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## **Title**

**Eat Well Keep Active: Qualitative findings from a feasibility and acceptability study of a brief midwife led intervention to facilitate healthful dietary and physical activity behaviours in pregnant women.**

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## **Abstract**

**Background:** Overweight and obesity in the pregnant population is increasing and this is a public health concern. Many women have difficulty in following the recommendation to maintain a healthy diet and to keep active, indeed some identify pregnancy as the start of their concern with being overweight.

**Objective:** To assess the feasibility and acceptability of the 'Eat Well Keep Active' intervention programme designed to promote healthy eating and physical activity in pregnant women. This brief midwife led intervention was based upon the Self Determination Theory (SDT) framework and utilised Motivational Interviewing and individualised goal setting.

**Design:** This was a prospective qualitative study to explore women's views on the acceptability and perceived efficacy of the 'Eat Well Keep Active' programme obtained through one-to-one interviews 6 weeks after the delivery of the intervention. Data were also analysed to assess fidelity of the intervention to the psychological constructs of SDT; autonomy, competence and relatedness.

**Setting:** Wales, UK

**Participants:** Pregnant women suitable for Midwife Led Care and therefore deemed to be 'low risk' were recruited from a large maternity unit in South Wales (n=20).

**Findings:** The results indicated that the 'Eat Well Keep Active' intervention programme was well received by participants who reported that it positively influenced their health behaviours. There was clear evidence of the intervention supporting the three SDT psychological needs.

**Key Conclusions:** The Eat Well Keep Active intervention was designed to be incorporated into existing antenatal provision and findings from this study have demonstrated its feasibility. The brief midwife led intervention based on SDT was found

to be acceptable by the participants who embraced the opportunity to discuss and explore their lifestyle behaviours with a midwife.

**Implications for practice:** Theoretically designed interventions that can facilitate women to pursue a healthy lifestyle during pregnancy are lacking and the 'Eat Well Keep Active' programme has the potential to address this. Further research is needed in order to assess the acceptability of the intervention to midwives and other groups of pregnant women prior to assessing its efficacy in changing and maintaining healthful behaviours.

**Keywords:** Maternal lifestyle, Diet, Physical activity, Interventions, Behaviour change, Self Determination Theory, Motivational Interviewing, Goal setting, Midwives, midwife led care.

## Introduction

As with the general population, the levels of overweight and obesity amongst pregnant women has increased over time and are now at levels which are a concern to public health (Heselhurst et al. 2010). Ideally women should be a healthy weight before they enter pregnancy (NICE 2010a), although it is recognised that many are identified as overweight (Public Health England. 2016). Pregnancy would seem to be the ideal time in which to communicate messages of behaviour change as women may have an increased motivation to improve their lifestyle behaviours for the benefit of their growing fetus. There is a lack of guidance in the United Kingdom with regards to what constitutes appropriate gestational weight gain. Therefore the focus of the advice is centred on healthy lifestyle behaviours rather than specifically targeting weight gain. If adhered to, this advice should ensure that the weight gained through the antenatal period is appropriate. The current recommendations (NICE 2010) are that pregnant women should have a healthy balanced diet which comprises: meals based on starchy foods opting for wholegrain where possible; consumption of a minimum of five portions of fruit or vegetables daily; and reduced energy dense food and snacks (i.e. those high in fat and/or sugar). Furthermore, thirty minutes of moderate intensity exercise daily is also currently recommended (NICE 2010). However it is recognised that many have difficulty in maintaining a healthy diet and exercising (Borodulin 2009; Crozier et al. 2009), indeed there is evidence which indicates that behaviours during pregnancy can be instrumental in the development of overweight and obesity in mothers (Linne et al. 2004) and their offspring . It would appear that health provider advice alone may not be sufficient to achieve behaviour change and therefore effective interventions are needed.

