INPLASY

INPLASY2026110075

doi: 10.37766/inplasy2026.11.0075

Received: 22 November 2026

Published: 22 November 2026

Ethnic and Regional Differences in Postpartum Dysglycemia Following Gestational Diabetes Mellitus: A Systematic Review and Meta-Analysis

Mohd Hasli, MN; Chai, HSK; Arshad, NI; Musab Al Khair, MAK; Ganeson, M; Teng, CL.

Corresponding author:
Muhammad Nabil Mohd Hasli

nabilhasli@gmail.com

Author Affiliation:
IMU University.

ADMINISTRATIVE INFORMATION

Support - NA.

Review stage at the time of initial registration - Piloting of the study selection process.

Conflicts of interest - Nil.

INPLASY registration number: INPLASY2026110075

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 22 November 2026 and was last updated on 22 November 2026.

INTRODUCTION

Review question / Objective Review Objectives 1. To estimate the global pooled prevalence of early postpartum dysglycemia within 4 to 13 weeks of postpartum among women with prior gestational diabetes mellitus by ethnicity and/or regional ancestry. 2. To evaluate whether the predictors of postpartum dysglycemia vary significantly by ethnicity and/or regional ancestry among women with prior gestational diabetes mellitus

Review Questions

1. What is the pooled prevalence of early postpartum dysglycemia within 4 to 13 weeks postpartum among women with prior gestational diabetes mellitus across the ethnicity and/or regional ancestry?
2. What are the predictors of early postpartum dysglycemia among women with prior gestational diabetes mellitus and how do the predictors vary significantly by ethnicity and regions?

Rationale Gestational diabetes mellitus (GDM) is a common pregnancy complication marked by varying degrees of glucose intolerance that begins or is first identified during pregnancy . Globally, GDM affects around 14% of pregnancies and strongly signals future maternal postpartum dysglycemia, spanning prediabetes and overt Type 2 Diabetes Mellitus. Meta-analyses show that women with prior GDM face a 7.43-fold higher risk of developing T2DM and a 3.69-fold higher risk of prediabetes than normoglycemic mothers. In South and Southeast Asia, 25.9% and 29.9% of mothers with prior GDM develop postpartum prediabetes and T2DM, respectively.
Pathophysiologically, while delivery removes placental counter-regulatory hormones, intrinsic -cell dysfunction combined with persistent subclinical insulin resistance often leads to early postpartum dysglycemia during the 6 to 12-week assessment window. Thus, the early postpartum

Mohd Hasli et al. INPLASY protocol 2026110075. doi:10.37766/inplasy2026.11.0075 Downloaded from https://inplasy.com/inplasy-2026-11-0075/

window at 6 to 12 weeks post-delivery serves as an essential assessment point. While some women present with T2DM at 6 to 12 weeks, a larger group displays prediabetes before potentially progressing to overt T2DM over time Identifying the predictors of early and late postpartum dysglycaemia is key to targeted risk stratification. However, foundational studies have predominantly focused on Caucasian populations, limiting applicability to multi-ethnic populations. Asian individuals often exhibit visceral adiposity and -cell failure at lower BMIs. In multi-ethnic Asian cohorts, specific subgroups (e.g., Indian ethnicity) demonstrate heightened risk for early postnatal dysglycemia.
Despite consensus on early postpartum evaluation, international clinical practice guidelines exhibit variations in recommended screening windows (ranging from 4 to 13 weeks post-delivery). The American Diabetes Association (ADA) and American College of Obstetricians and Gynecologists (ACOG) recommend the postpartum glycemic test at 4 to 12 weeks postpartum while the UK National Institute for Health and Care Excellence (NICE) guidelines advocate it at 6 to 13 weeks postpartum.
Although umbrella reviews and meta-analyses have established general postpartum conversion rates, existing systematic reviews either pool global populations without breaking down the ethnicity or restrict their scope to isolated regions without direct head-to-head ethnic comparisons. Furthermore, no systematic review has conducted an inter-ethnic or inter-regional comparative synthesis of early postpartum dysglycemia prevalence within the standardized 4 to 13 week testing window, nor evaluated whether clinical predictors vary significantly across ethnic subgroups. This systematic review addresses these gaps to inform targeted, ethnically and regionally tailored screening strategies.

