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Priorities to improve woman-centred gestational diabetes mellitus care: A qualitative study to compare views between clinical and consumer end-users

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Abstract

Background: Immigrants worldwide have a two-fold higher risk of gestational diabetes mellitus (GDM) than women of the host country. Providing culturally appropriate woman-centred GDM care to attenuate adverse maternal and neonatal health outcomes is a persistent challenge for health services. Underpinned by the Knowledge to Action Framework, understanding and comparing the views of patients from different ethnic backgrounds and healthcare professionals (HCPs) about current and optimal GDM care can highlight priority areas to improve woman-centred care. This qualitative study aimed to compare the views of ethnic Chinese and Australian-born Caucasian women and their HCPs, including endocrinologists, obstetricians, midwives, diabetes nurse educators and dietitians, about what constitutes optimal GDM care and how to improve woman-centred GDM care.

Methods: Purposive sampling was used to recruit 42 Chinese and 30 Caucasian women with GDM and 17 HCPs from two large Australian hospital maternity services to complete in-depth, semi-structured interviews. Patients' and HCPs' views were thematically analysed and compared.

Results: Four out of nine themes showed misalignments between patients' and HCPs' views on GDM care, reflecting priority areas to improve woman-centred care by (i) reaching agreement on the attitudes towards different treatment targets between HCPs; (ii) enhancing inter-professional communication; (iii) improving GDM care transition to postpartum care; and (iv) providing detailed dietary advice tailored to Chinese patients' cultural diet.

Conclusions: Further research on reaching consensus on treatment targets, enhancing inter-professional communication, developing a perinatal care transition model from pregnancy to postpartum, and developing Chinese patient-oriented educational resources is required to improve woman-centred care.

KEYWORDS

diabetes, gestational, maternal health, qualitative research, transitional care

Key points

- Comparing clinical and consumer end-users' views about gestational diabetes mellitus care can identify priority areas to improve woman-centred obstetric care.

- Four key priorities to improve care were identified: (1) reaching a consensus on treatment targets; (2) enhancing inter-professional communication; (3) improving continuity of care from the antenatal to the postpartum period; (4) and developing patient-oriented educational resources.

INTRODUCTION

Diabetes mellitus and obesity have emerged as major public health concerns because of their associated morbidity, mortality and increased healthcare costs.[1,2] The transgenerational cycle of transmission of dysglycaemia and obesity through epigenetic imprinting has contributed to the continuous rise in prevalence.[2] Diagnosis of gestational diabetes mellitus (GDM) identifies women who are at high risk of subsequent metabolic disease and offers a window of opportunity to intervene at an early stage through promotion and facilitation of a healthier lifestyle during and after pregnancy to prevent obesity and diabetes long term.[3] Because immigrant women worldwide generally have a two-fold higher risk of GDM than women of the host country, optimising the perinatal health status of immigrant women of childbearing age, including GDM management, becomes a governmental health priority.[4]

Similar to other metabolic diseases, GDM management often relies on a patient's ability to contend with considerable health behaviour changes.[5] Effective therapeutic relationships between healthcare providers (HCPs) and pregnant women with GDM are central to optimising maternal and neonatal health outcomes.[6] In achieving a desirable patient–provider relationship, over the past three decades, patient-centred care has been conceptualised and advocated in health research to tailor care to individual patients' values and needs.[7] In pregnancy care, effective patient–provider communication is the cornerstone of woman-centred care.[8] Although literature reviews have presented patient-centred care frameworks to improve patient–provider communication and facilitate informed decision-making,[7,9] inadequate woman-centred care in obstetrics is a persistent problem.[8] This is because the uniqueness of woman-centred obstetrical care is unable to be explained by the existing non-pregnancy-specific patient-centred care frameworks.[10]

A major factor is that cultural beliefs and practices in obstetrics can influence women's pregnancy and childbirth experiences and behaviours.[11] Existing literature emphasises the significance of health information delivery in a culturally appropriate manner.[12] However, it lacks a detailed exploration of how different patient characteristics influence expectations of and preferences in obstetrics care and patient–provider interaction during pregnancy and fails to clearly identify strategies to foster woman-centred care.[13]

Australian national clinical practice guidelines[14] emphasise the significance of woman-centred care in pregnancy to address women's physical, sociopsychological and cultural needs and expectations. Given that ethnic Chinese immigrants are one of the largest populations of foreign-born immigrants of childbearing age nationally and worldwide[15] and have a four-fold higher risk of GDM than the Australian host population,[16,17] they are a large and vulnerable population in which would greatly benefit from optimisation GDM management. Yet, recent studies in Australia have shown Chinese immigrants' dissatisfaction with GDM care in hospitals,[18,19] which highlights the evidence-practice gap in how to perform woman-centred GDM care appropriate for Chinese immigrants.

