Barriers and system improvements for physical activity promotion after gestational diabetes: A qualitative exploration of the views of health care professionals.

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Barriers and system improvements for physical activity promotion after gestational diabetes: A qualitative exploration of the views of healthcare professionals

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Abstract

Aim: Physical activity is an important behaviour for managing the ten times increased risk of type 2 diabetes after gestational diabetes. Previous studies exploring physical activity promotion in healthcare focus on general practitioners but have not explored the gestational diabetes pathway. Therefore, this paper explores the barriers to and suggestions for, activity promotion along the gestational diabetes healthcare pathway.

Methods: The paper was written in accordance with the Standards for Reporting Qualitative Research. Patient and Public Involvement with women who had lived experiences of gestational diabetes informed purposeful sampling by identifying which healthcare professional roles should be targeted in participant recruitment. Participants were recruited through word-of-mouth, that is, email and connections with local healthcare service leads. Twelve participants took part in semi-structured one-to-one interviews, analysed using reflexive thematic analysis.

Results: Participants included a Public Health Midwife ($n=1$), Diabetes Midwifes ($n=3$), Diabetes Dietitian ($n=1$), Diabetes Consultants ($n=2$), Diabetes Specialist Nurse ($n=1$), general practitioners ($n=2$), Practice nurse ($n=1$) and a Dietitian from the UK National Diabetes Prevention Program ($n=1$). Six themes were generated: 'management of gestational diabetes takes precedent', 'poor continuity of care', 'lack of capacity to promote PA', 'beliefs about the acceptability of PA promotion', 'resources to support conversations about PA' and 'adapting healthcare services for women post-gestational diabetes'.

Conclusions: During pregnancy messaging around physical activity is consistent, yet this is specific for managing gestational diabetes and is not followed through postnatally. Improvements in continuity of care are necessary, in addition to ensuring the availability and links with wider exercise and activity schemes.

KEYWORDS

exercise, gestational diabetes mellitus, health promotion, healthcare professionals, maternal health, physical activity, type 2 diabetes mellitus

1 | BACKGROUND AND RATIONALE

Gestational Diabetes Mellitus (GDM) first appears in pregnancy and is a type of acute glucose intolerance.[1] The prevalence of GDM is steadily increasing, which in 2021 was estimated as 16.7% globally, and even higher in the UK at 20.6%.[2] Risk of Type 2 Diabetes Mellitus (T2DM), among other chronic conditions, is increased tenfold after a GDM diagnosis[3] and the UK's National Health Service (NHS) spends £14 billion annually on T2DM diagnosis and treatment.[4] Managing T2DM has also been reported as burdensome and has lasting impacts on people's mental health, making T2DM risk reduction a clinical priority.[5]

A combination of diet, physical activity (PA) and weight management can effectively reduce risk of T2DM, but data from the Nurses' Health Study II cohort suggest that PA may independently reduce risk of T2DM, even after adjusting for body mass index.[6] PA may also confer further physiological and psychological benefits for women after GDM, such as reducing cardiovascular disease risk.[7] PA promotion in women after GDM is therefore important and necessary.

Healthcare professionals (HCPs) are influential in the promotion of PA in healthcare settings, which can be effective when promoted at several points of contact.[8] Their importance in PA promotion for reducing risk of chronic conditions has also been acknowledged by the World Health Organisation.[9] HCP support has been highlighted as important for behaviour change and PA uptake for women after GDM.[10] However, approximately 72% of physicians do not promote PA in healthcare settings.[11] Barriers to effective PA promotion in healthcare settings result from a variety of factors including lack of time, skills, training and confidence to promote PA, or held biases and beliefs about patients' readiness to increase PA.[12] NICE guidelines recommend discussing PA in the context of health-related changes for future T2DM risk reduction ante- and postnatally with women who have had GDM.[13] It is therefore pertinent to investigate barriers to PA discussions specifically for HCPs along the GDM and post-GDM pathway, as these may differ for general primary care PA conversations.

A recent systematic review of PA promotion among HCPs included only five studies from the UK.[14] The studies included in this review explored general PA promotion and were not specific to women with (previous) GDM. Another recent systematic review highlighted only three studies examining HCP perspectives towards postnatal promotion of health-related behaviours.[15] After a GDM diagnosis in the UK, women are offered antenatal care pathways with significantly increased points of contact with HCPs otherwise not seen in a pregnancy without GDM, such as diabetes midwife support for managing blood glucose levels during pregnancy.[13] HCPs along this pathway could be integral in long-term PA promotion to reduce future T2DM risk, and exploration of the barriers and facilitators to PA promotion amongst these HCPs is warranted. A scoping review from 2023 also highlights a need, not only to identify barriers and facilitators but also to investigate how these might be addressed.[16] Therefore, the aim of this study is to understand the views of HCPs in the UK regarding reducing risk of T2DM through PA, and how to better promote PA in women after GDM. Research questions were:

1. What are the barriers and facilitators to PA promotion after GDM in the UK according to HCPs working with women who have or have had GDM?
2. What do HCPs working with women who have or have had GDM in the UK think would improve uptake of PA after GDM?

