeria. A detailed description of the study methodology is available in earlier publications [24, 25]. Only methodological aspects of relevance to the current report are presented here. The study was implemented using the Replicating Effective Programmes (REP) framework and carried out in four overlapping phases [26].

The first phase, the **Pre-Condition** (formative evaluation and concept development) phase consisted 3 major activities (1) consultative engagement meetings with representatives of relevant groups (policy makers, women with lived experience of perinatal depression, community leaders and primary care providers) to seek their views and get their support for the project; (2) key informant interviews with 20 purposively selected heads of primary healthcare clinics to explore their understanding of perinatal depression and its current management; and (3) a planning workshop to review the planned programme in the light of previous experience with task sharing and training of PHCWs on the mhGAP-IG.

The second phase the **Pre-Implementation** aimed at assessing the organizational and clinical profile of primary maternal care clinics. There were two major activities during this phase: (1) review of the facility profile and the arrangements in place for managing chronic medical conditions in the clinic through key informant interviews with the 20 selected heads of the primary maternal care clinics. This was supplemented with a survey and administration of the Assessment of Chronic Illness Care (ACIC) tool on randomly selected primary healthcare workers and patients. (2) Recruitment and follow up of the first cohort of women (Cohort 1).

The third phase was the **Implementation Phase**. During this phase, using a train-the-trainer approach, all the frontline primary healthcare workers in all the selected primary health care clinics were trained to identify and provide evidence-based interventions for perinatal depression using the mhGAP-IG.

In the final phase- the **Maintenance and Evaluation Phase**, the selected clinics were randomly assigned into two arms and a second cohort of women (Cohort 2) were recruited and followed. Ongoing supportive supervision was provided to the primary healthcare workers and a refresher training was conducted for PHCW in the screening arm.

Study setting

The study was conducted at 27 selected primary maternal and child healthcare clinics (PHCC) located within and around the city of Ibadan, the capital of Oyo State, Nigeria (Fig. 1). These selected PHCCs were randomly assigned to two groups- a screening ($n = 11$) and a non-screening ($n = 16$) arm.

Assessment and treatment protocol

In the screening arm, all PHCWs were trained to routinely screen patients with the 2-item Patient Health Questionnaire (PHQ-2) [27, 28]. All women who responded positively to either of the 2 questions were assessed further using the WHO Mental Health Gap Action Programme-intervention guide (mhGAP-IG) [29] to establish a diagnosis of depression and provide treatment according to mhGAP-IG specifications. In the second (non-screening) arm, participants were not routinely screened with the PHQ-2 but the PHCWs were nevertheless expected to conduct an evaluation for depression using the mhGAP-IG if they considered this necessary based on their clinical judgment. Participants in this arm identified by the PHCW to have depression were similarly managed using mhGAP-IG treatment protocol.

Participant recruitment

Two cohorts of women were recruited from selected primary maternal and child healthcare clinics. The first cohort (Cohort 1) was recruited prior to the training of the PHCW on the use of the mhGAP-IG, allowing for determination of the rate of detection of perinatal depression by providers who are yet to be trained. The second cohort (Cohort 2) was recruited after the mhGAP-IG training.

Recruitment procedures in both cohorts were similar. Consecutively registered women who provided written informed consent were screened for perinatal depression using the Edinburgh Postnatal Depression Scale (EPDS) [30] by trained research assistants after their routine antenatal evaluation by PHCWs. All women who scored 10 and above were asked additional questions derived from the Composite International Diagnostic Interview (CIDI) depression module [31] to ensure they met diagnostic criteria for depression. Participants who met diagnostic criteria for depression and who provided further consent irrespective of whether or not they had been diagnosed with depression by the PHCW were recruited into the study.

Training of PHCW

A train-the-trainer approach was adopted for the training of all the 198 providers working in the 27 selected clinics. The primary healthcare coordinator in each of the 11 Local Government Areas in which the study was

