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**Barriers to a healthy lifestyle post
gestational-diabetes: an Australian
qualitative study.**

Abstract

Background: Overseas-born-women from certain ethnicities are at high risk of type-2 diabetes and related metabolic disorders. This study explored the barriers and facilitators to long-term healthy lifestyle recommendations among Australian-born and overseas-born-women who attended health promotion sessions at a tertiary Australian Hospital for gestational diabetes 3-4 years previously.

Method; Face-to-face semi-structured interviews were conducted. Data were analyzed to identify major themes and the differing experiences of both groups of women.

Findings: Women in both groups faced many barriers to improve post-gestational-diabetes lifestyle. Women from both groups recalled healthy lifestyle recommendations for during pregnancy they received at the service, but had difficulty recalling the long-term lifestyle recommendations. Timing of the health information, non-reiteration of lifestyle recommendations, uncoordinated and fragmented health system support after childbirth were barriers faced by all women. Additional barriers for overseas-born women included the cultural competence of the health education material, their cultural preferences for food and physical activities and unsupportive family and partner. Both groups had excellent compliance with the first annual postnatal oral-glucose-tolerance-test. This was attributed to the personal motivation and health professional reminder. Women only reverted to the healthy lifestyles postnatally for weight loss.

Conclusion. A better understanding of the barriers to healthy lifestyle by women in their everyday lives will assist in the development of culturally appropriate health promotion guidelines and strategies. Constant un-fragmented postnatal engagement by the specialised diabetes clinics and primary health care services is crucial to sustain the healthy lifestyle in the long-term for women with previous gestational-diabetes.

Key words; Gestational diabetes, health promotion, immigrants, lifestyle, Physical

activity, cultural competency.

Introduction

The increasing global incidence of gestational-diabetes (GDM) positively correlates with the obesity epidemic, increasing maternal age, and migration of women of high-risk ethnicity to large cities and westernized countries [1]. About 47% of the Australian population were born overseas or have a parent born overseas [3]. In Australia, the incidence of GDM increased by 21% between 2000 and 2009 and was twice as high in overseas-born-women compared with Australian-born-women [2].

Women with GDM have increased adverse maternal and neonatal outcomes such as preeclampsia, caesarean section, macrosomia and neonatal hypoglycaemia [5, 6]. GDM also increases the maternal and child risk of type 2 diabetes [T2D] and other metabolic conditions in the long-term [7,8], making it a priority area for primary health services. With increasing immigration, the incidence of GDM and associated conditions is expected to rise, putting more burden on the health care system.

Once diagnosed with GDM, women are advised to consume a healthy varied diet, and to control portion sizes. They are also advised to take moderate physical activity of 30 minutes most days of the week. The healthy diet and physical activity (referred to as a healthy-lifestyle) is recommended for the duration of pregnancy, after childbirth [9] and for the rest of their lives due to their increased T2D risk. Evidence shows that many women follow a healthy lifestyle during pregnancy, but fail to continue after childbirth [10-13].

Few Australian studies have explored the lifestyles of overseas-born-women with GDM after childbirth. These studies reported barriers such as lack of assistance with child-care, mental distress, low partner and social support, resulting in poor compliance with the healthy lifestyle following childbirth [10,11,14].

The current study investigated Australian-born-women and overseas-born-women managed by the Diabetes-in-Pregnancy-Service (DIPS) at the Canberra Hospital

(TCH). It aimed to compare and contrast the experiences of Australian-born-women and overseas-born-women with a history of GDM in following the healthy lifestyle recommendations after childbirth. It investigated whether women with a history of GDM were aware of healthy lifestyle recommendations for post pregnancy; encountered barriers in following recommended healthy lifestyles, and if these barriers were greater for overseas-born-women compared to Australian-born-women.

Methods

A qualitative, interview-based study was used to investigate the experiences of women trying to follow the health advice they received during pregnancy to maintain a healthy lifestyle more than three years after child-birth.

Sampling and recruitment

The study was approved by the Australian Capital Territory and Australian National University, Human Research Ethics Committees. It conforms to the Australian National Statement on Ethical Conduct in Research Involving Humans (2007 updated in May 2013) [15].

A two-stage recruitment process was adopted. DIPS staff compiled a list of all women (Australian-born-women and overseas-born-women) who attended a GDM related health education programme and delivered a live singleton baby between 1 June 2009 and 31 May 2011 at TCH. Australian-born-women and overseas-born-women from the list were then invited to participate. Women with another pregnancy or childbirth after the study cut-off point, or who were diagnosed with T2D or could not communicate in English were excluded.

