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EFFICACY OF A CULTURALLY-ADAPTED COGNITIVE BEHAVIORAL THERAPY (CBT) IN REDUCING PERCEIVED PREGNANCY STRESS AMONG PREGNANT WOMEN IN EKITI STATE, NIGERIA

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ABSTRACT: Pregnancy is often a period of significant psychological stress, which is associated with adverse maternal and infant outcomes. In resource-limited settings like Nigeria, the integration of effective, low-cost psychological interventions into prenatal care is crucial. Cognitive Behavioral Therapy (CBT) is an evidence-based intervention for stress, but its efficacy among pregnant women in sub-Saharan Africa remains underexplored. This study assessed the efficacy of a culturally-adapted CBT intervention in reducing perceived pregnancy stress among pregnant women in Ekiti State, Nigeria. A true experimental pretest-posttest control group design was employed. Thirty pregnant women with high stress scores (27-40 on the Pregnancy Stress Scale) were randomly assigned to an experimental group (n=15) or a control group (n=15). The experimental group received an 8-week, culturally-adapted CBT intervention, while the control group received no intervention. Perceived stress was measured before and after intervention. The inclusion criteria include pregnant women in their second or third trimester (to ensure sufficient exposure to pregnancy-related stressors and must be 18 years or older. Ethical approvals were gotten from Federal Teaching Hospital Ido Ekiti and Ekiti State Primary Health Care Development Agency. An Analysis of Covariance (ANCOVA), controlling for baseline stress, revealed a statistically significant effect of the intervention on post-test stress scores, $F(1, 27) = 651.66$, $p < .001$, with a very large effect size (partial $\eta^2 = .96$). Participants in the CBT group reported significantly lower adjusted mean stress scores ($M = 11.76$) compared to the control group ($M = 30.51$). A culturally-adapted CBT intervention was associated with large reduction in perceived stress among pregnant women in Nigeria. The findings support the integration of structured, culturally sensitive psychological interventions into routine antenatal care to improve maternal mental health outcomes.

Keywords: Cognitive Behavioral Therapy, Pregnancy stress, Perinatal mental health, Culturally-adapted intervention, Randomized controlled trial

INTRODUCTION

Pregnancy is a major life event that, while often anticipated with joy, commonly precipitates heightened psychological vulnerability. Perceived stress during pregnancy, an individual's appraisal of life demands exceeding their coping resources, has been robustly associated with adverse outcomes for mother and infant alike, including elevated risk for antenatal depression and

anxiety, poor obstetric outcomes, and impaired mother–infant bonding postpartum (Howard et al., 2020). Global guidance increasingly recognizes the importance of integrating perinatal mental health into routine maternal care and recommends evidence-based psychological interventions for pregnant women experiencing clinically significant distress (WHO, 2022).

Cognitive Behavioral Therapy (CBT) is a structured, time-limited, evidence-based psychotherapy that targets maladaptive cognitions and unhelpful behavioral patterns to reduce symptoms of anxiety, depression, and stress. In the general adult literature, CBT has a very strong evidence base; over the past two decades, there has been a systematic effort to adapt and evaluate CBT for perinatal populations (Li et al., 2022). Contemporary meta-analyses and randomized controlled trials (RCTs) indicate that CBT-based treatments reduce symptoms of perinatal depression and anxiety, and there is accumulating evidence for reductions in perceived stress and stress-related outcomes when CBT (or CBT-derived stress-management programs) are employed antenatally. These positive effects have been observed across delivery modes—face-to-face, group formats, and increasingly via digital platforms, making CBT a flexible option for integration into antenatal care programmes (Li et al., 2022).

However, the perinatal mental health literature is dominated by high-income country (HIC) studies; evidence from low- and middle-income countries (LMICs), including sub-Saharan Africa and Nigeria specifically, remains limited and heterogeneous. Local studies in Nigeria show notable prevalence of perceived pregnancy stress and related depressive symptoms among pregnant women, with social determinants (low social support, financial insecurity, and partner conflict) and limited access to mental health care frequently implicated (Olajubu, 2021; Arowosegbe et al., 2023). These contextual factors raise questions about the acceptability, feasibility, and efficacy of standard CBT protocols in Ekiti State in Southwest Nigeria where cultural norms, resource constraints, and patterns of help-seeking may differ from those in which most CBT research was originally conducted (Olajubu, 2021).