Interventions designed to modify lifestyle behaviours should have, and make explicit reference to, theoretical underpinning (Davidson et al. 2003; MRC 2008; NICE 2007), as interventions based on theory have been found to be more effective (Thirlaway and Upton 2009). One theory which is useful in understanding human motivation is that of Self Determination Theory (SDT) (Deci and Ryan 2008). Pivotal to the theory is the

notion that people have a natural propensity towards personality growth and development. The theorists suggest there is a clear link between self-determination of an action, and the quality of motivation. They argue that if an action is fully self-determined the motivation is considered to be stable and this results in an increased perseverance and maintenance of the desired behaviour. SDT provides a framework for improving the quality of the motivation through ensuring that an individual's social environment meets three innate psychological needs: autonomy, competence and relatedness (Deci and Ryan 2002). Therefore when applying SDT to an intervention one would expect that in order for an individual to be successful in achieving and maintaining the desired change, they must believe that their decision to alter their behaviour is volitional and self-regulated (autonomy), that they are capable and able to maintain the change (competence), and that they are supported to change by those whose opinion they value (relatedness).

Motivational Interviewing is a counselling style for promoting behaviour change which has been found to have strong parallels with SDT due to its client-centred approach which reinforces personal responsibility and supports self-efficacy (Miller and Rollnick 2012). Motivational Interviewing relies on the cooperative relationship between counsellor and client which is non-judgemental and respectful (Rollnick, Miller, and Butler 2008). This collaborative approach promotes an equal power balance between client and clinician and as such it sits comfortably with the woman-centred model of midwifery care. Motivational Interviewing (MI) was primarily developed as a technique in the field of addiction, however it has subsequently been applied to various fields of health including diet modification (Resnicow et al. 2001), exercise (Ang et al. 2007), smoking cessation (Glasgow et al. 2000) and diabetes management in teenagers (Channon et al. 2007). A meta-analysis identified that MI was significantly more effective than no treatment and at least as effective as other treatments for a variety of behaviours (Lundahl et al. 2010).

It is acknowledged that effective methods which assist women to manage their weight during pregnancy are needed (NICE 2010). A midwife-led intervention was therefore

developed informed by the framework identified in Self Determination Theory with the aim of improving the diet and physical activity behaviours of pregnant women. The intervention called 'Eat Well Keep Active' was delivered by the author (LW) to women at 16 weeks gestation and comprised three components:

1. A brief counselling session incorporating Motivational Interviewing and individual goal setting lasting between 10- 15 minutes (at approx 16 weeks gestation)
2. A personalised magnetic goal card sent to participants within a week
3. A follow-up telephone call lasting 5 minutes (two weeks after initial session)

Further details regarding the intervention and research protocol have been published elsewhere (Warren, Rance, and Hunter 2012).

### **Research aims and questions**

This study formed part of a larger programme of doctoral research by the first author (xx). The aim of this study was to evaluate the feasibility, acceptability and perceived efficacy of the novel 'Eat Well Keep Active' intervention programme. The research questions were:

- How acceptable are the various aspects of the midwife led intervention to participants?
- Do participants feel that the intervention positively influenced their diet and physical activity behaviours?
- Does the intervention's use of MI and goal setting adhere to the principles of Self-Determination Theory?

## **Methods**

### **Recruitment**

Pregnant women were recruited from a large maternity unit in South Wales, UK. The intervention was designed to facilitate healthy decisions regarding participants' diet and physical activity behaviours in line with the current recommendations for all pregnant women.

Participant criteria for inclusion were: gestation less than 16 weeks at recruitment, and suitable for midwife led care (MLC). Exclusion criteria included: lack of fluency in English, history of early pregnancy complications (e.g. threatened miscarriage) and history or diagnosis of eating disorders. By only including women who were assigned MLC, participants would have no identified underlying conditions or complications that may have made them unsuitable for inclusion in the study. Women with a BMI that exceeded 30 were excluded from the study as these individuals would be in receipt of consultant led care.

Potential participants were identified and approached by an antenatal clinic midwife when attending the unit for their routine dating scan (usually at approximately 10-12 weeks gestation). Prospective participants were informed about the study by the midwife and were provided with a detailed participant information sheet. If willing to consider taking part, contact details were provided to the clinic midwife. After a two week period, individuals were telephoned by the researcher and a convenient date and time for the initial counselling session within the participant's home was agreed.

### **Data collection**

Semi-structured interviews were used to evaluate the acceptability and participant perception of efficacy of the intervention **between six and eight weeks after delivery of the initial session**. An interview schedule was used to ensure the interview remained focused but the decision to use a semi-structured format provided the opportunity for further exploration thus providing richer data (King and Horrocks 2010).