Seventy-one women (18 Australian-born-women and 53 overseas-born-women) who agreed to participate were sent a participant information sheet containing study details. The lead author (TZ) phoned the women to arrange an interview. Thirty women agreed

to participate. Seven overseas-born-women were found later to be ineligible; two had T2D, and five had a subsequent child.

Data collection and analysis

Face-to-face interviews were held in English between March-July 2014 at a time and place convenient to the participants. Interviews were audio-recorded with the participants' consent [16]. TZ used a topic guide to steer open-ended questions covering previous GDM experience, diet and physical activity after GDM, post-natal glucose tolerance test and barriers and facilitators to follow the healthy lifestyle recommendations of the DIPS during pregnancy and in the long-term (see table 1). Interviewing for Australian-born-women concluded once no new information emerged from interviews [16]. Due to diversity of overseas-born-women, the data saturation couldn't be achieved and interviews continued till the end of the data collection period. TZ transcribed the qualitative interviews verbatim and used NVivo (version 10) for data management. Thematic analysis was conducted to search for themes or patterns across the interviews [17]. Coding was initially based on interview questions and then refined as the interviews continued. A number of themes were identified, based on inductive and deductive codes and have been organised into the broad categories of barriers and facilitators.

Results

Of the 23 interviews, 8 were with Australian-born-women and 15 with women born overseas. The Australian-born-women were mainly of European or British descent. Table 2 and 3 show participant's demographic characteristics.

Barriers to continuing a healthy lifestyle

This study aimed to identify barriers and facilitators that could be used to improve the service, particularly for women who found it difficult to follow healthy lifestyle recommendations provided by the DIPS. Pseudonyms are used in the study for confidentiality.

Difficulty in recall of long-term lifestyle advice

A group of six to eight women from all ethnicities and backgrounds attended their GDM health education group session at 24-28 weeks of pregnancy. This session was conducted in English and lasted for two hours. Women received oral and written information about GDM causation and their increased risk of future T2D and other metabolic conditions. They were informed about healthy diet and physical activity, skills to measure and record blood glucose levels, and were registered with the National Diabetes Services Scheme (NDSS). The written take-home information consisted of more than 10 different brochures in English elaborating information provided in the oral talk.

Women reflected that the information provided in the health education group session was more focused on the pregnancy lifestyle than the long-term lifestyle changes. There was more emphasis on diet related changes compared to the physical activity. Overseas-born-women, in particular, recalled being informed about GDM as a condition of pregnancy and therefore did not realise the need to continue the lifestyle following childbirth.

“I was told that the diabetes will go away after the baby is born...They said that I have high chances of developing diabetes later when I am old, but I may not...So when my blood sugar was normal after ----was born I thought it is gone now.....so I went back to normal”. Sonu

Some women thought that health educators rushed through the information session when the group included women with previous GDM history. This deprived the women with first-time GDM of sufficient information about the condition.

All woman reported that they remembered the key healthy lifestyle messages they followed during pregnancy, but many couldn't recall recommendations to continue the healthy lifestyle in the long-term. The most common explanation for poor recall of the long-term healthy lifestyle advice was that it was provided in the first health education session when women were more concerned about their unborn baby's health. After this session, women changed their dietary and physical activity pattern drastically to prevent harm to the baby's health. In the absence of post-natal reiteration of healthy lifestyle message, women from both groups abandoned the diet and physical activities after childbirth.

When I was pregnant I changed my life style drastically, because the talks were during pregnancy and because I was thinking about health of my child. I used to do a lot of tests, the blood tests, so I was quite diligent about that, but it was until the baby was born. ... I am sure they told us, but I may have not taken it more seriously or they could have stressed it more ...as it was gestational diabetes and also after the test was clear, I thought that it is over now. I haven't really thought about... I do think about it when I drink sugary drinks, but....it was so long ago, I don't remember clearly... (Taylor)

Lack of culturally-specific information

The absence of culture-specific information was an additional barrier for overseas-born-women. They thought that that the dietary information provided at the first group health education session, was tailored to the Australian-born-women. They believed that the health professionals do not understand their culture, which resulted in poor guidance.

"It's hard because they won't understand what sort of curries we eat ... He told me to eat cauliflower. I started to make a curry of

cauliflower but I started to add some potatoes ... instead of lowering my sugar it went up.”(Dipika)

Following the group health education session, women had a one-on-one session with the dietician, which they found very useful. The individual dietician sessions were considered culturally appropriate, individually tailored and easier to follow. However, very few women in both groups recalled receiving long-term physical activity and dietary recommendations.

