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Original research

The holistic maternity care needs of women with Gestational Diabetes Mellitus: A systematic review with thematic synthesis

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ABSTRACT

Problem: Models of care for women with gestational diabetes mellitus (GDM) have evolved in an ad hoc way and do not meet women's needs.
Background: GDM affects 50,000 Australian women per annum with prevalence quadrupling in the last ten years. Many health services are struggling to provide a quality service. People with diabetes are calling for care that focuses on their wellbeing more broadly.
Aim: To examine the holistic (emotional, social, economic, and spiritual) care needs of women with GDM.
Methods: Qualitative and mixed-methods studies capturing the healthcare experiences of women with GDM were searched for in CINAHL, Medline, Web of Science and Scopus. English-language studies published between 2011 and 2023 were included. Quality of studies was assessed using Crowe Critical Appraisal Tool and NVIVO was used to identify key themes and synthesise data.
Findings: Twenty-eight studies were included, representing the experiences of 958 women. Five themes reflect women's holistic needs through their journey from initial diagnosis to postpartum: psychological impact, information and education, making change for better health, support, and care transition.
Discussion: The biomedical, fetal-centric model of care neglects the woman's holistic wellbeing resulting in high levels of unmet need. Discontinuity between tertiary and primary services results in a missed opportunity to assist women to make longer term changes that would benefit themselves (and their families) into the future.
Conclusions: The provision of holistic models of care for this cohort is pivotal to improving clinical outcomes and the experiences of women with GDM.

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Statement of Significance	
Problem or Issue	People with diabetes are calling for care that is person-centred and focuses on their wellbeing more broadly, not just on clinical measures.
What is Already Known	The diagnosis of GDM has a significant psychological impact on women. Psychosocial wellbeing is positively associated with healthier dietary and lifestyle choices.
What this Paper Adds	A comprehensive understanding of women's holistic healthcare needs in the context of GDM. This may be used to inform the health care provision of women with GDM with models of care that are woman centred.

Introduction

Gestational Diabetes Mellitus (GDM) is the most common medical complication of pregnancy with prevalence around 15% in many high-income countries [1]. GDM poses significant short and long-term risks to both mother and baby. However, with good glycemic regulation and adoption of a healthy diet and lifestyle, many of these risks can be mitigated. Supporting women with GDM to make the necessary changes to their diet and lifestyle can be challenging as their needs as both pregnant women and women with GDM are complex.

GDM is defined as glucose intolerance caused by reduced pancreatic β-cell function, with first onset or recognition after the first trimester of pregnancy [2]. During pregnancy, women with GDM are at higher risk of pre-eclampsia, hypertension, early birth and caesarean section, and in the long-term, women are 7.7 times more likely to develop type 2 diabetes (T2DM) than women without GDM [3]. Emerging evidence points to increased risk of cardiovascular disease in women with a history of GDM, with one study demonstrating 63% increased risk [4].

Babies born to mothers with GDM are more often macrosomic which can result in birth injuries such as shoulder dystocia, and excess fetal insulin production can stress the developing pancreatic β-cells leading to β-cell dysfunction and insulin resistance in the fetus [5]. After birth, these babies are at risk of hypoglycaemia due to dependence on maternal hyperglycaemia. In the longer term, babies born of mothers with GDM have almost double the risk of childhood obesity [5,6] and are at increased risk of T2DM and cardiovascular disease. Impaired glucose tolerance has been detected in these children at five years of age [7]. These intergenerational effects contribute to the epidemic of diabetes globally.

Increased weight, increased maternal age, being of certain ethnic backgrounds and having a family history of T2DM are major risk factors [8]. While approximately 15–30% of women will require insulin therapy [8], Medical Nutrition Therapy (MNT) and lifestyle changes are the cornerstone of management of GDM. Making these changes requires significant effort on the part of the childbearing woman, at a time when she is also meeting the challenges of pregnancy. A recent systematic integrative review found that in the context of interventions related to GDM, psychosocial wellbeing is positively associated with healthier dietary and lifestyle choices [9]. This suggests that healthcare should include a focus on psychosocial health to achieve the best outcomes for these mothers and babies.

Women diagnosed with GDM often experience psychological distress, and a focus on the wellbeing of the fetus can leave women feeling devalued as a person and *"…valued solely as a means to produce a healthy infant"* [10]p.1. The lack of person-centered care is a theme emerging from a survey of people living with diabetes [11], which found their healthcare did not meet all of their needs especially in psychosocial, cultural, and emotional domains. People with diabetes are calling for care that is holistic, focusing not just on clinical measures (such as glycated hemoglobin) but their wellbeing more broadly [11]. Holistic healthcare has been described as care that considers the physical, emotional, social, economic, and spiritual needs of the person, their response to illness and the effect of the illness on their ability to meet self-care needs [12]. To fully engage women in making and sustaining the changes required to effectively manage GDM, we suggest that holistic models of care that address not only their clinical but cultural, psychosocial, and emotional needs, are required.

Systematic reviews on the topic of GDM have focused on prevalence in various nations or regions [13,14], interventions and clinical outcomes [15] or aspects of women's experiences [16] including the impact of the GDM diagnosis [17]. We have previously published a systematic review on the needs and experiences of women with GDM from minority ethnic backgrounds in high income settings [18]. To date however, no one has synthesised the qualitative evidence on the experiences of women with GDM with a view to understanding their holistic healthcare needs. The aim of this review, therefore, is to synthesise the qualitive research on women's experiences of GDM to understand their holistic (physical, emotional, social, economic, and spiritual) healthcare needs to provide insight for those providing their care.

Material and methods

Design

A systematic review methodology was used following the Systematic Reviews and Meta Analyses (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) guidelines [19] to identify all relevant primary studies available. The protocol was registered in PROSPERO (CRD42021286350). The research question guiding this review was: "what are the holistic care needs of women with GDM"?