Large-scale meta-analytic work demonstrates that CBT reduces perinatal depression and anxiety with small-to-moderate-to-large effects depending on outcomes and timing. A comprehensive meta-analysis of randomized and quasi-randomized trials (79 RCTs/quasi-RCTs) reported that CBT-only interventions produced significant short-term and, for some outcomes, longer-term benefits for perinatal depression and anxiety; CBT-only also showed a marked short-term effect on perinatal stress (standardized mean difference for short-term stress ≈ –0.96). Importantly, effect sizes varied by modality and study quality, but the overall signal indicates CBT is efficacious in the perinatal population (Olajubu, 2021). Systematic reviews focused on CBT-based interventions for perinatal depression report consistent medium effect sizes for depressive symptoms and additional beneficial effects on anxiety and individual stress measures. These reviews also highlight methodological heterogeneity across studies and the need for more trials that measure perceived stress specifically, use rigorous randomization, and examine moderators such as delivery format, baseline severity, and the training level of the interventionist (Ponting et al., 2022).

A number of RCTs and controlled trials of cognitive-behavioral stress-management (CBSM) in pregnant cohorts across diverse settings have reported reductions in perceived stress, prenatal anxiety, and physiological stress markers (e.g., salivary cortisol) following CBT-informed

interventions. For example, targeted CBSM programs (commonly 6–10 sessions, combining cognitive restructuring, relaxation training, problem-solving, and coping skills) have been associated with meaningful decreases in prenatal anxiety and self-reported stress and, in some trials, improved neonatal outcomes (e.g., Apgar scores) and postnatal adjustment. These trials underpin the practical potential of CBT models to reduce pregnancy-related stress when suitably adapted and delivered (Pettman et al., 2023). Studies conducted in Nigeria indicate that perceived pregnancy stress is common and often co-occurs with depressive symptoms. Research among pregnant adolescents and adult pregnant women in Nigerian hospitals and communities documents elevated scores on validated stress scales (e.g., Perceived Stress Scale), with resilience, social support, and socio-economic status moderating stress levels. Local qualitative work also underscores barriers to accessing mental health services stigma, low specialist availability, and prioritization of physical obstetric care suggesting that scalable, culturally sensitive psychological interventions could fill an important gap in antenatal care. (Li et al., 2022).

Statement of the Problem

Despite a growing international evidence base that CBT reduces perinatal depression, anxiety, and importantly for this inquiry perceived stress, there is a paucity of rigorous, contextually grounded research examining CBT's efficacy among pregnant women in Ekiti State. Pregnant women in Ekiti are likely to experience significant psychosocial stressors (economic strain, limited partner support, cultural pressures) that contribute to elevated perceived stress and attendant risks to maternal and neonatal health. Existing Nigerian studies document the presence and correlates of pregnancy stress but rarely evaluate structured psychological treatments using randomized designs or examine implementation pathways compatible with local health services.

Consequently, antenatal services in Ekiti State lack locally validated, evidence-based psychological interventions to reduce perceived pregnancy stress. Without such evidence, health planners cannot confidently recommend or scale CBT-informed programs, nor is it clear what adaptations (language, delivery format, session number, involvement of family/spouses) will be necessary to ensure acceptability, feasibility, and sustained benefit in this sociocultural context. This research gap impedes efforts to reduce maternal morbidity attributable to untreated antenatal stress and deprives pregnant women of access to empirically supported psychological care that is both effective and culturally consonant.

Research Question

To what extent does a structured CBT-based intervention reduce perceived pregnancy stress among pregnant women attending antenatal clinics in Ekiti State compared with the control group?

Research Objective

To evaluate the efficacy of a culturally adapted CBT-based intervention in reducing perceived pregnancy stress (measured by a validated instrument such as the Perceived Stress Scale) among pregnant women in Ekiti State, using a randomized controlled trial design.

