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Diet and physical activity in pregnancy: A qualitative study exploring Women's beliefs and behaviours

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Abstract

Being obese or gaining excessive weight during pregnancy can increase health risks for mother and baby. Adopting a healthy lifestyle (healthy diet and increasing physical activity) reduces these risks and has long term health benefits for women. Despite this, women do not always maintain a healthy lifestyle during pregnancy. This study aimed to explore the barriers and facilitators to maintaining a healthy lifestyle during pregnancy for a diverse group of women

12 women participated in semi-structured qualitative interviews, underpinned by the theory of planned behaviour. They were audio recorded, transcribed verbatim then subject to deductive thematic analysis.

Four themes emerged; women's knowledge of a healthy lifestyle, sociocultural influences, physical health and health professional support. These influenced women's intentions and actual behaviours during pregnancy. Enhanced health professional advice may motivate women to adopt a healthy lifestyle during pregnancy. This could be through novel means such as using health technology.

There is no conflict of interest by either author

Keywords: pregnant women; theory of planned behaviour; healthy diet; physical activity, obesity

Key points

- In the UK, there are increasing numbers of women who are overweight and obese
- Previous research has not considered the barriers and facilitator to a healthy lifestyle for women with differing BMIs and from different socio cultural backgrounds
- This study found that barriers and facilitators appear to be different for women from cultural backgrounds but more research is needed to support this.
- Support from health professionals was considered an important facilitator through either face to face contact or developing an evidence based mobile application around healthy lifestyle in pregnancy.

Background

In the UK, 46% of women of childbearing age are reported to be overweight or obese (NHS Digital 2015). Being obese or gaining excessive weight during pregnancy can increase the risks of maternal and neonatal morbidity and mortality (Lewis 2007). Evidence demonstrates that a healthy diet and increased physical activity levels in pregnancy reduces excessive gestational weight gain (Choi et al 2013, Muktabhant et al 2015). This in turn reduces the risk of adverse pregnancy outcomes and long term health complications (Thangaratnam et al 2012, Reiner et al 2013).

The UK recommends using the Eatwell guide (Public Health England 2016) to maintain a healthy diet and for adults to undertake 30 minutes of moderate intensity physical activity daily, which slightly raises the heart rate but the adult can still talk (Department of Health 2011). However, evidence suggests that pregnant women do not always maintain a healthy diet

(Crozier et al 2009, Reyes et al 2013) and/or perform the recommended amount of physical activity (Sui, Turnbull and Dodd 2013, Denison et al 2015). Women are not always aware of the health benefits (Crozier et al 2009, Sui, Turnbull and Dodd 2013, Denison et al 2015) and advice from health professionals can be inconsistent and lack detail (Brown and Avery, 2012, Ferrari et al 2013).

Previous research has focused on examining either a healthy diet or physical activity with pregnant women separately rather than the combining both to examine a healthy lifestyle. Research which has combined the two aspects has targeted women with a raised body mass index (BMI) (Choi, Fukuoka and Lee 2013) rather than women within a normal weight range who need to avoid excessive weight gain in pregnancy. In addition, little evidence could be found exploring perceptions of pregnant women from different black, Asian and minority ethnic groups (BAME) despite the evidence showing that sociocultural beliefs about a healthy lifestyle can influence obesity levels (Álvarez et al 2013, El-Sayed et al 2012, James et al 2006, Safford et al 2010). Consequently, this study aimed to explore the barriers and facilitators to maintaining a healthy lifestyle during pregnancy for a diverse group of women. Diversity included women with a normal as well as raised BMI and women from different BAME groups. The objectives were:

1. To explore the knowledge and beliefs of a diverse group of women regarding healthy lifestyle in pregnancy.
2. To understand sociocultural influences regarding healthy diet and physical activity during pregnancy.
3. To explore women's intended and actual behaviour regarding healthy lifestyle in pregnancy.