What's new?

What is already known?

Healthcare professionals have an important role in the promotion of physical activity. After gestational diabetes, women should be informed and supported to engage in regular physical activity.

What this study has found?

While healthcare professionals in contact with women with gestational diabetes antenatally discuss physical activity for pregnancy-specific blood glucose management, discussions of postnatal activity and health-related behaviours are not prioritised. Healthcare professionals in contact with women after gestational diabetes postnatally may be unaware of previous diagnosis and less likely to follow up or discuss activity.

What are the implications of the study?

Intervention is needed to improve continuity of care and support for women after gestational diabetes to engage in regular physical activity.

2 | METHODS

This paper was written in accordance with the Standards for Reporting Qualitative Research (SRQR).[17] NHS ethical approval (IRAS Project ID: 312509) was obtained as part

of a previously published study which included the views of women who have had GDM.[18]

2.1 | The researchers and context

The lead author, EI, is a PhD student with a background in sports science. She holds a master's in nutrition and is a registered nutritionist with the Association for Nutrition. This study has formed part of her PhD thesis. She has further experience with both quantitative and qualitative research methods. HH, CH and AP are supervisors of the lead author. HH and CH are experienced qualitative researchers and public health practitioners with qualifications in exercise and health psychology. The authors all identify as women, have never had GDM themselves and are not HCPs. The views captured by participants were taken to represent their own reality and experience, even where, as authors, we may not have agreed with their views or opinions.

2.2 | Lived experience advisory group

A lived experience advisory group consisting of seven women based across England with previous GDM worked with the study team to identify key HCPs to interview in this study (Figure 1). Members of the advisory group had diverse experiences of GDM and were recruited through social media, word of mouth and links with a Diabetes UK support group. The advisory group aided the conceptualisation of this study and identified key questions to include in the interview schedule (see Data S1) through one-to-one meeting with the lead researcher (EI).

On reflection, the inclusion of the advisory group in this work was valuable, as it helped guide the work in a practical and realistic context. Maintaining contact with the advisory group was relatively straightforward through bi-annual email updates throughout the duration of the lead authors PhD. For this study, members of the group were emailed and those who were able to contribute did so in a manner most convenient to them, for example, over the phone, online or email feedback. The flexibility aided involvement and meant the women in the advisory group were less burdened to participate and were all enthusiastic to contribute.

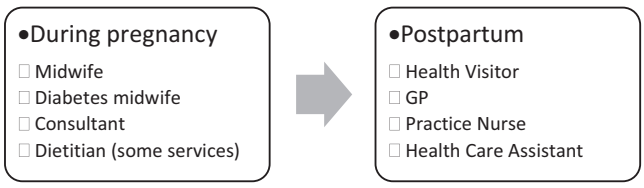

FIGURE 1 Important HCPs as identified through discussions with the advisory group over the course of pregnancy to the postpartum period. GP, general practitioner; UK, United Kingdom.

2.3 | Sampling and recruitment

The recruitment aim was to interview at least one and a maximum of three HCPs in each professional job role (Figure 1), to capture the diverse opinions of a range of HCPs, whilst ensuring a manageable sample size for a single PhD researcher. Potential participants were recruited via email and social media adverts. NHS service leads for specific HCP groups were also contacted and asked to forward the study poster and information to relevant colleagues. Participants were not reimbursed for their time.

2.4 | Data collection

Individual semi-structured interviews were conducted by EI. Four main topics were explored in interviews, including (a) attitudes and beliefs about PA, (b) perceptions of the barriers and facilitators to PA women who have had GDM may face, (c) opinions and experiences for improving uptake of physical activity and (d) where resources would best be targeted (see Data S1 for a more detailed interview schedule). Interviews took place in the UK from March to September 2023. Participants were eligible for the study if they could communicate and understand English and were an HCP with interest or experience working with women during or after GDM. As per participants' preferences, interviews were conducted online via Zoom (Zoom Video Communications Inc., USA) ($n=9$), face-to-face ($n=2$) or over the phone ($n=1$). Interviews were audio recorded and a transcription company transcribed password-protected audio files.