Existing evidence has provided individual-level strategies to narrow the evidence-practice gap and improve general culturally appropriate care.[20,21] However, the generalisability of these individual-level strategies to pregnancy care in hospitals remains unknown. Making practice change in complex and competing priorities in healthcare settings is likely to require an additional infrastructural and cultural shift in supporting woman-centred care.[22] Broadening the research scope to address organisational factors contributing to cultural appropriateness using implementation science research approaches will provide additional avenues to foster a desirable practice change.[21,23] Implementation science refers to the science underpinning effective knowledge translation from research evidence to knowledge utilisation.[24] Rigorous and systematic research approaches from implementation science have been used to identify, understand and develop targeted multi-level strategies to address evidence-practice gaps in cultural appropriateness research.[21] Yet, no research has been conducted aiming to improve culturally appropriate woman-centred pregnancy care in hospitals.

According to the Knowledge to Action Framework[25] in implementation science, identifying problems in providing culturally appropriate woman-centred care is the first step to understanding the barriers to evidence-based care. Comparing Chinese immigrants' views with the Australian host population's views on GDM care enables the differentiation of views common to women with GDM from views specific to Chinese immigrants. Given the importance of patient–provider communication in the current multidisciplinary model of care, comparing HCPs' views with pregnant women of different ethnic backgrounds can help identify potential disagreements in views between patients and HCPs to inform areas to improve woman-centred care. This innovative three-pronged approach to understanding and comparing Chinese immigrants', Australian host

population's, and multidisciplinary HCPs' views on current and optimal GDM care will help identify priority areas to improve woman-centred care generally (to both Chinese immigrants and Australian host population) and particularly to Chinese immigrants. Priority areas will be subsequently mapped to the most appropriate strategies using the best available research evidence and implementation science models, which will be evaluated in the future evidence-informed intervention trial to improve woman-centred care.

Therefore, the present study aimed to explore and compare the perceptions and experiences of GDM management in Australia among ethnic Chinese immigrants with GDM, Australian-born Caucasian women with GDM and HCPs involved in the provision of multidisciplinary GDM care.

METHODS

This research was part of a larger predominantly qualitative, mixed-methods study that aimed to compare the perceptions, experiences and health behaviour practices of ethnic Chinese immigrants with those of Australian-born Caucasian women living with and managing GDM. The qualitative component was comprised of in-depth, semi-structured, audio-recorded, face-to-face or telephone interviews (dependent on participants' preference) to enable an in-depth examination of GDM patients' and HCPs' perspectives of GDM care. The quantitative component was comprised of dietary and physical activity assessments to investigate health behaviour practices in GDM management. The study reports only on the qualitative results of the perceptions and experiences of GDM management among GDM patients and HCPs. The consolidated criteria for reporting qualitative research (COREQ) was followed with respect to reporting.[26]

The symbolic interactionism underpinning the study is a useful theoretical framework to understand individual motivations for making health behaviour choices in disease management.[27] A key underlying assumption of the symbolic interactionist framework is that individuals interpret and assign meanings to their experiences and actions and that subsequent actions are based on those perceptions and interpretations.[27–29] Gaining a better understanding of the interpretative lenses individuals with different cultural background use to interpret the world around them allows better explanations of the factors that influence health behaviour decision-making.[27] It also enables making sense of how similar or different GDM patients' and HCPs' perspectives influence their expectations and preferences of GDM management and patient–provider interaction. In-depth interviewing is the method that best enables the provision of insights into individuals' interpretations and/or assignment of meanings to their experiences and interactions.

Purposive sampling strategies were used to recruit self-identified ethnic Chinese (herein referred to as Chinese participants) and Australian-born Caucasian (host population; herein referred to as Caucasian participants) women with GDM and singleton pregnancies, as well as HCPs who were actively involved in the care and/or education of women with GDM at the two hospitals' GDM clinics. Women with GDM were interviewed in their third trimester in their preferred language (Mandarin, Cantonese or English) by a bicultural and multilingual female research dietitian with interviewing experience (CW). Interviewed HCPs included endocrinologists, obstetricians, midwives, dietitians and credentialed diabetes nurse educators. No relationship was established between the researchers and participants before the study commencement. Only the researcher's role as the interviewer (CW) was known by the participants to ensure study rigour. Theoretical sampling was used to determine the final number of participants recruited.[30] This involved continued sampling, data collection and iterative data analysis until no new conceptual insights were generated, which is when theoretical saturation was achieved.[30] A 1-year recruitment period ensured the examination of GDM management across seasons to determine any seasonal associations with maternal health behaviour and psychosocial factors.[31] All participants provided their written informed consent.

