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**RESEARCH PAPER**

**Smoking cessation during pregnancy: the influence of partners, family and friends on quitters and non-quitters.**

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**Abstract**

This research compared pregnant quitters' and non-quitters' accounts of how partners, family and friends influenced their smoking cessation attempts. Qualitative secondary data analysis was carried out on a purposive sample of motivational interview transcripts undertaken by research midwives with pregnant women as part of SmokeChange, a smoking cessation intervention. Interviews with all quitters in the intervention group (N=12) were analysed comparatively with interviews from a matched sample of non-quitters (N=12). The discourses of both revealed similarity in how their partners, family and friends influenced their cessation efforts: salient others were simultaneously perceived by both groups of women as providing drivers and barriers to quit attempts; close associates who smoked were often perceived to be as supportive as those who did not. However, women who quit smoking during pregnancy talked more about receiving active praise/encouragement than those who did not. While close associates play an important role in women's attempts to stop smoking during pregnancy, the support they provide varies; further research is needed to develop a better understanding of how key relationships help or hinder cessation during pregnancy.

**Keywords:** smoking cessation, pregnancy, social support, secondary data analysis

## Introduction

The antenatal period is acknowledged as an important window of opportunity to encourage smoking cessation (Department of Health 1998; Slade, Laxton-Kane, & Spiby 2006). Levels of smoking in pregnancy matter. Not only are women endangering their own health (Foulds 2002) but there is a growing and consistent body of evidence that continued smoking results in riskier pregnancies (Kyrklund-Blomberg, Hu & Gennser 2006) and in poorer health outcomes for babies both in the short and longer term (Pickett et al. 2003). During pregnancy, women tend to experience a poorer social acceptance of smoking (Haug, Aaro, & Fugelli 1992; Edwards & Sims-Jones 1998; Dunn, Pirie & Hellerstedt 2003; Irwin, Johnson, & Bottorff 2005) and they are often highly motivated to protect their unborn child (Department of Health 1998; Acharya et al. 2002). Nonetheless, 24% of pregnant women self-report as smokers; only a third of these quit (Department of Health 1998) and recent studies indicate that self-report assessments of smoking that are not confirmed by biochemical measures are likely to significantly underestimate true levels of the behaviour (Ford et al. 1997; Russell, Crawford, & Woodby 2004; Usmani et al. 2008).

Predictors of smoking and quitting in pregnancy are a complex amalgam of cultural, structural, social and individual factors. Studies have shown, for example, that, in parallel with overall smoking patterns, pregnant women living in deprived areas are more likely to smoke and less likely to quit antenatally (Haslam, Draper & Goyder 1997; Department of Health 1998; Penn & Owen 2002; Delpisheh et al. 2006). Other individual measures of socio-demographic status such as education level and housing status are also predictive of quitting. (Fingerhut, Kleinman & Kendrick 1990; Forrest et al. 1995; Walsh, Lowe & Hopkins 2001; Penn & Owen 2002) Further predictive factors include smoking behaviours (such as time of first cigarette in the morning –(Hymowitz et al. 1997)); pregnancy-related variables (for example, primiparous women are more likely to stop smoking – (Suzuki et al. 2005; Harwood et al. 2007)); individual motivation to quit (Hyland et al. 2006); and levels of smoking and cessation support within social networks. (Hymowitz et al. 1997; Ockene et al. 2002)

As there is no single set of predictors of smoking during pregnancy, a wide range of tobacco control interventions are used to encourage cessation in pregnancy. These include those aimed at populations and at more individual behaviour change. Smoking cessation interventions involving structured behavioural support, and more recently the provision of nicotine replacement therapy, can assist women to quit (Lumley et al. 2004; Medicines and Healthcare Products Regulatory Agency Committee on Safety of Medicines 2005). In 2006, a smoking ban was introduced in Scotland which prohibited smoking in all public places. Research conducted after the ban showed that while smokers were concerned about the impact of smoking on children, the ban had not influenced their smoking patterns at home and this highlights the importance of public health initiatives to encourage smoking cessation (Akhtar et al. 2007; Phillips et al. 2007).

