Dongola University

Faculty of Medicine and Health Sciences

Department of Community Medicine

Graduation Research Project, Batch 23

Research Proposal on:

Prevalence and Associated Factors of Postpartum Depression Among Women Attending Maternity Services in Dongola, Northern State, Sudan, 2026

A Proposal Submitted in Partial Fulfillment for the Requirements of the Degree of Bachelor of Medicine&Bachelor Surgery (MBBS)

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1. Introduction

1.1 Background

Postpartum depression (PPD) is a non-psychotic depressive episode that begins during pregnancy or within the first year after childbirth and affects the mother's mood, thinking and ability to care for herself and her infant [1]. It differs from the transient, mild “baby blues” in that it is more severe, persists beyond the first two weeks, and can impair daily functioning [1]. Untreated PPD is associated with poor maternal self-care, disturbed mother-infant bonding, and adverse effects on infant growth, cognitive and emotional development [2].

> Globally, postnatal depression affects approximately 17% of postpartum women, with wide variation between settings [3]; reviews of low- and middle-income countries report prevalence between about 5% and 50% [4]. In Sudan, a study among women in Khartoum state found a 3-month postnatal prevalence of 9.2% [5], while another hospital-based study in Khartoum reported 10.9% [6].

This regional pattern is consistent with the most recent global synthesis of the epidemiology of PPD. A meta-analysis pooling 565 studies from 80 countries and regions estimated that postpartum depression affects approximately 17.22% of postpartum women worldwide, with prevalence varying significantly by country income and level of development; substantially lower rates were reported in high-income countries, while the highest regional prevalence, close to 40%, was recorded in Southern Africa. The same analysis found that marital status, educational level, social support, exposure to violence, unplanned pregnancy, financial difficulties and breastfeeding status were all significantly associated with the pooled prevalence estimates, reinforcing that PPD in low-resource, African settings such as Sudan is shaped by broadly similar social and economic determinants [3].

PPD is usually identified using validated screening tools, most commonly the 10-item Edinburgh Postnatal Depression Scale (EPDS), which was developed to detect depressive symptoms in the postnatal period and has since been validated and used in many countries, including Sudan [5,7].

The consequences of untreated PPD extend well beyond the postnatal period itself. A review of the literature on maternal postpartum depression and child development concluded that children of affected mothers consistently show poorer cognitive and behavioural outcomes than children of non-depressed mothers, including delayed language acquisition, lower intelligence-quotient scores and more behavioural difficulties; these adverse effects appear to be mediated largely through impairment of the mother's interpersonal and caregiving behaviour, and seem more pronounced among boys than girls [8]. These findings reinforce that PPD is not only a maternal mental-health problem but also a threat to early child development, strengthening the rationale for identifying affected mothers early through routine screening in maternal health services [1,2].

Despite this burden, most affected women in low-resource African settings never receive care. A community-based survey in rural Ethiopia that screened more than 3,000 postpartum women for depressive symptoms found that, among those with high symptom

scores, only about one in twenty had obtained any formal mental-health care, and only around one in eight had been in contact with any health service at all since the onset of their symptoms; women with stronger social support, and those who attributed their symptoms to a physical rather than a psychosocial cause, were more likely to seek help [9]. This wide treatment gap highlights the importance of integrating mental-health screening into routine maternal and child-health services, particularly in settings such as Northern State, Sudan, where, to our knowledge, no local data on the scale of the problem currently exist [5,6,10].

1.2 Problem Statement

Ideally, women with PPD should be identified early through routine screening in postnatal care and offered timely counselling and treatment [1]. In practice, PPD is common, affecting approximately 17% of postpartum women worldwide, with regional prevalence approaching 40% in Southern Africa [3]. In Sudan, however, it remains under-recognized in routine maternal health services, and maternal mental health has been described as a neglected area of Sudanese healthcare [5,11]. The few published Sudanese studies, conducted in Khartoum State and in Gadarif (Eastern Sudan), report prevalence between 9.2% and 10.9% [5,6,10]; to our knowledge, no study has assessed the prevalence of PPD or its associated factors among women attending Dongola Maternity Hospital in Northern State, where the level of the problem and its determinants are therefore unknown. Without such local evidence, health providers and planners cannot allocate mental-health resources appropriately, and affected mothers are likely to remain unidentified and unsupported, with consequences for their own wellbeing, the mother-infant bond and their children's development [2,8]. This study aims to estimate the prevalence of PPD and identify its associated factors among women attending Dongola Maternity Hospital, in order to bridge this gap.