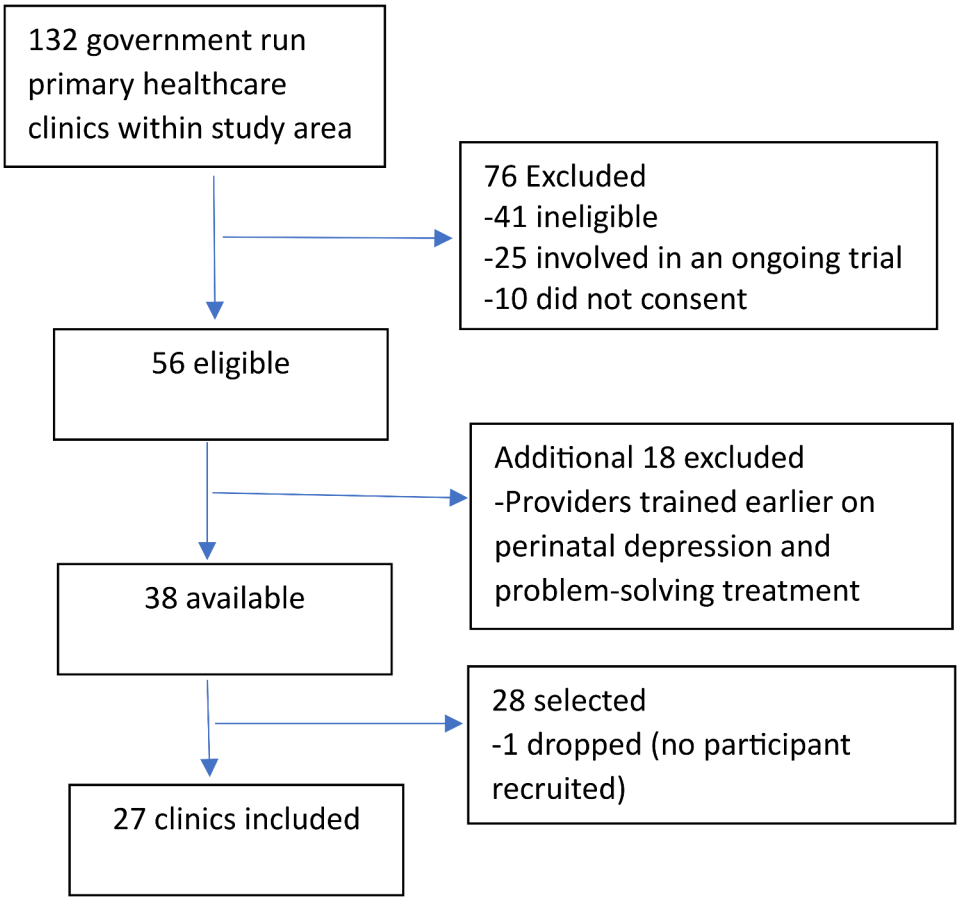

Fig. 1 Selection of clinics

conducted was asked to identify 3 other senior providers in the LGA for training; out of the 44 invited, 40 were available for training. These senior level PHCWs (physicians and senior nurse/midwives or community health officers (CHO)) were trained by psychiatrist trainers on the use of the depression module of the mhGAP-IG for the identification and treatment of perinatal depression. In addition, these senior PHCWs were trained on how to step-down the mhGAP-IG training to their peers. All the training materials (power point slides, training manuals, the mhGAP-IG, charts and role play scenarios) were made available to assist them in conducting the step-down training. The step-down trainings were conducted by 11 senior PHCWs assessed during the training to be the most competent, with good communication skills, enthusiastic about mental health, and had more years of experience working in primary care. The training was conducted in a series of 3-day workshops with about 20–25 participants in each session (more details are available in an earlier publication [32].

Refresher training and supportive supervision

Refresher training was conducted about 7 months into the study for the PHCWs from the clinics assigned to the screening arm. Following this training, monthly supportive supervision visits conducted by the trainers were introduced for both screening and non-screening arms. These visits allowed the trainers to observe PHCW fidelity to the use of the mhGAP-IG for assessment, treatment planning and intervention. The trainers were required to complete a supportive supervision checklist, provide feedback and hands-on training as needed, as well as hold a de-briefing session, with all the PHCWs in the clinic after each visit.

Detection of depression by PHCW

At the end of each clinic day, trained research assistants assigned to the clinic pooled the records of all patients seen to check whether PHCW documented any mental health related symptoms and/ or diagnosis. Research assistants specifically checked the clinic records for PHCW documentation of depression symptoms (such as low mood, sleep disturbance, hopelessness), the duration of symptoms, and specific mention of depression diagnosis. For the purpose of this study, detection of depression by PHCW was determined by the documentation of 3 or more depression symptoms of at least two weeks

duration or documentation of depression diagnosis in the patients' records.

Perceived usefulness, feasibility and acceptability of routine screening for perinatal depression

This was explored in key informant interviews on a sample of PHCWs and study participants. A total of 20 PHCW were purposively selected from among the providers in the screening arm across the different categories and cadres of providers (nurse/midwives- [nursing officers (NO), senior nursing officer (SNO) and chief nursing officers (CNO)]; community health officers (CHOs); and community health extension workers (CHEW) [junior (JCHEW), senior (SCHEW) and chief (CCHEW)] ensuring adequate representation by gender and years of experience. The interviews explored the views of the PHCWs on the use of the PHQ-2 screening questions, its usefulness and ease of administration as well as challenges with using the tool.

In addition, 22 study participants were purposively selected for key informant interviews. Participants were selected based on whether they achieved remission ($n=11$) or not ($n=11$) and to capture different demographic characteristics including years of education, marital status (married/ single/ cohabiting) and from across the different implementing clinics. The interviews explored their experience with screening and their perception on the usefulness of the screening questions.

