

Ingall, G. & Cropley, M. (2010). Exploring the barriers of quitting smoking during pregnancy: A systematic review of qualitative studies. Women and Birth, **23**, 45-52.

## **Exploring the barriers of quitting smoking during pregnancy:**

### **A systematic review of qualitative studies**

**Georgina Ingall & Mark Cropley**

Department of Psychology, Faculty of Arts and Human Sciences, University of Surrey, UK.

Correspondence: Mark Cropley, Department of Psychology, School of Human Sciences, University of Surrey, Guildford, Surrey, GU2 7XH, UK.

**Key words;** pregnancy, barriers, smoking cessation, qualitative

**Word count;** **3879** including abstract and table excluding references

## **Abstract**

Smoking during pregnancy is widely known to increase health risks to the foetus, and understanding the quitting process during pregnancy is essential in order to realise national government targets. Qualitative studies have been used in order to gain a greater understanding of the quitting process and the objective of this systematic review was to examine and evaluate qualitative studies that have investigated the psychological and social factors around women attempting to quit smoking during pregnancy. Electronic databases and journals were searched with seven articles included in this review. The findings demonstrated that women were aware of the health risks to the foetus associated with smoking; however knowledge of potential health risks was not sufficient to motivate them to quit. Several barriers to quitting were identified which included willpower, role, and meaning of smoking, issues with cessation provision, changes in relationship interactions, understanding of facts, changes in smell and taste and influence of family and friends. A further interesting finding was that cessation service provision by health professionals was viewed negatively by women. It was concluded that there is a shortage of qualitative studies that concentrate on the specific difficulties that pregnant women face when trying to quit smoking.

## Introduction

When women become pregnant this does not mean they will automatically quit smoking.<sup>1,2</sup> For example, Haslam, Draper and Goyder<sup>3</sup> found that half of the women they interviewed could state without any prompting two or more health risks including breathing problems, congenital malformations, low birth weight, premature birth, low IQ and circulatory problems. Research demonstrating the associated risks are widely documented. These include increased risk of perinatal mortality and morbidity such as miscarriage, sudden infant death syndrome (SIDS), low birth weight, foetal abnormalities, lung disorders and premature birth.<sup>3,4</sup> However, despite having this knowledge, women still continue to struggle to quit smoking during pregnancy.

The government in the United Kingdom has a target of reducing smoking in pregnancy from 23% to 15% by 2010.<sup>5</sup> National figures in Australia demonstrate an overall smoking rate of 17.3% in pregnancy with a decrease from an estimated 30% in the 1980's.<sup>6,7</sup> A national strategy is in place to reduce this further. The United States has a target to increase smoking cessation from 14% in 1998 to 30% by 2010.<sup>8</sup> Despite existing interventions, pregnant women remain difficult to motivate and support in the quitting process, with research illustrating that only approximately 30% of pregnant smokers quit.<sup>1,9</sup> Women who attempt to change

their smoking behaviours during pregnancy encounter numerous barriers.

Successfully quitting smoking does not solely involve managing nicotine dependence but also the management of the women's psychological and social environment.<sup>3</sup> A great deal of emphasis has previously been placed on the model of biological addiction as a mechanism to quitting, and although showing some success, this may have also hindered investigation of other factors involved in the quitting process.<sup>4</sup> A greater understanding of these factors will help researchers develop better smoking cessation interventions to help motivated women to quit.<sup>3,10</sup>

Qualitative methods of research enable us to understand how people make sense of personal experiences and situations.<sup>11</sup> These methods are suited to exploring in-depth issues and generate rich data, which are useful in the development of new theories or new approaches and interventions.

## **Objective**

The objective of this paper was to review qualitative research that has examined psychological and social factors involved with women's attempts to change smoking behaviours during pregnancy.

## **Study design and Inclusion Criteria**

A systematic review was undertaken using only primary studies that were written in English and published in peer review journals. Studies that collected data during the post-partum stage about changes made to smoking behaviour during pregnancy were also included. Studies were discounted if they employed a mix of both qualitative and quantitative methods.

### **Participants**

Women who had attempted to quit smoking during pregnancy. Originally it was planned to include only studies with participants who were 18 years old and over, however, this reduced the number of studies that could be included. Therefore, studies have been included with participation age of 15 years old and over.