Search strategy and procedures

The SPIDER (Sample, Phenomenon of Interest, Design, Evaluation, Research Type) framework [20], was used to develop search terms (see Box 1) and a specialist librarian provided advice on the search architecture.

The databases CINAHL, Medline, Web of Science and Scopus were searched using the key terms, with hand searching of the reference lists of included papers. Supplementary File A shows an example of the search strategy with results. Searches were limited to publication date between 2011 and 2023 to reflect contemporary healthcare, filters 'English' language, and 'human' studies were applied where available. Searches were performed on 30 November 2022 and updated in May 2023. Covidence [21] software was used to support the process. Author (EK) conducted the search and uploaded all citations to Covidence. Each article was reviewed independently by at least two authors (DD, IS, MA or EK).

Inclusion and exclusion criteria

The following inclusion criteria were applied to studies for this review. Studies were included if they: (1) involved women who had GDM or a history of GDM; (2) reported on women's experiences and/or perspectives of their maternity care; and (3) were peer-reviewed, primary research which utilised either qualitative, or mixed method approaches. Exclusion criteria were (1) lacked clearly reported data on women's experiences of GDM; (2) included interventions where the main health condition was not GDM; (3) centered around prevention of GDM or prevention of T2DM following GDM; (4) targeted an ethnic minority group (as we previously published a review with this focus [18]; (5) or

Box 1
Sample search terms using the SPIDER framework.

Sample	Phenomenon	Design	Evaluation	Research Type
Women with current or recent GDM	Holistic healthcare needs Experiences of maternity care	Qualitative or mixed-methods studies	Experiences, perspectives, and attitudes	Primary research studies

were not full reports of primary research, e.g., trial registrations, conference abstracts, or reviews.

Study selection

The selection of final articles for analysis followed the PRISMA flowchart as outlined in Fig. 1: PRISMA flow diagram. A total of 713 records were retrieved. Of these, 48 duplicates were removed, leaving 665 articles that were screened against title and abstract, with 607 excluded as they did not meet inclusion criteria. The full text of the remaining 58 records were assessed for eligibility and 30 were excluded as they did not meet inclusion criteria. Please see Supplementary File B for a full list of excluded studies with reasons. The remaining 28 studies were included for review.

Quality assessment

Each paper was critically appraised by two authors independently using the Crowe Critical Appraisal Tool (CCAT) v1.4 [22]. The CCAT enables the appraisal of a wide range of research designs, including quantitative and qualitative designs offering a standardised approach in the review. The CCAT is used to appraise the design, sampling, data collection and ethical practices of research papers with a higher score indicating higher quality manuscripts. A detailed list of items to be

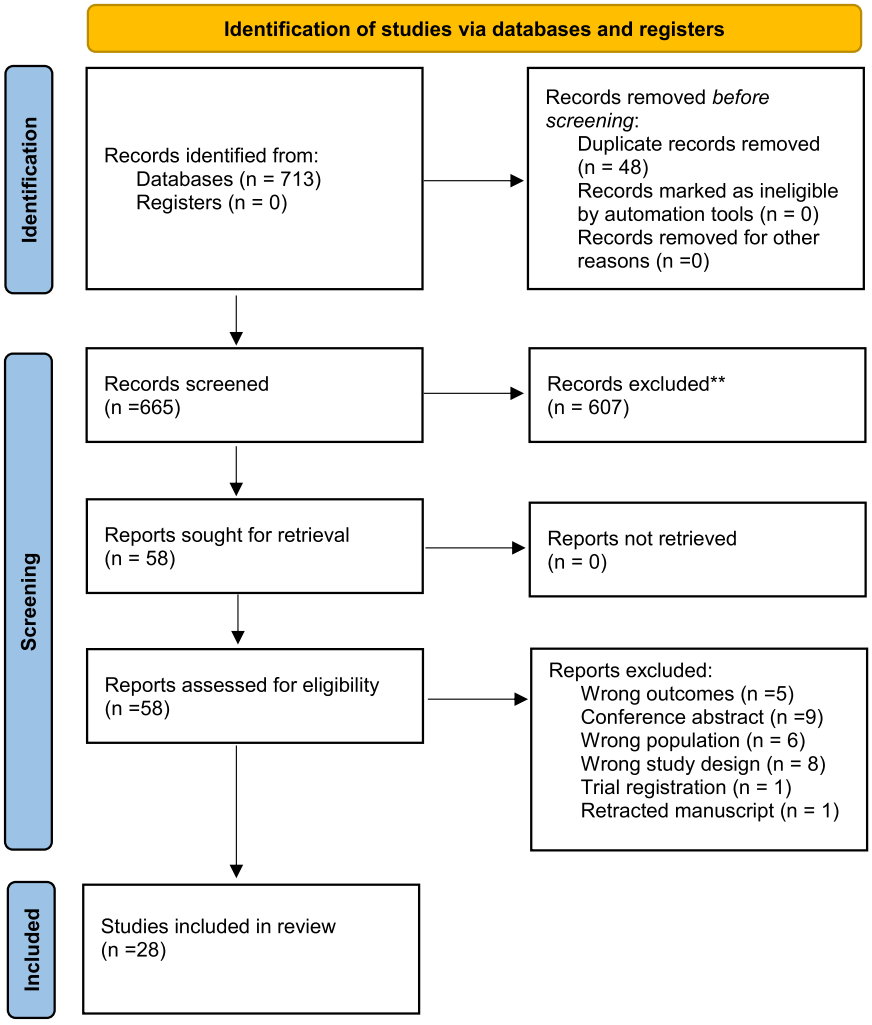

Fig. 1. PRISMA Flow Diagram.

Table 1
Characteristics of included studies.

