



Diagnosis of Gestational Diabetes: a 'Teachable Moment'

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Research Article **Educational and Psychological Aspects**
Diagnosis of gestational diabetes: a ‘teachable moment’

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The abstract for this study was published in the European Health Psychology (2016) conference abstract programme.

What’s new?

- Research regarding the determinants of effective gestational diabetes mellitus (GDM) self-management is limited.

- We tested whether the psychosocial changes outlined in the teachable moments model (a model of behaviour change) are associated with following GDM management recommendations during pregnancy.
- Higher perceived risk of complications during pregnancy and feeling supported by family or friends was associated with higher levels of concordance with GDM management recommendations.

Abstract

Aims Research regarding the determinants of concordance with gestational diabetes mellitus (GDM) treatment is limited. Here, we test whether the psychosocial changes outlined in the teachable moments model, as proposed by McBride *et al.*, Emmons and Lipkus, (McBride CM, Emmons KM, Lipkus IM. Understanding the potential of teachable moments: the case of smoking cessation. *Health Educ Res* 2003; **18**: 156–170) are associated with following GDM treatment recommendations.

Methods Fifty-nine ~~participants-women~~ completed a baseline questionnaire (~~1~~ week after GDM diagnosis) in which they reported risk perception, social support, emotional response, the importance of their maternal identity and self-efficacy. One month later, participants reported their concordance with instructions regarding glucose monitoring, diet and, if ~~applicable~~ applicable, medication. We used regression analysis to test for associations between the psychosocial factors measured at baseline and concordance at ~~1~~-month follow-up.

Results ~~Participants-Those~~ who perceived their risk as higher or felt supported by family or friends were more likely to report a high level of concordance with GDM treatment. Emotional response, identity salience and self-efficacy were not related to concordance.

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Conclusions Future interventions designed to increase concordance could benefit from a focus on risk perception and social support, as these factors appear to be most strongly associated with following GDM treatment recommendations.

<H1>Introduction

The prevalence of ~~Gestational-gestational Diabetes-diabetes Mellitus-mellitus~~ (GDM) is increasing in the UK, due to a rise in obesity, and other risk factors including advanced maternal age [2]. ~~If poorly controlled, This this condition, if poorly controlled,~~ is linked to a range of perinatal complications for the developing fetus and mother [3,4]. GDM is also associated with an increased ~~risk-risk~~ for both mother and ~~child-child~~ of developing obesity and ~~type-Type~~ 2 diabetes later in life [5–7]. Managing GDM can be a demanding experience. Women are advised to modify their diet and lifestyle. If hyperglycaemia persists, additional pharmacological intervention may be required (predominantly metformin or insulin) and women are advised to monitor their glucose ~~levels-levels~~, sometimes more than four times a day. In addition to these practical challenges, research indicates that a diagnosis of GDM can be a difficult experience emotionally. Loss of self-esteem, ~~autonomy-autonomy~~, and feelings of guilt and fear are common experiences among women diagnosed with GDM [8,9]. ~~Because of Due to~~ the complexity involved in managing the condition, women with GDM require effective support and education. However, knowledge regarding the psychosocial and practical barriers to effective blood glucose management is limited [10]. With a view to addressing this gap in the research, the aim of ~~the current-this~~ study was first, ~~ly~~ to describe the psychosocial consequences of a GDM diagnosis and, ~~secondly~~, to test how these psychosocial factors impact on concordance with GDM treatment.

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~~In order to~~ To identify psychosocial factors relevant to health behaviour change in the GDM population, we employed McBride, ~~Emmons and Lipkus~~ *et al.*'s [11] 'teachable moment' model [11]. The teachable moment model outlines how an event such as diagnosis can impact on three important determinants of behaviour change. Specifically, a teachable moment is ~~characterised~~ characterized by an increase in risk perception, a strong affective or emotional response (either positive or negative) and a change in or challenge to a social role or identity. It is proposed that these cognitive responses lead to an increase in motivation, self-efficacy and skill acquisition, which in turn increase the probability that an individual will engage in ~~health~~ health-protective behaviours [11]. We predicted that ~~participants~~ women who experienced the changes outlined in the teachable moment model would be more likely to follow GDM treatment recommendations.