Outcome measures

All consenting and eligible women (EPDS score > 10 and met the diagnostic criteria for depression) were recruited and scheduled for baseline assessments. The EPDS is a 10-item screening instrument for perinatal depression that has been previously validated and used in studies of perinatal depression in Nigeria [23, 33]. Baseline assessments were conducted within 48 hours of enrollment by a different research assistant blind to the allocation clinic. Assessments included demographic information, such as age, occupation, marital status, along with other clinical variables such as parity and functioning (measured with the 12-item WHO Disability Assessment Schedule (WHODAS)) [34].

Table 1 Sociodemographic Features

	PHQ-2 Clinics (*N* = 3984)	Non-PHQ-2 Clinics *N* = 3192	Total *N* = 7176
Age			
Less than/equal 19yrs	166 (4.2)	110 (3.4)	276 (3.8)
20 to 24yrs	1076 (27.0)	891 (27.9)	1967 (27.4)
Greater/equal 25yrs	2742 (68.8)	2191 (68.6)	4933 (68.8)
Marital status			
Married/cohabiting	3769 (94.6)	3049 (95.5)	6818 (95.0)
Others	215 (5.4)	143 (4.5)	358 (5.0)
Parity			
No child yet	1418 (35.6)	1163 (36.4)	2581 (36.0)
At least one	2566 (64.4)	2029 (63.6)	4595 (64.0)
Education			
None	31 (0.8)	27 (0.8)	58 (0.8)
1 to 6yrs	328 (8.2)	247 (7.7)	575 (8.0)
7 to 12yrs	2656 (66.7)	2063 (64.6)	471 (65.8)
Greater/equal 13yrs	969 (24.3)	855 (26.8)	1824 (25.4)
Mean Age	27.70 (5.61)	27.77 (5.54)	27.74 (5.58)
Mean EPDS	2.85 (3.67)	2.51 (3.28)	2.70 (3.51)

Data analysis

Descriptive data are presented. The associations between identification of depression and the demographic and clinical variables were explored in bivariate analysis using chi square tests for categorical data and ttests for mean age, EPDS and WHODAS scores.

For the qualitative data, the recorded key informant interviews were transcribed. The participant interviews conducted in the local language (Yoruba) were independently translated into English and back translated by two members of the team fluent in both languages. Areas of disagreement were then resolved to generate the English language transcripts of the interviews. The transcripts were explored using thematic analysis. The initial themes based on the interview guide were derived by BDO. The transcripts were read to understanding and familiarity by BDO and OA and independently coded to generate additional themes and the sub-themes as well as identify texts relevant to each theme.

Results

A total of 7176 consecutively registered women were screened with the EPDS of which 517 (7.2%) who met the diagnostic criteria for depression were recruited into the study. Demographic characteristics of participants are shown in Table 1.

Detection of perinatal depression

Depression detection (defined as documentation of at least 3 depression symptoms and/or a diagnosis of depression in patient records by the PHCW) rate before training (Cohort 1 data) was 1.4% (3 participants identified by PHCW out of 218 participants who met diagnostic criteria based on the interviews conducted by the research assistants). On the other hand, and following their training, PHCW identified depression in 15.7% (81 out of 517) of Cohort 2. Most of the patients identified by the PHCW (86.4%) were from the clinics where the PHCWs had routinely screened for depression using the PHQ-2 (Table 2). PHCWs in the screening clinics also identified 9 other women as depressed but who did not have depression based on the diagnostic interviews conducted by the research assistants (these women were

Table 2 Screening and detection of perinatal depression

	PHQ-2 Screening Clinics			Non- screening clinics		
	Identified by PHCW *n* (%)	Not identified by PHCW *n* (%)	Total *n* (%)	Identified by PHCW *n* (%)	Not Identified by PHCW *n* (%)	Total *n* (%)
Depressed	70 (88.6)	247 (6.3)	317 (8.0)	11 (100)	189 (5.9)	200 (6.3)
Not depressed	9 (11.4)	3658 (93.7)	3667 (92.0)	0 (0)	2992 (94.1)	2992 (93.7)
Total	**79 (100)**	**3905 (100)**	**3984 (100)**	**11 (100)**	**3181 (100)**	**3192 (100)**

Table 3 Factors associated with detection of perinatal depression (*N* = 517)