The impact of smoking cessation interventions in pregnancy are moderated by many factors, including women's personal and social circumstances. Previous studies have shown that family and friends influence smoking attempts. Smoking networks are found to offer potential buffers against stress, provide normative validation for smoking (Dunn 2004), fewer opportunities for quitting support (Mermelstein et al. 1986; Aaronson 1989) and the lure of temptation (Caplan, Cobb & French 1975; Mermelstein et al. 1986). In addition, since smoking is often practised as a social activity among friends and family, their expectations and opinions heavily influence cessation decisions (Schaffer & Lia-Hoagberg 1997; Dunn 2004). During pregnancy, particularly in low-income groups, family and friends in close proximity provide valued guidance and advice which may be actively directed against quitting. For example, women may be 'counselled' that smoking is an effective strategy to deal with stressful situations during pregnancy and that smoking will aid an easier birth as it can reduce the size of the baby (Cnattingius 1989; Forrest et al. 1995; Thompson et al. 2004). Women's mothers, in particular, can profoundly influence their daughters' perceptions about smoking in pregnancy (Dunn, Pirie & Hellerstedt 2003).

Evidence indicates that women trying to quit fare better when with a non-smoking partner or with one who is trying to quit (McBride et al. 1998; McBride et al. 1999; Pollak & Mullen 1997;

Severson et al. 1997; Pollak et al. 2006). However, some women with smoking partners do manage to stop. Research is at an early stage in understanding how partners can support the efforts of women beyond acting as non-smoking role-models. Frequent, positive encouragement has been shown to be effective whilst perceived 'nagging' can be counter-productive (Mermelstein, Lichtenstein, & McIntyre 1983; Coppotelli & Orleans 1985; Glasgow, Klesges & O'Neill 1986; Lichtenstein, Glasgow & Abrams 1986). Ginsberg and colleagues (1991) argue that partner interaction is a better predictor than perceived support per se. They found that partners able to offer support strategies that are aligned to the pregnant woman's own cognitive and behavioural coping techniques can improve quit efforts. Studies of the ebb and flow of partner support and influence within the quit attempt are limited in number and further research is required.

Many cessation interventions are modelled on the five-stage Transtheoretical model of change (TTM) which is based on individuals' motivation to change. The stages of change include: pre-contemplation (no intention to quit), contemplation (intention to quit within the next six months), preparation (considering quitting in the next 30 days with a quit attempt in the last year), action (continuously quit for <6 months) and maintenance (continuously quit for >6 months). Interventions tailored to participants' level of readiness to change have offered better results than those providing non-tailored support (Prochaska & DiClemente 1983; Carbonari, DiClemente & Sewell 1999). Cessation interventions underpinned by this model have attempted to mediate transition through these stages using cognitive-experiential and behavioural techniques but it is still unclear how to effectively utilise these techniques to encourage cessation among pregnant smokers (Carbonari, DiClemente, & Sewell 1999; Mallin 2002). TTM is also criticised for not taking social norms into account in the behaviour change process (Velicer et al. 1995).

The Self Determination theory stresses the importance of considering both orientation of motivation as well as level of motivation. Pregnant smokers' attempting to quit tend to be influenced by attitudes and perceptions of their social circle as well as concerns about how smoking may affect their health and the health of their unborn baby and thus tend to have an

extrinsic orientation to motivation (Ryan & Deci 2000). Social norms theory distinguishes between these extrinsic influences and classifies them as descriptive norms (perception of what others do) (Reno, Cialdini & Kallgren 1993), subjective norms (perception of significant others' opinions regarding smoking) (Rhodes & Courneya 2003) and injunctive norms (perceptions of acceptability of smoking in society) (Rimal & Real 2003). Most studies that have attempted to test the influence of all these influences within the context of smoking have not shown any significant results (Manfredi et al. 1998; Norman, Conner & Bell 1999; Bursey & Craig 2000; Opp 2002). An exception is a study by van den Putte et al (2009) which found that verbal norms, injunctive norms and subjective norms did have some influence on smoking behaviour. The Theory of Planned Behaviour is both a model as well as a predictor of behavior change which posits that individual behaviour is predicted by their intention to perform a specific behaviour. Furthermore, this theory postulates that intentions are influenced by attitudes to a behavior, subjective norms and perceived control over a behaviour (Casper 2007). Thus while this theory does take subjective norms into account it does not take verbal and injunctive norms into account which may enable better prediction of behavior change.