### **Analysis**



The audio recorded interviews were anonymised and transcribed verbatim by the author (xx), and then imported into NVivo programme for analysis. The factual coding of data captured participant characteristics such as age, parity and BMI category. Braun & Clarke (2006) suggest that although an inductive approach to qualitative data analysis is more common, there are some instances where a deductive or theoretical approach is more suitable. Given the theoretical underpinning of the intervention a deductive approach to analysis was used. The first stage of the analysis was concerned with the acceptability of the programme and each aspect of the intervention was explored. The next stage of analysis assessed whether the intervention programme supported the three psychological needs as set out by Self Determination Theory and thus the transcripts were scrutinised to identify instances where participants reported whether the programme supported their sense of autonomy, competence and relatedness. Therefore the analysis not only provided an insight into how the participants viewed their experience of the 'Eat Well Keep Active' intervention programme, but also whether the programme was able to meet the psychological needs as identified by SDT.

## **Ethics**

This study involved recruitment of maternity service users within a UK NHS setting and therefore ethical approval was obtained from the Local Research Ethics Committee (LREC reference 09/WA/0018). Participants were informed that they would continue to receive the routine care provided by their named midwife and that the intervention was supplementary to this.

## **Results**

### **Participant characteristics**

A total of twenty women were successfully recruited to the study, all but one of whom remained in the study until follow-up at six weeks post intervention. All participants

were Caucasian and spoke English as their first language. The majority were pregnant with their first baby, considered to be of a healthy weight and were in employment (see Table 1).

**Table 1**  
Participant characteristics

<b>Variable</b>	<b><i>n</i> (%)</b>
<b>Age, years</b>	
18-24	7 (35)
25-29	3 (15)
30-34	8 (40)
35+	2 (10)
<b>Employment</b>	
Professional	7 (35)
Clerical	5 (25)
Unskilled	6 (30)
Unemployed	2 (10)
<b>Parity</b>	
Primiparous	14 (70)
Para 1	5 (25)
Para 3	1 (5)
<b>BMI category</b>	
Healthy weight (18.5-24.9)	14 (70)
Overweight (25-29.9)	6 (30)

### **Acceptability of the 'Eat Well Keep Active' intervention**

Acceptability of the intervention was assessed through responses given to questions during the course of the one-to-one interview. All the participants felt the intervention to be acceptable. However the loss to follow-up of one of the participants (who was categorised as being a healthy weight) could be interpreted negatively on the acceptability of the study and as no reason for withdrawal was provided it is not possible to rule out that for one of the participants the programme was unacceptable.

Acceptability of the intervention by participants is likely to have been influenced by their perception of efficacy. Taking part in the study involved individuals giving approximately 1 -1.5 hours of their time. If they believed the intervention made no difference to lifestyle, they may have felt negatively about this use of their time and thus acceptability may have been lower. The majority of participants reported that it had made a positive change to their lifestyle, improving both the quality of their diet and the amount of physical activity they undertook. However there was one participant who felt inclusion in the study made no difference to her diet and physical activity as she classed herself to already be fit and healthy.

*"I think for me, because you know, my outlook is quite healthy anyway, then I don't think the study actually influenced me to make changes" (P8)*

Despite this, Participant 8 felt that the intervention would be of benefit to those women who were not so health conscious. Interestingly, she used the goal card that was sent to her and reported referring back to it daily. So although she felt the intervention did not influence her behaviour, the goal card was still utilised frequently and thus it must be assumed that she found it was of benefit.

All participants were asked whether there was any aspect of the programme that they thought should be removed, but none were identified. Participants were asked their views on all three aspects of the 'Eat Well Keep Active' programme; the counselling session, the goal card, and the follow-up phone call. Each of these will be looked at in turn.

#### *The counselling session*

A number of women reported that the first counselling session incorporating MI assisted them to re-assess their eating and physical activity behaviour and several talked about this session making them think differently about their diet and exercise.

*"You were asking me what I ate and I thought, I'm not that bad, I eat brown bread and stuff, but then I have a really sweet tooth. So it makes you think differently it did" (P11)*

Views like the above suggest that some participants had not really thought about looking at ways to improve the quality of their diet. Any changes they had made prior to inclusion in the study, tended to be avoidance of food associated with infection (e.g. the avoidance of undercooked eggs).

For some, the counselling session gave them a sense of reassurance. Although many understood what a healthy lifestyle in general should comprise, being pregnant made them have some doubts. This session therefore gave them the opportunity to seek advice and reassurance but also to address the areas that they felt needed improvement in a non-judgemental collaborative environment.