The audio-recorded, in-depth semi-structured interviews were guided in the first instance by an interview guide with a brief list of researcher-developed initiating questions. The interview guide was developed to outline key topic areas before conducting the interviews (Table 1). Probing questions were used to continue interview discussions and strengthen recognition of themes and key issues based on participant indications of relevance. All interviews were transcribed verbatim and de-identified. Coding of interview transcripts guided subsequent theoretical sampling decisions and interview guide refinement. Field notes and memos provided contextual information in the constant comparison process used to assist with qualitative data management. Thematic analysis[32] was used in data analysis with NVivo 11 Pro (QSR International Pty Ltd). The six phases of thematic analysis included data familiarisation, generating initial codes and themes, reviewing themes, defining and naming themes and writing up.[32] Patient and HCP data were analysed separately until initial codes and themes were generated. Initial themes generated from patient and HCP data were compared and combined when reviewing, defining and naming themes.

Checking inter-coder agreement on qualitative data coding was conducted to enhance rigour.[33] Coding of verbatim Chinese and English transcripts was first undertaken by the Chinese bicultural researcher (CW). The verbatim Chinese transcripts were then translated into English by the bicultural researcher (CW), followed

TABLE 1 Examples of questions asked in gestational diabetes mellitus patient and healthcare providers' interviews.

Question topics	Sample questions
Healthcare provider interviews:	
GDM protocol	What is your role in managing women with gestational diabetes? What is your view about the changes in diagnostic guidelines in Australia to conform with new international guidelines? What is your view about treatment targets used currently?
Cultural competency	Are there any similarities or differences in the way in which women with gestational diabetes of different ethnic backgrounds are treated? Are you aware of any similarities or differences in beliefs or practices about pregnancy between women born overseas and those born in Australia? Are there any difficulties in managing gestational diabetes patients of different ethnic backgrounds? Do you think ethnicity is an important factor in modifying your treatment plan or way to approach your patients? How do you feel about your interactions with women from different ethnic groups?
Chinese culture	Are you aware of any specific cultural beliefs or practices among ethnic Chinese women during pregnancy?
Opinion on GDM intervention	Is there anything that might help you in your interactions with women of different ethnic backgrounds with gestational diabetes and helping to manage their GDM? How do you feel GDM intervention could be better improved?
GDM patient interviews:	
Opinion on relationship with healthcare professionals	How do you feel about your relationships with healthcare professionals? How well could you distinguish between the roles of different healthcare professionals? What are your views about GDM management advice you have received from healthcare providers?
GDM guideline	What does GDM mean to you? Do you know about or what is your opinion on current GDM guidelines in terms of diagnosis processes and treatment targets? How do you feel about the multidisciplinary care that is provided?
GDM management	What are your views about help received from healthcare providers in managing GDM? Where else would you look for information on GDM management apart from education by healthcare professionals? How do you feel about your GDM management?
Opinion on areas of improvements in healthcare	How do you think GDM care could be better improved? What other information would you like to know?

Abbreviation: GDM, gestational diabetes mellitus.

by an independent analysis of the transcripts by a Caucasian senior qualitative researcher (RA).[34] The two researchers then compared and discussed the codes until a consensus was reached regarding coding, categorisation and themes. Critical comparison and discussion of codes and themes between members of the research team who were insiders and outsiders of Chinese culture and language enabled more rigorous data analysis.[35]

RESULTS

In total of 17 HCPs (five Asian and 12 non-Asian), 42 Chinese and 30 Caucasian women with GDM were interviewed. Potential participants who declined participation indicated a lack of interest in the study or were too busy to participate. The duration of interviews varied between 30 and 75 minutes for HCPs and 45–90 minutes for women with GDM. Demographic details of participants are shown in Tables 2 and 3. All HCPs had received professional education and accreditation in Australia.

Analysis of the interview data identified similarities and differences between HCPs and women with GDM on participants' interpretation of GDM diagnosis (themes 1 and 2), healthcare delivery (themes 3 and 4), culturally appropriate care (themes 5, 6 and 7), postpartum care (theme 8) and areas to improve care (theme 9), as detailed below. The four key misalignments of views on GDM care between HCPs and women with GDM were on treatment targets, inter-professional communication, transition care from pregnancy to postpartum and culturally appropriate dietary advice. Illustrative quotations are listed in Appendix 1. To enhance clarity, representative quotations are included in the identified themes outlined below.

TABLE 2 Characteristics of healthcare providers.

Type of healthcare providers	Ethnic background	Number of participants		Years of practice with women with gestational diabetes
		Female	Male	
Endocrinologists	Asian	1	1	2–7
	Non-Asian	2	1	6–20
Obstetricians	Asian	0	0	–
	Non-Asian	1	1	4–15
Midwives	Asian	0	0	–
	Non-Asian	2	0	10–16
Diabetes nurse educators	Asian	3	0	6–16
	Non-Asian	2	0	3–10
Dietitians	Asian	0	0	–
	Non-Asian	3	0	5–12
Total		14	3	

Theme 1: Interpretation of GDM diagnosis

All HCP participants viewed the diagnosis of GDM as confirmation that a patient was at increased risk of adverse pregnancy outcomes, requiring timely intervention to reduce these risks. With the changed diagnostic criteria, which were blood glucose thresholds for GDM diagnosis,[36] more inclusive cut-offs allowed for more extensive identification of women at increased risk of pregnancy complications. Despite the increased workload for GDM clinics and patients' increased anxiety, this was considered to be worthwhile as a means to intervene early in patients at risk of pregnancy complications:

> I know that [the use of more inclusive diagnostic criteria] comes along with more clinic visits, perhaps more anxiety and guilt … but it means that we are highlighting more women who are at risk of type 2 diabetes down the track (Caucasian dietitian)

Most Caucasian and Chinese participants perceived GDM diagnosis as anxiety-inducing and were alarmed at the information about the increased risk of future diabetes after giving birth:

> I am worried about whether my blood glucose will drop after birth or not (Mandarin speaking Chinese born Chinese participant)

There was only one Caucasian participant who noticed modified diagnostic criteria and felt doubtful about her GDM diagnosis:

> I am uncertain about my diagnosis … The diagnosis becomes stricter. They [HCPs] told me I wouldn't have been diagnosed with GDM if the OGTT test had been taken a couple of years ago. My fasting level was only 0.2 over

Theme 2: Diversity of attitudes towards treatment targets

Generally, HCPs were aware of the existence of variations in treatment targets between treatment centres. They all commented on the importance of consistency but had diverse opinions on the rationale behind variations in treatment targets. For example, one HCP focussed on the need for treatment targets to match the updated diagnostic criteria, whereas another suggested further research was necessary to identify the most appropriate treatment targets to reduce risks for pregnancy complications. Others adopted different treatment targets according to individual women's cases, as treatment targets had their own justification and benefits but needed to be applied with the individual woman's needs clearly in mind:

> As long as they can justify why they have those targets, I guess that's fine … I have worked simultaneously at different hospitals and support their treatment targets. And they [patients] are usually receptive to changing when they come here (Caucasian diabetes nurse educator)

Two Caucasian and two Chinese participants who knew there were different treatment targets between hospitals expressed confusion:

> A friend of mine is treated in another hospital, and her blood sugar target is 6.7 after meal. Here in this hospital, the target is 7.0. Why it's different in hospitals in Australia? If my sugar is 6.9, I would be considered over in her hospital, but I would be considered okay here. So I am confused (Mandarin speaking Chinese born Chinese participant)

The Chinese-born first-generation participant who knew treatment targets in China also raised similar concerns:

> I don't understand … lots of my friends in China told me that the doctors in China need their 2-hour postprandial to be 8 or below. But here, the doctor needs us to be below 7. I am confused about why there is so big difference

Some commented that doctors had slightly different attitudes towards similar blood glucose readings, even theoretically using the same treatment targets. The perceived diversity in doctor attitudes increased patient confusion about appropriate responses to "borderline" blood glucose readings:

> I have already seen two doctors at the diabetes clinic. And the first doctor I met was pretty strict. Even if my reading was 6.9, she said it was no good. But then the second doctor interpreted the reading as borderline and said, as long as it's no more than 7, it's okay (English speaking Malaysian born ethnic Chinese)

Theme 3: Delivery of multidisciplinary healthcare

HCPs (across disciplines) shared the view that GDM care required a multidisciplinary approach in the provision of integrated healthcare and continuity of care. Their comments suggested that each HCP was viewed as equally important in empowering women to engage in good GDM self-management and attain optimal pregnancy health. Regular team meetings were considered to facilitate communication. Overlap in roles was discussed as "ensuring comprehensive coverage of healthcare", with one providing basic knowledge and another with more expertise in the area providing more individualised suggestions in GDM management. HCPs considered that repetition of important messages from the same or different HCPs helped establish and/or reinforce healthier behaviour:

> With the diet and things … will overlap with the dietitian … so I will go through the basics, and hopefully the dietitian will build on that … Any overlap is good because it's drawing the message that is important (Caucasian diabetes nurse educator)

Irrespective of ethnic background, several Caucasian and first-generation Chinese participants were confused about the roles of HCPs in multidisciplinary clinical practices as a result of the perceived overlap in roles. They suggested that confusion could be resolved if HCPs introduced themselves by informing patients of their profession/role at their first meeting.

A few Caucasian and Chinese participants also commented on the need for better communication between HCPs because they reported not only receiving conflicting advice from different HCPs, but also having to repeat their medical history to different HCPs who were part of the team.