Condition being studied Early Postpartum Dysglycemia following Gestational Diabetes Mellitus (GDM), evaluated via an objective 75-g Oral Glucose Tolerance Test (OGTT) within 4 to 13 weeks postpartum, according to international diagnostic guidelines. This encompasses :
– Type 2 Diabetes Mellitus
-Prediabetes
– Total Postpartum Dysglycemia (Combined Prediabetes and T2DM)

This review applies two-tiered classification aligned with JAMA Network guidelines on reporting race and ethnicity [1].
– Inter-Regional Categories (Tier 1) : Broad geographic and continental ancestry groups, including East Asian, South Asian, Southeast Asian, White European, Black/African descent, Hispanic/Latina, and Indigenous/First Nations populations
– Inter-Ethnic Subgroups (Tier 2) : Specific national or ethnic origin groups (i.e. Chinese, Malay, Indian, Japanese, Korean, Thai, White European) evaluated across disaggregated multi-ethnic cohorts and single-ethnic national studies

[1] Flanagin A, Frey T, Christiansen SL, AMA Manual of Style Committee. Updated Guidance on the Reporting of Race and Ethnicity in Medical and Science Journals. JAMA. 2021;326(7):621–627. doi:10.1001/jama.2021.13304

METHODS

Search strategy A preliminary systematic literature search will be conducted across primary electronic databases, specifically Scopus, PubMed, and EBSCOHost. The search strategy will incorporate tailored keywords, Medical Subject headings (MeSH), and Boolean operators, utilizing term combination.

PubMed
(diabetes mellitus OR prediabetic state OR impaired fasting glucose OR impaired glucose tolerance OR dysglycemia) AND (diabetes, gestational OR gestational diabetes) AND (postpartum period OR postnatal) AND (glucose tolerance test OR OGTT)

Scopus
("diabetes mellitus" OR "prediabetic state" OR "impaired fasting glucose" OR "impaired glucose tolerance" OR dysglycemia) AND ("gestational diabetes" OR "diabetes, gestational") AND ("postpartum period" OR postnatal) AND ("glucose tolerance test" OR OGTT)

EBSCOhost (MEDLINE)
("diabetes mellitus" OR "prediabetic state" OR "impaired fasting glucose" OR "impaired glucose tolerance" OR dysglycemia) AND ("gestational diabetes" OR "diabetes, gestational") AND ("postpartum period" OR postnatal) AND ("glucose tolerance test" OR OGTT)

Participant or population Postpartum women with a documented history of GDM and report disaggregated data by racial or ethnic group i.e. South Asian, East Asian, Southeast Asian, White/ Caucasian, Black/African descent, Hispanic or single-Ethnic Cohort Studies where 100% of the cohort belongs to a clearly identified ethnic group i.e. India, China, Japan, Korea are included.

Mohd Hasli et al. INPLASY protocol 2026110075. doi:10.37766/inplasy2026.11.0075 Downloaded from https://inplasy.com/inplasy-2026-11-0075/

Intervention This review applies two-tiered classification aligned with JAMA Network guidelines on reporting race and ethnicity [1].
Inter-Regional Categories (Tier 1) : Broad geographic and continental ancestry groups, including East Asian, South Asian, Southeast Asian, White European, Black/African descent, Hispanic/Latina et cetera
Inter-Ethnic Subgroups (Tier 2) : Specific national or ethnic origin groups (i.e. Chinese, Malay, Indian, Japanese, Korean, Thai, White European) evaluated across disaggregated multi-ethnic cohorts and single-ethnic national studies
Studies also evaluate at least one variable associated with postpartum dysglycemia stratified by ethnicity or regional ancestry.
[1] Flanagin A, Frey T, Christiansen SL, AMA Manual of Style Committee. Updated Guidance on the Reporting of Race and Ethnicity in Medical and Science Journals. JAMA. 2021;326(7):621–627. doi:10.1001/jama.2021.13304

Comparator Inter-ethnic or regional comparisons.

Study designs to be included Observational Studies, Cohort Studies, Cross-Sectional Studies, Clinical Audits.