	Study reference	Country of origin	Aim of study	Study design	Population description	No. of participants	CCAT average %
1	Hui et al. 2014	Canada	To explore the stress and anxiety experiences during dietary management in women with gestational diabetes (GDM).	Mixed methods: Food choice map, interviews, and surveys	Women with GDM	30	77
2	Wazqar and Evans 2012	Canada	To gain an understanding of the socio-cultural factors pertaining to pregnant women's experience of diabetes self-management	Qualitative: Unstructured interviews	Women with GDM	12	69
3	Trutnovsky et al. 2012	Austria	To explore concerns, mood state, quality of life (QoL) and treatment satisfaction of women treated for gestational diabetes	Mixed methods: Semi structured interview and a series of three different questionnaires	Women with diet treated GDM and 18 women with insulin treated GDM	27	70
4	Tierney et al. 2015	UK	To examine the healthy lifestyle behaviours undertaken during and after a pregnancy complicated by gestational diabetes mellitus (GDM) and the factors that influenced the likelihood of undertaking of such behaviours.	Qualitative: Semi-structured interviews	Women who had GDM in the previous 3–7 years	13	77
5	Svensson et al. 2018	Denmark	To examine how Danish women diagnosed with GDM experience the transition from a GDM-affected pregnancy to the postpartum period.	Qualitative: Semi-structured interviews	Women with GDM	6	81
6	Skar et al. 2018	Norway	To explore the experiences of women with gestational diabetes mellitus (GDM) with controlling their blood glucose values and receiving health and nutrition information using a smartphone app (the Pregnant+ app).	Qualitative: Semi-structured interviews	Women with GDM who participated in an RCT which evaluated a smartphone app to augment GDM care	17	63
7	Sandsaeter et al. 2019	Norway	To explore women's experiences with PE and/or GDM, and their motivation and need for information and support to achieve lifestyle changes.	Qualitative: Focus groups	Women with GDM	17	82
8	Roberts et al. 2021	UK	To explore women's views and engagement experiences of postnatal care following Gestational Diabetes Mellitus	Mixed methods: Online survey	Women with GDM	31	71
9	Rasekaba et al. 2021	Australia	To identify the profiles of women accessing care for GDM in a large regional hospital with a rural catchment in Victoria, Australia as well as gain insight into the views of the women with GDM, clinicians and IT staff on the acceptability and feasibility of a GDM telehealth in this setting	Mixed methods: Audit of medical records and semi-structured interviews	Women with GDM	Audit = 25 interviews = 9	72
10	Pennington et al. 2017	Australia	To investigate enablers and barriers to postnatal care	Qualitative: Semi-structured interviews	Women with a history of GDM	16	78
11	Nolan et al. 2011	USA	To describe the maternal experience of having type 2 or gestational diabetes in pregnancy using focus groups and individual telephone interviews.	Qualitative: Focus groups and interviews	Women with gestational diabetes or type 2 diabetes in pregnancy	8	77
12	Nielsen et al. 2015	Denmark	To understand women's experiences with GDM treatment and care during pregnancy and to understand how these experiences influence participation in follow-up screening.	Qualitative: Open-ended interviews	Women with GDM	7	74
13	Muhwava et al. 2019	South Africa	To explore women's lived experiences of GDM and the feasibility of sustained lifestyle modification after GDM in a low-income setting.	Qualitative: Focus groups and interviews	Women with GDM	35	87
14	Morrison et al. 2014	Australia	To describe Australian women's reflections on the experience of having a pregnancy affected by GDM.	Mixed methods: Survey - questionnaire with some open-ended questions	Women who have had GDM	393	84
15	McParlin et al. 2018	UK	To investigate the views and experience of pregnant women newly diagnosed with gestational diabetes mellitus participating in a 1200 kcal/day diet to achieve moderate weight loss (the WELLBABE study), and to explore barriers to and facilitators of adherence	Qualitative: Semi-structured interviews	Women with GDM	16	79
16	McMillan et al. 2018	UK	To examine the views of females diagnosed with GDM to ascertain how to improve primary care support postnatally, and the potential role of technology in reducing the risk of progression to T2DM	Qualitative: Semi structured interviews	Postnatal women leaving secondary care with diagnosis of GDM	27	83

(*continued on next page*)

Table 1 (*continued*)