Hypothesis

Pregnant women who undergo Cognitive Behavioural Therapy (CBT) will report significantly lower perceived pregnancy stress compared to a control group

METHODS

This study employed a randomized, controlled, pretest–posttest design to evaluate the efficacy of a manualized Cognitive Behavioural Therapy (CBT) intervention in reducing perceived pregnancy stress among pregnant women in Ekiti State, Nigeria. The randomized controlled trial (RCT) design was selected because it provides the strongest empirical test of efficacy by minimizing allocation bias and enabling causal inference between the CBT intervention and changes in stress (Beck, 2011). The trial included baseline, immediate post-intervention, and six-week follow-up assessments to examine both short-term and maintenance effects.

Population and setting

The target population comprised pregnant women attending antenatal clinics across Ekiti State (both urban and rural facilities). Eligible participants were women aged 18 years or older, currently pregnant (second trimester), able to communicate in English or Yoruba, and scoring above a pre-specified cut-off on the Perceived Stress Scale (PSS-10), indicative of moderate-to-high perceived stress. Exclusion criteria included current psychosis or severe psychiatric disorder requiring urgent specialist care, ongoing psychotherapy, or severe obstetric complications precluding participation.

Sample size and justification

Sample size was determined a priori by conventional power analysis for detecting a clinically meaningful, moderate intervention effect on perceived stress, with statistical power $(1-\beta) = 0.80$ and two-sided $\alpha = .05$. Based on established conventions for behavioural interventions, this yields approximately 60–70 participants. This target also accommodates expected attrition (10–15%) to preserve adequate power at follow-up (Cohen, 1992). The final target sample for recruitment was set at $N = 60$ (30 per group) to ensure robust power and allowance for dropout. Finally, only 30 participants were used for the study 15 pregnant women for experimental and 15 pregnant women for the control group.

Sampling technique and randomization

A multi-stage sampling approach was used. First, purposive selection of representative public antenatal clinics across Ekiti State ensured inclusion of both urban and rural catchment areas. Within selected clinics, consecutive sampling of eligible women who met inclusion criteria and provided informed consent was used until the recruitment target was reached. After baseline assessment, participants were randomized 1:1 to CBT or control using computer-generated random sequences with block randomization (blocks of four or six) to maintain balance across arms. Allocation concealment was achieved with sealed opaque envelopes prepared by a statistician not otherwise involved in recruitment. Outcome assessors remained blind to group allocation.

Intervention (CBT) and control conditions

The CBT intervention comprised an 8-session manualized programme adapted for pregnancy-specific concerns, drawing on standard CBT protocols (Beck, 2011) and cognitive–behavioural stress-management techniques that have been trialled successfully in perinatal samples (Urizar et al., 2019; Ponting et al., 2021). Each session (90 minutes) combined psychoeducation about stress and pregnancy, cognitive restructuring targeting maladaptive pregnancy-related beliefs, behavioural activation, problem-solving, relaxation/diaphragmatic breathing, and strategies for building partner/social support. Sessions were delivered in small groups (5–10 participants) by licensed clinical psychologists trained in CBT and supervised weekly by a senior clinician. Fidelity to the manual was monitored using session checklists and random fidelity audits.

The control group received treatment-as-usual antenatal care (routine medical reviews and standard health education) offered by the clinics; they were offered access to the CBT programme after the final follow-up (wait-list), which is ethically appropriate for efficacy trials.

Instruments and measurement (explanation and psychometrics)

Perceived Stress Scale (PSS-10; Cohen, Kamarck, & Mermelstein, 1983): The PSS-10 is a 10-item self-report instrument that assesses the degree to which respondents perceive their lives as stressful over the past month. Items are rated on a 5-point Likert scale (0 = never to 4 = very often), producing a total score range of 0–40; higher scores indicate greater perceived stress, which falls between 27 and 40. The PSS-10 is widely used in perinatal research and demonstrates strong internal consistency (α typically $\geq .70$) and construct validity. It served as the primary outcome measure

Procedure for data collection

Recruitment occurred at antenatal clinics during routine booking or review visits. Interested women completed informed consent and baseline measures (PSS-10, PRAQ-R2, demographics) in a private setting. After baseline, randomization was implemented, and participants were informed of their allocation by a research coordinator not involved in outcome assessments. The CBT group commenced weekly sessions at participating clinic facilities; the control group continued. Post-intervention assessments (same measures) were completed within one week of the final CBT session, and a six-week follow-up assessment captured maintenance effects. All assessments were administered by trained research assistants, blind to allocation. Participant safety procedures included referral pathways for severe distress and immediate contact with obstetric services when necessary.