Theme 4: Individualised patient–provider interaction

HCPs reported having a similar attitude towards providing appropriate care to patients of different ethnic backgrounds. Delivering "collaborative individualised care" would enable them to tailor their practice to patients with different cognitive capabilities, levels of health literacy and personalities, irrespective of ethnic origin:

> I think that's an individual thing. I have had consultations with Chinese women who ask lots of questions and some who hardly ask any questions (Caucasian midwife)

They viewed themselves as practising culturally appropriate care because they believed they incorporated an awareness of patients' cultural backgrounds in their individualised care:

> Every single [ethnic] population you get the ones you need to work harder for … It's the cognitive functioning … Be aware of their cultural background … It's not the language … It would work best if the two of you collaborated on managing your diabetes (Asian diabetes nurse educator)

Approaches to providing individualised care included adjusting dietary advice to fit with cultural dietary preferences. For example, HCPs viewed Chinese diets as rice-based and hence provided education on better rice options. Other strategies to manage health literacy issues included arranging interpreter services, organising longer consultations, making more frequent review appointments, using culturally appropriate written and pictorial educational resources, and reducing the use of jargon:

> Particularly when talking to patients with culturally and linguistically diverse backgrounds, I don't use a lot of medical jargon in the appointments. The education resources are all in plain English (Caucasian midwife)

Similarly, all Chinese and Caucasian participants commented they were satisfied with HCPs' modes of communication. They expressed gratitude to HCPs for using layperson language in conversations and devoting time to clarify the meanings of some medical terminologies used in consultations:

> I was initially worried about medical jargon, but then I found out that they used simple languages that I could understand … doctors are nice enough to spend more time with us repeating what they are trying to say (Mandarin speaking first-generation migrant)

Theme 5: Recognition of ethnic differences in GDM care

HCPs treated women similarly despite recognising ethnic differences in clinical characteristics, communication style and presentation at consultation. Caucasian women were viewed as having more "severe" GDM than ethnic Chinese women. Ethnic Chinese women were viewed as having leaner bodies with fewer requiring insulin, being less interactive, less likely to ask questions in consultations and receiving greater social support from family members than Caucasian women. They commented on needing to use more open-ended questions to explore ethnic Chinese women's needs:

> The Chinese will be more reserved … They tend to not to ask questions (Asian diabetes nurse educator)

HCPs suspected migration generation (first-generation or subsequent) to be one of the factors influencing GDM self-management. Caucasians and second-generation ethnic Chinese migrants were viewed as more likely to be overweight, working outside the home and more interactive in consultations. First-generation Chinese migrants were viewed as less likely to follow instructions if they were confused about how the Australian health system operated:

> Some Chinese migrants don't know what to do with the blood glucose monitor ordering form or when to go to chemists … only check their blood sugar for a week … not following instructions or letting the strips run out … It could be about their misunderstanding of the health system (Asian diabetes nurse educator)

HCPs from Asian backgrounds were more aware of how variations in Chinese culture could influence GDM management and the complexity of culturally appropriate practice required due to the diversity of within-Asian cultural values. HCPs commented on needing more knowledge about different cultural beliefs, traditions, diets during pregnancy, and factors contributing to adherence to traditional cultural practices. Yet, they were unsure if that would improve their provision of GDM care:

> If you think all Chinese people are the same, they are not … it depends on their background, their degree of education, how long they have been living in this country … Would be good to know more (Asian diabetes nurse educator)

The variations in characteristics of participants with GDM between ethnic groups shown in Table 3 matched HCPs' perceptions regarding lower body mass index and less insulin use in Chinese participants. All second-generation Chinese participants thought they had an adequate understanding of the Australian health system, whereas eight first-generation Chinese participants mentioned they were not familiar with it. No pattern in occupation and overweight was observed between the generation of migration.

Most first-generation ethnic Chinese participants perceived the GDM education they received as based on western diets and not adequately culturally appropriate:

> From my experience, the foods that they recommended are relevant to western people's diet here [Australia] … Apart from rice and bread, there is nothing that is related to my diet (Mandarin speaking Chinese born ethnic Chinese)

Theme 6: Ethnic differences in response to GDM intervention

Some HCPs viewed ethnic Chinese women as more fearful than Caucasians about the potential consequences of poor lifestyle-related GDM management. This view was inferred from perceptions that ethnic Chinese women were more committed to health behaviour change, more likely to over-restrict their diets and more anxious about insulin use, disproportionate to their actual "excellent self-management". In addition, HCPs noticed that ethnic Chinese women with GDM were less engaged in physical activity because they associated physical activity with miscarriage risk. Some HCPs believed that they used food such as bitter melon as remedies to manage blood glucose but were not revealing this to HCPs:

> They probably eat those Dang Gui or something like that, but they won't tell you

TABLE 3 Characteristics of women with gestational diabetes mellitus by ethnicity.