### **Search strategy for identification of studies**

The following electronic databases were searched for relevant studies; Assia (1987-date), Medline (1950-date), Maternity and Infant Care (1971-date), CINAHL (1982-date), psycARTICLES (no dates given), psycINFO (1806-date),

ScienceDirect (1995-date), Embase.com (1974-date) and Cochrane Library. Search terms used to identify the relevant articles were: 1, maternity and smok\*; 2, preg\* and tobacco; 3, preg\* and nicotine; 4, smoking and pregnancy; 5, qualitative studies; 6, smok\* and preg\* and qualit\*; 7, interviews and smoking. These searches were further refined by combining the following search terms: 4 and 5; 4 and 7; and also 4 and 5 and 7; to ensure all relevant studies were included. Finally, 3 and 5; and 2 and 5 search terms were combined.

## **Methods and Results**

The search strategies identified 663 abstracts. Following review, 634 abstracts were immediately discarded as a purely qualitative method had not been employed. Twenty-three full texts articles were retrieved and following further scrutiny, 16 were excluded because they did not meet the inclusion criterion. The remaining seven articles were included in this review.

## **Description of Studies**

Table 1 shows a summary of the studies included in this review. Two studies

were conducted in the UK,<sup>12,13</sup> two studies in the USA.<sup>2,14</sup> one in Sweden,<sup>1</sup> one in Canada<sup>15</sup> and one in Australia.<sup>16</sup> Six of the studies employed interviews as a data collection method<sup>1,2,12-15</sup> and one study used focus groups.<sup>16</sup> One study conducted two interviews with the same women.<sup>15</sup> Two studies carried out three interviews with the same women<sup>2,14</sup> and the four remaining studies did not specify how many times women participated.

The following different qualitative methods of analysis were utilized; Framework Analysis techniques<sup>13</sup> Grounded Theory,<sup>15</sup> Phenomenographic approach<sup>1</sup> and Thematic Analysis.<sup>14,16</sup> The total number of participants in the seven studies was 183, with a range of 11 women to 53 women participating. The studies reviewed all used opportunity samples.

One study investigated the effects of women's tobacco reduction during pregnancy on couples' interactions. Findings demonstrated that the way couples interacted affected the women's success at quitting.<sup>15</sup> Women are greatly influenced by partners and friends that smoke and attempting to quit can be costly to these relationships.<sup>13,15,16</sup> Abrahamsson et al concluded that women need to be empowered and in control of their immediate environment if quitting is to be maintained. Abrahamsson et al's<sup>1</sup> study further identified the need to increase self-efficacy.

A further study that demonstrated how women make sense of their smoking

during pregnancy, concluded that women feel ashamed of their smoking and try to justify their smoking behaviour.<sup>1,16</sup> However, despite these negative emotions, smoking was still depicted as an essential daily coping mechanism. Furthermore, women lacked self confidence regarding their ability to maintain abstinence post-natally, which consequently decreased their motivation to attempt to quit during pregnancy.<sup>12,16</sup>

Haslam and Draper<sup>12</sup> explored 'awareness' to the related health risks of smoking during pregnancy. The study illustrated that despite women having medical knowledge and being aware of health risks, there was still an inclination to trust personal experience and experiences of others over medical advice. Moreover, the women that did acknowledge, and personalise medical information, still did not regard this information sufficiently motivating to quit.<sup>1,12,13</sup>

Barriers to cessation, attitudes to nicotine replacement therapy (NRT) and perception of the counselling provided by health professionals were examined.<sup>13,16</sup> Cessation service provision was viewed negatively by women as they had previously been dealt with in a judgemental manner by health professionals and were therefore reluctant to discuss their current smoking behaviour.<sup>1,13,16</sup>

A further study explored the reasons why women quit during pregnancy and the factors that were involved in relapsing.<sup>2</sup> Successful quitters were found to be women who had a strong sense of moral identity and had a more stable living



environment. Relapse was related to factors such as contradictory messages being offered by family and friends regarding their smoking behaviour.

Finally, Pletsch et al.<sup>14</sup> examined the physiological factors that motivate women to quit smoking during pregnancy. These physiological changes to the body during pregnancy made the smell and taste of primary and secondary smoke unpleasant. This was sufficient to motivate an attempt to quit smoking, but it was found problematic maintaining this quit attempt as it was not instigated by desire.