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<H1>Participants and ~~Methods~~ methods

A previous study into the determinants of concordance with a diabetes regimen, reported effect sizes (f^2) of ~ 0.18 [12]. Assuming we would observe similar effect sizes in our study, we needed a sample size of 80 to achieve 80% power. Participants were recruited from ~~2~~ two maternity outpatient units in the west of Scotland ~~approximately ~ 1-1~~ week after being diagnosed with GDM (between 24- ~~and~~ 28 weeks of pregnancy). We were able to increase the number of participants in our study by extending the initial recruitment period from ~~three~~ 3 to ~~nine~~ 9 months. However, our final sample size of 59 was below our initial target of 80 ~~participants~~.

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Written consent was obtained from all participants. This study was given a positive opinion by the East of Scotland ~~Research~~ Research ~~Ethics~~ Ethics Service and was approved by NHS Ayrshire and Arran R&D Department.

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Participants were asked to complete ~~2~~two questionnaires, the first (pen and paper) questionnaire was administered at the time of recruitment (~~1~~1 week following diagnosis), and the second was administered over the telephone and completed ~~1~~1 month later. Both questionnaires are ~~provided~~given in the Appendix.

The first questionnaire was designed to measure the components outlined in the teachable moment model; ~~namely~~namely, an affective or emotional response, perceived risk and change in social identity. We additionally assessed level of perceived social support, intention to follow ~~to~~ dietary and ~~glucose~~glucose-monitoring ~~guidelines~~guidelines, and self-efficacy (~~operationalised~~operationalized as perceived confidence). We chose to include these additional factors ~~as~~because they have previously been associated with successful behaviour change during pregnancy [13,14].

Affective or emotional response to GDM diagnosis, hereafter referred to as affective response, was measured ~~with~~using an abridged ~~6~~six-item version of MacLeod and Hagan’s Post Diagnostic Mood Assessment Questionnaire [15] (the original questionnaire consists of 14 items, we narrowed this down to ~~6~~six by excluding those with overlapping content). The questionnaire used in our study consisted of ~~3~~three questions regarding change in negative affect and ~~3~~three ~~questions~~ regarding change in anxiety. Response options were: ‘much worse’, ‘moderately worse’, ‘slightly worse’ ‘no difference’, ‘slightly better’, ‘moderately better’ and ‘much better’. Responses were scored on a scale of ~~-~~-6 to +6 with lower scores indicating an increase in negative affect or anxiety. Individual item scores were summed to create an overall affective response score. The reliability of this scale was high [16].

Risk perception was measured with an adapted version of Heaman and Gupton’s Perception of Pregnancy Risk Questionnaire [17]. This consisted of four questions, regarding the participant’s perceived risk of complications (for themselves and their baby). Participants

were asked to estimate the risk of complications, assuming their blood glucose was well controlled, and, separately, assuming their blood glucose was poorly controlled. Response options were: 'no risk at all', 'quite low risk', 'medium risk', 'quite high risk' and 'very high risk'. Responses to each item were scored on a scale of 0–4 (higher scores representing higher risk) and summed to create an overall risk perception score. Reliability of this scale was high [16].

According to the teachable moment model, a change in or challenge to a particular social identity may motivate individuals to engage in behaviour change. Pregnancy marks the adoption of a new social identity namely that of 'mother to be'. We predicted that women who placed greater importance on this identity would be more likely to follow to advice about GDM management. As-Because there are no available measures of identity in pregnancy, we used an adapted version of 'The Pie' – an identity measure developed by Touliatous, ~~Perlmutter and Straus~~ *et al.* [18]. This measure consisted of one item: 'Think of who you are as a person, and the many identities (for example: friend, worker, sister, neighbour, mother) that make up who you are, yourself. How important to you is your identity as "mother to be" at this point in your life?' Response options were 'not important at all', 'not very important', 'quite important' and 'very important'. These responses were scored on a scale of 0 to 3 with higher scores indicating greater importance.