	Chinese ($n = 42$)	Caucasian ($n = 30$)
Age (years)	31.9 ± 3.7	33.3 ± 4.8
Pre-pregnancy body mass index (kg/m^2)	21.5 ± 2.5	29.9 ± 7.1
Gestational age (weeks)	31.1 ± 3.6	30.1 ± 5.1
Country of birth, *n* (%)		
– China	31 (73.8)	–
– Taiwan	1 (2.4)	–
– Singapore	1 (2.4)	–
– Malaysia	5 (11.9)	–
– Vietnam	1 (2.4)	–
– Australia	3 (7.1)	30 (100)
Marital status, *n* (%)		
– Married	36 (85.7)	21 (70.0)
– De facto	6 (14.3)	8 (26.7)
– Single	0 (0.0)	1 (3.3)
Level of education, *n* (%)		
– High School	3 (7.1)	6 (20.0)
– Diploma	6 (14.3)	10 (33.3)
– Bachelor	23 (54.8)	11 (36.7)
– Postgraduate	10 (23.8)	3 (10.0)
Occupation, *n* (%)		
– Housewife	5 (11.9)	3 (10.0)
– On maternity leave	4 (9.5)	4 (13.3)
– Self-employed	5 (11.9)	0 (0.0)
– Desk based work	12 (28.6)	9 (30.0)
– Non sedentary work	12 (28.6)	10 (33.3)
– Health professional	4 (9.5)	4 (13.3)
Insulin use, *n* (%)	7 (16.7)	12 (40.0)
Language of interview conducted, *n* (%)		
– English	13 (31.0)	30 (100)
– Mandarin	22 (52.4)	–
– Cantonese	7 (16.7)	–

> … They might probably don't think it might affect their blood sugar. I have not had anybody ask me that (Asian diabetes nurse educator)

Six Chinese participants who tried food remedies in managing GDM did not discuss this with HCPs because they suspected negative responses received from HCPs:

> I don't think doctors will understand the Chinese food remedies and agree to use the remedies, so why should I tell them? (Mandarin speaking Chinese participant)

By contrast, Caucasian participants were doubtful about complementary and alternative medicine use effectiveness unless recommended by naturopaths.

HCPs' perceptions of ethnic differences in GDM management were similar to what was reported by Chinese participants about their own behaviour, such that they over-restricted their diets, were worried about the impact of physical activity on babies and were more anxious about insulin use.

Theme 7: Sources of GDM information

HCPs viewed their role as providing GDM information in easily understandable forms. Similarly, Caucasian and Chinese participants viewed information provided by HCPs as the most trustworthy and reliable source to guide health behaviour changes. However, differences in information-seeking behaviour were evident between first-generation Chinese and Caucasian participants. The first-generation Chinese participants sought additional GDM knowledge from Chinese and English language websites and peers who previously had GDM. They viewed gaining access to multiple sources of information as enabling them to make more informed choices but did not check on the reliability of those sources:

> I receive information from families and friends … I also read Chinese and English written information from different websites and blogs so that I have an idea in mind … compare between them and make a proper decision (Mandarin speaking Chinese born Chinese participant)

However, second-generation Chinese and Caucasian participants searched for what they viewed as "reputable" online resources and gained peer support from friends. They discussed seeking doctors' advice when they found conflicting information from varied sources:

> I did a little bit online search from official organisations … If there is conflicting information … I went to the hospital … ask doctors … know more what should I do (Caucasian participant)

Theme 8: Postpartum care – Non-alignment of patient expectations and HCP views and practice

Disparate views between HCPs and patient participants regarding continuity of care beyond giving birth were evident. Most HCPs believed postpartum care was irrelevant as "by definition, GDM resolves after delivery". Therefore, it was not viewed as part of their role, even though some mentioned the postpartum oral glucose tolerance test (OGTT). Some HCPs (irrespective of ethnic background) also indicated their awareness and respect for diverse cultural practices, such as Chinese confinement practices (one whole month of convalescence after childbirth). Yet, they emphasised the discussion of confinement as irrelevant to GDM care because it was a postpartum issue:

> I haven't heard of anyone asking me about that. I guess the confinement is more after the delivery … not relevant to GDM (Asian endocrinologist)

Chinese and Caucasian participants expressed concern regarding the lack of information about postpartum issues. They expected to receive continued care from their HCPs until the review of the post-partum OGTT or beyond:

> Expressing colostrum and blood sugar levels … as well as post-partum OGTT check. In the hospital, no one mentioned anything after giving birth, but I know what will happen because of that [Facebook] group … no one has mentioned it to me in the hospital … It is important to communicate about things after birth (Caucasian participant)

Irrespective of the accuracy or otherwise of their knowledge, some Caucasian participants raised queries about colostrum storage in late pregnancy to treat neonatal hypoglycaemia and issues tied to glycaemic control during lactation. Some Chinese participants expressed the need for information about the association between diabetes prevention post-birth and confinement practices. For example, two Chinese participants wanted to know whether they still needed to prick their fingers and record their blood glucose every day post-birth and expected this information to be provided by their HCPs.

Theme 9: Improvement in GDM education to advance practice

Increasing public awareness of GDM and providing more efficient GDM clinic routines were mentioned by all HCPs as areas needing improvement. They believed increased public awareness about GDM would assist in promoting healthier behaviours before and during pregnancy among women at high GDM risk, thus optimising gestational weight gain and reducing the likelihood of developing GDM:

> I guess their level of risk does not equate to their acceptance of being diagnosed, so like to me, they are very high risk but are always quite surprised when they have developed GDM. I think it's because they don't know their risk (Caucasian diabetes nurse educator)

Some HCPs who conducted group education sessions suggested improving healthcare by encouraging family members to accompany patients to the sessions. Inviting women to complete education evaluation after group sessions were viewed as assisting in knowing how to improve practices. Arranging at least one individual dietitian session after group education, encouraging women to weigh themselves at every appointment and providing better peer support to non-English speaking women were also mentioned as areas needing improvement.