Prior to the start of the interviews, written informed consent was obtained. General Data Protection Regulations (GDPR) as outlined by the Data Protection Act 2018 were followed for all handling of personal information. Participants' names and contact details were kept in a separate password-protected file. None of the audio files nor transcripts contained any identifiable data. Participants were only referred to on transcripts and reported here through a unique participant number.

2.5 | Analysis

Transcripts were uploaded to the qualitative data analysis software NVivo 12 (Lumivero, Denver, USA). Reflexive thematic analysis was conducted.[19] Stages of analysis included familiarisation, initial open coding, theme generation,

reflection and reviewing themes, defining, and writing up the themes.[19] Open coding was used to generate themes inductively by EI for all transcripts. CH and HH independently read and coded a random sample of three transcripts each. These initial codes and preliminary themes were discussed in iterative theme refinement meetings with EI, CH and HH. Discussion over several rounds aided researcher reflexivity regarding possible biases and the exploration of different potential interpretations of the data.[20] Preliminary theme names were changed and altered throughout these iterative rounds of refinement, with final theme names decided based on what would 'best fit' these data, once all authors were content with the organisation of the data.

3 | RESULTS

3.1 | Participant characteristics

Fourteen participants indicated an interest in the study with 12 proceeding to take part in an interview. These included a Public Health Midwife ($n=1$), Diabetes Midwife ($n=3$), Diabetes Dietitian ($n=1$), Diabetes Consultant ($n=2$), Diabetes Specialist Nurse ($n=1$), GP ($n=2$), Practice nurse ($n=1$) and a Dietitian from "Healthier You", and the UK National Diabetes Prevention Program (NDPP) ($n=1$). Table 1 includes the participant number aligning with their profession. Participants were based in different trusts across England, including from the counties of South Yorkshire ($n=6$), and then one each based in Derbyshire, Wiltshire, Oxfordshire, Yorkshire, North Yorkshire and Somerset. These details are not included in Table 1 to protect participant anonymity. Despite repeated efforts, Health Care Assistants and Health Visitors were not recruited. Interviews lasted on average 38 min (range: 24–54 min).

TABLE 1 Representation of each participant number and analogous role along the pathway for women who have or have had gestational diabetes.

Participant number	Profession
P1	Clinical Team Manager (NDPP & Tier 2)
P2	Diabetes Specialist Midwife
P3	Consultant Obstetrician
P4	Diabetes Dietitian
P5	Public Health Specialist Midwife (leads a team of healthcare advisors)
P6	Practice Nurse
P7	Consultant in endocrinology, diabetes and gestational diabetes
P9	Diabetes Lead Midwife
P10	Diabetes Midwife
P12	Diabetes Nurse
P13	GP
P15	GP

Note: Participants who agreed to participate and then withdrew from the study prior to interview are not included here. P#, indicates the participant number.

Abbreviations: GP, general practitioner; NDPP, National Diabetes Prevention Program.

3.2 | Main themes

Six themes were generated: 'management of GDM takes precedent', 'poor continuity of care', 'lack of capacity to promote PA', 'beliefs about the acceptability of PA promotion', 'resources to support conversations about PA' and 'adapting healthcare services for women post-GDM'. These are described in further detail below, with relevant quotes.

3.3 | Management of GDM takes precedent

Participants reported that they consistently encouraged PA during the antenatal period, primarily to manage blood glucose:

> whenever we saw the patient, we would always bring in activity as an alternative way to help reduce glucose levels, so I'd constantly be saying, after a meal they should be going for a walk, etc., just to try and avoid these postprandial spikes.
>
> (P12)

There was still recognition that acknowledging and discussing future T2DM were important in pregnancy, but participants reported a greater focus on immediate management of GDM:

> we don't think about, we're not thinking about what happens when baby comes. Because right now you've got high glucose levels and we need them to come down, so we only focus on what's happening right now.
>
> (P4)

Participants also felt that a pregnancy with GDM was not like a pregnancy without GDM and recognised that women would have a lot of information to take on board during pregnancy:

> it's quite difficult when you look at the grand scheme of things and the things that they

> have to go through in pregnancy... I personally feel that they are quite overwhelmed at the time to take all this advice and to change all of these things up.
>
> (P7)

Overall, the management of GDM was more pressing for participants and was emphasised more than future T2DM risk.