Methods

The theory of planned behaviour (TPB) was used to underpin this study. This is a psychological theoretical framework that links barriers and facilitators to behaviour change with beliefs about the behaviour (behavioural, normative and control beliefs) (Aizen 2006). We examined the three elements that influence beliefs and therefore predict behaviour; women's attitudes, subjective norms and perceived behaviour (see table 1). We explored perceived barriers and facilitators to women adopting a healthy lifestyle in pregnancy and mapped them against these three elements in order to understand how any barriers can be addressed.

The research was conducted in a multicultural city in Northern England, comprising of 63.9% White British, 20.3% Pakistani, and 15.8% other ethnic backgrounds. This city has a high level of deprivation with a lower life expectancy in comparison to other areas in England.

The study focused on women attending the maternity unit for their 26 week glucose tolerance test (GTT) appointment. This is offered to all women in the city to monitor for gestational diabetes and women who attend have been found to be representative of the general population (Wright et al 2012). The inclusion criteria were women aged over 16, with an ongoing low risk pregnancy and a good understanding of written and verbal English. Women with medical conditions were excluded. Stratified sampling was undertaken based on social and ethnic background and BMI to ensure maximum variation, representing the local population.

Ethical approval was granted by HRA Yorkshire and the Humber and Leeds West ethics committee 11th November 2016 Ref 16/YH/0328

Data collection and analysis

An interview schedule underpinned by the TPB was constructed. This examined possible barriers and facilitator which could influence a woman's knowledge, attitudes and behaviour towards a healthy lifestyle during pregnancy (see table 2). Following gaining informed consent,

semi-structured interviews were undertaken in a private room during the two hour period of the GTT appointment where women had been given a sugary drink and were waiting for the subsequent blood test.

The interviews were audio recorded and transcribed verbatim by the researcher. Deductive thematic analysis was undertaken (Attride-Stirling 2001) using the theoretical assumptions of the TPB to drive the coding and theme development. This ensured the themes focused specifically on the barriers and facilitators rather than the overall data collected (Braun & Clarke, 2006) but also provided flexibility for the themes to be broader than the concepts in the model. To ensure credibility of the process, coding and themes were checked by the researcher's academic supervisor.

Findings

Twelve women were interviewed between December 2016 and May 2017 of these women, four were British, four from a Pakistani background and four Polish. The women's ages ranged from 22-36. Five women had a normal BMI, two women were overweight and five obese. Half of the women lived within the most deprived areas in the UK (Department for Communities and Local Government 2015). However, interestingly, half the women appear to have been educated beyond the age of 16 with four having University degrees (see table 3).

Four themes were developed from the data reflecting women's perceived barriers and facilitators which fit into the TPB framework (see table 4); knowledge of healthy lifestyle, sociocultural influences, physical health and health professional support.

Knowledge of a healthy lifestyle

Women's knowledge of a healthy diet was limited with half of the women not having heard of the Eatwell guide and a further five women having limited knowledge of the detail of this. Only one woman was knowledgeable of the guide and healthy eating in pregnancy. Despite this, nine women felt their diet pre-pregnancy was similar to the Eatwell guide.

"I try eat some vegetables, some fruits, urm some milk or yeah, I think, so it's not bad how I am eating" (P010)

Most women perceived healthy diet in pregnancy to be important for their health and their baby but there was a limited understanding of why. One obese Pakistani woman believed healthy eating would develop her baby's good eating habits:

"I believe what you eat will build up on the taste buds of my baby.....I want my baby to be healthy" (P007)

Despite believing a healthy diet in pregnancy is important half the women lacked fruit and vegetables in their diet and two had too much fatty and sugary food.