For brevity and to enhance participation, social support, intention and self-management self-efficacy were assessed with one item each. For the social support item, participants were asked to indicate the extent to which they felt supported (by family or friends) in fulfilling the responsibilities associated with their pregnancy. Response options were: 'I feel very supported', 'I feel supported most of the time', 'I feel supported sometimes' and 'I don't feel supported at all'. For the intentions measure, participants were asked to indicate the extent to which they agreed with the statement 'I plan to manage my gestational diabetes by following

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the advice I have been given at the clinic'. For the self-efficacy measure, participants were asked to indicate whether they agreed with the statement 'I feel confident that I can manage my gestational diabetes'. Response options to questions regarding intentions and self-efficacy were: 'strongly disagree', 'somewhat disagree', 'neutral', 'somewhat agree', 'strongly agree'.

Responses were scored on a scale of -2 to $+2$ with higher scores representing higher levels of confidence.

Information regarding the participants' age, BMI, postcode and history of previous pregnancies was obtained from their medical records. Postcodes were used as an index of socio-economic status (SES) as defined by the Scottish Index of Multiple Deprivation (SIMD) [19]. SES categories range from 1 to 5 with 1 representing the highest level of deprivation.

All participants attended a ~~blood-glucose~~ monitoring demonstration with a diabetes specialist nurse (~~1~~ week following diagnosis); at this demonstration, ~~participants~~ women were given guidance regarding diet, glucose monitoring and medication (if applicable). All participants received the same guidance regarding GDM management. The ~~follow-up~~ telephone questionnaire was designed to assess the participants' level of concordance with these instructions over the past month. Questions were adapted from the Diabetes Compliance Questionnaire [14]. Participants were asked how frequently (always, mostly, sometimes or never) they followed three specific sets of behaviours; keeping to their overall diet plan, eating foods they should avoid and following instructions regarding glucose monitoring. Those who were prescribed metformin or insulin therapy were additionally asked to report how frequently (always, mostly, sometimes or never) they followed instructions regarding their medication and how frequently they had forgotten or chosen not to take their medication. Responses to each of these questions were scored on a scale of 0 to 3. An overall concordance score was calculated by summing scores for each question, these scores were then transformed to a scale ranging from ~~(0 to 10)~~ using the formula: raw score/theoretical

maximum $\times 10$. This approach allowed us to create comparable concordance scores for participants treated with diet alone and participants that were prescribed medication.

<H2>Statistical analysis

Firstly, we reported how participants responded to the baseline questionnaire in terms of the number and percentage of participants in each response category. Next, we ran a Spearman's rank correlation test to examine associations among the variables measured at the first interview. Finally, to test for associations between these variables and concordance score, we ran two linear regression models with concordance score as the outcome variable. In the first model, we entered affective response, risk perception, identity salience, intention, self-efficacy and social support. In the second model, ~~in order~~ to test whether levels of concordance also varied as a function of demographic differences, we additionally adjusted for age, smoking status, whether it was the participant's first pregnancy, BMI and SIMD. All analyses were conducted using IBM SPSS Statistics ~~Version-version~~ 22.0 [20].

<H1>Results

Of the 59 participants ~~we~~ recruited, ~~9-nine~~ were not contactable for the ~~follow-follow-up~~ interview. Of the 50 participants contacted at ~~1-1~~-month follow-up, 27 managed their GDM with diet alone, 19 were prescribed ~~Metformin-metformin~~ and ~~4-four~~ were prescribed insulin.

The characteristics of the sample stratified by tertile of concordance score, ~~are displayed~~ ~~given~~ in Table 1.

One week following diagnosis of GDM, 36 participants (72%) reported an increase in negative affect and anxiety. However, the magnitude of this change was small, the mean score for affective response was ~~-4.7~~ (~~SD-SD~~ = 9.2); possible scores ranged between ~~-36~~ and +36. In response to questions regarding the risk of complications, 42 participants (84%) believed there would be a low to moderate risk of complications if their glucose levels were

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controlled. In the case of uncontrolled glucose levels, 38 participants (76%) believed that their risk of complications would be quite high or very high (10 believed there would be a moderate risk and ~~1-one~~ that there would be a low risk). Most participants (~~49-out-of-of~~ 50) reported their identity as '~~mother-'mother to be'-be'~~ as either very important or quite important. In response to the question regarding social support, 40 participants (80%) reported feeling very supported, ~~7-seven~~ (14%) felt supported most of the time and ~~3-three~~ (6%) felt supported sometimes. ~~Some~~ 46 participants (92%) expressed an intention to follow guidelines regarding glucose control and 47 participants (94%) felt confident they would be able to follow these guidelines. At follow-up, most participants reported high levels of concordance with GDM management guidelines: 43 (86%) participants reported always or mostly following their diet plan, 49 participants (98%) reported always or mostly checking their blood sugar as recommended and 30 (81%) participants reported that they never or sometimes ate food that should be avoided. The mean concordance score in this ~~sample-group~~ was 14.2 (~~SD-SD~~ = 4.3).