3.4 | Poor continuity of care

Participants described challenges associated with continuity of care which were considered to result from reduced funding and lack of quality of care for postpartum women:

> Postnatal care is very lacking... once you've had the baby you're on your own.
>
> (P2)

> Maternity services generally from when I started to now are much thinner and stretch much further.
>
> (P5)

Procedural challenges specific to women after GDM were discussed, such as that women after GDM were often 'lost' after birth, due to factors impacting the ability of primary care to follow up women postnatally:

> We put on their discharge letter that they need a follow-up with the GP.
>
> (P3)

> If it's not really been highlighted very clearly on any paperwork from antenatal clinic or from antiseptics... I might not notice it.
>
> (P13)

Where postnatal follow-up was impacted, participants recognised this would further reduce contact points to discuss PA, for example, annual screening and referral to the NDPP, and highlighted further challenges specifically about primary care:

> It's reliant on how much the woman's going to engage and how much the GP is willing to engage... it's already hard enough trying to get a GP appointment.
>
> (P10)

In discussing postnatal opportunities, many participants were not aware of schemes women after GDM could be eligible for, while one participant recognised existing resources that should be used where appropriate for support:

> I would have to look in to see if there's dedicated post-GDM groups but certainly weight management services and [local exercise referral program name] exercise referrals, you can refer anyone in who's over a BMI of 25... a lot of people do meet the criteria there.
>
> (P15)

Overall, participants described challenges in continuing care after birth which reduced contact points postnatally and resulted in fewer opportunities to provide support for T2DM risk after pregnancy.

3.5 | Lack of capacity to promote PA

All participants described heavy caseloads, feeling overworked and not having the time to address PA in appointments:

> I'm really struggling with my workload at the moment, so there's no way that I could [address PA conversations]... from 250 [cases of GDM] a year in 2017, to 553 last year. The numbers [of women with GDM] have just gone up and up.
>
> (P9)

Participants emphasised that PA was not on the top of their agenda, with other matters taking priority:

> I would say there's a lot of barriers to being able to have that conversation... activity is definitely important. But you've got to almost cherry pick... it's important but there's other things... it really does depend what the focus of the conversation is.
>
> (P4)

Participants also did not feel adequately trained or prepared to have conversations to support behaviour change in the event that patients raised barriers to PA:

> try to always mention it but I feel like there's often barriers when you start bringing up everything... So I find discussions about physical activity tricky.
>
> (P6)

There was a common perception that dedicated HCPs, or other roles in the wider healthcare system would be better placed to have PA conversations with women after GDM:

> Social prescribers [non-HCPs] are really well placed... they have the time. We have 10-minute appointments, they have 30-minute appointments, and they're placed to speak about things like day-to-day lifestyle things, such as finances, physical exercise, weight loss and social pressures... it's a GP or nurse-led referral.
>
> (P15)

Overall, participants did not feel it was solely their role to support PA after pregnancy, either due to their own large caseloads, without enough time in appointments to address this in addition to not feeling adequately trained to do so.

3.6 | Beliefs about the acceptability of PA promotion

Participants' explicit or implicit personal beliefs and values regarding PA appeared to impact their perceptions of their ability and willingness to promote PA with women during or after GDM. For example, where participants felt PA discussions were not appropriate, or potentially insensitive and polarising, they did not want to have these discussions:

> Postnatally as well when they're also very hormonal and struggling to try and maybe regain their body image and things, it's a very difficult line to know when's the right time to talk about it [PA].
>
> (P9)

> I feel like it never goes down that well when I'm like, you could think about doing some exercise... you don't want to ruin the relationship you're building with someone by waffling on about exercise if you know that they're sat there thinking, you silly woman, I don't have time to exercise.
>
> (P2)

Some participants recognised complex barriers to PA and the need to support women to overcome them, while others felt that accessing PA was simple:

> there are some women who physically, we have to make it [PA] a little bit easier...
>
> (P10)

> Nobody needs anywhere to be able to access activity; you just need a pair of shoes and to be able to go outside.
>
> (P13)

All participants recognised the need to empower women to be more physically active but had different perceptions of how to best promote PA:

> even housework or some women just dancing to some music at home, something as simple as that. Just getting them moving is better than them not doing anything.
>
> (P1)

Overall, some participants recognised the importance of PA promotion postnatally however, feeling unable to support this and the uncertainty on how this may be received by their patients acted a as barrier.