*“Actually the chats just give you reassurance, the peace of mind that, you know, it’s OK to push yourself a tiny bit” (P9)*

It was apparent that these women had anxiety that exercise during pregnancy may be harmful or risky to them or their growing baby. However, it also showed that with a collaborative approach that enabled them to explore their feelings around their behaviour, their anxiety could be abated.

*“Before [the study] I used to think, if you are stamping and bouncing you think oh my God there is something there, you have to protect it... But no, it’s protected anyway.” (P7)*

It was clear that the counselling therefore enabled participants to change their perception of exercise from being viewed as a negative health behaviour during pregnancy to being a desirable behaviour.

#### *The goal card*

When participants were asked about how they felt about the individualised goal card they received, all responded positively and reported that they had found it of use and had referred back to it. For some the goal card acted as a reminder and when they looked at the card it prompted them to ensure they achieved their goals.

*“I would read it and I’d say I’m doing this and I can’t do that today, but I’ll do it tomorrow, or I’ve got to go out for a walk even if it was just a quick one.” (P1)*

The participants reported that the goal card gave them confidence to be able to make lifestyle changes and it provided them with concrete evidence of the goals they had said they wanted to achieve.

*“I think that when you came and we had the chat and we went through the goals. .... I had a plan. And I knew what I was doing, and I found that really beneficial. It really made a difference to me. It didn't put any pressure on me, but they filled me with confidence in what I was doing.” (P9)*

The habitual nature of diet and physical activity means that in order for an individual to implement a change, often they need to be able to replace one behaviour with another healthier one (Parekh 2014). Examples include swapping unhealthy snacks such as chocolate and crisps with fruit or nuts, walking the children to school instead of driving them in the car. And this requires an element of planning, the goals often reflected this.

*“I used to have like a big bag of crisps round with me but I don't do that now. I've got cereal bars, nuts more fruit. I'm doing it to protect the baby you know and it's good for myself as well.”(P4)*

Others had less specific and more generalised goals, which they found worked for them.

*That goal card is good you know: Eat more fruit! Oh yes, OK it's on my goal card so I will, it's written down!” (P3)*

The data demonstrated that achievement of the goals, gave the women a sense of accomplishment and wellbeing. For some this meant they felt able to aim for further improvements to their lifestyle behaviours, above and beyond the initial goals.

*“I wanted to do the little steps, little steps on the goal card. And once you've done them you feel so good about yourself that you think, well actually I am going to try something bigger.” (20)*

### *The follow-up telephone call*

The brief phone call, lasting approximately 5 minutes, was considered worthwhile by all the participants. Several women described the phone call as acting like a prompt in assisting them to stay on track with their aims.

*"It was fine. Like I said to you some days are good and some not so good, so speaking to someone then makes you think. Oh get back on it. Or come on start again tomorrow" (P13)*

*"It was good just to keep an eye and act as a reminder" (P7)*

Other participants felt that the telephone call provided them with some extra support. For some this meant that it gave them the opportunity to talk through the difficulties that they had been encountering.

*"You haven't been too pushy, you know. You gave a quick phone call and answered any questions I had. You were there on the other end of the phone. So I think it's good to have that extra support that people really need" (P15)*

The aim of the phone call was to ensure participants felt supported in achieving their goals; they were given encouragement and praise for the targets they had met and were not made to feel judged if they were having difficulty with them.

For several women it was clear that their sense of accomplishment resulted in them feeling proud of their success and wanting to share this. For these women the phone call gave them the opportunity to report back on their achievement with pride and also they appeared to value someone taking the time to see how they were progressing with their goals.

*"I thought I've done really well and I was really excited when you spoke to me on the phone. Trying to, you know, not please you but, I was pleased with myself and wanted to show you. Look no crisps!" (P17)*

*"I thought; she's actually taken an interest. So I thought, oh yeah, it's not just forgotten. So it was nice. Someone to ask me how I'm doing." (P6)*

## **Adherence to Self-Determination Theory Principles**

## *Supporting Autonomy*

The intervention programme was developed utilising theory from SDT and MI and therefore at its centre was the aim to support women's sense of autonomy in assisting them with behaviours that they wished to change. Consequently it was important that during any contact with participants, choice and personal control were emphasised, to ensure any behaviour change was volitional.