	Identified *n* (%) *n* = 81	Not identified *n* (%) *n* = 436	Chi-square	*p*-value
Age				
Less than/equal 19yrs	11 (13.6)	55 (12.6)	0.565	0.754
20 to 24yrs	30 (37.0)	146 (33.5)		
Greater/equal 25yrs	40 (49.4)	235 (53.9)		
Marital status				
Married/ cohabiting	70 (86.4)	401 (92.0)	2.598	0.107
Others	11 (13.6)	35 (8.0)		
Parity				
No child yet	37 (45.7)	197 (45.2)	0.007	0.934
At least one	44 (54.3)	239 (54.8)		
Education				
None	4 (4.9)	6 (1.4)	6.328	0.097
1 to 6yrs	11 (13.6)	42 (9.6)		
7 to 12yrs	53 (65.4)	298 (68.3)		
Greater/equal 13yrs	13 (16.0)	90 (20.6)		
Clinics				**< 0.001***
Screening	11 (13.6)	189 (43.3)	25.520	
Non-screening	70 (86.4)	247 (56.7)		
	Mean (SD)	**Mean (SD)**	**t-test**	***p*-value**
Age	25.80 (6.4)	26.12 (6.1)	-0.432	0.666
EPDS	12.67 (2.9)	11.75 (1.8)	2.752	**0.007***
WHODAS	21.03 (8.3)	18.28 (6.0)	2.620	**0.011***

***Significant at *p* < 0.05 two-sided test**

excluded from the analysis as they were not enrolled in the study because they did not meet the specified inclusion criteria).

Effect of training and supportive supervision on depression detection rates

Over the first six months following the initial training, the rate of detection of perinatal depression was 4.3% in clinics where the PHCWs were not screening with PHQ-2 and 11% in the screening clinics. Following the booster training for PHCWs from the screening clinics and the introduction of supportive supervision in both arms, the rate of detection increased to 7.6% in the non-screening clinics and 40% in the screening clinics over the next 6 months.

Factors associated with identification of depression (table 3)

When data across both arms were pooled to explore the demographic and clinical factors associated with the detection of depression, screening and depression severity were the main factors associated with detection. The mean EPDS score was significantly higher in women identified to have depression by the PHCW than in those who were not identified (mean score of 12.67 compared to 11.75; ttest-2.75, p-0.007). Reflecting this, the mean score on the WHODAS was significantly higher in women that the PHCW identified to have perinatal depression (21.03[8.3]) compared to those not identified (18.28[6.0]). Screening with PHQ-2 significantly increased the rates of detection of perinatal depression ($p < 0.001$). Detection was not significantly associated with any of the other clinical or demographic variables explored in this study.

Perceived helpfulness of screening

Results from the qualitative interviews with the providers and selected participants support the feasibility of screening; both providers and participants found screening helpful. However, the providers reported some initial challenges with using the tool. Table 4 provides a summary of the key themes that emerged from the thematic analysis of the key informant interviews.

Provider interviews

The PHCWs interviewed included 6 nurse/ midwives (4 of whom were clinic heads), 6 community health officers (CHOs) and 8 community health extension workers (CHEWs). The age of PHCW ranged from 36 to 59 years and years of experience from between 12 and 35 years.

Themes that emerged from the provider interviews

Feasibility of Routine PHQ-2 Screening- Almost all the PHCWs interviewed (18 out of 20) found the PHQ-2 feasible, easy to administer and useful.

> *"The questions are easy to use and very helpful." (39-year-old, CHEW).*
> *"It really is very useful" (52-year-old, C-CHEW).*

Table 4 Summary of themes from qualitative interviews

Key Themes from Provider Interviews	Key Themes from Participants Interviews
Feasibility of routine PHQ-2 screening • Feasible, easy to administer and useful	**Usefulness of screening** • Screening is helpful and should be available to all perinatal women
Perceived usefulness of PHQ-2 • The Screening instrument (PHQ-2) is a good aid for depression diagnosis • The PHQ-2 helps to identify women in need of further assessment	**Perceived helpfulness** • Screening helped to specifically talk about depression symptoms • The screening questions helped their providers identify the problem and provide useful treatment
Challenges and difficulties with using the screening tool • Language and need to explain to participants • Cultural sensitivity in discussing "negative" feelings/emotions • Reluctance of the women to admit to depression symptoms	

Perceived Usefulness- The PHQ-2 is a good aid for identification of depression- helps them to ask the right questions and serves as a 'clinical test' for depression.

"If we did not have these questions, no one can predict that this person is depressed, it is just like malaria test, someone can say that I have headache or high temperature. Without [a] malaria test, the person cannot be sure of having malaria." (36-year-old, SCHEW).

"The questions help us to use the right probes to get the right answers. The tool hastens the rate at which one detects depression, otherwise it would have not been that easy to do." (49-year-old, CHO).

"It is just a searching light for us. It is a guide for us, because if we did not ask those two questions, we may not know what is happening. The reason is that some who are depressed may have physical signs, and it could be that our focus will be on the physical signs if we did not have those two questions to ask them" (50-year-old, Nursing Officer).

Serves as an icebreaker and helps identify women in need of further assessment

"The screening helped patients to open up; serves as the gateway through which more information was gotten about a patient's depression" (46-year-old, CHO).