3.7 | Resources to support conversations about PA

Some participants highlighted the value of specific behaviour change techniques and strategies including motivational interviewing, reminders, prompts and SMART goals:

> just trying to get those SMART goals in place... tailoring it around them... making it realistic... set a to-do list, reminders for exercise... if a patient's not walking at all, I might start them off 10 minutes every other day.
>
> (P1)

Others emphasised the importance of a compassionate approach to PA conversations:

> I don't think any doctor really, any clinician wants to blame their patients, but we use certain languages without realising... I think, yes, in terms of upskilling clinicians... There's online resources, there's specific interactive programmes set up now to basically upskill professionals about this [compassionate approach].
>
> (P15)

Some participants discussed the use of the Chief Medical Officer's PA guidelines or other trust-specific templates to aid and guide PA conversations, to frame and provide information to encourage PA while still building and adapting these to their patient's needs:

> The recommendations are 150 minutes over a week. I say, actually we'd recommend at least, doing a bit more than that, if you can.
>
> (P10)

> lots of GP practices have templates that they use when doing postnatal checks and discussion about activity with a history of GDM, something that's useful in there... I don't know because I don't tend to use the template.
>
> (P13)

Giving women after GDM written information, in addition to having conversations about PA and explaining why being active was beneficial, was thought to be valuable:

> I explain about the muscles and how about the cells and things like that work. Very briefly, but just so they have an idea why I'm asking them to do something. People are much more likely to do something if you say to them, why I want you to do it...
>
> (P10)

Participants also highlighted the usefulness of subsidised resources they could direct women after GDM to, for example, postnatal exercise classes or council-led PA opportunities:

> I think the tricky thing is it has to be something that women can bring their babies to because, you know. A simple thing, it could just be meeting up in the park for a walk, couldn't it, a lot of women want to do that, it would be nice to have things to signpost women to.
>
> (P3)

> They [antenatal and postpartum specific physical activity program name] have loads and loads of things going on every week, it changes, so they'll have like park walks or baby yoga or aqua-natal swimming... you can do whatever, as much or as little as you want... the classes, yeah, they're subsidised [by the council], so there's a lot of free things or it'll be like 50p.
>
> (P9)

Overall, resources to support conversations about PA were both related to the training of HCPs, the use of educational and written materials in addition to the availability of community-based PA.

3.8 | Adapting healthcare services for women post-GDM

Participants highlighted that opportunities already exist where HCPs have contact points with women with previous GDM. They felt that these opportunities needed to be capitalised on, by making use of these contact points to embed post-GDM care. For example, through using GP surgeries and combining appointments with other routine appointments:

> so many opportunities we are seeing postnatal women and yet we're not engaging... they're going to a GP surgery anyway because they're going to have their babies' vaccinations at 12 weeks, so they could do a double appointment. We've got to make things easier for people to engage with us.
>
> (P10)

However, some participants recognised that primary care may not have the resources to manage women after GDM, and instead highlighted that other community-based opportunities would be good contact points for support and PA promotion:

> They [children centres] had toddler groups, baby groups, health visitors...they were free at point of access... And then with the austerity they all got cut... they'd [trained adviser] have said shall we do a little buggy fit on a Thursday morning, well it's a really nice day so let's have a little, stick it out on social media, everyone's having a little bit of a, a little spring walk round the park and that's really nice.
>
> (P5)

Participants also felt that improving uptake of the NDPP could improve PA engagement for women after GDM. Some participants suggested allowing the antenatal team to directly refer to the NDPP:

> our uptake of the DPP, I think, in [location] is quite poor... but because the GPs have to refer, it can't be a midwife at the moment, that's where I think it falls down... I told this to the DPP link guy ages ago, that this was the barrier... and I said, why can't I refer ladies because I've seen them all the way, and he said, no, at the moment it has to be their GP.
>
> (P9)

However, participants also recognised that the NDPP may not be well suited to women after GDM in its current

format. There were suggestions that the programme and any related PA opportunities may need to be more flexible and adapted to this group of women:

> I don't know how successful the DPP is... I'm not sure what the dropout rate is... especially when they've got a baby, you're busy.
>
> (P9)

Overall, participants recognised a need to change healthcare services to make them more accessible and better suited for supporting women who have had GDM.

4 | DISCUSSION

This study aimed to explore perspectives of HCPs working with women during or after GDM, on PA promotion. Poor continuity of care and role-based restrictions limited HCP's ability to support PA postnatally. HCPs felt that important opportunities to encourage PA postnatally are being missed, for example, capitalising on the NDPP. Additionally, the need for external and specialist PA programmes, and the usefulness of specifically dedicated professionals such as social prescribers was emphasised.

