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Mapping the components of the effective implementation of diabetes prevention programmes after gestational diabetes mellitus: a protocol for a scoping review

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ABSTRACT

Introduction Women with a history of gestational diabetes mellitus (GDM) have a high lifetime risk of developing type 2 diabetes. Diabetes prevention programmes may reduce this risk. However, challenges related to the successful implementation of diabetes prevention programmes after GDM exist. Our objective is to map the components of the effective implementation of diabetes prevention programmes after GDM. We also plan to connect the available evidence on the effective implementation of diabetes prevention programmes to the Consolidated Framework for Implementation Research.

Methods and analysis We will conduct a scoping review following Levac's adaptation of Arksey and O'Malley's framework for scoping reviews. We will report it according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews. Using a peer-reviewed search strategy, we will search Medline, Embase, PsycInfo and Emcare for primary studies describing the effective implementation of diabetes prevention programmes after GDM. Study selection will be completed in DistillerSR by two independent reviewers. Data will be extracted by one reviewer and verified by a second reviewer for accuracy using data extraction forms in DistillerSR.

Ethics and dissemination Ethics approval was not required. Study results will be published in a peer-reviewed journal and presented at relevant conferences.

Study registration details This scoping review protocol was registered with Open Science Framework (OSF; preregistration, 15 April 2024; registration ID: 10.17605/OSF.IO/MPNQD).

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ Leveraging the scoping review methodology will allow us to explore the challenges related to the implementation of diabetes prevention programmes after GDM through a comprehensive mapping of the components of the effective implementation of such programmes.
⇒ Our study will be further strengthened through the framing of our findings within the context of an established implementation science framework.
⇒ However, one of our study's limitations is that we will only include studies published in English due to the abilities of the authors.

BACKGROUND, RATIONALE AND OBJECTIVES

Up to 10% of women are diagnosed with gestational diabetes mellitus (GDM).[1] A diagnosis of GDM comes with the risk of multiple complications during pregnancy. Complications include pre-eclampsia, premature delivery, birth injury and neonatal intensive care, among others.[2] The effects of GDM are not only seen during pregnancy but also in the postpartum period and beyond. Women with a history of GDM go on to have a high risk of type 2 diabetes and its sequelae over their lifetime. 10 years after delivery, one in five women will develop type 2 diabetes; their lifetime risk is up to 60%.[3–8] Type 2 diabetes is associated with additional medical complications, including blindness and kidney and cardiovascular disease.[9–12]

Given the established link between GDM and type 2 diabetes, much attention has focused on diabetes prevention strategies. Studies suggest that interventions aimed at promoting healthy diets and physical activity lead to a reduction in the occurrence of type 2 diabetes.[13–16] Although the evidence appears to be favourable for diabetes prevention programmes, women with a history of GDM pose unique challenges in terms of programme recruitment, attendance and retention.[17]

As successful implementation of diabetes prevention programmes poses a challenge, frameworks based on implementation science, a form of applied research, can be used to inform such evidence-based interventions.[18] The Consolidated Framework for Implementation Research (CFIR)[19] is

Database: Ovid Medline Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE(R) Daily and Ovid MEDLINE(R) 1946 to Present

1. Diabetes, gestational/
2. GDM.mp
3. Gestational diabet*.mp
4. Or/1-3
5. Postnatal care/
6. Postpartum period/
7. Puerperium.mp
8. Postnatal.mp
9. Post-natal.mp
10. Postpartum.mp
11. Post-partum
12. Or/5-11
13. Diabetes mellitus, type 2/
14. Diabetes mellitus/
15. Type 2 diabetes mellitus.mp
16. Type 2 diabet*.mp
17. T2D.mp
18. T2DM.mp
19. Prediabetic state/

Figure 1 Search strategy for Ovid Medline. GDM, gestational diabetes mellitus.

Database: Ovid Embase 1974 to Present

1. Gestational diabetes/
2. Pregnancy diabetes mellitus/
3. GDM.mp
4. Gestational diabet*.mp
5. Or/1-4
6. Postnatal care/
7. Postpartum period.mp
8. Puerperium/
9. Postnatal.mp
10. Post-natal.mp
11. Post-partum.mp
12. Or/6-11
13. Non insulin dependent diabetes mellitus/
14. Diabetes mellitus/
15. Type 2 diabetes mellitus.mp
16. Type 2 diabet*.mp
17. T2D.mp
18. T2DM.mp
19. Impaired glucose tolerance/
20. Prediabet*.mp

Figure 2 Search strategy for Ovid Embase. GDM, gestational diabetes mellitus.

one such framework. The CFIR comprises five domains to assess the implementation of evidence-based interventions, including (1) intervention characteristics (eg, evidence strength, adaptability of intervention components, complexity); (2) outer setting (eg, patient needs, organisational needs and existing policies); (3) inner setting (eg, structural characteristics to support integration, culture and readiness); (4) characteristics of individuals (eg, knowledge, beliefs about the intervention) and (5) process (eg, engaging local champions, executing and reflecting).