"....serve as leading questions for us to know what questions we need to ask next" (36-year-old, SNO).

"It is the one that points to the direction of knowing what is really wrong with these women. It is when they are asked these questions and they respond that opens the way for us to probe further." (51-year-old, CNO).

Challenges with use of the PHQ-2 in routine practice

Half of the PHCWs expressed some challenges with using the PHQ-2. Challenges expressed include getting the patients to understand exactly what was being asked, cultural sensitivity, and reluctance of the women to disclose symptoms. However, the difficulties lessened as the PHCW gained experience with the use of the screening questions.

"How to put the questions to them, how to ask them, so we have to practice this among ourselves before we ask them." (36-year-old F, Senior CHEW).

"The only difficulty is making them to understand what you are asking them; you have to explain and explain before some would understand." (36-year-old, CHO).

"At first, I found it difficult to put the questions well to the patient but that later changed when I got used to it" (49-year-old, CHEW).

"....some of the patients do not really grasp the meanings and some do feel very sensitive about them. This is especially because the cultural background of people around my clinic concerning negative things or feelings is something that we health workers are usually very conscious about. Most times it will require us giving more explanations or repetitions for them to get what we mean and this might a take longer time than expected." (51-year-old, Chief Nursing Officer).

"....making them to understand what you are asking them, because I think they believe that we are interfering in their family affairs, so sometimes when you are asking them they will not respond until you explain and explain before they respond; some of them would be hiding that there is nothing wrong with them, some will not respond, so you have to explain and explain to them before they will respond." (51 year old, Chief CHEW).

"They usually want to avoid answering that question 2. They believe the question is too negative and so they answer no to it. It is after we press further that we realise that their answers were actually 'yes' to the question and not 'no'." (52-year-old, Chief CHEW).

Participant interviews

A total of 22 study participants were interviewed, their ages ranged from 21 to 43 years.

The major themes that emerged were:

All participants interviewed felt the questions were useful and described the PHQ-2 as "useful", "helpful", "important", and "good". They thought that the introduction of the screening was a good idea and something that should be available to all pregnant women.

"It's a good idea. If they did not ask such questions, they will not be able to help the patient.....they know what to do when you share your feelings with them." (20-25-year-old, hairdresser):

"This will help them to know what to do and how to go about it. I believe they are serving their purpose and are very useful" (30-35-year-old, trader).

Perceived helpfulness of screening

The PHQ-2 screening enabled them to specifically voice out their symptoms.

"Most people with depression do not speak out even when in the presence of people who can help them. But when questions like these are asked, they are able to talk especially when done privately." (25-30-year-old tailor).

"They create the opportunity to share your feelings with people who are ready to listen" (20-25-year-old trader).

"It has good effects on the pregnant women when asked. It creates an atmosphere for pregnant women with depression to voice out their problems." (30-35-year-old, teacher).

The screening questions helped the PHCWs identify the problem and offer appropriate intervention

"Those questions help them to know what we are passing through and to know the right treatment to administer." (20-25-year-old Tailor).

"It is through these questions that they will know about our health status and our depression state." (20-25-year-old, Tailor).

"With the questions, you get to share your problems and experience with them and that will give them the knowledge to be able to help you." (30-35-year-old hairdresser).

Discussion

This study is novel in providing a systematic exploration of the factors that could improve the detection of perinatal depression by non-physician PHCWs who are the usual frontline providers of maternal and child healthcare in most low- and middle-income countries. Our findings show that even though training appreciably improved the rate of detection of perinatal depression by non-physician primary healthcare workers, detection rates were still low. Our study demonstrated the incremental gains in identification rates with additional training and clinical support strategies. Thus, while the detection rate was 1.4% prior to training, after a single training session, without the introduction of screening, detection improved about threefold to 4.3%; whereas with addition of routine screening it improved almost eightfold to 11%. When monthly structured supportive supervision visits were implemented, detection rose from 4.3 to 7.6%. The highest detection rate of 40% was obtained when PHCWs, in addition to screening, received a refresher training along with structured supportive supervision.

Our study supports findings from other studies that non-detection of perinatal depression by clinicians who provide care to women in the perinatal period is an important barrier to receiving treatment [11]. The detection gap is evident even in studies conducted in high resource settings where frontline maternal care clinicians have a higher level of education, and are more likely to be physicians or specialists (family physicians, obstetricians and paediatricians) [35]. A study of the records of general practitioners in the United Kingdom found that between of 31–46% of perinatal depression cases were missed [12]. In another study of obstetrics/ gynecology providers who provide primary care for women of childbearing age in the USA, only 41% of the women who screened positive for anxiety or depressive symptoms had any documentation of psychiatric symptoms or diagnoses in their medical records [11]. It is therefore clear that introducing measures aimed at improving identification of perinatal depression is an important step in improving detection and, consequently, closing the treatment gap [15].