Eligibility criteria Exclusion Criteria
1.Women with pre-existing diabetes mellitus diagnosed prior to pregnancy or overt diabetes confirmed in the first trimester
2. Multi-ethnic studies that mix all participants together into a single overall number without breaking down the outcomes by ethnicity or regions.
3. Studies lacking ethnic/region breakdown or predictor data where prevalence cannot be extracted
4. Single-cohort studies with fewer than 20 participants per ethnic/region subgroup
5. Self-reported diabetes without biochemical/ laboratory verification
6. Studies evaluating postpartum dysglycemia exclusively beyond 14 weeks postpartum or studies reporting only perinatal/fetal outcomes without maternal postpartum diabetes screening.
7. Case Reports, Case Series, Review Articles, Editorials, Letters, Conference Abstract

Information sources Comprehensive electronic literature searches will be conducted across major bibliographic databases (PubMed, Scopus and EBSCOhost (MEDLINE)) from their inception to November 2026. Secondary search method, which is backward snowballing of the reference lists of all included primary studies, will be performed to ensure exhaustive literature capture.

Main outcome(s) 1. Postpartum dysglycemia diagnosed at 4 to 13 weeks postpartum according to established international criteria guidelines with ethnicity/regional breakdown
2. Relative Risk or Odds Ratio of postpartum dysglycemia development across ethnicity and/or regions and their clinical predictors

Additional outcome(s) Nil.

Data management The study selection process will be conducted systematically in two phases. First, two independent reviewers will screen the titles and abstracts of all retrieved records against the pre-defined eligibility criteria using Covidence. Second, the full texts of potentially relevant articles will be thoroughly appraised for final inclusion. Discrepancies will be resolved through consensus or via consultation with a third senior reviewer.

Data from the selected articles will be systematically extracted using a standardized Microsoft Excel form. The variables collected will include for example study characteristics, demographic data, specific timing of the OGTT within the 4-13 week window, diagnostic criteria utilized, primary prevalence/incidence rates with ethnicity/regional breakdowns, and extracted exposure variables or risk factors stratified by ethnicity/regional associated with postpartum dysglycemia.

Quality assessment / Risk of bias analysis The methodological quality and risk of bias of the included primary studies will be critically appraised using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Studies Reporting Prevalence Data.Two independent reviewers will evaluate the validity each study across nine specific domains : appropriateness of the sampling frame, sampling method, sample size adequacy, detail of study subjects and setting, sample coverage, validity of diagnostic criteria (standard 75-g OGTT), standardized measurement of outcome, statistical analysis appropriateness, and handling of response/defaulter rates. Any discrepancies between reviewers will be resolved through consultation with a third reviewer. The appraisal findings will be reported domain-by-domain in a Risk of Bias summary table and visual plot.

Strategy of data synthesis A meta-analysis of prevalence data will be performed using JASP (JASP version 0.96, University of Amsterdam, Netherlands, 2026) to estimate the global pooled prevalence of early postpartum dysglycemia.

Mohd Hasli et al. INPLASY protocol 2026110075. doi:10.37766/inplasy2026.11.0075 Downloaded from https://inplasy.com/inplasy-2026-11-0075/

Statistical heterogeneity across studies will be evaluated using Cochran's Q test and quantified with the I^2 statistic. If substantial heterogeneity is present ($I^2 > 50\%$), a random effect model would be used to perform the meta-analysis.[1]

Subgroup analyses were undertaken to investigate the heterogeneity based on participants characteristics (ethnic group/region). Meta-regression of the prevalence will be conducted using variables such as mean maternal age, family history of diabetes, parity, proportion of antenatal insulin therapy, pre-pregnancy BMI and postpartum dysglycemia diagnostic criteria (where data are available)

Reference

[1] Section 10.10 Heterogeneity. In: Cochrane Handbook for Systematic Reviews of Interventions, Second Edition. Oxford: The Cochrane Collaboration and John Wiley & Sons Ltd; 2019:259.

Subgroup analysis Subgroup analyses will be conducted prior to investigate potential sources of statistical heterogeneity (I^2) and clinical variation across the following pre-specified dimensions upon data availability across included studies:

Inter-Regional Categories (Tier 1) : Broad geographic and continental ancestry groups, including East Asian, South Asian, Southeast Asian, White European, Black/African descent, Hispanic/Latina et cetera
Inter-Ethnic Subgroups (Tier 2) : Specific national or ethnic origin groups (i.e. Chinese, Malay, Indian, Japanese, Korean, Thai, White European) evaluated across disaggregated multi-ethnic cohorts and single-ethnic national studies
Specific Glycemic Outcome Category: Overt Type 2 Diabetes Mellitus (T2DM) vs. Prediabetes vs. Total Postpartum Dysglycemia

Study Population Cohort Type: Disaggregated multi-ethnic cohorts (diaspora populations in Western settings) vs Single-ethnic national cohorts (in country of origin)

Methodological Quality / Risk of Bias: High quality (low risk of bias) vs. Moderate/Low quality studies (based on JBI critical appraisal score threshold).