Participant responses to the base-line and follow-up questionnaires are ~~displayed-given~~ in Tables S1 and ~~2-2,~~ respectively.

We tested for associations between these independent variables. ~~Table 2 displays-gives~~ a summary of the results. It should be noted that following a Bonferroni correction for multiple comparisons [21], only the correlation between risk perception and intention was statistically significant. This significant correlation indicates that participants who perceived ~~that~~ the risk of complications as high- were more likely to express a strong intention to follow guidelines regarding glycaemic control during pregnancy.

Results from the linear regression analysis predicting concordance are displayed in ~~Table 3,~~ Significant predictors of concordance in model 1 were risk perception and social support. ~~A~~

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standard deviation (~~SD~~~~SD~~) increase in risk perception score was associated with a 0.42 ~~SD~~~~SD~~ increase in concordance score ($P = 0.03$); a ~~SD~~~~SD~~ increase in social support score was associated a 0.36 ~~SD~~~~SD~~ increase in concordance score ($P = 0.02$). This model accounted for 13% of the variance in concordance scores ($R^2 = 0.13$). The second model additionally included age, BMI, smoking status, SES and whether it was a first-time pregnancy; in this model, the association between risk perception and concordance was attenuated (0.38, $P = 0.06$); however, the association between social support and concordance remained significant ($P = 0.01$). The adjusted R^2 for this model was 0.18.

<H1>Discussion

The aim of our study was to describe the psychosocial consequences of a GDM diagnosis using the teachable moment framework. Our results indicate that diagnosis of GDM is ~~characterised~~~~characterized~~ by an increase in negative affect and risk ~~perception~~~~perception~~, and coincides with the adoption of a highly valued identity of mother to be. These findings provide support for the idea that diagnosis of GDM presents a ‘teachable moment’—; in other words, diagnosis is likely to motivate an increase in ~~health~~~~health~~-protective behaviours. A further aim of our study was to test whether the factors outlined in the teachable moment model (affective response, risk perception and identity), as well as self-efficacy and social support, were predictive of concordance with GDM treatment during pregnancy. Risk perception and social support were the only factors associated with concordance in our sample.

Our findings regarding psychosocial changes following diagnosis build on those reported by previous studies. Qualitative studies have documented the emotional experiences of women diagnosed with GDM; many women report initial feelings of shock, fear and anxiety followed by a movement towards acceptance as the pregnancy progresses [8,22–24].

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However, few studies have investigated the experience of women diagnosed with GDM in the United Kingdom (UK). The experience of British women may be distinct, ~~as~~ because, in contrast with many other high-income countries, ~~where~~ all women are screened for GDM at 24-24 weeks of pregnancy, women in the ~~United Kingdom~~UK are only screened if they are identified as being at risk (i.e. having a BMI over 30, a history of GDM or a family history of diabetes) [25]. Daniells *et al.* [26] argues that selective screening may cause women to feel greater distress because they are singled out as being ‘high risk’. One week following diagnosis, most participants in our study reported a moderate increase in negative affect, suggesting that diagnosis under a selective screening system may not cause additional distress. However, further qualitative work with British women, particularly focusing on the time of diagnosis, would provide further insight regarding the emotional consequences of selective screening for GDM.

Research into risk perception among women diagnosed with GDM remains scarce. One study examined this topic from the perspective of health-care practitioners [27]. According to this previous study, many women with GDM are unaware of the risks associated with a GDM pregnancy. In contrast with these previous findings, ~~participants~~ women in our study held accurate views regarding the risk of experiencing perinatal complications. Risk of complications among women with GDM is higher than in the general population [28] and is increased further if glucose levels are not controlled [29].