Participants working with women antenatally were consistent in the PA messages delivered, such as encouraging walking after meals. Short post-meal walks have recently been suggested as a viable way to manage GDM,[21] with the sooner these are initiated after a meal, the better the blood glucose responses.[22] While participants discussed encouraging PA in this context with their patients, they were less consistent in discussing PA over the longer term. This has important implications, especially as the prescriptive nature of encouraging post-meal walks for blood glucose regulation may not be helpful for promoting PA longevity. Additionally, the American Diabetes Association and UK CMO guidance that recommends 150 min per week of PA is important for reducing risk of T2DM,[23] with further evidence suggesting this should be moderate intensity, or 75 min vigorous-intensity PA per week.[24] Given that women also feel unsupported for PA postnatally,[25] there is still the need to capture and support women after GDM, to encourage sustained PA and other health-related behaviours, to reduce risk of T2DM.

Despite the need for continued postnatal support for women after GDM, this study identified poor continuity of care and role-based restrictions as important barriers to supporting and promoting PA postnatally. Participants suggested the loss of women after GDM at primary care follow-up was likely the result of a general lack of funding for maternal health. Discussions surrounded the overreliance on GPs, who participants felt may not be best suited to follow up after birth, yet antenatal teams were no longer responsible for women postnatally and did not have the time and resources to follow up. There is a reliance on GPs to support women after GDM and refer them to further resources, for example, the NDPP.[26] This could be problematic, given that 19% of GPs find it difficult to know whether a woman has had GDM,[27] and the current demand on GPs. Allowing the antenatal team to make referrals to the NDPP could improve uptake of the NDPP and subsequently support health-related changes including being more active. Future research should further evaluate why women are being 'lost' at follow-up or in primary care and explore this suggestion of allowing the antenatal team to refer to the NDPP to understand if it is feasible.

In this study, HCPs had varying personal beliefs around PA, which impacted the way they approached and encouraged PA promotion. Participants discussed several techniques to encourage PA, including motivational interviewing or implementing a compassionate approach. Weight-management services have recently began employing a compassionate approach,[28] as a means of reducing stigma and judgement.[29] This is important for women after GDM, who have previously echoed feeling judged.[30] Training HCPs engaged in GDM-related care to take a compassionate and non-judgmental approach to the promotion of health-related changes may also be important for reducing the impact of HCPs internally held biases and stereotypes, on PA promotion and women's subsequent PA engagement. Embedding these recommendations into routine care could further limit bias and help equip HCPs to comfortably deliver PA support to women with prior GDM.

The need for dedicated PA or exercise schemes and the suggestion of having an individual in a dedicated role to support women after GDM was important. For example, participants suggested that this could include exercise specialists, healthcare assistants and/or social prescribers. Specifically, social prescribers were discussed most often and the HCPs discussing these felt they would be the best solution to embedding PA into primary care. Social prescribing is based on healthcare systems but further involves professionals that are not accredited HCPs in longer, dedicated appointments to improve people's health and well-being, through connecting them to their local communities and resources.[31] Social prescribing is suggested to be important for behaviour change,[32] benefiting both individuals and healthcare services by directing to community resources.[33] Connecting women to community resources may also be more helpful than promoting PA solely to them as individuals during appointments.[18] Participants also highlighted several exercise-referral schemes they believed women after GDM could be eligible for that may not currently be utilised. For example, women who have had GDM may be eligible for some

exercise-referral schemes, as they may meet some eligibility criteria.[34] However, despite the potential benefits of social prescribing and exercise referral, there are several 'teething issues' in their application.[35] Therefore, the implementation and funding of such scheme in post-GDM contexts requires further investigation.

4.1 | Strengths and limitations

While there are both strengths and limitations associated with virtual interviews, in line with other's experiences, the study authors perceived remote interviews to offer the same quality as face-to-face interviews.[36] The flexibility aided engagement in the interviews and HCPs felt it was easier to attend, given their busy caseloads. Furthermore, a range of HCPs were interviewed across the UK. While this wider context and understanding was helpful, it may have limited understanding of how pathways act within one specific area or NHS trust.

The variety of roles of HCPs recruited were based on the experiences and perspectives of the advisory group. The focus of the study was therefore more applicable and relevant to women with lived experience of GDM in the UK.[37] The issues identified and topics discussed were also guided by the advisory group, which allowed for investigation of issues that the researchers were not initially aware of or intended to target. However, members of the advisory group may not have been aware of other professionals who may be appropriate for PA promotion. For example, HCPs interviewed discussed social prescribers, whose views may be valuable to explore in future research.

The work may have been limited where health visitors and healthcare assistants were not recruited and did not contribute to the results. These are key professionals who may have contact with women after GDM, who could have provided useful insights into the promotion of PA. Future work should aim to explore more HCP and non-HCP roles, for example, social prescribers, health visitors, healthcare assistants, etc., to understand how to best support PA after GDM.