During the interviews the participants reported volitional behaviour especially when discussing how they felt about the goal setting and goal cards, resulting in them clearly identifying ownership of the goals.

*"I think everybody has got like an individual plan and that I think makes a difference. Everyone's is individual and it does alter depending on what they are trying to do and what their plan is and stuff." (P9)*

*"Because I made the decisions in the first place, not you. I made them and you just typed them out for me really!" (P3)*

Some reported that they recognised the approach used during consultation was different from the approach they might have expected with a health professional, in that they were not being told what they should do, but were being asked what they wanted to do.

*"You asked me what I wanted to change. So most health people say you should change this if you are doing this and to change that. And they were my goals, not like someone else's just thrown at me! That might not mean anything to me then" (P1)*

During the goal setting participants were encouraged to be the decision maker when it came to behaviour change. For example, for some that meant they would reduce their consumption of unhealthy snacks such as crisps. They were not being told to stop eating these altogether, instead they were being encouraged to think about things they could do to improve their diet and physical activity levels. And as a result the women felt that these changes were being driven by themselves, thus their sense of autonomy was supported.

*“They were definitely the things that I have always thought about changing, but just haven’t got around to changing.” (P18)*

*“They were what I wanted to do anyway. You didn’t come in here and crack a whip! You’ve got to do this. You’ve got to do that! (P7)*

### *Supporting competence*

An environment that supports an individual’s belief in their ability to affect their behaviour is fundamental to successful behaviour change. Therefore competence is seen as a fundamental psychological need and a key component of self-determined behaviour (Deci and Ryan 2002). When the women discussed meeting their goals they talked about the sense of achievement and wellbeing it gave them. Many felt pride that they had met the goals they set themselves, and this built on their sense of confidence that they could maintain these healthier behaviours, in other words they felt competent to effect change.

*“The more of an effort I’ve made the better I’ve felt afterwards, so you know I’ve thought, yes. There is a reason I should be doing this. Not just because I feel I should do it, but because I know it’s good for me if I do it. I feel better if I do it” (P18)*

Several participants identified that the goals that they had set themselves were small but manageable; they were goals that they felt certain they could attain. Through making small changes to their diet and exercise the women gained confidence in their ability to improve their lifestyle.

*“I cut it down and cut it down a bit more and it was a lot easier. It was better than saying; don’t do this, because you make the changes gradually and get used to it and then you’re doing it all the time.” (P1)*

Some participants found the targets they had set themselves relatively easy whilst others found them more challenging and were not able to achieve all of them.



*“Some days have been bad; I’m not going to lie. But then some days have been quite easy to do it. So I know I can do it if I really, really want to. (P13)*

This participant appeared to show some ambivalence in her behaviour change. She was confident that if she really felt committed to behaviour change she would be successful, however she interpreted the times when she encountered difficulty as being the result of perhaps a less strong motivation to change. Within the MI literature, behaviour change can only occur when that change is deemed as being both important and attainable (Miller and Rollnick 2002). In this instance she reports that she feels competent to change but did not always feel that it is a priority, and this may explain why she was not always able to maintain the behaviour.

Some participants discussed how difficult they found some of the behaviour changes that they had set for themselves and talked about the strategies they used to assist them.

*“The sweets were hard and the coke was hard as well. But knowing that I could still have it on the weekends and not cut it out fully was a bit better, you know...Oranges help me and grapes help me. Because they have a little bit of sugar in them in oranges which I didn’t realise. (P1)*

Prior to the programme this participant was drinking cola on a daily basis and regularly ate sweets throughout the day. During the goal setting task she chose to cut down on these products rather than stopping altogether. Her diet was significantly improved by the small changes she made; sugary drinks and snacks were limited to the weekends only and during the week she replaced them with fruit. This is an example of how making seemingly small changes helped participants to achieve their goals and built on their sense of competence. By participants determining their own goals, they were able to set themselves targets that they felt confident they would be able to achieve.

*“It’s just making sure it’s realistic, obviously I didn’t want to put anything in there that I knew I wouldn’t eat. It’s just being realistic really” (P16)*

### *Supporting relatedness*

In SDT support for relatedness is pivotal in the enhancement of motivation (Deci and Ryan 2002). The women reported being supported by their partners in attainment of their goals.