In an attempt to better understand pregnant smokers' experiences of social support, this study analyses secondary data in the form of motivational interviews that were conducted as part of a stage-matched randomised controlled trial. Using this secondary data, the study explores whether pregnant women's perceptions of social support for smoking cessation, as revealed in their discussions with midwives employing motivational interviewing (MI) techniques, were indicative of quitting outcomes during pregnancy.

## 115 **Methods**

### Setting

The study used data from a large randomised controlled trial of home-based MI (the 'SmokeChange' study) which took place in Glasgow, Scotland from 2000-2003 (Tappin et al. 2005). Ethics approval for this study was received from the Yorkhill Research Ethics Committee. At their antenatal booking visit, women who consented to participating in

motivational interviews, that would be recorded and later analysed, were recruited to the study. Baseline data relating to demographics and smoking history were also collected. During the course of the trial, women received between 0-5 visits and while most interviews were conducted with only the participant present, in a few cases, a family member (partner, mother, child) was also present. This study demonstrated no intervention effect; it concluded that MI was not an effective aid to smoking cessation in pregnancy.

Whilst this study was concerned with the impact of MI as an intervention, it also aimed to ensure that a non-effect should not be attributed to poor programme delivery. To this end, those delivering the intervention were trained and mentored so that the interviews were carried out in a non-judgmental motivational manner. Table 1 includes the topics that were discussed during the interviews. All interviews were recorded (N=625); a sub-sample were transcribed verbatim and assessed (N=47) to ensure that the approach was appropriately implemented. This number was made up of all interviews with the 12 women who quit during pregnancy (N=34) and 113 interviews with 94 non-quitters. A total of 478 recorded interviews remained untranscribed. Together these interviews represented a pre-existing archive telling a potentially rich story about the place of smoking in women's lives and of their attempts to quit.

**Insert Table 1 here**

In particular, the data offered the opportunity to move beyond the question of whether MI works as an aid to smoking cessation to explore whether there are any observable differences in the discourse of quitting and non-quitting women as they discuss their experiences of trying to quit smoking during pregnancy. An early reading of these interviews identified an emphasis on the roles of partners, family, friends in helping and hindering the cessation process.

As the authors of this paper were not involved in data collection, our approach to analysis was not theory-driven instead the current study was developed to answer whether the qualitative data on such social support collected during the SmokeChange study could provide 'markers' of quitting behaviour particularly in relation to social norms. (Quitting was defined by self-



reported cessation verified by plasma cotinine <13.7ng/ml or salivary cotinine <14.2ng/ml (Jarvis et al. 2003). Cotinine levels were assessed at their booking visit and then during visits in mid and late pregnancy. The study did not follow women beyond pregnancy). Ethics approval for qualitative analysis of these motivational interviews was sought and granted retrospectively as an amendment to the original ethics application for the SmokeChange study.

### Data

The current study was undertaken in three steps. First a potentially information rich sample of interviews was identified. To do this we assumed that we needed to make maximum use of data emerging from those who quit. This yielded a sample of 12 women (34 interviews). We then attempted to derive a comparable sample of women who did not quit. The variables that we used for matching purposes were socio-demographic (area-level deprivation category), pregnancy-related (parity and smoking behaviour such as number of other smokers at home, cigarette consumption at booking visit). All were derived from a questionnaire completed by midwives at women's antenatal booking visit on recruitment to the SmokeChange study. Deprivation category was measured using the Scottish Depcat score (Carstairs & Morris 1989) used at the time to categorise small area levels of aggregate disadvantage (with a score of 1 representing the most affluent communities and 7 the most deprived). Parity was operationalised as a binary category with 0 indicating primiparous women and 1 representing multiparous women. The number of smokers living in the same house and cigarette consumption were measured on an interval scale. We noted the number of intervention interviews that each woman had participated in – although the outcome study had not found this to influence results we wanted to maximize the amount of qualitative data available to the study. Table 2 below summarises the level of matching that was achieved using these variables. It indicates exact matching on deprivation category, parity and presence of smokers at home. Cigarette consumption was more difficult to match but the best possible fit was made. Most of the women included in this sample had partners except for one quitter and three non-quitters. In terms of number of interviews, around half the women had broadly

180 similar number of interviews; for the other half, women who quit had more 'doses' of the  
intervention.