Lack of support from the DIPS after childbirth

After the robust support by the DIPS staff during pregnancy, women were surprised by its absence after childbirth. During pregnancy, women with GDM were accustomed to repeated appointments and telephone discussions with the DIPS staff regarding their blood glucose management. If they missed appointments they would receive follow up calls and rescheduling of appointments. Women with GDM also had afterhours access to the DIPS staff. However, this support disappeared once women went into labour.

Participants from both groups articulated the need for relevant health information in the immediate postnatal period by the DIPS staff. Absence of postnatal follow-up visit by the DIPS staff resulted in confusion and many assumed that the risk to their health was over.

“So I just thought, well the insulin would go away... the crazy diet will go away... and I will go back to normal. So I went back to normal.” (Joan)

“They said that you do have a higher risk of developing diabetes, but I do not think I took it as seriously as I could have. You forget such things when you have a baby and all those other things are going on”. (Paula)

Weak postnatal health system support

Women from both groups disclosed weak diabetes support after hospital discharge. Women received home-visits by the midwives, and the maternal and child health (MACH) nurses in the early postnatal period. Many believed that the midwives and the MACH nurses were not informed about their history of GDM, therefore post GDM lifestyle was never discussed during postnatal home visits.

Women in both groups preferred long-term healthy lifestyle advice from the DIPS staff as it was free and was trusted. Most women considered physicians an expensive second option. Some women were unsatisfied with the GP advice and found it superficial, compared to their experience at the DIPS.

“I went to see the GP, the GP just suggested to me not to take a lot of rice; just to take more bread... and do some walk”...(Lilly)

Australian-born-women gained postnatal dietary information from family, friends and work colleagues with previous GDM. Many overseas-born-women used the internet instead of friends and families, as they thought they wouldn't have the relevant knowledge. These women also found information on the internet not culturally specific or useful.

“Even if I go to the Internet...it's all like according to Australian things like steak, meat pie and that sort of thing but then we don't eat those things.” (Nilo)

All women expressed the need for a free postnatal follow-up service and a helpline, to provide information on the long-term maternal and child diet, physical activity, reminders for annual glucose testing, and healthy food recipes.

“Follow-up might give people awakening to realise that it is an ongoing thing, and will help a lot. You tend to forget... so much occurs after the childbirth.” (Ritta)

“The information they provided was really good, but there was no follow up... it was not that I did not get support but they could have been more supportive.”(Jenny)

Post-natal oral glucose- tolerance-test (OGTT)

Women in both groups were aware of their increased risk of future T2D. Almost all women had postnatal OGTTs within 6-12 weeks, which coincided with the first postnatal check-up, on the recommendations of their physician or midwife. A few overseas-born-women didn't consider the test worth having as their glucose levels normalised after childbirth.

The first annual OGTT was performed by most participants but because they tested negative, few participants had the 2nd year test. They understood that the reason for the postnatal and annual OGTT was to ascertain their post- GDM glucose status and to learn that their diabetes had resolved.

“I've seen friends passing away with diabetes. It only makes me think that I have to have the test done, I did it last year to find outI wanted to know if it was not back”. (Sally)

Mental distress

GDM diagnosis caused anxiety in both groups, although more so for the overseas-born-women. Social stigma associated with diabetes in their home countries resulted in concealing their diagnosis from families and friends causing social isolation, loneliness and increased depression. Consuming culturally valued foods was an important way for them to curb their homesickness thus increasing the challenge to follow dietary recommendations.

“Because maybe the culture. Coming from ... I think something to do with the comfort that if you eat your own food it reminds you that you feel home, you feel closer to your home and that you still have this power and that you’re still free to choose. No one is dictating you of what to do, what to eat.” (Angela)

Some overseas-born-women disliked the taste of recommended foods and ate small quantities of restricted foods. A few even recorded lower glucose levels in their logbooks. These women swiftly reverted to their pre- GDM lifestyles after the first post-natal normal blood glucose level.

Participants from both groups complained of lack of information about social eating. Some women declined social invitations leading to social isolation and depression and others abandoned the recommended healthy diet at social gatherings, which resulted in hyperglycaemia. Due to central role of food in social gathering of many foreign cultures and lack of clear information, overseas-born-women found it exceptionally hard to follow the recommended healthy lifestyles during and after childbirth.

After childbirth many women were sleep deprived and fatigued due to the newborn care. Breastfeeding resulted in increased appetite. Caring for newborn left little time to exercise. This was more likely to occur when women had their first baby and added to mental distress postnatally.