Knowledge of physical activity was also limited with eight women understanding this was related to moving around but being unable to accurately recall the recommended levels of physical activity in terms of duration and frequency. Most women believed that regular physical activity improved their fitness, reduced their weight gain and alleviated pregnancy ailments and all women stated they had undertaken at least 30 minutes of physical activity daily pre-pregnancy where they felt slightly warm and out of breath. Generally, they reduced these levels during pregnancy. Four women were concerned about whether physical activity was safe for both her and the baby and consequently two women had adopted a sedentary lifestyle;

"when I found out I was pregnant, I was scared to start again you know, that's why" (P009)

Some women talked about the positive impact of physical activity on labour, however, only two women perceived that regular physical activity in pregnancy would be beneficial for their baby's health.

Sociocultural influences

Most women received advice on a healthy lifestyle during pregnancy from friends and family. This included good dietary advice around increasing intake of healthy foods, cutting down on junk food and avoiding eating for two. However, some women were given the opposite advice such as eating for two and eating anything appetizing, whether it was healthy or not.

Advice from family appeared more prevalent in women from Pakistani backgrounds. One woman was advised by her grandparents to increase her intake of milk, fish and pomegranate. Another woman was advised to avoid warm foods such as nuts, pickles and fish, before 12 weeks gestation due to the risk of miscarriage.

"don't eat fish because it makes you warm inside and that causes you to bleed"

(P006)

The same woman was advised to eat warm foods towards the end of her pregnancy to assist with the onset of labour;

" when I was 9 days over with my son, she gave me milk, honey and nuts basically blended and mixed in milk and that was really hot, that will kick start your labour and I had them for 5 days and it was quite good you know" (P006)

Over half of the women responded to advice received about diet from family and friends. The other women didn't trust and therefore chose to ignore the advice. Some women's diet were influenced by family for example cooking unhealthy food due to their partner's preference.

However, this was also a facilitator for a Pakistani woman living with her extended family who chose healthy foods for the family.

Eight women received advice about physical activity levels during pregnancy from their friends and family, some encouraging physical activity and others discouraging it. This appeared to be culturally influenced with both Polish and Pakistani woman being advised to rest during pregnancy.

"our culture they don't understand that, they think that as soon as you find out you are pregnant that's it, you shouldn't get up" (P003)

Interestingly, women who received advice encouraging physical activity advice followed the advice and those that received discouraging advice ignored the advice:

"I want to listen to myself and I think so, everybody knows your own body and you know what you need" (P010)

Most women sourced additional information about a healthy lifestyle during pregnancy from internet sites such as NHS direct and medical portals, social media sites such as Whatsapp, Facebook and Utube and pregnancy mobile applications, which they felt were easily accessible and very informative.

"they give you that scientific explanation.....this particular food gives you this vitamin etc" (P007)

Lack of time and cost were considered barriers to maintaining a healthy lifestyle. Some women did not cook healthy foods as this was perceived to be time consuming but also more expensive:

"I have spent sometimes £15 on one meal that is going to be really healthy and I could just go buy a pizza for £2" (P005)

Competing priorities such as childcare responsibilities, work commitments and housework were also considered a barrier to increasing physical activity levels. Some women cancelled gym membership to save money in pregnancy, thus reducing their physical activity levels.

Physical health

Most women felt that their physical health during pregnancy negatively influenced their ability to maintain a healthy lifestyle. Minor ailments such as heartburn and nausea influenced women's diet, with snacking on unhealthy foods to relieve the symptoms.

In addition, pregnancy related health problems including sciatica, shortness of breath, dizziness, headaches, sickness, backache and tiredness were the main barriers to undertaking physical activity in pregnancy.

"sometimes I don't feel like doing anything at all, I just want to stay in my pyjamas and just not move, because I just feel tired" (P008)

However, some women who were active during pregnancy noticed the health benefits for themselves including improved self-confidence, enhanced sleep and reduced stress. This good health was a facilitator to continue with physical activity in pregnancy:

"I cannot live without exercise, that's how I feel, like I am not achieving something, if I am not exercising. It makes me feel different physically as well, I feel very heavy, but when I am exercising I actually find myself having more energy" (P012)

Professional support

Only half of the women remembered being provided dietary advice from health professionals during their pregnancy. Other women could recall foods to avoid but not what to eat to stay healthy:

" at first she said blue cheese.....and fish, first couple of weeks and then after that.....just carry on doing what you are doing" (P008)

Other women felt that the advice varied in terms of its format and content. Overweight women were told to keep control of their weight by opting for healthy snacks.