The second component of the current study involved transcribing all interviews associated  
with matched non-quitters (number of women = 12; number of interviews = 16).

185 **Insert Table 2 here**

#### Analysis

The third stage of the study was data coding and analysis. Data was stored and retrieved  
using Atlas-ti software (Muhr 1996). It was decided by the research team that the Framework  
approach to qualitative analysis would be used to answer the key question driving analysis  
190 which was whether different patterns of influence could be identified for quitters and non-  
quitters. The researcher first familiarised herself with the data by listening to the tape  
recordings and reading the transcripts multiple times. Emerging themes were tested and  
refined in discussion with members of the research team and these together with a priori  
themes derived from the objectives of the study were used to develop a thematic framework  
195 for both quitters and non-quitters containing themes (such as influence of partner, influence of  
friends and influence of close family) and subthemes such as (support from smoking partner,  
support from non-smoking partner, partner's negative influence). The framework was then  
applied to all the data which enabled the data to be arranged into charts using MS Excel  
software. Data which revealed cross-cutting themes were also identified and recorded in the  
200 charts. For example: partners' efforts to cut down their cigarette intake influenced their own  
smoking behaviour and this was also perceived as being supportive by the women This  
process of charting the data enabled systematic comparisons to be made across data  
categories and participants which in turn, aided the process of identifying links between  
themes and developing explanations (Ritchie & Spencer 1994).

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#### **Results:**

The results are described under three main thematic categories: the influence of partners; the  
role of close family; and the support of friends. Illustrative data are presented in Table 4  
below. We view these as interrelated spheres of influence operating within the context of the

210 wider social and cultural networks within which individual women are located. Our broad  
analysis framework is depicted in Fig. 1.

**Insert Figure 1 here**

Before moving on to these, it is important to highlight the trends associated with cutting down  
for those included in this study.

215

From the time of booking till their first motivational interview, 8 out of 12 quitters had reduced  
their daily cigarette consumption more than their matched non-quitter. Of the remaining 4  
pairs; two had similar reduction levels and in the other two pairs, the non-quitters had reduced  
more than their matched quitter. In addition, for the small number of non-quitters with multiple  
220 interviews, reduction patterns were not as sustained as they were for quitters. This indicates  
that the quitters in this small sample may have differed from non-quitters not only in their  
achievement of 'quit' status but also in their efficiency at reducing cigarette consumption. This  
potential difference has, of course, to be treated cautiously because of the very small sample  
size.

225 **Insert Table 3 here**

Although at their booking visit women were not asked to indicate their readiness to change  
their smoking behaviour using the formal stages of change approach, they were asked to  
report their commitment to quitting using a different four point scale (see Table 3). This scale  
did not distinguish between the stages of change exactly like the Transtheoretical Model  
230 despite the Smokechange study being underpinned by the Transtheoretical Model. Using this  
four point scale, it was seen that four quitters had a higher level of commitment than the  
matched non-quitters, one quitter's level of commitment was unknown and non-quitters levels  
of expressed commitment was higher (N=3) or equal (N=4) to the matched quitters in the  
remaining pairs. However, it may be significant that of the four women indicating the highest  
235 level of self-reported commitment, three went on to quit. Nonetheless, these quantitative data  
do not provide grounds for concluding that the women in this sample who quit were any more  
committed to doing so than those who did not. A self-efficacy scale or stages of change  
approach may have been better able to assess participants' perceptions of their ability to quit  
smoking but the scale was chosen by the researchers involved in the Smokechange study.