Our results regarding identity highlight that diagnosis coincides with the adoption of a highly valued maternal identity. A number of authors have suggested that adoption of this identity qualifies pregnancy as an important ‘teachable moment’ [11,30]. While a maternal identity is likely to play a central role in the processes of psychological adaptation during the period of GDM diagnosis, the experience of diagnosis itself may also mark the adoption of an ‘ill health’ identity [31]. More detailed measurement of change in identity during pregnancy, and

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the relationship between a maternal and an ill health identity as prompted by a diagnosis of GDM warrants further investigation.

Our finding that higher risk perception was associated with greater concordance is in line with health behaviour theory [32–34]. However, in our [sample study](#), following adjustment for demographic factors, BMI and smoking status, the association between risk perception and concordance score was non-significant ($P = 0.06$). Raising awareness of the risks associated with a GDM pregnancy might encourage concordance with GDM management advice; however, such an approach should be adopted cautiously, as increasing risk perception can have unintended consequences. Previous work illustrates that heightened risk perception in combination with anxiety or worry can cause individuals to develop fatalistic beliefs about their health, and to disengage from [health protective behaviour](#) [health-protective behaviours](#) [35]. The interaction between negative affect and risk perception may be particularly relevant in cases when women with GDM are prescribed glucose-lowering medication. In a qualitative study with 19 participants, Draffin *et al.* [36] found that women reported an increase in risk perception and anxiety in response to the prescription of insulin.

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Social support was the strongest predictor of concordance in our sample. This finding is in line with results reported in a previous cross-sectional quantitative study ($n = 98$), in which higher social support was significantly associated with greater (self-reported) concordance with instructions regarding diet and (insulin) medication [11]. Our findings are also in accordance with a recent qualitative study into the enablers and barriers to achieving good glycaemic control during a GDM pregnancy. Women with GDM in this latter study reported that support from partners, family, friends and others, was key to achieving good glycaemic control [23]. Support programmes for women with GDM may benefit from placing a greater emphasis on the role and support provided by significant others. Future studies could also explore the potential relationship between social support and risk perception. For instance,

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women with a family history of GDM may have additional insight regarding the potential risks associated with the condition, and, also receive greater support from family members.

In our study, negative affect and self-efficacy were not related to concordance at ~~follow~~ follow-up. However, these factors should not be discounted. Previous qualitative work has documented women’s experiences of anxiety and fear following GDM diagnosis and how such negative emotional responses, particularly in combination with feelings of low self-efficacy, can result in defence responses ~~which-that~~ negatively impact GDM management [37]. In addition, other quantitative studies have reported an association between self-efficacy, depression and self-management in the case of ~~type-Type~~ Type 1 and 2 diabetes [38,39]. It is possible that our sample size was not large enough to detect these associations. Identity salience was also not related to concordance in our study. Assessing the effect of this variable was problematic in our study due to low response variability – that is, all women in our ~~sample-study prioritised-prioritized~~ the identity of ‘mother to be’. Items regarding self-efficacy and intentions also suffered from ceiling effects, which may have limited our chance of detecting associations between these variables and levels of concordance.

An important limitation of our study is the small sample size. Because of this, our study was underpowered to detect small to medium effect sizes; replication of our study in a larger sample may reveal associations between concordance and additional psychosocial factors in the ~~Teachable-‘teachable Moments-moments’~~ model. A second limitation of our study is that concordance was assessed using a self-reported measure. This measure was likely subject to a certain degree of self-report bias: participants may have over-reported their level of concordance [40]. It would have been preferred to assess actual (observed) concordance rather than rely on self-report or intention, although this is more complex, costly and difficult to achieve. A further limitation is the use of mainly single-item, non-validated measures in this study. This reflected the exploratory nature of the work, and the pragmatic nature of

carrying out the study in an [National Health Service \(NHS-NHS\)](#) clinical context. The study could be repeated using validated measures of the main study constructs. The different methods of administration for the baseline and follow-up questionnaires is an additional limitation; at baseline, participants self-completed a pen and paper questionnaire, whereas at follow-up, participant responses were recorded via a brief telephone interview. This approach was chosen to ~~maximise~~[maximize](#) participant retention at follow-up. However, it is possible that participants were less willing to report actual levels of concordance over the phone. Finally, we did not record information regarding participants' level of education, or ethnicity. These additional factors may be related to GDM self-management, and should be considered in future studies.

In summary, our results support the idea that GDM diagnosis provides a 'teachable moment'. Interventions designed to improve glycaemic control during pregnancy may benefit from a focus on risk perception, self-efficacy and social support.