1.3 Justification

Determining the prevalence and associated factors of PPD among women attending Dongola Maternity Hospital will generate the first local evidence on maternal mental illness in Northern State, Sudan. These findings will enable clinicians to identify high-risk mothers, integrate routine screening into postnatal care, and develop context-appropriate counselling and referral pathways. This study addresses a critical evidence gap, as nearly all Sudanese PPD research has been conducted in Khartoum [5,6,10], limiting generalizability to northern populations with distinct sociodemographic and health system contexts.

2. Objectives, Hypothesis and Research Question

2.1 Main Objective

To estimate the prevalence of postpartum depression and its associated factors among women attending Dongola Maternity Hospital, Northern State, Sudan, in 2026.

2.2 Specific Objectives

- To estimate the prevalence of postpartum depression among the study participants using the Edinburgh Postnatal Depression Scale (EPDS).

- To identify sociodemographic factors associated with postpartum depression.
- To examine psychosocial and infant-related factors associated with postpartum depression.
- To examine obstetric and reproductive factors associated with postpartum depression.

2.3 Hypothesis

Null hypothesis (H0): there is no association between postpartum depression and the women's socio-demographic, obstetric, social-support or infant-related factors.

Alternative hypothesis (H1): postpartum depression is associated with at least one of these factors, for example low social support, unplanned pregnancy, adverse birth outcomes, low income, or a personal or family history of mental illness.

2.4 Research Question

What is the prevalence of postpartum depression, and what factors are associated with it, among women attending Dongola Maternity Hospital, Northern State, Sudan, in 2026?

3. Literature Review

PPD is an important public-health problem because childbirth is often considered a positive life event, and depressive symptoms may therefore be missed by families and healthcare workers. Women may also avoid seeking care because of stigma, lack of mental-health services, financial difficulties, or the belief that emotional suffering is a normal part of motherhood. For this reason, screening during antenatal and postnatal care is important, particularly in areas where specialist psychiatric services are limited [12].

3.1 International Evidence

Reviews from low- and middle-income countries report a wide range of postnatal depression prevalence, approximately 5% to 50%. Across these settings, poverty, poor partner relationships, and lack of social support are consistently identified as risk factors for PPD [4].

3.2 African Evidence

A systematic review and meta-analysis of 19 African studies (40,953 postnatal mothers) estimated a pooled prevalence of postnatal depression of 16.84% [12]. Odds of depression were higher among women with poor obstetric outcomes, a history of adverse birth or infant health outcomes, a personal history of common mental disorders, poor social support, lower economic status, and exposure to intimate partner violence [12]. A separate review focused on sub-Saharan Africa similarly identified intimate partner violence, poor social support, unwanted pregnancy and maternal age as the strongest correlates of postpartum depression [13].

3.3 Sudanese Evidence

In Khartoum state, a cohort of 300 pregnant women followed to 3 months postpartum found a PPD prevalence of 9.2% using the EPDS at a validated cut-off of ≥12, with the scale

showing good sensitivity (89%) and specificity (82%) against clinical diagnosis [5]. Factors associated with postnatal depression in this cohort [11], and in a further hospital-based study of 129 Sudanese women reporting a prevalence of 10.9% [6], included poor marital relationships, lack of social support, and adverse obstetric or infant outcomes. In Eastern Sudan, a cross-sectional study of 300 women attending Gadarif Maternity Hospital for postnatal follow-up within six weeks of childbirth reported a prevalence of 10.3% using the EPDS (cut-off ≥12); a past history of depression was the only factor significantly associated with PPD in univariate analysis (OR 3.04, 95% CI 1.03–8.97), whereas age, parity, education, occupation and planned pregnancy were not [10].