The majority felt advice influenced their eating decisions; however some women felt the advice had no impact because they were already healthy or multiparous and they had heard it before.

"I am listening and I am like yeah I know that, but I wasn't really" (P006)

Less than half the women recalled receiving advice about physical activity in pregnancy from health professionals and the advice appeared inconsistent. Two women received written information but few women could remember being advised to undertake 30 minutes of activity daily. Two women recalled swimming was discussed as an option in pregnancy.

Women felt that more support from health professionals would be a facilitator to a healthy lifestyle. This could include more information about the benefits of healthy eating and how to ensure the right levels of vitamins are consumed. More information around safe levels would facilitate an increase in physical activity levels.

Women felt that support could be face to face as part of routine antenatal appointments or a dedicated group or it could be through a health professional produced pregnancy mobile application.

"a session for mum's or something.. because if you are like on your own you are not motivated or you are not... confident maybe or you are thinking that exercising can damage the baby or you might do something wrong or over exercise so like doing it as a group with someone professional maybe" (P007)

Discussion

This study has identified that there are barriers and facilitators to women from diverse backgrounds eating a healthy diet and undertaking physical activity in pregnancy. Four key themes were identified from the data which appeared to influence women's beliefs, intentions and behaviour. Although similar barriers have been found in previous research, (Cramp et al. 2009, Leiferman et al. 2011, Sui et al. 2013, Reyes et al. 2013, Fieril et al. 2014, Redmond et al. 2014, Denison et al. 2015 & Thompson et al, 2015). This study has focused on a combination of diet and physical activity to encourage a healthy lifestyle rather than one or the other. In addition, this study has focused on women with differing BMIs and women from different sociocultural backgrounds, which appears to have influenced their barriers and facilitators to a healthy lifestyle.

A lack of understanding around healthy lifestyle during pregnancy was an identified barrier to adopting a healthy diet and undertaking recommended levels of physical activity. This included a lack of knowledge of the Eatwell Guide, the NHS recommended tool for discussing diet (Public Health England 2016). In addition, there was a lack of understanding of why healthy eating is important, especially in terms of fetal health, reflecting previous studies (Sui et al 2013, Reyes et al 2013, Denison et al 2015). Women were not aware of the national recommendations for physical activity levels, they had insight into the health benefits but lacked knowledge of why it was beneficial and what was safe during pregnancy reflecting previous research (Leiferman et al 2011).

Health professionals, especially midwives have a role in advising pregnant women about healthy lifestyle, however, in this study, advice women received during pregnancy was minimal and variable. Some women were informed about foods to avoid, others were provided general rather than specific advice about healthy eating. Very few women received advice about

physical activity levels in pregnancy and the advice received was inconsistent and minimal reflecting previous studies (Brown & Avery 2012, Ferrari et al, 2013). As previously found (Choi et al 2013), women said they would follow health professional advice regarding healthy lifestyle during pregnancy if they received it, suggesting a good opportunity to promote health in this population. Women believed that support from health professionals could be a facilitator to adopting a healthy lifestyle and suggested antenatal groups focusing on healthy lifestyle or a mobile application to refer to would be useful.

There were sociocultural barriers and facilitators identified by the women in relation to both diet and physical activity. Family and friends were influential with some advice about diet being appropriate, others providing advice that was incorrect. Cultural beliefs were also influential with advice to avoid certain foods associated with bleeding and miscarriage and eat other foods to aid the onset of labour. In addition, physical activity in pregnancy was considered taboo by the families of the Polish and Pakistani women. Interestingly, the women ignored the advice to rest in pregnancy as they were aware that it was safe.