Funding sources

None.

Competing interests

None declared.

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<H1>Appendix

<H2>Baseline questionnaire

1. Emotional impact

These questions are about how you have been feeling since being told you have gestational diabetes. Please circle the number on each scale that best represents how your mood has been since being told. An example question is given below to explain how to answer these questions. So, for example, if you think you are worrying slightly more than usual you would circle -2 as shown.

Example question:

Have you found yourself worrying more or less than usual?

-6	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5	+6
much	moderately		slightly		no		slightly		moderately		much	
more	more		more		difference		less		less		less	

Questions:

Have you experienced higher or lower levels of anxiety than is normal for you in pregnancy?

-6	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5	+6
much	moderately		slightly		no		slightly		moderately		much	
higher	higher		higher		difference		lower		lower		lower	

Has your ability to relax been better or worse?

-6	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5	+6
much	moderately		slightly		no		slightly		moderately		much	
worse	worse		worse		difference		better		better		better	

Have you become more or less tense?

-6	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5	+6
much	moderately		slightly		no		slightly		moderately		much	
more	more		more		difference		less		less		less	

Have you been feeling more or less unhappy than usual?

-6	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5	+6
much	moderately		slightly		no		slightly		moderately		much	
more	more		more		difference		less		less		less	

Has the quality of your sleep been better or worse?

-6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6
much moderately slightly no slightly moderately **much**
worse worse worse difference better better better

Have you been enjoying your life more or less?

-6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6
much moderately slightly no slightly moderately **much**
less less less difference more more more

2. Risk perception

When blood sugar is not controlled in gestational diabetes the risk of birth complications (such as needing to induce labour or the baby having low blood sugar) can increase. The next questions are about how you think about this risk. There are no right or wrong answers we are only interested in your opinion.

Thinking about the plans you have to control your blood sugar, how high do you think the risk will be for you during this pregnancy? Please tick the box that gives the best answer for you.

☐ ☐ ☐ ☐ ☐
 very quite high medium risk quite low risk no risk
 high risk risk at all

Thinking about the plans you have to control your blood sugar, how high do you think the risk will be for your baby during this pregnancy? Please tick the box that gives the best answer for you.

☐ ☐ ☐ ☐ ☐
 very quite high medium risk quite low risk no risk
 high risk risk at all

How high do you think the risk for you during this pregnancy would be if your blood sugar was **not controlled**? Please tick the box that gives the best answer for you.

☐ ☐ ☐ ☐ ☐
 very quite high medium risk quite low risk no risk
 high risk risk at all

How high do you think the risk for your baby would be if your blood sugar was **not controlled**? Please tick the box that gives the best answer for you.

☐ ☐ ☐ ☐ ☐
 very quite high medium risk quite low risk no risk
 high risk risk at all

3. Identity

Think of who you are as a person, and the many identities (for example, friend, worker, sister, neighbour, mother) that make up who you are, yourself. How important to you is your identity as ‘mother to be’ at this point in your life? Please tick the box that gives the best answer for you.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
very important	quite important	not very important	not important at all

Thinking about your identity as ‘mother to be’ what responsibilities do you feel you have during pregnancy? There is no right or wrong answer we are just interested in your opinion (please provide details below).

⋮

⋮

⋮

⋮

⋮

Do you feel that your family/friends support you in fulfilling these responsibilities? Please tick the box that gives the best answer for you.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I feel very supported	I feel supported most of the time	I feel supported sometimes	I don’t feel supported at all

4. Intentions

Please tick the box that gives the best answer for you.

I plan to manage my gestational diabetes by following the advice I have been given at the clinic

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
strongly disagree	somewhat disagree	neutral	somewhat agree	strongly agree

I feel confident that I can manage my gestational diabetes

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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strongly disagree somewhat disagree neutral somewhat agree strongly agree

<H2>Follow-up questionnaire

One month follow-up questionnaire: concordance with diet and medication plan (telephone interview)

I am going to ask you a few quick questions about how you have been managing your gestational diabetes over the past month.