*“He’s like, ‘Right we are going to have to start this now, you need lots of fruit’. So he buys loads of fruit and the water and we have chicken breast and rice and veg for tea. So it helps when there’s two and he does it as well.” (P7)*

Some women mentioned that the programme and more specifically the goal card helped their partners to support them in pursuit of their targets. It would seem that the partners took notice of the goal card and because it was devised in conjunction with a midwife, it appeared to be embraced by them. In the participants’ perception, the partners identified that the goals were important for the women to achieve and they described how their partners would refer back to the goal card and ask the participants how they were doing with their goals. It may be seen that the goals were given credence by the woman’s partner because they were devised with the assistance and support of a health professional.

*“He was like ‘How are you getting on with your targets for the midwife?’ and I’d say ‘well I haven’t done this’.... So he would sort of keep me motivated as well which was nice” (P18)*

*“Even my husband says ‘have you got your brown bread this week?’...He loves that [the goal card] so he can say ‘Are you eating this? Are you eating this?’ Something in black and white you know? (P4)*

Social support from significant others has been identified as key to women’s perception of their weight management behaviours during pregnancy (Thornton et al. 2006; Tovar et al. 2009), and in this study it was evident from the discussions that these women highly valued the support they had from their partners to achieve and maintain their goals. This finding would appear to support the SDT notion that relatedness is pivotal in the enhancement and maintenance of motivation (Deci and Ryan 2002). Evidence of

the value of relatedness was not limited to partners and family, as some women cited that they found the support built into the intervention assisted them also.

*"I think to have someone.... because obviously it's your job and you know what you are talking about. So to have someone to remind you that it's still important and that it does help the baby (P10)*

*"Because you make people feel so comfortable, you know.... And it was nice to know you were thinking like; I'd better ring her and see how she's doing, it was nice." (P19)*

The intervention was designed to ensure that the women felt supported and free to explore how they perceived their behaviour through a non-judgemental empathetic approach and it would appear that this approach was popular with the women and that they found this supportive.

## **DISCUSSION**

This small exploratory study has shown that a midwife led intervention programme aimed at improving health behaviours was acceptable to this sample of women with uncomplicated pregnancies. And that it was feasible to deliver an intervention using MI and goal setting whilst adhering to the principles of SDT

Acceptability for the intervention was very high and participants reported that they welcomed being included in the programme and the opportunity it provided to discuss both their diet and physical activity behaviours with a midwife. However, it should be noted that data regarding the number of women approached by the recruiting midwives were not collected. Thus acceptability can only be assessed from those who received the intervention and not from those who were invited but declined to participate. Initial interest in the study appeared to be indicative of future participation as once contacted by the researcher all accepted to take part. The women in this study reported that involvement in the programme was effective at improving their lifestyle behaviours, and although this is a subjective measure of efficacy, it is none the less encouraging and may explain the unanimous acceptability of the intervention from all

the participants who remained in the study. It is unlikely to be as warmly received if participants felt it made little difference to their diet and physical activity levels. It could be argued that a strength of the 'Eat Well Keep Active' intervention programme is that it could easily be incorporated into existing patterns of midwife led antenatal care, and therefore would be financially feasible. Participants responded positively to all three stages of the intervention (counselling, goal card and telephone call).

There was much evidence throughout the interviews that the intervention programme met the fundamental psychological needs of autonomy, competence and relatedness as set out by SDT. The women reported a strong sense of ownership of the goals set during the goal setting, and identified the generation of goals as coming from within them, addressing the areas of lifestyle that they felt were pertinent to them. The goals that they set themselves were relatively small achievable targets. Rather than having generic goals such as 'I will only eat healthy foods' or 'I will get fit' they tended to be more specific; 'I will swap my crisps for fruit or nuts' or 'I will take the dog for a ten minute walk every evening'. Literature around the psychology of lifestyle behaviour change is clear, when using goal setting as a technique it is important for participants to have a high level of confidence in their ability to achieve their goals (Davies 2011) and identifying do-able goals is associated with an increase in self-efficacy (Siegert 2004) By assisting participants in this study to set tasks that they believed were realistic and could be achieved, levels of confidence in their ability to change their behaviour appeared to be improved, increasing their sense of competence. The women reported how their needs for relatedness were met by having significant others supporting them in improving their diet or physical activity and specifically referred to the goal card as serving as a prompt for partners. It could be argued that the goals were valued by the partners because they had been developed with and endorsed by a health professional and therefore they had greater credence, though without the partner view point it is not possible to confirm this assumption. Research has identified the key role that the views of partners have on the health behaviours of pregnant women (Campbell et al. 2011). This is an area that should be looked at in any future studies, as obtaining