240 **Insert Table 4 here**

### **The influence of partners**

Half of all women (both quitters and non-quitters) whose discussions were analysed, had a smoking partner at home. Women identified positive and negative influences associated with smoking and non-smoking partners and there were few pointers within the data to significantly  
245 different patterns of influence between those women who were able to quit and those who did not.

Smoking partners offered negative influence in terms of providing temptation and a reminder of the pleasure in smoking as a couple activity (Edwards & Sims-Jones 1998). On the other  
250 hand all smoking partners (except for one woman who didn't quit) were attempting (not always successfully) to either quit alongside the women or were not smoking in their presence (McBride et al. 2004).

Non-smoking partners were more likely to be perceived to use pressure and 'nagging' as a  
255 means of influence (McBride et al. 1998; Thompson et al. 2004). This kind of pressure resulted in cases of both quitter and non-quitter women smoking out of their presence to avoid negative reactions (Glasgow, Klesges & O'Neill 1986).

On the other hand there were examples of non-smoker partners who were thought to be  
260 encouraging and non-judgemental (Suzuki et al. 2005) and within the available data there were more quitter women than non-quitters who talked about their partners offering encouragement (regardless of whether they were smokers themselves). In one particular case this encouragement acted as a buffer against negative reactions experienced elsewhere in the woman's social network and illustrates the inter-relationship between spheres of  
265 influence (Park et al. 2004).

One quitter explicitly acknowledged her partner (a non-smoker) as a key motivating factor in her wanting to quit whilst another described her partner (a smoker) as a '*tower of strength*' (Q4). There were no such comments by non-quitters in the sample about their partners.

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**The role of close family**

Quitters and non-quitters described very similar patterns of influence with family members (and their discussions focused particularly on mothers, sisters, mother-in-laws, and sister-in-laws). There were similar numbers of quitters and non-quitters who described current smokers, ex-smokers and non-smokers within their families. In general, smoking was prevalent.

275

Non-quitters mentioned ex-smokers within their family slightly less frequently; because of the nature of the method of data collection it is not possible to make claims about whether they had fewer of such individuals within their family circle or whether non-smokers' status as having previously smoked was less salient to them.

280

For quitters and non-quitters families provided both help and hindrance to cessation efforts. Both groups of women, for example, described receiving encouragement from their mothers (although there was much less discussion of this within the non-quitter transcripts) (Dunn, Pirie & Hellerstedt 2003).

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Temptations came both in the form of individuals who actively offered them cigarettes and from social settings where family members smoked (Mermelstein et al. 1986; Wakefield et al. 1998). Three women (two quitters and one non-quitter) talked about the experience of family members who smoked during pregnancy. Two (a quitter and a non-quitter) gave positive examples of close family stopping smoking antenatally; the remaining woman (a quitter) described family smoking in pregnancy as an argument against quitting (Quinn, Mullen & Ershoff 1991; Denham 2002).

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The complexity of how family members influence cessation efforts was demonstrated by the ways in which many women (both quitting and non-quitting) described the same relationship as both motivating and stress-provoking. One woman who quit illustrates this with the following quotations describing her interactions with her mother:

300 *She phoned up the other day and she says 'well, I'm not going to say anything [about a recent relapse]. I'm just going to say to you just try again and I'll phone you later (Q4).*

305 *She's on and on and on and on ... sometimes you're like ..., 'I need a bloody fag noo to calm doon after you've been chewin' the face off me for two hours' (Q4).*

### **The support of friends**

Discussion about support from friends shared many similarities with women's accounts of the  
 310 influence of partners and families. Thus there were stories provided of non-smoking and smoking friends; friends aiding cessation and those offering temptation; and, of the same friends acting as both help and hindrance. Some women had friends who were ex-smokers who were able to offer valuable advice and support whilst some friends attempted to maintain their smoking culture. No clear relationship was, however, seen between the nature of  
 315 influences and actual cessation. Women who quit, for example, talked about the negative influence of being accompanied by smoking friends. In contrast, those who did not quit talked about the positive influence of non-smoking friends (Hoffman & Hatch 1996).