Family and partner support

Many overseas-born-women had relatives move in with them to assist after childbirth while a few overseas-born-women returned to their home countries. Others consulted their families online or over the phone. The presence of relatives reduced loneliness and helped new mothers with childcare. However, women reported being fed

traditional high calorie foods to promote breastfeeding and to assist in recovery. Overseas-born-women also reduced their physical activity levels to minimum for at least a month after childbirth due to their cultural norms.

“...but one month definitely not going outside, because your body is not very strong that time. It's most rest and eat “proper” food”(Mennu)

Australian-born-women were more likely to have support from their partners in household chores during and after pregnancy but many overseas-born-women didn't have this help.

... As well as my husband like our culture is different background and husband's not doing housework sort of things.”(Zainab)

Partners of many overseas-born-women didn't attend the pregnancy health-education-sessions and were unaware of the importance of lifestyle changes during and after gestational-diabetes. Although majority partners were supportive of lifestyle changes throughout pregnancy due to their concern for the unborn child's health but it was difficult for them to understand the need to continue the lifestyle post-pregnancy.

“I couldn't do it without his help... he said do as they say...he tried to eat what I used to have...and walk with me.....no, not afterwards...then he said but why you have to do it, the tests are normal...”(Kelly)

Facilitators

Three years after gestational-diabetes women were not following a healthy lifestyle, unless they planned another pregnancy or desired weight loss. To lose weight, some Australian-born-women participated in sports with their children, whereas overseas-born-women relied on home exercise equipment because it was considered more comfortable and they did not have time to for outdoor activities.

Having gestational-diabetes enhanced women awareness about the importance of healthy eating, portion sizes and exercise. Once diagnosed, most women began a healthy diet, lowered unhealthy food consumption and increased their physical activity. Australian-born-women and overseas-born-women with previous gestational-diabetes switched to a healthier lifestyle after becoming pregnant again.

Three years post-gestational diabetes some women reported maintaining a healthier lifestyle and a few reported a poorer lifestyle compared to their pre- gestational-diabetes lifestyle. Participants found it easier to limit consumption of unhealthy foods but only a few said they were achieving the recommended 30 minutes of physical activity daily.

Discussion

This qualitative exploratory study revealed that both Australian-born-women and overseas-born-women were unaware that they had to maintain a healthy lifestyle after pregnancy despite an awareness of future increased risk of type-2-diabetes. The health system didn't support women with follow-up information and advice in the immediate and long-term post-natal period, similar to other studies [20] [24]. Women therefore didn't realise that they needed to maintain a healthy lifestyle over the long-term to minimise their risk of type-2-diabetes. They were motivated to follow a healthy lifestyle more by a desire to lose weight than concern about diabetes.

This study, in agreement with others [11, 14, 10, 18], found that the overseas-born-women experienced additional barriers; lack of partner, family and social support resulting in isolation and stress, and diverse cultural preferences and expectations. Overseas-born-women required constant guidance by the health professionals to clarify the cultural conflicts with the recommended healthy lifestyles. Women in both groups had difficulty recalling details of long-term healthy lifestyle recommendations as has been shown before [19], because the information was only provided in the first

health education session. Similar to the results of other studies [20],[21], too much information provided, when women were more concerned about the unborn baby's health. If postnatal healthy lifestyle advice was provided close to the childbirth, women may have recalled and followed it better.

Women found one-to-one sessions with the dietician easier to follow as they were tailored to their needs. Studies suggest that women prefer to receive less information during the first health education session, with more details given at subsequent appointments [20], or to receive an easy-to-read bullet point pamphlet with options for further readings online [22]. Despite being well educated with good English language skills, overseas-born-women faced difficulties in understanding how to align their ethnic diet with the dietary recommendations. Culturally-specific group health education sessions with women from similar cultural background may be useful, as it would create a support group, which many overseas-born-women need in postnatal period.

It would assist women maintain a healthy lifestyle in the long-term if DIPS continued to meet women to reiterate messages [13], [25]. Specialist clinics such as DIPS, should be required to do so, otherwise it is unlikely to happen [26]. Provision of postnatal lifestyle information at the last antenatal visit at the DIPS clinic and better information sharing between different tiers of health system such as the DIPS, the GPs, the midwives and the MACH nurses may improve the compliance issues with the long-term healthy lifestyle for these high risk women.

Health professional's involvement facilitated women's high compliance with 6-12 weeks and annual OGTT in both groups. This finding was contrary to the other studies, who found a low compliance with 6-12 weeks and annual OGTT [13,30,14]. Low compliance for the second annual test by both groups was attributed to a lack of contact by health professionals.