Cost and time were also seen as barriers reflecting previous research (Sui et al 2013 and Reyes et al 2013). In this study cost was in the context of gym and exercise class membership, suggesting that women associated adequate physical activity levels with structured programmes rather than increasing physical activity in everyday life such as brisk walking.

This study was small, carried out in one location, with self-selecting women who may have had a bias towards a healthy lifestyle. There were inadequate women from different ethnic backgrounds to draw generalizable conclusions and with increasing migration, more research is needed in this area. However, many of the findings support previous research. In addition, there are new findings which provide an insight of the issues for midwives and other health professionals.

It is vital to improve information sharing with women. Information needs to be standardised, and consistent but also culturally and socially sensitive. Women may be demotivated and

potentially obese if they are unaware of the risks of non-adherence to a healthy lifestyle.

Obesity will affect women's health; put pressure on the economy and clinical practice.

Pregnancy is an optimal time to inform women as they are a captive audience, attending appointments to check on their health.

The influence of family and friends suggests that healthy eating and physical activity levels in pregnancy needs promoting within local communities to ensure women receive positive influence from family. This would appear particularly important for Polish and Pakistani families who do not believe physical activity in pregnancy is safe.

To increase knowledge, women used social media, mobile applications and the internet to search out additional dietary and physical activity advice via these routes. No previous studies could be found examining the use of health technology in this context. However, this was a common strategy. There is a plethora of mobile applications and websites available to women and it is important that additional information women are reading is evidence based, therefore either recommending NHS approved health technology or developing health technology such as a mobile application which addresses the key barriers about a healthy diet and physical activity could be undertaken, pilot tested and evaluated with service users input. Having a mobile application for all supports the NHS long term plan. The DOH is currently supporting the Baby Buddy app which contains general information about healthy lifestyle, but it is not tailored to the individual, including culturally appropriate information. In addition, as the app contains a breadth of information about pregnancy, childbirth and childcare, anecdotal information suggests that the lifestyle information is not readily available and also that the app is targeted at younger women, creating an avatar which may not appeal to all women.

Conclusions

This study has found that enhanced health professional advice may empower and encourage pregnant women to adopt a healthy lifestyle through healthy eating and increasing physical

activity levels. Interventions to support this could include using health technology in the form of a midwife led mobile application. Further research would need to consider the impact of such interventions. This could help reduce care costs incurred through complications arising when women gain excessive gestational weight, or are overweight or obese at the start of their pregnancies.

CPD Reflective questions

- What information do you provide to pregnant women about maintaining a healthy lifestyle during pregnancy?
- How much emphasis do you place on tailoring your advice to the individual woman in terms of healthy eating and physical activity?
- How could you improve your practice in relation to this important public health aspect of practice?
- What could be the barriers and facilitators to you improving your practice?
- How can any barriers be overcome?

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Table 1- The elements of the theory of planned behaviour (Aizen 2006)

Behavioural beliefs	Attitude towards the belief	A person's favourable or unfavourable evaluation of a behaviour
Normative beliefs	Subjective norms	Perceived social pressures towards performing or not performing the behaviour
Control beliefs	Perceived behavioural control	Perceived ability; ease or difficulty to perform the behaviour