To date, the characteristics of effective diabetes prevention programmes after GDM have not been synthesised. Furthermore, the existing evidence has not been linked to established implementation science frameworks. Our objective is to examine the existing literature and map the components of the effective implementation of diabetes prevention programmes after GDM. We also aim to connect the available evidence on the effective implementation of diabetes prevention programmes to the CFIR.

METHODS

Study conduct and reporting

This scoping review protocol was registered with Open Science Framework (OSF; preregistration, 15 April 2024; registration ID: 10.17605/OSF.IO/MPNQD). We will follow Arksey and O'Malley's[20] framework for conducting scoping reviews with additional refinements made by Levac *et al*.[21] The results will be reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews.[22]

Identifying the research question

The research questions ask:

1. What are the components of the effective implementation of diabetes prevention programs after GDM?
2. How do effectively implemented diabetes prevention programs align with the domains of the CFIR?

Identifying relevant studies

We will conduct extensive database searches informed by peer-reviewed search strategies. Databases will include Medline, Embase, PsychINFO and Emcare. Search strategies will be reviewed by a medical librarian using the Peer Review of Electronic Search Strategies guideline.[23] Figures 1–4 provide the planned search strategies for each database. No filters or limits will be used. The database searches will be conducted between June and July 2024. We will also review ClinicalTrials.gov and the reference lists of relevant literature and included studies for additional eligible studies.

Study selection

The results of the database searches will be screened using DistillerSR at the title and abstract and then full-text level

Database: APA PsycInfo 1806 to Present

1. Gestational diabetes/
2. GDM.mp
3. Gestational diabet*.mp
4. Or/1-3
5. Postnatal period/
6. Postpartum period.mp
7. Puerperium.mp
8. Postnatal.mp
9. Post-natal.mp
10. Postpartum.mp
11. Post-partum.mp
12. Or/5-11
13. Type 2 diabetes/
14. Type 2 diabetes mellitus.mp
15. Type 2 diabet*.mp
16. T2D.mp
17. T2DM.mp
18. Prediabet*.mp
19. Pre-diabet*.mp
20. Or/13-19

Figure 3 Search strategy for APA PsycInfo. APA, american psychological association; GDM, gestational diabetes mellitus.

Database: Ovid Emcare 1995 to Present

1. Pregnancy diabetes mellitus/
2. GDM.mp
3. Gestational diabet*.mp
4. Or/1-3
5. Puerperium/
6. Postpartum period.mp
7. Postnatal.mp
8. Post-natal.mp
9. Postpartum.mp
10. Post-partum.mp
11. Or/5-10
12. Non insulin dependent diabetes mellitus/
13. Type 2 diabetes mellitus.mp
14. Type 2 diabet*.mp
15. T2D.mp
16. T2DM.mp
17. Impaired glucose tolerance/
18. Prediabet*.mp
19. Pre-diabet*.mp
20. Or/12-19

Figure 4 Search strategy for Ovid Emcare. GDM, gestational diabetes mellitus.

by two independent reviewers to identify primary studies that describe the components of the effective implementation of diabetes prevention programmes after GDM. Any disagreements will be resolved by discussion with a third reviewer. Studies will be excluded if the described diabetes prevention programme consists of only a single session, does not have a diet and physical activity component or uses a retrospective design. Due to the abilities of the authors, we will also exclude studies if they are not written in English. Table 1 provides the inclusion criteria using the population, concept and context framework.[24]

Charting the data

Data will be extracted from each study using a standardised data extraction form. We plan to extract the relevant characteristics of all included studies, including publication year, country of origin, study design, participant characteristics and sample size. We will also extract details from each study as per the Template for Intervention Description and Replication (TIDieR) checklist.[25] Data extraction will be done by one reviewer and verified by a second reviewer using data extraction forms in DistillerSR.

Table 1 Inclusion criteria based on study population, concept, context and study design

Population	Postpartum women with a history of gestational diabetes mellitus
Concept	Diabetes prevention programme with: ► Multiple sessions/contacts ► At least two components (diet and physical activity)
Context	Takes place in a real-world setting, such as a community or healthcare location; prospective studies only.

COLLATING, SUMMARISING AND REPORTING THE RESULTS

Following data charting, extracted data will be mapped to the domains of the CFIR. Specifically, the characteristics of each of the described diabetes prevention programmes will be mapped to each of the five CFIR domains. Results will then be summarised narratively as well as displayed using tables and graphics where appropriate. First, we will narratively summarise and report the general diabetes prevention programme components framed by the TIDeR checklist criteria. Next, we will narratively summarise and report the specifics related to the implementation of the diabetes prevention programmes based on the CFIR domains. Further details will be provided in table (TIDieR and CFIR) and chart format (TIDieR).

Patient and public involvement statement

Patients and the public were not involved in the design or conduct of this scoping review protocol. However, patients and the public will be involved in the dissemination

plans as we plan to publish the scoping review results in a peer-reviewed journal and present them at relevant conferences.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were involved in the design, conduct, reporting or dissemination plans of this research. Refer to the Methods section for further details.

Patient consent for publication Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.

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