5 | CONCLUSIONS

Overall, HCPs in this study recognised the need to promote PA during pregnancy. Postnatally, HCPs were apprehensive to encourage PA because of a lack of time and guidance for how and what PA to promote, in addition to perceiving PA conversations would not be well-received. HCPs also felt that postnatal PA promotion was beyond the scope of their role. Better postnatal maternal health funding and continuity of care is necessary, to improve points of contact and opportunities for PA discussion with women after GDM. The presence of exercise-referral schemes and funding professionals, such as social prescribers, to have PA-based conversations with women after GDM is also important for PA engagement.

AUTHOR CONTRIBUTIONS

All authors were involved in the discussion of, and formulation of the research questions addressed. EI performed the one-to-one interviews and data collection. Analysis plans and results were discussed and decided by all authors. HH and EI did the initial coding, with themes generated iteratively in team meetings with CH. EI prepared the original draft manuscript. All authors read, edited and approved the final manuscript. HH, CH and AP are the lead author's (EI) supervisors and aided the whole process.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are not available on request due to privacy or ethical reasons.

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REFERENCES

1. WHO. Diagnostic criteria and classification of hyperglycaemia first detected in pregnancy: a World Health Organization guideline. *Diabetes Res Clin Pract*. 2014;341–63:341-363. doi:10.1016/j.diabres.2013.10.012
2. IDF. *United Kingdom diabetes report 2000–2045. 10th ed. IDF Diabetes Atlas*. 2021. https://diabetesatlas.org/data/en/country/209/gb.html
3. Vounzoulaki E, Khunti K, Abner SC, Tan BK, Davies MJ, Gillies CL. Progression to type 2 diabetes in women with a known history of gestational diabetes: systematic review and meta-analysis. *BMJ (Clinical research ed.)*. 2020;369:m1361. https://doi.org/10.1136/bmj.m1361
4. DIABETES UK. 2023. *Cost of diabetes*. Cost of Diabetes Guides and Information. https://www.diabetes.co.uk/cost-of-diabetes.html