3.4 Research Gap

Published Sudanese data on postpartum depression come almost exclusively from Khartoum State [5,6,11], with a single study from Eastern Sudan (Gadarif) [10]. To our knowledge, no study has assessed the prevalence or associated factors of PPD among women attending Dongola Maternity Hospital or elsewhere in Northern State, where socio-cultural context, support systems, and access to care differ from the capital. This study addresses that gap by estimating the prevalence of PPD and its sociodemographic, psychosocial, infant-related, and obstetric/reproductive correlates among postpartum women at Dongola Maternity Hospital in 2026.

4. Materials and Methods

4.1 Study Design

A descriptive, cross-sectional study hospital-based study design.

4.2 Study Area

The study will be conducted at the Dongola Maternity Hospital in Dongola, the capital of Northern State, Sudan. Data will be collected during October and November 2026.

4.3 Study Population

4.4 Inclusion Criteria

- Women aged 18 years or older at the time of study participation
- Women who delivered within the preceding 12 months and are attending Dongola Maternity Hospital.
- Women who capable of communicating in Arabic.

4.5 Exclusion Criteria

- Women who are severely ill or unable to respond to the interview.
- Women with a known pre-existing major psychiatric illness diagnosed before the current pregnancy (to focus the study on depression with postnatal onset).

4.6 Sample Size Determination

Because no previous estimate of PPD prevalence exists for Dongola or Northern State, the

population proportion is treated as unknown and the sample size is calculated for an unknown population using the single-population-proportion formula [14]:

$$n = Z^2 \times p\,(1 - p) / d^2$$

Where: Z = 1.96 (the standard normal value for a 95% confidence level); p = 0.50, the proportion assumed when no local estimate is available, because it yields the maximum possible sample size and so is the most conservative choice; d = 0.05, the margin of error (precision) that the study will accept.

Substituting these values:

$$n = (1.96)^2 \times 0.50 \times (1 - 0.50) / (0.05)^2 = 3.8416 \times 0.25 / 0.0025 = 384.16$$

This is rounded up to n = 385 women.

To compensate for possible incomplete questionnaires or refusals, a non-response allowance of 10% is added:

Final sample size = 385 + (385 × 0.10) = 385 + 38.5 ≈ 424 women

The final sample size for the study is therefore 424 women attending Dongola Maternity Hospital.

4.7 Sampling Technique

Systematic random sampling will be used. The sampling interval (k) will be calculated by dividing the expected number of eligible women attending the clinic during the data collection period by the sample size (424). The first woman will be chosen randomly among the first k attendees, and every kth woman thereafter will be interviewed until the sample is complete.

4.8 Data Collection Tools

Data will be collected by trained data collectors using a structured, interviewer-administered questionnaire, prepared in Arabic. It will include: socio-demographic and obstetric characteristics; the 10-item Edinburgh Postnatal Depression Scale (EPDS), the validated tool for screening postnatal depressive symptoms [5,7]; and items on social and family support, and awareness of and attitudes towards seeking mental-health care. The questionnaire will be pre-tested on about 10% of the sample outside the study group and modified as needed.

Operational definition: a woman is considered to have probable postpartum depression if she scores ≥12 on the EPDS, the cut-off validated among Sudanese women [5]; otherwise, she is classified as not depressed. Women who screen positive will be advised to seek further clinical assessment.

4.9 Data Management and Analysis

Questionnaires will be checked daily for completeness, coded and entered into SPSS. Descriptive statistics (frequencies, percentages, means and standard deviations) will summarize the data. The chi-square test will assess the association between PPD and each categorical factor. Factors with $p<0.25$ at this step will be entered into a multivariable

logistic regression model, and results will be reported as adjusted odds ratios (AOR) with 95% confidence intervals. A p-value below 0.05 will be considered statistically significant. Results will be presented in tables and figures.

4.10 Ethical Considerations

Ethical approval will be sought from the Faculty of Medicine and Health Sciences, Dongola University, the State Ministry of Health, and the Research and Quality Control Office of Dongola Maternity Hospital. Each participant will receive an explanation of the study and give informed consent. Participation is voluntary and a woman may withdraw at any time without affecting her care. Names will not be recorded, data will be kept confidential and used only for research purposes, and access will be limited to the research group. Any woman who screens positive for probable depression will be sensitively informed and referred for further assessment and support.