As with family members there were examples of both quitters and non-quitters who  
 320 mentioned the reassurance of witnessing healthy babies with mothers who had smoked during pregnancy (Quinn, Mullen & Ershoff 1991).

Three potentially important differences were identified in the data. First, whilst three women who managed to quit talked about avoiding certain social situations where smokers would be  
 325 present none of the non-quitters raised this as a strategy. Second, no non-quitters explicitly mentioned receiving active praise from their friends although a few of the quitters did. Third, and more nebulously, non-quitters in general were less likely to discuss the role of friends at all.

### 330 **Discussion**

Before discussing the study findings we describe two limitations. The first relates to the potentially problematic distinction between quitter and non-quitter. As described earlier, women categorised as quitters were those who reported stopping smoking by the end of their pregnancy and were verified by cotinine validation. This definition does not tell us when  
335 women stopped smoking nor about subsequent relapse. This is important because the distinction may lead us to look for greater differences in interactional and support styles than is justified. In other words, the categorical distinction doesn't do justice to the usually blurred journeys that women make from cutting down, to quitting and often to relapse (Mullen et al. 1997; Edwards & Sims-Jones 1998).

340

The second limitation is that the study undertook secondary analysis of transcripts that were not originally conceived as data. This meant that our research question was not known by those conducting the motivational interviews. These were not research interviews and did not afford the opportunity for systematic probing of areas of particular research interest. This  
345 leaves us with the methodological issue of reading significance into the absence as much as the presence of data. We were mindful of these limitations in reporting and interpreting our findings.

Existing research indicates that women trying to quit do better when living with a non-smoking  
350 partner or with one who is trying to quit (Pollak & Mullen 1997; Severson et al. 1997; McBride et al. 1998; McBride et al. 1999; Pollak et al. 2006) and with non-smoking social networks. Positive encouragement from partners has been shown to be effective whilst critical comments can be counter-productive (Mermelstein, Lichtenstein, & McIntyre 1983; Coppotelli & Orleans 1985; Glasgow, Klesges & O'Neill 1986; Lichtenstein, Glasgow & Abrams 1986).  
355 Ginsberg and colleagues (1991) found that partners offering support strategies that matched women's cognitive and behavioural coping techniques improved quit efforts. However, it has been suggested that partners may find it difficult to engage in relational thinking and problem solving to aid the women's quit attempts while other members of the social circle may be more adept at providing this type of support (McBride et al. 2004).

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That women discussed the role of friends, family and partners in their quit attempts, without prompting, illustrates their importance to women's experiences of trying to quit smoking. A key finding from women's accounts in this study is that their relationships with partners, friends and family were complex – the same individual was often perceived as help and hindrance at different times. Also, both smoking and non-smoking salient others were thought to offer drivers and barriers to smoking reduction and cessation. This non-binary notion of support fits with the literature and points to the need for more sophisticated understanding of the warp and weave of close relationships (Mermelstein, Lichtenstein & McIntyre 1983; Pollak et al. 2006; Park et al. 2009).

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There were indications that women who managed to quit during pregnancy were more likely to describe their partners, family and friends as providing encouragement and validation. This does not mean that partners of non-quitters were necessarily less likely to do so. Whilst they may indeed have offered less encouragement; alternative interpretations include that their encouragement may have been less salient to their partners or that comments that might be construed by some individuals as positive are viewed negatively as unwanted pressure by others (Coppotelli & Orleans 1985). These findings are consistent with those of Wakschlag et al (2003) who identified pregnant non-quitters as tending to have unstable social relationships and difficulty developing regular routines which may have made it harder for them to receive support from their social circles or through prenatal cessation interventions. Furthermore, many studies have alluded to the adoption and continuance of smoking as a stress-relieving strategy by women from disadvantaged areas which enables them to cope with a multitude of role demands while having access to few social resources (Jun et al. 2004). This suggests that non-quitters may not have perceived the support they received as alleviating their daily pressures.

385

While the data for this piece of qualitative secondary data analysis was collected prior to the introduction of the smoking ban in Scotland, this study helps to confirm and expand our understanding of the complexity of close social influences for pregnant smokers. Furthermore,



390 it highlights how perceptions of support may be constructed in different social interactions.  
Fig. 2 summarises how features of social support from partners and close friends and family,  
located within a broader social, structural and cultural context are construed by pregnant  
women in their attempts to quit smoking.