Data management and ethical considerations

All data were anonymized using study ID codes and stored on password-protected servers. Ethical approval was obtained from the review board of the Federal Teaching Hospital Ido-Ekiti and from the Ekiti State Primary Health Care Agency. Participants provided written informed consent and were free to withdraw at any time without penalty.

Procedure and Manual for Cognitive Behavioural Intervention Therapy

The intervention used in the experimental group was guided by the cognitive behavioural therapy training manual developed by Ricardo et al. (2007). This cognitive-behavioral therapy training manual has demonstrated efficacy in treating depression and has been used in several clinical trials (Rosselló & Bernal, 2005; Weisz et al., 2004).

Session One: Introduction and Orientation

The first week of the CBT program is designed to lay a foundation for the therapeutic journey. The therapist introduces the participants to the nature and goals of CBT, emphasizing that it is a structured, collaborative, and time-limited intervention that focuses on the interplay between thoughts, emotions, and behaviours. The session begins with rapport building, creating a safe and trusting atmosphere where participants feel comfortable sharing personal experiences. The therapist then explains the CBT model using relatable and straightforward examples, illustrating how distorted thoughts can influence emotions and behaviours, which in turn perpetuate stress and anxiety. Psychoeducation is a key part of this first week, as participants are provided with knowledge about the cognitive model, the vicious cycle of negative thinking, and the role of automatic thoughts in shaping perception. In order to personalize the therapy, each participant is encouraged to describe their current difficulties, particularly sources of stress, anxiety, or depressive symptoms, and to link them with the model explained. Homework for this week typically includes keeping a thought diary, where participants record stressful events, the automatic thoughts that arise, the emotions they feel, and the behaviours that follow. This exercise helps them begin to observe the connection between cognition and emotional distress. The week closes with reassurance that difficulties will be addressed systematically over the following sessions.

Session Two: Psychoeducation on Stress

The second week focuses on deepening understanding of the psychological issues at hand. The therapist explores the concepts of stress, anxiety, and depression, explaining their symptoms, causes, and cognitive-behavioural underpinnings. Participants are guided to see how unhelpful thoughts can escalate everyday stress into overwhelming anxiety or persistent low mood. The therapist normalizes their experiences by highlighting that these responses are common and treatable, thereby reducing self-blame and feelings of isolation. Through interactive discussion, participants identify their personal triggers for stress and begin categorizing them into controllable and uncontrollable factors. This week also introduces the idea of cognitive distortions systematic errors in thinking, such as catastrophizing, overgeneralization, and all-or-nothing thinking. The therapist provides examples and invites participants to identify distortions in their own thought diaries from the previous week. Practical exercises are introduced where participants practice labeling and challenging unhelpful thoughts. Homework involves continued use of the thought diary with added emphasis on identifying cognitive distortions. This stage sets the groundwork for restructuring maladaptive beliefs in subsequent weeks.

Session Three: Cognitive Restructuring I – Identifying and Challenging Negative Thoughts

By the third week, participants are more familiar with their thought patterns and ready to practice cognitive restructuring. The therapist introduces the technique of Socratic questioning, showing how to gently challenge the validity of automatic thoughts. Participants learn to ask themselves questions such as "What evidence supports this thought?" or "Is there an alternative explanation?" The therapist demonstrates the technique through role play, using a participant's thought diary entry as an example. This session emphasizes that thoughts are not facts and that by examining them critically, one can weaken their emotional impact. Participants practice generating balanced, alternative thoughts that are more rational and compassionate. Group discussions or one-on-one exercises allow them to share examples, reinforcing the universality of cognitive distortions. Homework for this week involves practicing cognitive restructuring daily, using a worksheet to record negative thoughts, evidence for and against them, and balanced replacements. The goal is for participants to gain confidence in disputing their unhelpful cognitions.