One such measure is the introduction of routine screening along with guidelines for its implementation. Screening helps with early detection and the prevents the emergence of severe symptoms. Screening has been shown to be generally acceptable to perinatal women and health professionals [36]. A study in South Africa reported that up to 95% of women offered screening for

perinatal depression agreed to be screened [37]. Our findings support the feasibility, acceptability and the utility of a brief screening instrument to improve detection in primary maternal and child healthcare services. The rates of detection of perinatal depression in clinics where the PHQ-2 was routinely used by primary healthcare workers to screen women presenting to antenatal services was significantly higher than in the clinics where routine screening was not carried out. The primary healthcare workers found the PHQ-2 easy to administer in the context of their busy schedules to identify women in need of further assessment. Similar findings have been documented on the feasibility and acceptability of screening with a brief instrument by midwives in Malawi [22].

A review of the literature from the member countries of the Organisation for Economic Co-operation and Development (OECD) on screening and screening guidelines revealed that while most publications generally endorsed screening for perinatal depression, there were variations within and between countries on the timing, frequency, screening tool and the responsible healthcare provider [14]. While early screening and intervention is known to help alleviate some of the negative outcomes of perinatal depression on maternal and child health, reports suggest that even with policies and guidelines in place screening rates are about 40% [10, 18]. The low rates of screening and detection have been attributed to both provider and patient factors. Provider factors include lack of professional education and training, lack of reimbursement for this service, lack of knowledge about treating mental disorders in pregnant and lactating women, concerns about incorporating screening into the daily workflow and the extra time needed to assist patients in distress [38]. Patient factors center around shame, stigma and fear of having their child removed from their care [18, 39]. In the current study, a comparison of women whose depression was detected to those whose depression was not, showed that depression severity was the main factor associated with the identification of perinatal depression by primary healthcare workers. It is likely that the emotional distress and disability associated with the severity of symptoms make participants more willing to disclose their symptoms.

The importance of providing supportive supervision for non-specialist providers in the context of task-sharing was further supported by our findings. Supportive supervision is known to improve provider competence and fidelity to treatment guidelines. A trial of supervision on healthcare worker performance in Zimbabwe reported improvements in drug stock management and adherence to standard treatment guidelines in facilities where health workers received supervision compared to those not supervised [40].

The results of this study should be interpreted in the context of its limitations. While the screening tool (the PHQ-2) was made available to the PHCWs and they were expected to screen all pregnant women registering for antenatal care, we know that in practice not all the women would have had the screening tool administered to them. A major limitation of our study was that we were unable to document the number of women who were actually screened with the PHQ-2. While screening did improve rates of identification, we cannot comment on whether this can be improved further by increasing the rate of screening. We also do not have information on differences in the rate of identification of perinatal depression by different cadres and categories of PHCWs (nurses versus community health extension workers) especially considering that their basic training, qualifications and years of experience differ. This is worth exploring in future studies.

Introducing measures aimed at improving the detection of perinatal depression by frontline healthcare workers who provide care for women in the perinatal period is important in reducing the treatment gap for and the negative consequences of perinatal depression. In addition to improving the knowledge and skills of non-physician primary healthcare workers to diagnose and treat the condition, the introduction of universal screening (with a brief tool) combined with supervision and support are important strategies in efforts aimed at improving the competence of these frontline providers and increasing the reach of interventions to mothers with depression.

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Author contributions
BDO drafted the manuscript with input from OG and SS. OG designed the study with inputs from BDO, LK, and PZ. OG, BDO and OOA delivered the training and along with LK supervised the conduct of the study. TB managed the study database and carried out the statistical analyses. All authors reviewed, revised and approved of the final version for submission.

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Data availability
The datasets generated and/or analyzed during the current study are not publicly available yet but are available from the most senior author on reasonable request.

Declarations

Ethics approval and consent to participate
Written informed consent was obtained from all participants. All procedures involving human subjects/patients for the SPECTRA study were approved by the University of Ibadan and University College Hospital Ethics Committee

(approval number- UI/EC/16/0003). Additional ethics approval was obtained to use the data emanating from the SPECTRA study for a doctorate degree. The protocol: Integrating care for perinatal depression in primary care: an implementation study (adapted from the SPECTRA study protocol) was approved by the University of Stellenbosch Health Research Ethics Committee HREC Reference No: S21/04/074 (PhD).