	Study reference	Country of origin	Aim of study	Study design	Population description	No. of participants	CCAT average %
17	Martis et al. 2018	New Zealand	To identify enablers and barriers for women with GDM to achieve optimal glycaemic control.	Qualitative: Semi-structured interviews	Women with GDM	60	88
18	Lie et al. 2013	UK	To explore factors influencing post-natal health behaviours following the experience of gestational diabetes, and to elicit women's views about the feasibility of lifestyle intervention to prevent diabetes during the first 2 years after childbirth.	Qualitative: Semi-structured interviews	Women in the postnatal period following pregnancy with GDM	31	75
19	Kilgour et.al 2015	Australia	To explore and assess women's communication experiences of postnatal GDM follow-up.	Qualitative: Convergent interviews	Women in the postnatal period following pregnancy with GDM	13	74
20	Helmersen et al. 2021	Norway	To explore how women with gestational diabetes mellitus (GDM) experience advice about diet and self-monitoring of blood glucose received in primary health care (PHC) and secondary health care (SHC) with a focus on how women perceived the care coordination and collaboration between healthcare professionals.	Qualitative: Semi-structured interviews	Women with GDM	12	85
21	Harrison et al. 2019	Australia	What are the attitudes of women diagnosed with gestational diabetes mellitus (GDM) towards physical activity during pregnancy? What are the perceived barriers to and enablers of physical activity during pregnancy in women with GDM?	Qualitative: Semi-structured interviews	Women with GDM	27	85
22	Gunn et al. 2020	USA	To analyse women's narratives about their GDM-affected pregnancies in order to (1) identify different patterns (narrative archetypes) that capture the GDM experience; (2) explore how these patterns relate to awareness of ongoing risk after pregnancy and affect participation in selfcare, monitoring, and preventive health care going forward; and (3) explore the use of identified patterns to tailor conversations with patients during prenatal and postpartum care to their actual perceptions and concerns about future risk.	Qualitative: Open-ended interviews	Women who had given birth in the prior 5 months after a GDM-affected pregnancy	30	84
23	Gray et al. 2017	USA	Our objective in this study was to foreground the voices of women speaking about their treatment experience.	Qualitative: Focus groups	Women treated for GDM with medications, primarily insulin	16	82
24	Eades et al. 2018	UK	To explore experiences, knowledge, and perceptions of women with GDM to inform the design of interventions to prevent or delay Type 2 diabetes.	Qualitative: Semi-structured interviews	Women with GDM	16	90
25	Draffin et al. 2016	UK	To explore the concerns, needs and knowledge of women diagnosed with GDM	Qualitative: Focus groups	Women who were both pregnant and recently diagnosed with GDM or post-natal with a recent history of GDM	19	84
26	Carolan et al. 2012	Australia	The current study sought specifically to understand the factors that facilitated or inhibited women's understanding and adherence to GDM dietary self-management principles.	Qualitative: Semi-structured interviews	Women with GDM	15	93
27	Carolan 2013	Australia	To explore the factors that facilitated or inhibited gestational diabetes self-management among women in a socially deprived area.	Qualitative: Semi-structured interviews and one focus group	Women with GDM	15	87
28	Abraham and Wilk 2014	USA	To explore the lived experiences of women in rural communities with GDM and potentially gain insight into the low reported return rates for post-partum glucose testing	Qualitative: Semi-structured interviews	Women with a history of GDM	10	77

assessed is provided for each of the eight domains [23]. Each domain was scored (from 0 to 5), with 0 being lowest possible score and 5 the highest giving a total score out of 40. Scores from the two assessments were compared and discussed to reach consensus. CCAT scores are presented as percentages in Table 1: Characteristics of included studies. The range of scores was from 60% to 93%, indicating satisfactory quality.

Data extraction and synthesis

Data were extracted within the Covidence platform by two authors and results were compared and agreed by discussion leading to

Table 2
Comparison of SCNC and adaptations for Holistic Care needs in GDM.

Supportive care needs in cancer[24]	Holistic care needs in GDM
Psychological	Psychological
Health system and information	Health services
	Health education and information
Physical and daily living	Diet and lifestyle
Patient care and support	Socio-cultural
Sexuality	Sexuality
	Spirituality
	Economic

consensus. A table of study characteristics was generated (see Table 1).

Coding and synthesis of data followed. Initial coding borrowed from the Supportive Care Needs Survey (SCNS) [24] used in cancer care, which is a well-validated and widely used instrument that measures holistic care needs in cancer patients. Table 2 shows the domains included in the SCNS and the adaptations used for coding in our study.

NVivo Pro (version 12) software was used to code data [25]. DD conducted the initial coding, and the full team of researchers were involved in analysis. Most studies reported women's experiences rather than needs, therefore, our analysis and findings extensively describe women's experiences and from this we extrapolated needs. No data were coded to the codes, "sexuality", and "spirituality" and minimal to the code "economic". Information coded to "economic" was absorbed into the theme "making changes for better health". After the initial coding, which was a deductive process, analysis progressed inductively. The team examined the coded data and developed sub-categories. Illustrative quotations were highlighted, and each code and sub-category were discussed. The team considered the integrity of the coding by examining illustrative quotations within the context of the original study, the degree to which the codes and sub-categories captured the full breadth of the included data, relationships between codes/categories and overlaps and a variety of ways of presenting the data. The final themes and sub-themes were agreed, after much discussion and many iterations. The final themes presented here (psychological impact; information and education; making changes for better health; support; and care transition) broadly follow the woman's journey from diagnosis of GDM through to transition from tertiary maternity/endocrinology services to primary care. Table 3 shows the studies contributing to each theme. The numbers presented in the "Studies" column of the table refers to the reference number of the article as found in the reference list.

Table 3
Themes and subthemes.

Theme	Sub theme	Studies
Psychological impact	From shock to adjustment	28, 29, 32, 34, 37, 39, 41, 44, 46, 48, 49, 53
	Guilt, shame, and stigma	28, 30, 48, 53
	Fear and anxiety	36, 39, 48, 49, 53
Information and education	Understanding diagnosis, risk and consequences	26, 27, 30–34, 37, 40, 41, 43–45, 47, 48, 51–53
	Quality of sources and accessibility	28, 32, 33, 35, 40, 42, 43, 47, 52
	Balance of information to make informed choices	33, 40, 44, 53
	Consistent advice	28, 33, 35, 37, 43, 44
Making changes for better health	Motivation to change	26, 27, 29, 34, 36–38, 41, 46, 48, 51, 53
	Diet and exercise	26, 28, 29, 32–34, 37, 38, 40, 41, 46, 50–53
Support	Support network	26, 28, 30, 34–36, 40, 50, 52, 53
	Partnership with healthcare professionals	26, 28, 29, 31–33, 36, 40, 42, 44, 47–50, 52, 53
Care transition	Feeling abandoned	33, 37, 43, 45, 53
	Maintaining diet and exercise changes	27, 33, 34, 36–38, 41, 48, 50, 51
	Follow up	26, 31–33, 35, 36, 41, 43, 45, 47, 49, 50

Results

Study characteristics

The 28 papers included in this review consist of 23 qualitative studies [26–48], and 5 mixed methods studies [49–53]. The collated papers represent the experiences of 958 women, of whom 363 women were pregnant and diagnosed with GDM, and 595 women had a previous history of GDM. Studies were conducted in Canada (2), Austria (1), the United Kingdom (7), Denmark (2), Norway (3), Australia (7), the United States (4), South Africa (1) and New Zealand (1). Qualitative studies primarily employed semi-structured interviews, while mixed methods studies primarily used a combination of questionnaires and interviews. Participant numbers in qualitative studies ranged from 6 to 60 and those in mixed methods studies ranged from 27 to 393. The characteristics of these studies are presented in Table 1.