**Insert Figure 2 here**

395 This study points to the need for further research that can inform smoking cessation  
interventions. Three specific gaps are identified.

First, it would be illuminating to undertake linked case-studies of the experiences of pregnant  
women as they attempt to quit smoking alongside those identified as their salient others so as  
400 to identify processes within their interactions such as descriptive and injunctive norms that aid  
and inhibit their salient others' attempts to encourage cessation. This in turn may influence  
their motivation and their transition to latter stages of change (Park et al. 2004; Aveyard et al.  
2006; van den Putte B et al. 2009).

405 Second, designing and testing interventions that offer tailored support within a wider social  
network (rather than engaging partners alone) would help to strengthen our understanding of  
how positive support might be garnered from a wider range of close acquaintances. Family and  
peers, in particular, are known to influence smoking patterns as their opinions and behaviours  
influence individuals' core cultural values and norms (Nichter 2003). By engaging these  
410 significant others, health professionals may be better able to raise awareness about the  
benefits of quitting and thus influence subjective and injunctive norms (Ginsberg, Hall &  
Rosinski 1991; Ryan & Deci 2000; Rhodes & Courneya 2003; Rimal & Real 2003). This in turn  
can help endorse smokers' own concerns about their health and the health of their baby  
thereby increasing their motivation to quit smoking (Ruggiero et al. 2003). Furthermore, such  
415 research would help in developing theory and provide practitioners with guidance about how  
best to support women to negotiate the potentially conflicting messages received from partners,  
friends and family.

420 Thirdly, this paper highlights the complex interplay between smoking and social contexts and  
this may explain why one-to-one cessation interventions which have little or no influence on  
smokers' interaction with their social circles are largely unsuccessful. Unlike group interventions  
that have been more successful among other subgroups of smokers, they do not allow for  
support and encouragement from other smokers (Stotts, DiClemente & Dolan-Mullen 2002;  
Stotts et al. 2004; Judge et al. 2005; McEwen, West & McRobbie 2006). Further research into  
425 the efficacy of group interventions among pregnant smokers would help in designing  
interventions and inform policy.

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**Conflict of Interest:**

435 None of the authors declared any conflict of interest.

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**Table 1: Topics discussed during the motivational interviews**

<b>Topics discussed</b>
<ul style="list-style-type: none"><li>• Efforts to cut down/stop smoking</li><li>• Concerns about the baby</li><li>• Awareness of effects of smoking on the baby</li><li>• Experiences of prior pregnancies</li><li>• Influence of smokers in social circle</li><li>• Influence of ex-smokers in social circle</li><li>• Positive support from social circle to quitting smoking</li><li>• Negative support from social circle to quitting smoking</li></ul>



**Table 2: Level of quitter and non-quitter matching**

Matched Pair	Number of other smokers at home	Depcat score	Parity	Cigarette Consumption	Total number of interviews	Presence of partner
1	0	6	0	25(Q) 20 (NQ)	1(Q) 1 (NQ)	+(Q) +(NQ)
2	0	5	1	20(Q) 30 (NQ)	3(Q) 1 (NQ)	+(Q) -(NQ)
3	0	6	0	20(Q) 20 (NQ)	1(Q) 1(NQ)	+(Q) +(NQ)
4	1	4	1	10(Q) 20 (NQ)	3(Q) 1(NQ)	+(Q) +(NQ)
5	0	7	1	20(Q) 20(NQ)	5(Q) 1(NQ)	+(Q) -(NQ)
6	0	6	1	18(Q) 10(NQ)	4(Q) 4(NQ)	+(Q) +(NQ)
7	1	6	0	40(Q) 50(NQ)	2(Q) 2(NQ)	+(Q) +(NQ)
8	1	6	0	20(Q) 20(NQ)	2(Q) 1(NQ)	+(Q) -(NQ)
9	1	7	0	5(Q) 40(NQ)	4(Q) 1(NQ)	-(Q) +(NQ)
10	1	2	1	20(Q) 30(NQ)	3(Q) 1(NQ)	+(Q) +(NQ)
11	0	4	1	30(Q) 20(NQ)	3(Q) 1(NQ)	+(Q) +(NQ)
12	1	2	0	30(Q) 40(NQ)	3(Q) 1(NQ)	+(Q) +(NQ)