qualitative data on partner's response to any health behaviour intervention programme may provide insight into the views and experiences of those individuals with a key role in supporting and affecting behaviour change in pregnant women. The follow-on call, was also seen to support relatedness, they described looking forward to updating the midwife (XX) and wanted to talk of their successes. They also suggested that this call acted as a prompt to assist them in achieving their goals, and research exploring efficacy of health provider prompts in behaviour change would appear to support this (Fry 2009).

### *Limitations*

It is acknowledged that the acceptability of the intervention study may be due to the perceived increased healthcare professional support that inclusion in the study provided. It may be that acceptability of the intervention programme would be less if the intervention was delivered during routine antenatal appointments instead of supplementing the usual pattern of care, and any future studies should address this.

A further limitation of this study is that acceptability of the EWKA programme was assessed through one to one interviews conducted by the same person who delivered the intervention. Women participating in the study may have felt obliged to provide a positive response i.e. there may be social desirability bias. However, women were encouraged to discuss negative as well as positive aspects of the programme, and, one participant did report that she felt her involvement in the study did not alter her health behaviours, so this might indicate that social desirability may have been limited.

The design of this research means that this study may have been subject to selection bias. Pregnant women fitting the criteria were invited to take part in this research, and those individuals who consented to participate may have agreed to do so because they were already motivated to be as healthy as possible. It is likely that potential participants who did not wish to make lifestyle behavioural changes would not have agreed to take part. Therefore the acceptability of this intervention may be less in those women who are reluctant to consider dietary or physical activity behaviour

change. Reluctance to participate may also be greater in those who are heavier, as the proportion of women in this study who were of healthy weight significantly outnumbered those who were overweight. Also the sample may not be considered to be representative of the wider pregnant population as a significant proportion were professionals and presumably well educated. It has been acknowledged that recruiting participants to behaviour change interventions from lower socioeconomic groups, can be problematic (Michie et al. 2008), indeed these may be the individuals who would benefit most from targeted interventions in a bid to address health inequalities (Pampel, Krueger, and Denny 2010). Therefore acceptability of the intervention to those with lower socioeconomic status has already been identified as a priority in the further development of this intervention.

### **Implications**

The findings from this study suggest that this sample of women welcomed a more individualised discussion regarding their diet and exercise, and clinicians should consider the way in which they communicate messages about these health behaviours to deliver a more personalised approach.

Further research investigating the delivery of this intervention by community midwives providing care to women from areas of high deprivation is currently underway. This aims to not only assess the acceptability of the intervention to women from disadvantaged communities, but also to further explore its feasibility and clinical utility to delivering midwives. It is expected that the results from both these studies will inform a larger trial to assess the actual rather than perceived efficacy of the intervention through objective measures of behaviour change.

If found to be effective, this intervention could easily be incorporated into the existing antenatal service provision delivered by community midwives in the UK. Midwives should already be having tailored discussions with women regarding their diet and physical activity (NICE 2010b), and the intervention's initial brief counselling and goal setting session could be treated as such replacing the more traditional didactic

approach to health education often adopted in health settings. It may be considered that in the short term, this would be expensive to roll out to maternity services as it would require training of midwives in the use of behaviour change techniques. However, providing health professionals with the necessary evidence based skills to facilitate behaviour change is recognised to be pivotal in improving public health (NICE 2007), and therefore may prove to be cost effective in the longer-term in reducing morbidity and mortality through modification of maternal health behaviours.

## **Conclusion**

This brief intervention appears to be both feasible and acceptable to this sample of healthy low-risk pregnant women. Information regarding diet and physical activity behaviours during pregnancy should already be included as part of the standard antenatal care given by midwives which encourages healthy lifestyle behaviours (NICE 2008). This intervention changes the way in which this is conducted from women being given standard information to a more individualised woman centred discussion that puts the woman's needs and views at the centre.

Further research is required to assess more objective measures of efficacy of the intervention in altering and improving the dietary and physical activity behaviours of pregnant women.

## Conflict of Interest Statement

The authors have no conflict of interest.

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