Themes

In exploring the care experiences of women, five primary themes were constructed: *psychological impact; information and education; making changes for better health; support;* and *care transition.* Sub themes are shown in Table 3: Themes and Subthemes below along with the studies contributing to each sub-theme.

Psychological impact

The theme 'Psychological Impact' is comprised of the sub-themes: *from shock to adjustment; guilt, shame and stigma;* and *fear and anxiety*. The findings represent women's responses to diagnosis plus their emotional experiences and motivations for addressing GDM.

From shock to adjustment

The initial impact for women diagnosed with GDM was that they felt: *"shocked [and] very disappointed…"* [48]. Coming to terms with GDM was distressing and *"…… very traumatising…… I cried for several days. It was my first baby, and I waited so long for this baby."* [34]. In addition, another woman made the comment: *"I remember her [obstetrician) saying to me I had failed it [glucose tolerance test] and I would have to go meet with a diabetic educator and that's when I started crying. It kind of hit me at that point. It was kind of overwhelming"* [41].

Being diagnosed with GDM was particularly distressing for women who did not have risk factors or had not experienced either adverse symptoms or been unwell. Some women described a state of denial: *"I'm really small and I just thought that it wasn't going to happen to me…… when I flunked the 3 hour, I was shocked because I felt fine"* [32].

Despite their initial shock, women had to adjust quickly, as many neared the end of their pregnancy. There is frequently a short period between GDM diagnosis and birth (as little as 12 weeks) which, in turn, can make undertaking recommended diet and exercise changes overwhelming. Most women however, decide pragmatically to: *"…just do it, so just get on with it "* [39]. Achieving optimal glycaemia gave many women a positive sense of control while those who struggled to manage their blood glucose levels experienced more negative emotions, such as loss of control, fear, and anxiety.

Guilt, shame, and stigma

Diagnosis came with a sense of guilt and shame for many. GDM was assumed to be primarily caused by poor diet and exercise choices, thus wholly within a woman's sphere of control: *"When I was first told that I had gestational diabetes, I blamed myself … That it was me who had a bad diet, me who did not exercise enough"* [4]. A GDM diagnosis equated to the belief that a woman had "failed", the following sentiment was voiced: *"My baby hasn't asked for this; and what if the baby comes out and has some*

kind of disease? Then it's my fault. Then I haven't done it well enough. So, there is actually a huge sense of guilt……" [28].

Women felt ashamed: "*There is kind of weird stigma of shame about gestational diabetes…… I didn't shout it from the rooftops, it was a kind of an embarrassing thing.*" [41]. Women also sensed that their every move was monitored by those around them adding extra pressure to an already stressful situation: *"I felt like everyone was watching what I was eating…… and when I did eat something that I shouldn't have, I felt like people were definitely looking at me and thinking like, "Oh my God. look at this girl. She has [gestational] diabetes, and she's eating a cookie."* [41].

Fear and anxiety

Fear was a motivating factor for addressing GDM with the following comment highlighting this emotion: *"Each fluctuation of my levels scared me. I truly found my pregnancy, in particular the diabetes quite traumatic……. It is one of the main reasons I am scared of falling pregnant again even though I want another child.''* [53] The potential for difficulties with labor and birth in addition to health issues with the baby was anxiety creating: *"I don't want any complications during labor or don't want the baby to have any difficulty breathing."* [49].

The risk of birthing a large baby was constantly on the minds of many: *"I was concerned that I would have to be induced and I didn't want that whole spiral that everyone talks about that ends up in a C-section"* [32]. There was a strong sense that GDM had denied women the opportunity to be part of important decision making regarding their maternity care: *"I had no choice. You have no choice anymore, if you don't, then it will affect the baby, and everything affects the baby"* [46].

Information and education

The theme 'information and education' is comprised of the sub-themes: *understanding diagnosis, risk, and consequences; quality of sources and accessibility; balance of information to make informed choices;* and *consistent advice.* Women face a steep learning curve regarding the changes that are needed to manage GDM successfully.

Understanding diagnosis, risk, and consequences

Some women exhibited a poor understanding of GDM diagnosis and consequences not only in relation to themselves but their unborn baby as well. A lack of knowledge around diagnostic testing, for example, led some women to question the veracity of their diagnosis: "*They didn't tell me the side effects for the baby. They just told me you've got diabetes, you'd better control with this and that." But they didn't tell me, like, what are the side effects for having sugar levels up. like why it's really important to monitor your sugar levels"* [39].

Women were largely unaware of the longer-term consequences of GDM such as higher risk of developing T2DM or experiencing GDM in a future pregnancy. For many women, GDM was an acute, self-limiting episode relevant only to pregnancy*: "In my brain it [risk of T2DM] just went away. I had my baby, so oh it went away"* [41]. Some reported that healthcare providers trivialised the diagnosis and potential consequences to their health in the longer term and the need for lifestyle changes.

Quality of sources and accessibility

Women prefer information about GDM to come from credible sources, which were seen as for example*: "… doctor, a midwife, a physio, rather than a gym person …"* [48]. On the flip side, some women felt their healthcare providers were not knowledgeable enough to manage their GDM: "*I don't think they knew much … When I couldn't make it work, they just gave me a phone number, but I ended up going online and learning about the blood glucose measurement by myself and how to do everything"* [29].