**Table 3: Four point scale used to assess level of commitment to quit smoking at booking**

Level	Commitment to quit smoking
1	Not considering quitting at the moment
2	Considering quitting in the next 6 months but not the next 30days
3	Considering quitting in the next 30days but have not made a 24 hour attempt in the last year
4	Considering quitting in the next 30days and have made a 24 hour attempt in the last year

**Table 4: Illustrative data of the complex relationship between social influence and quitting**

<b>Theme 1: Influence of partner</b>	<b>Quotations</b>
Partners as negative influence	<p><i>I found myself sitting there watching telly not bothering but see the minute that he walked in the room, I said 'gies a fag.' (Q3)</i></p> <p><i>The minute he comes in ... I'm like 'gimme a fag.' (NQ4)</i></p>
Non-smoking partners and 'nagging'	<p><i>He doesnae smoke... he's always nagging at me 'put that oot.' (Q5)</i></p> <p><i>He's a health freak and ... he's always on at me 'you've got a wee tiny baby inside you and you're putting smoke inside it.' (NQ6)</i></p> <p><i>I will not smoke in front of my husband now – I know he might come in at ten o'clock so I'll quickly come downstairs at half past and open a window. (Q7)</i></p>
Partners providing encouragement	<p><i>He likes it if I don't smoke and if I'm no' smoking all day he'll go 'well done' ... but if I was to do it he probably wouldnae say 'I don't want you to' but he would rather that I didn't. (Q1)</i></p> <p><i>[partner] is really proud that I can stop ... he seems to be the only one ...that says 'you're daein' well' ...he's been great right enough. (Q12)</i></p>
<b>Theme 2: The role of close family</b>	<b>Quotations</b>
Smoking in close family circles	<p><i>Everybody smokes that I know apart fae [partner's] mother (Q3)</i></p> <p><i>I don't think there's anybody that disnae smoke in my family (NQ2)</i></p>
Temptations from family smokers	<p><i>[Partner's] mother is constantly 'do you want one?' ... she'll go away upstairs and shout 'if you want one they're in the kitchen. (Q4)</i></p> <p><i>When I go to my mum's, it's an escape and I could go and have a cigarette, peace and quiet ...</i></p>

	<i>so never went to my mum's cos I felt the need for my break, for my cigarette. (NQ7)</i>
Mothers as pregnant role models	<i>My mother, for example, quit when she was pregnant with me. (NQ1).</i>  <i>My mum smoked all through her pregnancy wi' ma wee brother and sister ... but they were perfectly normal ... I'm no' a heavy smoker ... when you think about it ... it's doing less damage than if you smoked say, fifty fags. (Q3).</i>
<b>Theme 3: The support of friends</b>	<b>Quotations</b>
The influence of smoking friends	<i>If I'm sitting wae people that don't smoke it wouldnae bother me because ... I cannae smell it and it's no' there in front of me and I can sort of forget about it. But if I'm wae people that do smoke then it is there ...so it'll just gie me more incentive or something to just smoke (Q3).</i>  <i>It's been absolutely no problem whatsoever actually 'cos none of my friends smoke ... when I go out with them I'm not tempted at all 'cos it's kind of frowned upon (NQ10).</i>
Friends as pregnant role models	<i>I mean, it's the wrong way of me looking at it [but] [friend]'s had three children and she's smoked heavy right throughout her pregnancies and see when I look at her kids today – they're absolutely fantastic (Q7).</i>  <i>The [friends] that smoked [when pregnant], they're like 'don't worry, it's awright' – sometimes it's reassuring (NQ8).</i>

**Figure 1: Illustrates different social influences on pregnant women's quit attempts**

**Figure 2: Illustrates pregnant women's perceptions of positive and negative social influences on their quit attempt**