Sensitivity analysis Sensitivity analyses will assess the robustness of pooled prevalence estimates and predictor effect sizes:

Risk of Bias Impact: Re-running meta-analyses after excluding studies with high risk of bias (JBI score ≤ 60%).

Leave-One-Out Sensitivity Analysis: Sequentially omitting one study at a time to check for disproportionate influence.

Meta-Analysis Model Sensitivity: Comparing Random-Effects vs. Fixed-Effects models.

Strict Postpartum Window Restriction: Restricting analysis strictly to studies conducting 75-g OGTT screening between 4 and 13 weeks postpartum.

Sample Size Threshold: Restricting analysis to studies with ≧ 20 participants per ethnic/region subgroup.

For clinical predictors reported across ≧ 2 studies (e.g., antenatal insulin requirement, elevated fasting OGTT, family history of DM), log odds ratios will be pooled using random-effects meta-analysis.

Language restriction Nil.

Country(ies) involved Malaysia.

Other relevant information Nil.

Keywords Gestational Diabetes Mellitus; Postpartum Dysglycemia; Type 2 Diabetes Mellitus; Prediabetes; Glucose Tolerance Test; Ethnicity; Region; Systematic Review; Meta-Analysis.

Dissemination plans Peer-Reviewed Publication: Submission of the completed manuscript to a high-impact international journal in endocrinology or obstetrics and gynecology (e.g., Diabetes Care, Diabetologia, or Lancet Diabetes & Endocrinology).

Scientific Conferences: Presentations at major national and international academic conferences (e.g., Annual Scientific Conference 2027, American Diabetes Association [ADA] Scientific Sessions, European Association for the Study of Diabetes [EASD], or International Diabetes Federation [IDF] World Diabetes Congress).

Contributions of each author

Author 1 - Muhammad Nabil Mohd Hasli. Author 1 conceptualized the study, developed the methodology, conducted literature screening and data extraction, drafted the original protocol manuscript, created visualizations, and managed overall project administration.
Email: nabilhasli@gmail.com

Mohd Hasli et al. INPLASY protocol 2026110075. doi:10.37766/inplasy2026.11.0075 Downloaded from https://inplasy.com/inplasy-2026-11-0075/

ORCID: https://orcid.org/0009-0002-1298-8653
Author 2 - Herrick Sheng Kang Chai. Co-conceptualized the study, contributed to methodology development, conducted screening and data extraction, validated extracted data, co-drafted the original protocol manuscript, and assisted with visualizations.
Email: herrickchai@gmail.com
ORCID: https://orcid.org/0009-0004-9438-2915
Author 3 - Nur Insyirah Arshad. Conducted literature screening and data extraction, validated extracted data, and critically reviewed and edited the protocol manuscript.
Email: nurinsyiraharshad@outlook.com
ORCID: https://orcid.org/0009-0009-8137-2837
Author 4 - Mifzal Al Khair Musab Al Khair. Conducted literature screening and data extraction, validated extracted data, and critically reviewed and edited the protocol manuscript.
Email: mifzaldelta@gmail.com
ORCID: https://orcid.org/0009-0008-9862-0123
Author 5 - Malanashita Ganeson. Supervised the project, validated study methodology and screening processes, and critically reviewed and edited the protocol manuscript.
Email: malanashita@imu.edu.my
ORCID: https://orcid.org/0000-0001-8446-4539
Author 6 - Cheong Lieng Teng. Supervised the project, guided statistical methodology, designed the formal meta-analysis and software analysis plan, validated data synthesis, and critically reviewed and edited the protocol manuscript.
Email: cheonglieng_teng@imu.edu.my
ORCID: https://orcid.org/0000-0002-8165-0405

Mohd Hasli et al. INPLASY protocol 2026110075. doi:10.37766/inplasy2026.11.0075 Downloaded from https://inplasy.com/inplasy-2026-11-0075/