5. Ayman G et al. The top ten research priorities in diabetes and pregnancy according to women, support networks and healthcare professionals. *Diabet Med*. 2021;00:14588.
6. Bao W, Tobias DK, Bowers K, et al. Physical activity and sedentary behaviors associated with risk of progression from gestational diabetes mellitus to type 2 diabetes mellitus: a prospective cohort study. *JAMA Intern Med*. 2014;174:1047-1055.
7. Harreiter J, Dovjak G, Kautzky-Willer A. Gestational diabetes mellitus and cardiovascular risk after pregnancy. *Womens Health (Lond)*. 2014;10:91-108.
8. Keyworth C, Epton T, Goldthorpe J, Calam R, Armitage CJ. Are healthcare professionals delivering opportunistic behaviour change interventions? A multi-professional survey of engagement with public health policy. *Implement Sci*. 2018;13:1-9.
9. WHO. *Global action plan for the prevention and control of noncommunicable diseases 2013–2020*. World Health Organization. 2013. https://apps.who.int/iris/bitstream/10665/94384/1/9789241506236_eng.pdf
10. Ioannou E, Humphreys H, Homer C, Purvis A. Systematic review and thematic synthesis of the barriers and facilitators to physical activity for women after gestational diabetes: a socio-ecological approach. *Br J Diab*. 2023;23:2-13.
11. Chatterjee R, Chapman T, Brannan MGT, Varney J. GPs' knowledge, use, and confidence in national physical activity and health guidelines and tools: a questionnaire-based survey of general practice in England. *Br J Gen Pract*. 2017;67:e668-e675.
12. Nelson PA, Kane K, Chisholm A, et al. 'I should have taken that further' - missed opportunities during cardiovascular risk assessment in patients with psoriasis in UK primary care settings: a mixed-methods study. *Health Expect*. 2016;19:1121-1137.
13. NICE. *Diabetes in pregnancy: management from preconception to the postnatal period*. NICE Guideline. 2015. https://www.nice.org.uk/Guidance/NG3
14. Albert FA, Crowe MJ, Malau-Aduli AEO, Malau-Aduli BS. Physical activity promotion: a systematic review of the perceptions of healthcare professionals. *Int J Environ Res Public Health*. 2020;17:1-36.
15. Makama M, Awoke MA, Skouteris H, Moran LJ, Lim S. Barriers and facilitators to a healthy lifestyle in postpartum women: a systematic review of qualitative and quantitative studies in postpartum women and healthcare providers. *Obes Rev*. 2021;22:e13167.
16. Woodhead G, Sivaramakrishnan D, Baker G. Promoting physical activity to patients: a scoping review of the perceptions of doctors in the United Kingdom. *Syst Rev*. 2023;12:104.
17. O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting qualitative research: a synthesis of recommendations. *Acad Med*. 2014;89:1245-1251.
18. Ioannou E, Humphreys H, Homer C, Purvis A. Beyond the individual: socio-ecological factors impacting activity after gestational diabetes mellitus. *Diabet Med*. 2024;41(6):e15286.
19. Braun V, Clarke V. Reflecting on reflexive thematic analysis. *Qualit Res Sport, Exer Health*. 2019;11:589-597. doi:10.1080/2159676X.2019.1628806
20. Adler RH. Trustworthiness in qualitative research. *J Hum Lact*. 2022;38:598-602.
21. Christie HE, Chang CR, Jardine IR, Francois ME. Three short postmeal walks as an alternate therapy to continuous walking for women with gestational diabetes. *Appl Physiol Nutr Metab*. 2022;47:1031-1037.
22. Engeroff T, Groneberg DA, Wilke J. After dinner rest a while, after supper walk a mile? A systematic review with meta-analysis on the acute postprandial glycemic response to exercise before and after meal ingestion in healthy subjects and patients with impaired glucose tolerance. *Sports Med*. 2023;53:849-869.
23. Colberg SR, Sigal RJ, Yardley JE, et al. Physical activity/exercise and diabetes: a position statement of the American Diabetes Association. *Diabetes Care*. 2016;39:2065-2079.
24. Yang J, Qian F, Chavarro JE, et al. Modifiable risk factors and long term risk of type 2 diabetes among individuals with a history of gestational diabetes mellitus: prospective cohort study. *BMJ (Clinical research ed.)*. 2022;378:e070312. https://doi.org/10.1136/bmj-2022-070312
25. Dennison RA, Griffin SJ, Usher-Smith JA, Fox RA, Aiken CE, Meek CL. 'Post-GDM support would be really good for mothers': a qualitative interview study exploring how to support a healthy diet and physical activity after gestational diabetes. *PLoS One*. 2022;17:e0262852.
26. Bernstein JA, Quinn E, Ameli O, et al. Follow-up after gestational diabetes: a fixable gap in women's preventive healthcare. *BMJ Open Diabetes Res Care*. 2017;5:e000445.
27. Pierce M, Modder J, Mortagy I, Springett A, Hughes H, Baldeweg S. Missed opportunities for diabetes prevention: postpregnancy follow-up of women with gestational diabetes mellitus in England. *Br J Gen Pract*. 2011;61:e611-e619.
28. City of Doncaster Council. *Doncaster's compassionate approach. Compassionate Approach to Health Wellbeing*. 2023. https://www.doncaster.gov.uk/services/health-wellbeing/doncaster-s-compassionate-approach
29. Duarte C, Gilbert P, Stalker C, et al. Effect of adding a compassion-focused intervention on emotion, eating and weight outcomes in a commercial weight management programme. *J Health Psychol*. 2021;26:1700-1715.
30. Davidsen E, Maindal HT, Rod MH, et al. The stigma associated with gestational diabetes mellitus: a scoping review. *EClinicalMedicine*. 2022;52:101614.
31. NHS Health Education England. Social Prescribing at a Glance (Issue March). 2016 https://www.hee.nhs.uk/sites/default/files/documents/SocialPrescribingataglance.pdf
32. Cunningham KB, Rogowsky RH, Carstairs SA, Sullivan F, Ozakinci G. Social prescribing and behaviour change: proposal of a new behaviour change technique concerning the 'connection' step. *Health Psychol Behav Med*. 2022;10:121-123.
33. Drinkwater C, Wildman J, Moffatt S. Social prescribing. *BMJ*. 2019;364:l1285.
34. Rahnemaei FA, Abdi F, Kazemian E, Shaterian N, Shaterian N, Behesht Aeen F. Association between body mass index in the first half of pregnancy and gestational diabetes: a systematic review. *SAGE Open Med*. 2022;10:2050312 12211099.
35. Porter B, Wood C, Belderson P, et al. We care but we're not carers: perceptions and experiences of social prescribing in a UK national community organisation. *Perspect Public Health*. 2023. doi:10.1177/17579139231185004
36. Johnson DR, Scheitle CP, Ecklund EH. Beyond the in-person interview? How interview quality varies across in-person, telephone, and skype interviews. *Soc Sci Comput Rev*. 2019;39(6):1142-1158. doi:10.1177/0894439319893612

37. Brett J, Staniszewska S, Mockford C, et al. A systematic review of the impact of patient and public involvement on service users, researchers and communities. *Patient*. 2014;7:387-395.

SUPPORTING INFORMATION

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

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