Both ethnic Chinese and Caucasian participants mentioned needing to increase public awareness and education about GDM. Some of them said they would have made health behaviour changes earlier to prevent GDM. They also discussed their desire to improve the education of others more generally in the hope it would improve peer support from families and friends:

> I think they [families and friends] don't … know much about it … I need to explain to them that I am using insulin now … they probably think it is more severe than it is … The general public knows that main diabetes would probably be type 2 [diabetes] … more public awareness so that I could receive better family support … and don't need to explain how to manage sugar to friends (English speaking Chinese participant born in Taiwan)

Almost all first-generation Chinese participants commented that group GDM education sessions could be improved by inviting family members, providing relevant interpreter services if necessary and, most importantly, providing more detailed culturally relevant dietary advice and meal plan examples. They suggested offering supermarket tours, food label reading courses, and online forums to gain peer support and improve self-confidence in GDM self-management. Some Chinese participants talked about the importance of discussing recommended gestational weight gain:

> What they taught us are all relevant to their own dietary habit here … lots of suggestions

they made are not useful to us, as we have Chinese dietary habits … So Chinese might find diet modification much easier if their dietary advice is more culturally relevant (Mandarin speaking Chinese born Chinese participant)

If I know my recommended weight gain, I will weigh myself more regularly because I know what the number means (Mandarin speaking ethnic Chinese)

DISCUSSION

To our knowledge, this is the first study to compare ethnic Chinese and Caucasian GDM patient perspectives with those of HCPs about GDM care. Our study has identified misalignment of patient needs and HCP concerns, highlighting priority areas to improve woman-centred GDM care generally and culturally appropriate care specifically for ethnic Chinese immigrants.

The study highlights the concerns of women with GDM with inconsistencies in treatment targets. The diversity of treatment targets between hospitals can lead to patient confusion and inconsistencies in HCPs' advice based on patients' blood glucose readings. This can potentially harm patient–provider relationships and health outcomes.[37] HCPs are similarly affected by the variability of glycaemic targets, potentially adversely influencing the confidence in providing sound and consistent clinical advice. A previous study has investigated the impact of different treatment targets on pregnancy outcomes and found inconclusive observations in the association between tighter treatment targets and improved neonatal outcomes.[36] High-quality research is urgently needed to define treatment targets for optimising pregnancy outcomes.[36] Given that more inclusive diagnostic criteria have been widely adopted over the past decade and the characteristics of women becoming pregnant are changing, service providers have been increasingly challenged by an escalating workload. Furthermore, women diagnosed with GDM are understandably anxious about the effects of GDM on their baby, their pregnancy and the risks of developing diabetes in the future.[38] Therefore, research efforts are required to assess the cost-effectiveness and cost-utility analysis of GDM treatment targets, enabling policy-makers to make more secure decisions about treatment target options.

Our study also revealed fundamental differences between women with GDM (irrespective of ethnic background) and HCPs in their perceptions of the role of HCPs in postpartum care and highlighted the perceived significance of continuity of care from pre- to postpartum for both ethnic groups. These findings are consistent with earlier research reporting that women with GDM regarded continuity of GDM care from diagnosis to OGTT postpartum as empowering ownership of their pregnancy health, managing blood glucose post-birth and minimising the risk of developing diabetes in the longer term.[39,40] There is a key difference between patients and HCPs regarding what constitutes continuity of care and who should provide it. Disentangling barriers in transitioning from hospital-based antenatal care to primary care-based postpartum care is urgently required to enhance woman-centred care and promote postpartum diabetes screening in the primary health care system.

Stakeholders' views of inter-professional GDM care were also examined and found HCPs expressed satisfaction regarding inter-professional collaborative care. However, women with GDM expressed a need to improve communication between HCPs and clarify their roles in GDM care when communicating with patients. These findings confirm earlier research emphasising the need to improve "coordinated care".[41–43] Just as effective multidisciplinary GDM care improves maternal care and neonatal outcomes,[44,45] inter-professional communication enhancement may increase patient satisfaction and reduce adverse pregnancy outcomes.[45] The use of an evidence-based consensus-building framework specific for facilitating inter-professional team collaboration may enhance woman-centred care delivery.[46]

To improve GDM care of ethnic Chinese immigrants specifically, the present study highlights areas for improving the cultural relevance of the content of education information, rather than just changes in the modes of information delivery. This finding echoes the findings of a study in Sydney[18] where ethnic Chinese immigrants commented on receiving culturally inappropriate advice. Given that woman-centred care requires effective communication and culturally appropriate care to enhance GDM management,[47] it suggests there is a clear need to develop patient-oriented GDM education resources to improve pregnancy care for Chinese women.