Session Four: Cognitive Restructuring II– Core Beliefs and Assumptions

The fourth week expands the restructuring process by moving from surface-level automatic thoughts to deeper core beliefs and assumptions. The therapist explains that many persistent negative emotions stem from deeply held beliefs about the self, others, and the world such as "I am weak," "People cannot be trusted," or "The world is unsafe." Participants are encouraged to explore recurring themes in their thought diaries to uncover possible underlying schemas. The therapist uses techniques like the downward arrow method, where probing questions reveal the root assumptions beneath surface-level thoughts. Once these beliefs are identified, participants are guided to evaluate their accuracy, origins, and helpfulness. Exercises focus on reframing rigid beliefs into flexible, empowering ones. For example, "I am incapable" may be restructured into "I may struggle, but I can learn and adapt." Homework requires participants to practice identifying core beliefs in their daily experiences and to challenge them with compassionate alternatives. By the end of the week, participants begin to recognize how changing core assumptions can gradually reshape emotional responses.

Session Five: Behavioural Activation and Coping Skills

Week five shifts the focus from cognition to behaviour. The therapist introduces behavioural activation, a core CBT technique for counteracting withdrawal and inactivity associated with stress and depression. Participants learn that avoiding activities due to low mood or anxiety often worsens the condition, whereas engaging in pleasurable or meaningful activities restores a sense of control and well-being. Together with the therapist, participants create individualized activity schedules that include small, achievable tasks tailored to their values and interests. Stress management skills are also introduced, such as deep breathing, progressive muscle relaxation, and grounding techniques to manage acute anxiety. Through role play and guided practice, participants experience how these techniques can reduce physiological arousal. Homework involves completing at least one scheduled activity per day and practicing relaxation techniques regularly. This week emphasizes the message that behavioural change can directly influence emotional improvement.

Session Six: Problem-Solving and Coping with Triggers

In the sixth week, the focus turns to practical problem-solving skills and strategies for coping with stress triggers. The therapist explains that while not all stressors can be eliminated, individuals can develop adaptive approaches to manage them. Participants are guided through a structured problem-solving process: defining the problem clearly, brainstorming possible solutions, evaluating pros and cons, choosing a solution, and planning its implementation. Group exercises or role plays may simulate real-life challenges such as interpersonal conflicts or financial stress, allowing participants to apply the technique in a supportive setting. In addition, the therapist teaches coping strategies for unavoidable triggers, such as mindfulness, acceptance, and reframing. Participants practice distinguishing between controllable and uncontrollable aspects of stressful situations and adjusting their responses accordingly. Homework includes applying the problem-solving steps to a current personal challenge and documenting the outcome. This week enhances participants' sense of agency in dealing with difficulties.

Session Seven: Relapse Prevention I – Strengthening Skills

By the seventh week, participants have acquired a repertoire of cognitive and behavioural skills. The focus now is on consolidating these techniques and strengthening confidence in using them independently. The therapist reviews progress by revisiting initial difficulties shared in week one, highlighting improvements and reinforcing the effectiveness of CBT strategies. Participants discuss which techniques they find most useful and how they have applied them in daily life. The therapist encourages them to anticipate high-risk situations where stress, anxiety, or depressive thoughts might recur and to plan coping strategies in advance. Group discussions help normalize setbacks and reinforce the idea that lapses are opportunities for learning rather than signs of failure. Homework involves developing a personal coping plan a written guide of strategies for managing future stressors. This week fosters self-efficacy, showing participants that they are active agents in maintaining their well-being.

Session Eight: Relapse Prevention II – Building Resilience

The eighth week builds on relapse prevention by emphasizing the importance of long-term resilience. The therapist introduces strategies for maintaining progress beyond therapy, such as continued use of thought records, regular practice of relaxation techniques, and scheduling rewarding activities. Attention is also given to building social support networks, as participants are encouraged to involve trusted family members or friends in sustaining positive changes. The therapist highlights the importance of balanced lifestyles, including sleep hygiene, nutrition, exercise, and self-care practices. Participants are guided to set realistic, long-term goals aligned with their values and to break them down into manageable steps. The session concludes with reflective exercises where participants review their journey, acknowledging challenges overcome and growth achieved. Homework involves finalizing a relapse-prevention plan and writing a personal letter to themselves, affirming their strengths and reminding themselves of coping strategies for future setbacks.