1. What treatment are you currently receiving?
Diet alone ☐ Oral medication (metformin) ☐ Insulin therapy ☐
2. In the past month have you followed the diet plan prescribed by the Dietician?
Always ☐ Mostly ☐ Sometimes ☐ Never ☐
3. In the past month have you eaten foods that you should avoid on your diet?
Always ☐ Mostly ☐ Sometimes ☐ Never ☐
4. In the past month have you checked your blood sugar as often as recommended by the diabetes nurse?
Always ☐ Mostly ☐ Sometimes ☐ Never ☐
5. *Do you take metformin/insulin injections as prescribed by the diabetes nurse?
Always ☐ Mostly ☐ Sometimes ☐ Never ☐
6. *In the past month have you forgotten to take or skipped your diabetes medication?
Always ☐ Mostly ☐ Sometimes ☐ Never ☐

*Questions for women receiving oral medication or insulin therapy only.

<H1>Supporting Information

Additional Supporting Information may be found in the online version of this article:

Table S1. Participant responses to the baseline questionnaire.

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Table 2. Participant responses to the follow-up questionnaire.

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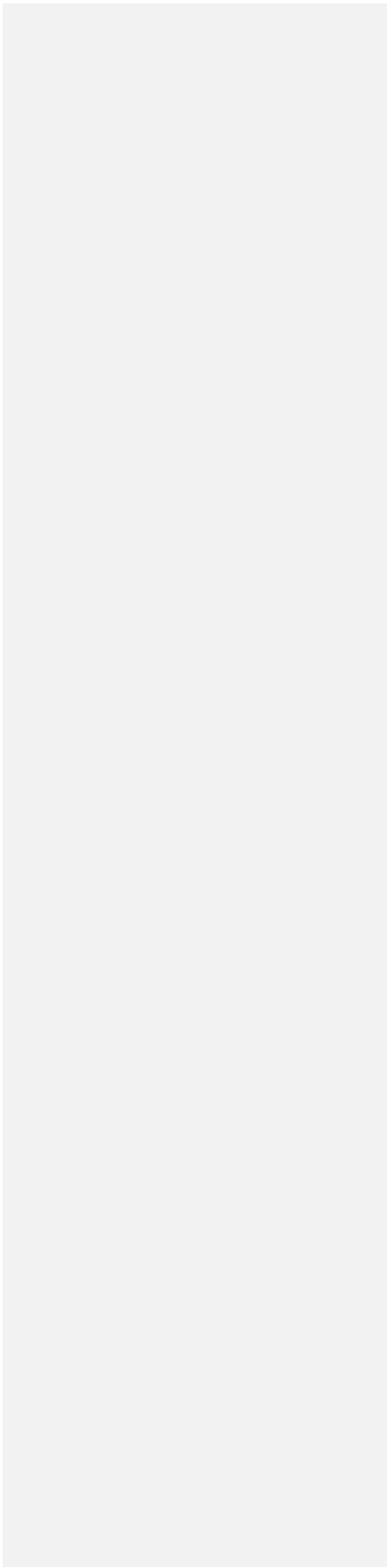


Table 1. Characteristics of women 1 week after diagnosis with gestational diabetes stratified according to tertile of concordance (for gestational diabetes recommended treatment), which was assessed 1 month later ($n = 50$)

Characteristic	Low	Middle	High
<i>N</i>	19 (38)	13 (26)	18 (36)
Concordance score	7.36 (0.29)	8.28 (0.13)	9.20 (0.58)
Minimum and maximum	6.67–7.50	8.00–8.33	8.50–10.00
Age	31.8 (6.4)	32.3 (4.9)	31.4 (6.0)
BMI	32.3 (6.8)	33.2 (8.0)	36.8 (9.2)
Current smoker*	1 (5)	1 (8)	0 (0)
First pregnancy*	12 (63)	7 (54)	7 (39)
No glucose-lowering medication*	13 (68)	9 (69)	5 (28)
SIMD score*			
1 or 2	11 (58)	9 (69)	16 (89)
3	4 (21)	2 (15)	2 (11)
4 or 5	2 (11)	2 (15)	0 (0)

Data are shown as mean (SD) or * n (%). For concordance score, we additionally show minimum and maximum scores within each tertile. SIMD, Scottish Index of Multiple Deprivation.