A significant barrier to accessing education included lack of time with healthcare providers: "*They don't sit down and talk to you about little things; and I feel like if I was to bring up stuff that I want to talk about, I know there are like 15 women in the waiting room waiting to get seen; so I just don't bring it up and they don't bring it up; so you just get checked out and leave"* [41]. As a result, many women felt compelled to augment their knowledge from other sources: *"I found it [information] more outside of those appointments. I mean it was helpful, but it wasn't really in depth. Well like the food for instance, it wasn't a very extensive list of what you could eat, it was very limited and most of the food I eat wasn't on it."* [39]. While information found on the Internet could be useful, it was also described as potentially *"scary"* [44] and of uncertain quality. Health service websites (such as the National Health Service (NHS) in the United Kingdom) were considered credible, however, women voiced the fact there is a lack of guidance on accessing other quality sources via the Internet. Social media forums (such as Facebook groups) were a useful source of information and social support for some women [44].

Balance of information to make informed choices

In the early days post diagnosis, many women reported feeling deluged by the amount of information provided. However, the opinion was expressed that GDM diet and exercise advice was nebulous often lacking the necessary detail to support individual change. One woman reflects she was told "*obviously to eat healthily and exercise but I think the problem is it's very vague as to what eating healthily is*?" [37]. One woman recounted receiving a letter from her General Practitioner (GP) with ambiguous instructions on how to manage her condition: *"You should just change your lifestyle a little, 'Eat healthier food', it said. That wasn't much advice. There were only two sentences. But I read up on it myself. I know what to eat and what not to eat. But not everybody knows that."* [30]. Regarding drug therapy for glycemic control, many women felt there had been a lack of consultation between themselves and their healthcare providers: "*They didn't give me any options either, just like, this is what you're going to do, you're going to have insulin. But I did ask for options*" [36].

Consistent advice

Once enrolled in a service, information provided was not always adequate or woman centered. Frustration was voiced at having to see a multitude of different healthcare providers leading to a lack in continuity of care. "*You speak to a lot of people; I find that difficult. I've never once had the same [clinician]"* [52]. Another frustration was with women receiving conflicting advice. *"The GPs I saw gave me completely opposing information to the diabetes educator"* [53].

Making changes for better health

The theme of 'making changes for better health', is comprised of the sub-themes: *motivation to change;* and *diet and exercise changes.* Many women were still facing challenges in the self-management of their GDM despite making necessary diet and exercise changes.

Motivation to change

Women were motivated to undertake lifestyle changes for the health and wellbeing of their unborn child: *"I was very determined to make sure I could do absolutely anything within my power to not allow something to happen to the baby…."* [39]. The following sentiment was shared by many: *"I was more concerned for the health of my child than my own" (33).* Despite the challenges women faced they had the impetus to do whatever it took to ensure a positive outcome: *"So right through the pregnancy I was on insulin and metformin, and it's not an easy thing for us. It's really not easy to inject yourself every time"* [34].

Diet and exercise

Diet and exercise are the cornerstone of GDM management. Nevertheless, undertaking the appropriate changes adds stress to a woman's life particularly if it coincides with the latter stages of pregnancy or is a significant departure from their usual diet and exercise regime. One woman made the comment: *". having to go from being able to buy foods [ready cooked] and having to actually think about it, prepare it and cook*

healthy food. Yeah, lots of processed food [previously]. That's my biggest change, probably, going from never cooking" [39].

Time constraints and the physical challenges of pregnancy made it difficult for some women to exercise in pregnancy. "*There is really no time for me to just stop and get to the gym and exercise, which I love to do, but there's just no time in the day for it right now* " [41] and "*Because I have had pelvic pain, I haven't been able to move a lot. And I have been quite ill.*" [39].

Most women seemed motivated to avoid pharmacotherapy thus were committed to making the diet and exercise changes necessary to effectively manage blood glucose levels: "*Because at the diabetes doctor, she just gave me the list of what I have to eat and not eat. I am sticking to it because I don't want to take the insulin unless I have to do it …"* [40]. Diet and exercise changes required considerable personal commitment compared to, for example, taking antibiotics for the treatment of an infection: "*Yeah, well you just have to do it yourself,you have to take it on. If you have it [GDM] you have it, you can't do anything else*" [48]. Many women felt that GDM diet and exercise advice was too general and would have appreciated more individualised guidance with one woman making the comment: "*I'm a shift worker and I find it really hard … it was a big change, to routine mealtimes."* [44]. Women with GDM did not have the luxury of time to work out effective strategies and felt pressured by the need to bring about immediate change: "*I had 3 days to control my diet, and it was just not working. When the midwife called me, she was like, well, we tried to cut you some slack, but it looks like you're going to have to be on insulin. I just burst into tears"* [36]. The costs associated with a healthy diet and exercise were an issue for some: *"Now we've got more expenses for everything. It's either I get his things or buy stuff for myself. I can't do both of them"* [34]. While it was difficult for many women to find the time and energy to undertake exercise and meal preparation, a variety of mitigating strategies were pursued including clearing out pantries of unhealthy food, taking their own food to work or events, pre-preparing meals, limiting socialising, and careful scheduling of mealtimes and sometimes exercise.

Support

The theme of 'support' is comprised of the sub-themes: *support network;* and *partnership with healthcare professionals.* Women require a comprehensive network of help if they are to manage GDM successfully alongside their pregnancy. Their support network encompassed family, friends, community, healthcare providers and other women also experiencing GDM.

Support network

Women felt most supported by close family as one woman pointed out*: "Now actually my husband comes for a walk with me as well he's kind of like me, he doesn't eat vegetables and he still doesn't eat vegetables but he's now cooking more for me and he's healthier because he doesn't, because if he's going to eat junk food that's just going to make me jealous. So, he's kind of trying to eat healthy as well for me"* [40]. Women did not necessarily expect friends and family to change their lifestyle but felt more supported when their needs were taken into consideration.