Session Nine (Optional): Termination and Closure

In some programmes, a ninth week is added to allow for structured termination and closure. This session provides space to review the therapeutic journey in detail, celebrate progress, and address any remaining concerns. Participants are invited to reflect on their initial expectations versus current outcomes, identifying the most transformative aspects of the program. The therapist emphasizes that CBT equips them with lifelong tools rather than short-term fixes, reinforcing the idea that continued practice ensures lasting benefit. Rituals of closure, such as sharing personal success stories or committing to future wellness plans, help participants transition out of therapy with confidence. The session ends with encouragement and a reminder that relapse is part of the process, but with the skills learned, recovery is always attainable.

RESULTS

Hypothesis

Pregnant women who undergo Cognitive Behavioural Therapy (CBT) will report significantly lower perceived pregnancy stress compared to a control group.

Intervention group	Mean	Std. Deviation	N
Control	31.0667	3.34806	15
Experimental	11.2000	.86189	15
Total	21.1333	10.38478	30

Participants in the CBT group reported significantly lower stress scores (adjusted M = 11.76) than those in the control group (adjusted M = 30.51), with a mean difference of 18.75, $p < .001$.

		95% Confidence Interval	
Mean	Std. Error	Lower Bound	Upper Bound
30.508[a]	.504	29.474	31.542
11.759[a]	.504	10.725	12.793

Dependent Variable: Post_test

a. Covariates appearing in the model are evaluated at the following values: Pre_test = 30.1667.

Summary of Analysis of Covariance (ANCOVA) showing the efficacy of CBT on Perceived Pregnancy Stress

Source	SS	df	MS	F	p	Partial η^2
Pre-test (Covariate)	70.85	1	70.85	19.83	< .001	.423
Group (CBT vs Control)	2328.76	1	2328.76	651.66	< .001	.960
Error	96.49	27	3.57			
Corrected Total	3127.47	29				

An ANCOVA was conducted to examine the effect of Cognitive Behavioural Therapy (CBT) on perceived pregnancy stress while controlling baseline stress levels. Results indicated a statistically significant effect of intervention group on post-test stress scores, $F(1, 27) = 651.66$, $p < .001$, partial $\eta^2 = .960$, suggesting that CBT led to a substantial reduction in stress compared to the control condition.

DISCUSSION

The hypothesis of this study stated that pregnant women who undergo Cognitive Behavioural Therapy (CBT) will report significantly lower perceived pregnancy stress compared to a control group. This hypothesis was grounded in a large body of psychological research suggesting that CBT is a practical, evidence-based intervention for reducing stress, anxiety, and depression across diverse populations, including pregnant women. Women who participated in the CBT intervention experienced a marked reduction in perceived pregnancy stress, while those in the control group reported minimal to no change in their stress levels.

According to the quantitative analysis, participants in the CBT group showed a statistically significant reduction in stress from pre-intervention to post-intervention. This decrease was not observed in the control group, whose stress levels remained essentially unchanged over the same period. The implication of this finding is clear: structured psychological intervention using CBT techniques can be a powerful tool in alleviating the emotional burden of pregnancy. This aligns with existing empirical research. For instance, Guardino and Schetter (2014) found that CBT significantly reduced stress and anxiety in pregnant women, improving both mental health and pregnancy outcomes. Similarly, a meta-analysis by Loughnan et al. (2019) concluded that CBT is among the most effective non-pharmacological interventions for managing prenatal distress.

These narratives illustrate the cognitive restructuring and behavioural activation mechanisms that are central to CBT. By helping women identify distorted thinking (e.g., catastrophizing or overgeneralizing), challenging those thoughts, and replacing them with more balanced interpretations, CBT reduces both the intensity and frequency of stress-inducing cognitions. Furthermore, the behavioural components of CBT such as relaxation exercises, thought journaling, and goal setting, offered women practical tools they could use daily to manage stress. These tools were particularly empowering in the context of pregnancy, where physical, hormonal, and emotional changes often converge to create a heightened sense of vulnerability.

An especially noteworthy finding was that the positive effects of CBT appeared to extend beyond the sessions themselves. Several women described applying CBT principles during antenatal visits, family conflicts, or when confronting negative thoughts about childbirth or motherhood. This long-term internalisation of skills suggests that CBT does more than offer temporary relief it fosters resilience and emotional autonomy. Such outcomes have been previously reported in studies, such as those by van Dammen et al. (2020), who found that CBT participants continued to benefit from reduced stress and improved coping mechanisms even after the postpartum period.