Table 2. Spearman correlation coefficients between characteristics of the women one week after diagnosis with gestational diabetes

	Affective Response	Risk Perception	Identity Salience	Intention	Self-efficacy
Affective Response					
Risk Perception	−0.30* (0.025)				
Identity Salience	0.21 (0.361)	0.01 (0.937)			
Intention	−0.02 (0.876)	0.48** (0.001)	0.21 (0.145)		
Self-efficacy	0.32* (0.025)	−0.24 (0.098)	0.14 (0.350)	0.32* (0.024)	
Social Support	0.29* (0.038)	−0.07 (0.660)	0.20 (0.162)	−0.07 (0.650)	−0.07 (.648)

Exact *P*-values are shown in parentheses.

*Correlation significant at the 0.05 level (two-tailed).

**Correlation significant at the 0.01 level (two-tailed).

Table 3. Regression models showing associations between baseline measures and concordance score at 1 month follow-up

	Univariate analysis	<i>P</i> -value	Model 1	<i>P</i> -value	Model 2	<i>P</i> -value
	<i>B</i> (SE <i>B</i>)		adj. <i>R</i> ² = 0.13 <i>B</i> (SE <i>B</i>)		<i>R</i> ² = 0.18 <i>B</i> (SE <i>B</i>)	
Affective Response	0.01 (0.01)	0.46	0.02 (0.02)	0.29	0.02 (0.02)	0.35
Risk Perception	0.10 (0.06)	0.09	0.18 (0.08)	0.03	0.16 (0.08)	0.06
Identity Salience	0.21 (0.24)	0.37	−0.02 (0.27)	0.94	0.03 (0.28)	0.92

Social Support	0.64 (0.21)	0.01	0.68 (0.28)	0.02	0.79 (0.30)	0.01
Intention	−0.01 (0.13)	0.91	−0.16 (0.16)	0.35	−0.22 (0.18)	0.24
Self-efficacy	−0.02 (0.16)	0.90	0.08 (0.22)	0.72	0.15 (0.22)	0.51

Model 1, multivariate analysis with all six baseline measures; model 2, multivariate analysis, additionally adjusted for age, first pregnancy, BMI and SIMD score.

B, parameter estimate; SE *B*, standard error of the parameter estimate; SIMD, Scottish Index of Multiple Deprivation.

For Peer Review

Supporting Information

Diagnosis of Gestational Diabetes: a ‘Teachable Moment’

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Table S1. Participant responses to the baseline questionnaire

Item	N (%)
Negative affect,	
Increase	36 (61)
No change	16 (27)
Decrease	7 (12)
Anxiety	
Increase	43 (73)
No change	10 (17)
Decrease	6 (10)
Risk Perception	
Controlled	
Own	
Low/moderate risk	52 (90)
Quite/very high risk	6 (10)
Baby’s	

Low/moderate risk	51 (90)
Quite/very high risk	6 (11)
Uncontrolled	
Own	
Low/moderate risk	14 (24)
Quite/very high risk	44 (75)
Baby's	
Low/moderate risk	11 (19)
Quite/very high risk	47 (81)
Identity Salience	
Very important	36 (61)
Quite important	22 (37)
Not very important	1 (2)
Not important	0
Intention	
Strongly agree	50 (85)
Somewhat agree	3 (5)
Neutral	6 (10)
Disagree	5 (9)
Self-efficacy	
Strongly agree	40 (68)
Somewhat agree	14 (24)
Neutral	1 (2)
Disagree	5 (9)
Social Support	

Very support	45 (76)
Mostly supported	10 (17)
Sometimes supported	4 (7)
Never supported	0

Table 2. Participant responses to the follow-up questionnaire

Item	N (%)
GDM treatment,	
Diet alone	27 (46)
Oral medication	19 (32)
Insulin therapy	4 (7)
Followed diet plan	
Always	12 (24)
Mostly	31 (62)
Sometimes	6 (12)
Never	1 (2)
Eaten foods that should be avoided	
Always	1 (3)
Mostly	6 (16)
Sometimes	27 (73)
Never	3 (8)
Checked blood sugar as recommended	
Always	32 (64)
Mostly	17 (34)

Sometimes	1 (2)
Never	0
Metformin/insulin injections as directed	
Always	20 (87)
Mostly	2 (9)
Sometimes	1 (4)
Never	0
Forgotten/skipped GDM medication	
Always	1 (6)
Mostly	1 (6)
Sometimes	4 (24)
Never	11 (65)