Some women felt embarrassed by their GDM diagnosis and chose to keep it a secret. This decision and the challenges associated with socialising (including avoiding temptation, making appropriate food choices etc) left women feeling isolated: "*You just feel a bit out of things."* [39]. Others were also self-conscious about testing blood glucose levels or administering insulin in public particularly in the workplace.

Engagement with peers whether via social media or face to face was highly valued as one woman exclaimed: *"I'm thinking about the difference between peer support and medical advice. They're two very different things, and both are really important. Because the doctor, you're going to see them every couple of weeks, but [managing GDM] is a minute-by-minute decision-making process"* [36]. Importantly, engagement provided a sense of community to a group of women who often felt isolated: *"I'm really loving hearing all these different perspectives because I felt so alone in it"* *(36)*.

Partnership with healthcare professionals

Women emphasised the need for a collaborative working relationship with healthcare providers in addition to emotional support particularly at the time of diagnosis. One woman made the comment: *"I needed a little hand holding to be reassured. A doctor probably doesn't think it's a big deal because it happens all the time and everybody does fine and it all works out great, but when you're insular and you're getting diagnosed it's overwhelming"* [36]. While experiences with healthcare providers varied, it was clear that women wanted to feel valued as a person (not just as a host for the fetus) [33]. They wanted to be heard, to be recognised as an autonomous individual: "*...this is still my decision and then all of a sudden, at the end, it's like you can't make your own decisions, you can't decide what to do, and they know best.*" [32] Some women reported not being offered choices in their care and instead, being instructed on what they will have to undergo: "*I felt like… it was just going to be a cascade of interventions that would put me out of control"* [36].

Negative healthcare professional interaction led to feelings of shame: "*There was a sense that it's your fault, you're fat and at risk of diabetes! They really point the finger and put blame – there was really no empathy"* [53]. In contrast, positive reinforcement was a strong motivating factor: "*The professor gave me inspiring encouragement; and I think that is what kept me going"* [34]. Where continuity of care was provided, this model was valued by women enabling them to develop a meaningful relationship with their healthcare professional: "*It meant a lot to me that I didn't have to see a new person every time I was there. That would definitely have made me feel all confused – it wouldn't have been fun at all."* [33].

Care transition

The theme 'care transition' is comprised of the sub-themes: *abandonment, maintaining diet and exercise changes and care transition and follow up.* Findings emphasised the need for care to extend into the postpartum period for women to maintain a focus on good health into the future.

Feeling abandoned

Women with GDM experience a pregnancy that is often comprehensively monitored by various healthcare specialists. This abruptly changes for many women once the baby is born, leaving some feeling abandoned,*"You feel kind of abandoned, you have this horrendous situation where everything you eat has to be checked and then suddenly, they kind of go, "well off you go then"* [43]. *"…you're left high and dry*." [45].

Maintaining diet and exercise changes

Much of the focus and motivation for change in pregnancy is a healthy baby so when the baby is born, many women found it difficult to maintain healthy lifestyle behaviours, *"I made some changes after I had him [baby] those first couple months, but it just goes by the wayside after a while you know. You get busy, you forget about it. It just doesn't become a priority, unfortunately"* [41]. The postnatal period is also a challenging time for new mothers, *"It's chaos, it's hectic and I don't feel I have time for myself. When she's asleep, I have to lie down and sleep too, I don't have time to eat. Then sleeping's more important than eating."* [30].

Women also reported a lack of emphasis on longer term health by healthcare professionals with most of the attention focusing on pregnancy outcomes. "*Well obviously since I've had my glucose tolerance test since, after giving birth and everything's back to normal so I've sort of been making up for lost time a little bit with all the chocolate I couldn't have.*" [45] While the risk of future T2DM was noted, there was little support available to women for maintaining a healthy lifestyle to mitigate this risk, "*There was nothing really mentioned afterwards. It was like, yeah, you're at increased risk [of T2DM*]." [31].

Follow up

Provision of care to women with GDM frequently crosses the primary, tertiary divide with some antenatal care provided by GPs and with women referred to primary healthcare following birth. Key to the effective transition of women from one service to the other was clear communication (between services and to the woman). While some women had the importance of postnatal follow-up explained: "*by both the hospital and the GP*" [47] other women experienced inconsistency with their follow-up care: "*I got the feeling that the surgery didn't understand why I was asking for a 6–8 [week] test, I said that I had been advised to come back and get the glucose test done but they said that wasn't necessary*" [51]. This experience was contrasted with pregnancy where women generally experienced a high level of contact with healthcare professionals: "*I think the main problem is that the support isn't there afterwards. Nobody prompts you to get a blood test every year to check…. My doctor doesn't ring me and say you need to have a blood test now. I do that myself.*" [45]. Nevertheless, it was acknowledged that the postnatal period is a busy time for new mothers with multiple priorities and adjustments: "*Well, it would be a lot easier if I got a letter that said, now it's time – like they do for that cervix cancer screening.*" [33].

The lack of follow up in the postnatal period presents a missed opportunity for healthcare professionals to support women to maintain life changes for better health into the future: "*I just think it's easy to fall back into the unhealthy lifestyle again when there isn't anyone keeping an eye on you anymore. There is a greater risk of developing diabetes – I think that it's type 2 diabetes when you've had gestational diabetes, right? So maybe you should give more attention to the risks afterwards also*" [28].

The need for better postnatal follow-up and support was identified as being most appropriately provided by primary health care providers. Other suggestions included social support via 'mums' groups', online forums, programs based at community centers, walking groups, or subsidised baby-friendly leisure facilities.