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

Author details
[1]Department of Psychiatry, College of Medicine, University of Ibadan, Ibadan, Nigeria
[2]WHO Collaborating Centre for Research and Training in Mental Health, Neurosciences and Drug and Alcohol Abuse, Department of Psychiatry, College of Medicine, University of Ibadan, Ibadan, Nigeria
[3]Department of Psychiatry, McGill University, Montreal, Canada
[4]Department of Psychiatry, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa

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References

1. Woody CA, Ferrari AJ, Siskind DJ, Whiteford HA, Harris MG. A systematic review and meta-regression of the prevalence and incidence of perinatal depression. J Affect Disord. 2017;219:86–92.
2. Fisher J, Cabral de Mello M, Patel V, Rahman A, Tran T, Holton S, Holmes W. Prevalence and determinants of common perinatal mental disorders in women in low- and lower-middle-income countries: a systematic review. Bull World Health Organ. 2012;90(2):139–H149.
3. Roddy Mitchell A, Gordon H, Lindquist A, Walker SP, Homer CSE, Middleton A, Cluver CA, Tong S, Hastie R. Prevalence of Perinatal Depression in Low- and Middle-Income countries: a systematic review and Meta-analysis. JAMA Psychiatry. 2023;80(5):425–31.
4. Fekadu Dadi A, Miller ER, Mwanri L. Antenatal depression and its association with adverse birth outcomes in low and middle-income countries: a systematic review and meta-analysis. PLoS ONE. 2020;15(1):e0227323.
5. Stein A, Pearson RM, Goodman SH, Rapa E, Rahman A, McCallum M, Howard LM, Pariante CM. Effects of perinatal mental disorders on the fetus and child. Lancet. 2014;384(9956):1800–19.
6. Adewuya AO, Ola BA, Aloba OO, Dada AO, Fasoto OO. Prevalence and correlates of depression in late pregnancy among Nigerian women. Depress Anxiety. 2007;24(1):15–21.
7. Oates M. Perinatal psychiatric disorders: a leading cause of maternal morbidity and mortality. Br Med Bull. 2003;67(1):219–29.
8. Asare H, Rosi A, Scazzina F, Faber M, Smuts CM, Ricci C. Maternal postpartum depression in relation to child undernutrition in low- and middle-income countries: a systematic review and meta-analysis. Eur J Pediatr. 2022;181(3):979–89.
9. Rahman A, Fisher J, Bower P, Luchters S, Tran T, Yasamy MT, Saxena S, Waheed W. Interventions for common perinatal mental disorders in women in low- and middle-income countries: a systematic review and meta-analysis. Bull World Health Organ. 2013;91(8):593–l601.
10. Cox EQ, Sowa NA, Meltzer-Brody SE, Gaynes BN. The Perinatal Depression Treatment Cascade: Baby steps toward improving outcomes. J Clin Psychiatry. 2016;77(9):1189–200.
11. Goodman JH, Tyer-Viola L. Detection, treatment, and referral of perinatal depression and anxiety by obstetrical providers. J Womens Health (Larchmt). 2010;19(3):477–90.
12. Prady SL, Pickett KE, Petherick ES, Gilbody S, Croudace T, Mason D, Sheldon TA, Wright J. Evaluation of ethnic disparities in detection of depression and anxiety in primary care during the maternal period: combined analysis of routine and cohort data. Br J Psychiatry. 2016;208(5):453–61.
13. Bhat A, Nanda A, Murphy L, Ball AL, Fortney J, Katon J. A systematic review of screening for perinatal depression and anxiety in community-based settings. Arch Women Ment Health. 2022;25(1):33–49.
14. El-Den S, Pham L, Anderson I, Yang S, Moles RJ, O'Reilly CL, Boyce P, Raine KH, Raynes-Greenow C. Perinatal depression screening: a systematic review of recommendations from member countries of the Organisation for Economic Co-operation and Development (OECD). Arch Women Ment Health. 2022;25(5):871–93.
15. O'Connor E, Rossom RC, Henninger M, Groom HC, Burda BU. Primary care screening for and treatment of Depression in pregnant and Postpartum women: evidence report and systematic review for the US Preventive Services Task Force. JAMA. 2016;315(4):388–406.
16. ACOG Committee Opinion No. 757: screening for Perinatal Depression. Obstet Gynecol. 2018;132(5):e208–12.
17. Venkatesh KK, Nadel H, Blewett D, Freeman MP, Kaimal AJ, Riley LE. Implementation of universal screening for depression during pregnancy: feasibility and impact on obstetric care. Am J Obstet Gynecol. 2016;215(4):e517511–518.
18. Griffen A, McIntyre L, Belsito JZ, Burkhard J, Davis W, Kimmel M, Stuebe A, Clark C, Meltzer-Brody S. Perinatal Mental Health Care in the United States: an overview of policies and programs. Health Aff (Millwood). 2021;40(10):1543–50.
19. Klawetter S, McNitt C, Hoffman JA, Glaze K, Sward A, Frankel K. Perinatal depression in low-income women: a literature review and innovative Screening Approach. Curr Psychiatry Rep. 2020;22(1):1.