Table 2- Interview schedule

- 1) Have you heard of the Eatwell guide? **If no** describe and check understanding or **if yes** can you describe the Eatwell guide to me?
 - 2) Think about your diet before pregnancy, looking at the Eatwell guide how does it compare? Probe: can you expand on your answer?
 - 3) Think about your diet now, looking at the Eatwell guide how does it compare? Probe: can you expand on your answer?
 - 4) Do you think a healthy diet is important in pregnancy? Probe: If yes, why? can you expand on your answer?
 - 5) What do you think will happen to you if you don't eat a healthy diet? Probe: can you expand on your answer?
 - 6) Do you know the term physical activity? **No** - inform them what it is, or **if yes** can you tell me what it is?
 - 7) How much physical activity did you do prior to pregnancy in relation to the recommended 30 minutes of daily activity? Probe: how much per day/type of activity?
 - 8) How much physical activity do you do now during pregnancy in relation to the recommended 30 minutes of daily activity? Probe: how much per day/type of activity?
 - 9) What do you believe are the benefits of doing 30 minutes of exercise a day? Probe: can you expand on your answer?
 - 10) If your Midwife or another health professional asked you to keep a healthy lifestyle during pregnancy, do you believe you would be able to achieve this? Probe: can you expand on your answer?
 - 11) What advice has your Midwife or other health professionals given you regarding diet and or physical activity during pregnancy?
 - 12) Has this advice influenced the way you behave around diet and physical activity decisions during pregnancy?
 - 13) Have you followed their advice? Probe: Can you expand on your answer?
 - 14) What advice have your friends, family or other people (work colleagues, general public) given you regarding diet and or physical activity during pregnancy?
 - 15) Has this advice influenced the way you behave around diet and physical activity decisions during pregnancy?
 - 16) Have you followed their advice? Probe can you expand on your answer?
 - 17) Where else have you found advice from regarding diet and or exercise during pregnancy? For example; magazines, posters, internet, gym, other groups? Probe; can you expand on your answer?
 - 18) Can you think of anything that will help/facilitate you to eat a healthy diet? Probe: can you expand on your answer?
 - 19) Can you think of any barriers that will keep you from being able to achieve a healthy diet during your pregnancy?
 - 20) Can you think of anything else that will help/facilitate you to perform 30 minutes of physical activity daily? Probe: can you expand on your answer?
 - 21) Can you think of any barriers/problems that will make it difficult or stop you from being able to perform 30 minutes of daily physical activity during pregnancy?
 - 22) Do you think you be able to achieve a healthy lifestyle during pregnancy?
- Finally; is there anything else you think is important that you would like to add that you may not have had the chance to say?

Table 2 Demographic data

(NVX = Normal Vertex delivery)

Study no	Gestation	Gravida	Parity	Type of delivery	Age	Ethnicity	BMI (Kg/M2)	Smoker	Drug misuse	Alcohol intake	Educational level	Index of Multiple Deprivation Decile
001	26+5	1	0	N/A	33	White British	20.8	No	No	No	Post graduate study	9
002	28+0	3	2	2 x NVX	33	White British	32.9	No	No	No	A Levels	3
003	26+6	1	0	N/A	22	Pakistani	20.8	No	No	No	Under graduate	2
004	26+3	1	0	N/A	26	White British	37.6	No	No	No	GCSE's	3
005	26+5	3	1+1	1 x NVX	23	White British	26.4	Ex-smoker (quit after conception)	No	No	GCSE's	6
006	29+4	2	1	1 x NVX	30	Pakistani (British)	39.2	No	No	No	NVQ level 4 / PTLLS (Teaching)	1
007	26+0	2	1	1 x NVX	27	Pakistani	32.7	No	No	No	BsC Chemistry	1
008	29+1	4	0+3	N/A	34	Pakistani	26.3	Smokes 4 a day (reducing)	No	No	GCSE's	1
009	26+2	1	0	N/A	21	Polish	20.9	No	No	No	left school at 18	1
010	27+1	1	0	N/A	26	Polish	23.3	No	No	No	left school at 20	4
011	26+3	1	0	N/A	33	Polish	30.6	Smokes 10 a day (reducing)	No	No	College (Beautician)	1
012	26+1	3	0	N/A	34	Polish	23.7	No	No	No	Masters - (Teacher)	1

Table 4: Data analysis

Theme	Link to the TPB	Description of codes
Knowledge of healthy lifestyle	Behavioural belief	Woman's physical health Effect on unborn baby Benefits for pregnancy and labour
Sociocultural influences	Subjective norms towards the behaviour	Family and friends influences Cultural norms Social media Cost Time
Physical health	Individual control	Pregnancy ailments Self motivation
Health professional support	Behavioural belief	Diet and physical activity advice Support in pregnancy