Using and holistic care framework, we have described a range of emotions and experiences expressed by women with GDM. From these, we extrapolate holistic healthcare needs and these are presented in Table 4: Holistic care needs of women with GDM. Tailored information and education includes consideration of language and culture; issues that have been highlighted in our previous review focusing on the needs of women from culturally and linguistically diverse communities [18].

Table 4
Holistic care needs of women with GDM.

Psychological
Support for psychological impact of diagnosis
Support to manage anxieties and fears
Non-judgmental, respectful care
Information and education
Access to high quality information from credible sources
Tailored information that facilitates understanding of the risks and consequences of GDM
Information to enable informed choices
Consistency of information and advice from healthcare professionals
Adequate time with healthcare professionals
Self-management and diet and exercise
Provision of timely, accessible healthcare
Tailored information and education that facilitates diet and exercise changes that effectively manage blood sugar levels
Financial support/assistance to manage additional costs
Practical strategies for supporting diet and exercise changes
Support
To feel like a partner in their healthcare
To feel they are of value in and of themselves
Connection to others with lived experience of GDM
Motivational / appreciative approach by healthcare professionals
The support of family, friends, and colleagues
Care transition
Seamless transfer of care and communication between acute and primary healthcare service providers
Postpartum reminders for diabetes screening
Support for maintaining healthy lifestyle after baby is born

Discussion

This is the first comprehensive systematic review to examine the holistic maternity care needs of women with GDM. This review complements findings from previous reviews [16–18], while providing deeper understanding of the holistic care needs of women who have lived with GDM, highlighting potential areas of unmet need.

A holistic approach to healthcare considers not only the physiological effects of a health condition but includes psychological, social, economic, and spiritual aspects. The biomedical approach to healthcare has long been criticised for its exclusive focus on physical parameters of health and disease [54] with many critics calling for more holistic approaches [55]. Holistic approaches to healthcare align with woman or person centred healthcare and have been found to improve clinical outcomes, the experience of healthcare and reduce costs [55].

The experiences of women represented in this review highlight the psychological impact of GDM, with many experiencing psychological distress. Pregnancy is a time of psychological vulnerability as it brings significant change to all aspects of a woman's life; from her body to her intimate relationships, to work, finances and social life. The diagnosis of GDM adds substantially to the psychological burden as many women grapple with guilt and fear for the wellbeing of their unborn baby. A systematic review examining associations between GDM and depression and anxiety [56] found that women with GDM were more likely to experience depression and anxiety than women without GDM. Further, this review found that women with GDM and depression or anxiety experienced poorer clinical outcomes than those with GDM without depression or anxiety. Poor perinatal mental health can have long term consequences for the mother and baby including lower rates of breastfeeding initiation [57] and disrupted maternal-infant bonding [58,59]. The psychological wellbeing of women with GDM is poorly addressed by healthcare services in Australia and we join others in recommending that services routinely offer psychological support to this group of women [16,60].

This review shows women do not always receive individualised care and find navigating the plethora of available information both confusing and, at times, contradictory. It is difficult for women to successfully make changes to their diet and lifestyle without tailored information, practical strategies and support. Our previous review of the healthcare experiences of ethnically diverse women with GDM in high income countries highlighted the need for culturally relevant information and support by for example, including food relevant to various cultures, in dietary information provided [18]. A systematic review of self -management support strategies in primary healthcare setting found that no, single strategy was suitable for all patients but those with several interacting components, that were tailored to the patient's individual need were most effective [61]. Our review highlights that a "one size fits all" approach to the provision of information, education, and support in the context of GDM, does not adequately meet women's needs. Models of care that are woman centred and provide a tailored approach are needed.

Our review highlights the dis-continuity between hospital based and primary healthcare services, which is a well-established problem in many healthcare systems [62]. Importantly we highlight a significant missed opportunity for healthcare providers to promote the longer-term health of the mother and her family. Pregnancy has been described as a 'teachable moment' – a naturally occurring life transition or event that motivates people to make positive health and lifestyle changes [63]. Models of care that predominate for women with GDM are biomedical, and feto-centric, focusing on short term outcomes. A more seamless transition to primary healthcare, continuity of care, consistency in health messaging and rigorous follow-up could assist women to make longer term changes to their diet and lifestyles that would benefit themselves (and their families) into the future.

Strengths and limitations

To the best of our knowledge this is the first systematic review addressing the holistic maternity care needs of women with GDM. Studies were drawn from a range of western healthcare contexts and countries which enhances the generalisability of the findings. Studies were limited to those published in English due to the resources available to the team, so some important studies may have been missed. We did not include research focused on minority ethnic groups as we had previously published a systematic review on this topic. The quality of systematic reviews like the one reported here, relies on the quality of the studies contributing to analysis and this was rigorously assessed in our study. The experiences of women with GDM were comprehensively described in the included studies though healthcare "needs" were not explicitly identified and were therefore extrapolated by the authors of this review. There was a bias towards information relating to barriers or challenges faced by women with GDM in the published literature (rather than positive experiences) which may skew our understanding of healthcare services and assessment of the level of unmet need experienced.

Further research

To better understand the nature and extent of met and unmet holistic healthcare need in women with GDM, it will be useful to develop a robust scale for measuring need in this group, like that used in the cancer care setting [24]. This will allow an objective measure of need and provide healthcare services with valuable feedback on their services and models of care.

Conclusion

The aim of this review was to illuminate the holistic maternity care needs of women with GDM. The needs highlighted by this review cluster around the psychological impacts of GDM and the woman's ongoing need for information and advice that is tailored to their circumstances. They need continuity of care and advice as they transition from maternity services to primary care with follow-up that prioritises the woman's health into the future including the prevention of T2DM. The identification of these holistic needs may be used to inform the health care provision of women with GDM with models of care that are woman centred.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.wombi.2023.08.005.

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