4.11 Study Variables

The dependent variable in this study will be postpartum depression. The independent variables will include sociodemographic, obstetric, infant-related, and psychosocial factors.

5. Annexes

Annex A Questionnaire

The structured, interviewer-administered questionnaire (Arabic) is available as a live Google Form:

https://forms.gle/1WMdRr31siW2tsDx7

An English translation of the questionnaire items is provided below for reference. Serial no. ____ Date: ____ (no names are recorded).

Section 1: Socio-demographic Data

1. Age
2. Marital status (married / divorced / widowed)
3. Educational level
4. Occupation
5. Residence (urban / rural)
6. Monthly household income
7. Do you live with your husband in the same house?

Section 2: Obstetric History and Recent Delivery

8. Number of previous deliveries (parity)
9. How long ago did you give birth? (in weeks/months)
10. Mode of delivery (vaginal / caesarean)
11. Was this pregnancy planned?
12. Did you experience complications during pregnancy or delivery?
13. Is the baby currently in good health?
14. Does the baby need special care (prematurity, health problems)?
15. Are you breastfeeding?
16. Is this your first experience of motherhood?

Section 3: Psychological and Social Support

17. Who helps you care for the baby? (husband / mother / mother-in-law / no one)
18. How would you describe your relationship with your husband currently?
19. Do you feel you receive enough support from your family?
20. Do you have someone you can talk to about your feelings?
21. Have you felt lonely since giving birth?
22. Have you faced financial or family pressures recently?
23. Was the baby's sex consistent with your / your family's expectations? (sometimes an important cultural factor)

Section 4: Personal and Family History

24. Have you previously been diagnosed with depression or a mental illness?
25. Is there a family history of depression or mental illness?
26. Have you previously experienced a miscarriage or stillbirth?
27. Did you experience depression after a previous delivery?

Section 5: Awareness and Health-seeking Behaviour

28. Have you heard of “postpartum depression” before?

29. Do you know its symptoms?

30. If you felt symptoms, would you seek help? From whom?

31. Is there social stigma that prevents you from seeking psychological help?

Part 6: Edinburgh Postnatal Depression Scale (EPDS) — the standardized, validated 10-item scale is administered in its official Arabic-validated form (as used by Khalifa et al. among Sudanese women [5]), with a cut-off score of ≥12 indicating probable postpartum depression. The original scale items are not reproduced here to preserve the tool's copyright and psychometric validity; the validated Arabic version should be obtained directly from the source publication [5] or the Royal College of Psychiatrists for use in data collection.

Annex B Informed Consent Form

We are medical students from Dongola University conducting a study on the emotional wellbeing of women after childbirth at Dongola Maternity Hospital. We will ask you some questions for about 10–15 minutes. Taking part is voluntary, you may refuse or stop at any time, and this will not affect your care. We will not record your name and your answers will remain confidential and be used only for research. If any answers suggest you may benefit from further support, we will gently inform you and can help arrange a referral. If you agree to participate, please confirm below.

I agree to participate: Yes / No Signature or thumbprint: _____ Date: _____

Annex C Work Plan and Time-line

Activity	Sep 2026	Oct 2026	Nov 2026	Dec 2026
Submission of research proposals 20–24 Sep 2026	•			
Presentation of proposals 27 Sep – 01 Oct 2026	•	•		
Data collection 04–22 Oct 2026		•		
Data analysis 25 Oct – 05 Nov 2026		•	•	
Writing results and discussion 08–19 Nov 2026			•	
Writing the final report 22 Nov – 03 Dec 2026			•	•

Annex D Budget

Source of funding: Private — self-funded by the research group members. No institutional or external grant is requested.

Budget breakdown (confidential — amounts withheld):

Item	Cost (SDG)
Printing and photocopying of questionnaires (about 424 copies)	130,000
Data collectors: transport and communication	150,000
Internet and data entry / analysis software	150,000
Printing and binding of the final report	50,000
Contingency (10%)	100,000
Total	**580,000**

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