Although HCPs reported recognising ethnic differences in clinical characteristics and responses to GDM intervention, they expressed the need for continuing professional training on within- and between-cultural beliefs and practices. HCPs viewed consideration of patient characteristics and individual cognitive, social and psychological factors as important in predicting patients' health behaviours, formulating individualised clinical strategies and enhancing adherence to treatment plans.[48,49] Similarly, by acknowledging patients' cultural beliefs and factors associated with behavioural variations, woman-centred GDM care could be enhanced.[50,51]

Our study had several strengths and limitations. The qualitative design using in-depth interviews as the primary means of data collection enabled in-depth exploration and comparison of stakeholders' views of

patient-provider interactions and identification of challenges in the provision of woman-centred care. The involvement of a bilingual researcher enabled the recruitment of ethnic Chinese women with GDM with limited English literacy, making possible the investigation of other potential health disparities that may not have been perceived or experienced by Chinese participants with good English proficiency. The inclusion of HCPs from diverse professions enabled the evaluation of challenges in multidisciplinary GDM care. The insider–outsider positionality of the research dietitian who conducted data collection and analysis as an insider of HCP and Chinese immigrant and as an outsider of GDM experiences allows the researcher to establish rapport with participants, prompt appropriate questions, and conduct data analysis without making assumptions about GDM experience. Interviewing HCPs and women with GDM separately also promotes their sincerity in expressing viewpoints. Checking and discussing inter-coder agreements between researchers who were insiders and outsiders of Chinese culture and HCP enables reflexive analysis of how cultural and HCP positionality influences data analysis and improves study rigour. However, because of the research dietitian's interest in dietary modification in GDM management, a more in-depth exploration of dietary management in data collection was made. Recruitment was limited to Chinese and Caucasian women with GDM and HCPs who worked at GDM outpatient clinics in hospitals. The number of HCP recruited from each health discipline was also limited to HCPs working at participating sites. The diversity of health disciplines in sampling and the high-quality in-depth interviews ensure data richness. Hence, the findings are transferable to GDM outpatient hospital care. Future HCP recruitment from community settings may enable greater exploration of continuity of care. Caution is needed in generalising findings to other healthcare settings and ethnic groups. As a result of the heavy clinical workload of HCP participants and the time commitment of the quantitative component of the study among women with GDM, participants were not provided with transcripts for checking, nor asked to give feedback on the findings, which limited their involvement in data analysis.

CONCLUSIONS

Guided by the implementation science framework, our research compared views of GDM care between HCPs and patients (ethnic Chinese immigrants and host population) and found considerable consistency in patients' views within and between ethnic groups. However, the views of HCPs were less aligned with the views of the patient groups, mainly relating to the attitudes towards treatment targets, the opinions on current inter-professional communication and the understanding of involving postpartum care in GDM care. This highlights the urgent need to improve woman-centred GDM care by addressing the organisational-level priorities around reaching a consensus on treatment targets, enhancing inter-professional communication and improving continuity of care from the antenatal to the postpartum period. At the individual-level, patient-oriented educational resources may improve GDM care for ethnic Chinese participants. Co-design research on developing a healthcare transition model from hospital-based antenatal care to community postpartum care and developing more culturally appropriate GDM education resources for Chinese women is suggested. The ability of our research to identify individual- and organisational-level problems in providing woman-centred GDM care demonstrates the value of implementation science research to narrow the evidence-practice gap in delivering culturally appropriate woman-centred care.

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AUTHOR CONTRIBUTIONS

Ching Shan Wan: Conceptualisation, Methodology, Investigation, Formal analysis, Visualisation, Writing – Original Draft. **Alison Nankervis:** Conceptualisation, Writing – Review & Editing, Supervision. **Helena Teede:** Conceptualisation, Writing – Review & Editing, Supervision. **Rosalie Aroni:** Conceptualisation, Methodology, Writing – Review & Editing, Supervision.

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TRANSPARENCY DECLARATION

The lead author affirms that this manuscript is an honest, accurate, and transparent account of the study being reported. The reporting of this work is compliant with COREQ guidelines. The lead author affirms that no important aspects of the study have been omitted and that any discrepancies from the study as planned have been explained.

CONFLICTS OF INTEREST STATEMENT

The authors declare that there are no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request. The data are not publicly available because of privacy or ethical restrictions.

ETHICAL STATEMENT

This study was approved by the Monash University Human Research Ethics Committee (Project number: 8458) and Monash Health (Reference: LNR/16/MonH/396) and also the Royal Women's (Reference: LNRSSA/16/monH/406) Human Research Ethics Committees to recruit participants at both Monash Health and the Royal Women's Hospital (two large metropolitan tertiary public health systems in Australia providing maternity services to ethnically diverse populations).

PEER REVIEW

The peer review history for this article is available at https://www.webofscience.com/api/gateway/wos/peer-review/10.1111/jhn.13191.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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