With increasing immigration in Australia, health professionals face challenges to understand the needs of a diverse population. Similarly the immigrants also face challenges to adapt their cultural preferences according to the health services of the newly adopted country. Initiatives such as cultural responsiveness framework, involving cultural competence training for healthcare professionals [27], will enhance the responsiveness of the health professionals at all levels enabling them to better understand the health needs of the patients[28].

Strengths and limitations

This study adds to the few Australian studies which explore the barriers to the long-term healthy lifestyles in overseas-born-women following gestational-diabetes. The immigrant background of the CI was also a strength of the study as it led to better understanding of the overseas-born women's' perspective [31].

Overseas-born-women with poor language skills are known to have poorer understanding and adherence to gestational-diabetes recommendations[32]. However, these women were excluded from the study due to time constraints, which is a limitation of the study.

Conclusions

This study recommends the availability of culturally appropriate health education sessions and material for overseas-born-women in simple and clear language and format, the establishment of post-natal services, and a free helpline to reiterate long-term healthy lifestyle messages for women with previous gestational-diabetes. There is a need for improved information sharing between various tiers of the health system and the need for uniform culture specific training for the primary health care providers. Finally, it is suggested that sustained engagement with the high-risk women through

integrated postnatal services by the specialised clinics and primary health care service providers would reduce the risk of further diabetes.

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Competing interests

The authors declare that they have no competing interests.

Authors' contributions

TZ was the chief investigator who designed the research, developed questionnaire, recruited participants in stage 2, conducted the interviews and data analysis and wrote the original manuscript. CN and FL were the research supervisors and were involved in the research design, questionnaire development and editing and revision of the manuscript. LB, RY and MI were clinical staff who recruited study participants in stage 1. TZ CN, FL and CB, revised the manuscript. All authors read and approved the final manuscript.

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Contributions to the literature

<p>What is Already Known?</p> <p>Women with gestational diabetes have poor compliance with healthy lifestyle recommendations after childbirth. Non-compliance is greater in overseas-born-women.</p>
<p>What is already known?</p> <p>Common reasons for noncompliance in overseas-born-women are lack of assistance with child-care, mental distress, low partner and social support.</p>
<p>What this paper adds</p> <p>Weak and fragmented health system support is an additional factor in poor compliance, more so for the overseas-born-women. The compliance could be improved with culturally appropriate health education in simple and clear language and format, the establishment of post-natal services, and a free helpline to reiterate long-term healthy lifestyle messages</p>

Table 1. Demographic characteristics of Australian and overseas born women

	Australian born women			Overseas born woman		
	n	% or Mean \pm SD	Range	n	% or Mean \pm SD	Range
Age (y)	8	37* \pm 5	28 - 45	15	37 \pm 4	31-44
Self-reported BMI (kg/m ²)	8	22 \pm 4	20 - 32	15	23 \pm 4	17-29
Tertiary educated [%]	8	100		13	87	
Working mothers [%]	6	75		10	67	
Second language [%]	0			13	87	
Years since migrating					11 \pm 9	5-38
Migrated before 2007				8	53	

Number of children		3 ± 1	2-4		2 ± 1	1-4
Own house [%]	8	100		11	73	
Bedrooms/family		4 ± 1	3-5		3 ± 1	2-4
Insulin requiring GDM [%]	5	63		11		73
Positive family history of diabetes [%]	4	50		12	80	

*numbers are rounded off

Table 2. Countries of birth and GDM history of study participants

	Pseudonyms	Country of origin	GDM history
1	Cate	Australian-born	All pregnancies
2	Taylor	Australian-born	First time
3	Sally	Australian-born	First time
4	Kelly	Australian-born	Second time
5	Joan	Australian-born	First time
6	Jenny	Australian-born	All pregnancies
7	Laura	Australian-born	First time
8	Paula	South Africa	First time
9	Annie	Thailand	First time
10	Sally	Peru	All pregnancies
11	Angela	Philippines	First time
12	Sonu	India	All pregnancies
13	Catty	Indonesia	First time
14	Fatima	Pakistan	All pregnancies
15	Dipika	India	First time
16	lilly	China	First time
17	Nilo	Bangladesh	First time
18	Sara	Bangladesh	First time
19	Ritta	Sri Lanka	First time
20	Mennu	India	First time
21	Zainab	Bangladesh	First time
22	Maliha	Bangladesh	First time

*pseudonyms are used

Figure 1: Barriers to adopt long-term lifestyle recommendations