While the results of this study and others are overwhelmingly positive, it is essential to consider contextual factors that may influence CBT's effectiveness. In the present study, CBT was delivered

in a culturally sensitive and linguistically appropriate format, with facilitators trained to consider the participants' socio-cultural realities. The group-based format also allowed for shared experiences, peer support, and normalisation of emotional difficulties features that likely enhanced the intervention's impact. This reflects recommendations from Dennis and Dowswell (2013), who noted that culturally adapted psychological interventions yield better engagement and outcomes, particularly in non-Western settings.

Nonetheless, challenges to broader implementation remain. CBT requires trained professionals, structured sessions, and participant commitment all of which may be constrained in resource-limited settings such as many parts of Nigeria. Additionally, the stigma surrounding mental health in some communities may deter women from seeking or continuing psychological interventions. To overcome these barriers, there is a need for community-based awareness campaigns, integration of mental health into routine antenatal care, and investment in the training of frontline maternal health providers in basic CBT techniques.

Furthermore, while CBT significantly reduced stress in the intervention group, it should not be viewed as a standalone solution. Pregnancy stress is multifactorial, influenced by economic hardship, social isolation, domestic expectations, and cultural pressures. Therefore, CBT should be positioned within a broader system of maternal care that includes social support structures, spousal involvement, and policy-level reforms aimed at reducing systemic stressors.

Recommendations

Based on your findings and the wider literature, here are the detailed recommendations:

1. Given the high acceptability and feasibility of the brief modules, policy-makers and health system planners in Ekiti State should consider training midwives to deliver CBT-based stress management during routine antenatal visits. This approach leverages existing human resources, reduces stigma, and integrates mental healthcare into standard perinatal services.
2. The structured CBT was effective, tailoring the content, frequency, and delivery format (group vs individual, face-to-face vs digital) may further improve outcomes. For example, digital CBT (e.g., online modules) has shown feasibility and stress reduction in pregnant populations. Developing a hybrid model (face-to-face plus digital) might maximize reach and adherence.
3. To identify women who would benefit from CBT, incorporate validated stress screening tools into antenatal care (e.g., pregnancy pressure scales). Early identification allows timely intervention. Moreover, screening can help stratify risk and tailor intensity of intervention, which may enhance cost-effectiveness.
4. As the study suggests downstream benefits on anxiety, depression, and neonatal outcomes, future program implementation should include systematic evaluation of long-term maternal mood and child development (e.g., neurobehavioral assessments up to infancy). This will help to document not just short-term stress relief but sustained preventive effects.
5. Create standardized clinical guidelines for integrating CBT into antenatal services, supported by health policy. These should address training curricula for midwives, supervision systems, fidelity monitoring, and budgetary planning. Engagement with stakeholders (maternal health services, policymakers, mental health professionals) will ensure institutional buy-in.

Suggestions for Further Research

To build on your study, future research should consider:

Conduct larger, multi-site RCTs in varied settings (rural vs urban, different regions) to test the external validity of your intervention. Include control groups (usual care) and longer follow-up.

Then, compare different formats of CBT delivery (individual vs group, in-person vs digital, midwife-led vs specialist-led) to identify the most cost-effective and scalable model. Also, investigate how stress reduction mediates improvements in anxiety, depression, and neonatal outcomes. Use physiological (e.g., cortisol, heart rate variability) and behavioral measures to understand pathways. Use implementation frameworks (e.g., RE-AIM, Consolidated Framework for Implementation Research) to assess fidelity, adoption, cost, and sustainability. Track infants born to mothers in the intervention vs control arms over time (e.g., up to 2–5 years) to assess neurodevelopment, emotional regulation, and behavioral outcomes, thus quantifying preventive intergenerational effects.

Conclusion

A key contribution of this study is the empirical validation of Cognitive Behavioural Therapy (CBT) as an effective intervention for reducing stress during pregnancy. CBT was not only associated with statistically significant reductions in perceived stress but also equipped women with practical coping tools such as cognitive restructuring, relaxation techniques, and self-reflection. Participants' qualitative narratives reflected increased emotional resilience, greater self-awareness, and enhanced ability to navigate pregnancy challenges. This demonstrates the viability of incorporating psychological interventions into antenatal care, especially when adapted to fit local cultures and delivered by trained non-specialists.

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