20. Tabb KM, Choi S, Pineros-Leano M, Meline B, McDonald HG, Kester R, Huang H. Perinatal depression screening in a women, infants, and children (WIC) program: perception of feasibility and acceptability among a multidisciplinary staff. Gen Hosp Psychiatry. 2015;37(4):305–9.
21. Williams CJ, Turner KM, Burns A, Evans J, Bennert K. Midwives and women's views on using UK recommended depression case finding questions in antenatal care. Midwifery. 2016;35:39–46.
22. Chorwe-Sungani G, Mwagomba M, Chirwa E, Jere D, Chipps J. Acceptability and feasibility of a screening protocol for antenatal depression (SPADe) in Blantyre District, Malawi. BMC Psychiatry. 2022;22(1):544.
23. Gureje O, Oladeji BD, Montgomery AA, Araya R, Bello T, Chisholm D, Groleau D, Kirmayer LJ, Kola L, Olley LB, et al. High- versus low-intensity interventions for perinatal depression delivered by non-specialist primary maternal care providers in Nigeria: cluster randomised controlled trial (the EXPONATE trial). Br J Psychiatry. 2019;215(3):528–35.
24. Gureje O, Oladeji B, Ayinde OO, Kola L, Abdulmalik J, Abass WAL, Faregh N, Zelkowitz P. Scaling up care for perinatal depression for improved maternal and infant health (SPECTRA): protocol of a hybrid implementation study of the impact of a cascade training of primary maternal care providers in Nigeria. Int J Mental Health Syst. 2021;15(1):73.
25. Oladeji BD, Ayinde OO, Bello T, Kola L, Faregh N, Abdulmalik J, Zelkowitz P, Seedat S, Gureje O. Addressing the challenges of integrating care for perinatal depression in primary care in Nigeria. Soc Psychiatry Psychiatr Epidemiol; 2024.
26. Kilbourne AM, Neumann MS, Pincus HA, Bauer MS, Stall R. Implementing evidence-based interventions in health care: application of the replicating effective programs framework. Implement Science: IS. 2007;2:42–42.
27. Kroenke K, Spitzer RL, Williams JBW. The PHQ-9: validity of a brief depression severity measure. J Gen Intern Med. 2001;16:606–13.
28. Kroenke K, Spitzer RL, Williams JB. The Patient Health Questionnaire-2: validity of a two-item depression screener. Med Care. 2003;41(11):1284–92.
29. World Health Organization. mhGAP intervention guide. Geneva: World Health Organization; 2010.
30. Cox JL, Holden JM, Sagovsky R. Detection of postnatal depression. Development of the 10-item Edinburgh postnatal depression scale. Br J Psychiatry. 1987;150:782–6.
31. Kessler RC, Calabrese JR, Farley PA, Gruber MJ, Jewell MA, Katon W, Keck PEJ, Nierenberg AA, Sampson NA, Shear MK, et al. Composite International Diagnostic interview screening scales for DSM-IV anxiety and mood disorders. Psychol Med. 2013;43(08):1625–37.
32. Oladeji B, Ayinde O, Bello T, Kola L, Faregh N, Abdulmalik J, Zelkowitz P, Seedat S, Gureje O. Cascade training for scaling up care for perinatal depression in primary care in Nigeria. International journal of mental health systems 2023, In Press.
33. Uwakwe R. Affective (depressive) morbidity in puerperal Nigerian women: validation of the Edinburgh postnatal depression scale. Acta Psychiatrica Scandinavica. 2003;107(4):251–9.
34. Von Korff M, Crane PK, Alonso J, Vilagut G, Angermeyer MC, Bruffaerts R, de Girolamo G, Gureje O, de Graaf R, Huang Y, et al. Modified WHODAS-II

provides valid measure of global disability but filter items increased skewness. J Clin Epidemiol. 2008;61(11):1132–43.
35. Ford E, Shakespeare J, Elias F, Ayers S. Recognition and management of perinatal depression and anxiety by general practitioners: a systematic review. Fam Pract. 2017;34(1):11–9.
36. El-Den S, O'Reilly CL, Chen TF. A systematic review on the acceptability of perinatal depression screening. J Affect Disord. 2015;188:284–303.
37. Honikman S, van Heyningen T, Field S, Baron E, Tomlinson M. Stepped care for maternal mental health: a case study of the perinatal mental health project in South Africa. PLoS Med. 2012;9(5):e1001222–1001222.
38. Gjerdingen DK, Yawn BP. Postpartum depression screening: importance, methods, barriers, and recommendations for practice. J Am Board Fam Med. 2007;20(3):280–8.
39. Farr SL, Denk CE, Dahms EW, Dietz PM. Evaluating universal education and screening for postpartum depression using population-based data. J Womens Health (Larchmt). 2014;23(8):657–63.
40. Trap B, Todd CH, Moore H, Laing R. The impact of supervision on stock management and adherence to treatment guidelines: a randomized controlled trial. Health Policy Plan. 2001;16(3):273–80.

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