Table 1. Summary of the studies included in this review

Authors & Country	Number of participants	Recruitment	Demographics	Mean number of cigarettes smoked per day	Data collection	Method of data collection	Method of data analysis	Brief summary of results.
Abrahamsson et al., <sup>1</sup>  (Sweden)	17	Midwives	Not specified	Not specified	During pregnancy but at how many weeks was not specified	Interviews using open-ended questions	Phenomenographic approach	Findings illustrated five story types that women used to make sense of their smoking; smoking can be justified, will stop smoking later, my smoking might hurt my baby, smoking is just giving up, smoking must be taken charge of.
Bottorff et al., <sup>15</sup>  (Canada)	28 (and their partners)	Research assistants	Primiparous and multiparous women recruited. Average age for women was 30 years old and majority were white, Anglo or of European descent. Seven had completed high school, 21 post secondary education	Not specified	Quitting during pregnancy was explored through two interviews that took place at 2-4 weeks postpartum and 3-6 months postpartum	Open ended interviews either held in the home or over the telephone. Couples interviewed separately	Grounded theory	Findings demonstrated three categories of couple interactions; disengaging, conflictual and accommodating. Disengaging interactions showed expectations that only the woman should quit. Conflictual interactions resulted in initiating the process of creating peace and reducing conflict. Accommodating couples negotiated strategies in a non-confrontational way to achieve common goals.

Haslam and Draper <sup>12</sup> (UK)	40	Clinical staff informed the researchers	Not specified	12 cigarettes per day	During pregnancy following a hospital ante-natal appointment. Number of weeks pregnant not specified	Semi-structured interviews lasting 30-45 minutes	Verbatim material coded into emerging themes	Findings identified four categories of barriers to quitting; willpower, physical and psychological addiction, being irritable and other smokers. Women were aware of health risks and cited various prompts that encouraged continued smoking.
Hotham et al., <sup>16</sup> (Australia)	19	Researchers	Not specified	Not specified	During pregnancy but not specified at how many weeks pregnant	Focus groups	Thematic analysis was conducted	Findings showed barriers to quitting were; skepticism of foetal smoking-related harm, fear of weight gain, family and friends smoking and nicotine addiction. Women felt that health professionals approach was influenced by own smoking status and that cutting down was considered acceptable. There was a negative attitude reported towards the nicotine patch with cost being a deterrent.
Nichter et al., <sup>2</sup> (USA)	53	Researchers	Low income	20 cigarettes per day	Three interviews during pregnancy, time not specified	Semi-structured interviews held in the home	Verbatim material coded	Findings illustrated 3 grouped categories, quitters, shifters and harm reducers. Quitters tended to have more stability in living arrangements, shifters tended to distance themselves from medical complications and harm reducers tended to feel the most guilty about smoking.

Pletsch et al., <sup>14</sup> (USA)	15	Not specified	Women were from a range of ethnic and racial backgrounds. All high school graduates. Forty percent were primagravida	13.8 cigarettes per day	Three interviews at early pregnancy, 36 weeks and 3 months post-natally	Semi-structured interviews	Thematic analysis of transcripts	Explored factors that motivated women to quit smoking during pregnancy. Findings illustrated changes in women's taste and smell of primary and secondary smoke suggesting a physiological change during pregnancy making tobacco smell and taste aversive. Therefore olfactory and gustatory changes were considered as extrinsic motivators to quitting.
Tod <sup>13</sup> (UK)	11	Midwives	Mean age 26 yrs. Nine out of 11 partners smoked	Not specified	During pregnancy but not specified at how many weeks pregnant	Semi-structured interview lasting 20 minutes	Framework Analysis techniques	Findings demonstrated that all women were aware of major risks of smoking. Five categories of barriers to quitting were identified; willpower, role and meaning of smoking, influence of family and friends, service issues and interpretation and understanding of facts.

## **Methodological quality**

Midwives or clinical staff recruited participants for three studies.<sup>1,12,13</sup> Three studies used the researchers to recruit women.<sup>2,15,16</sup> One study did not specify who recruited participants.<sup>14</sup>

The recruitment of pregnant participants was reported as challenging. All studies reported using an opportunity sample; however three of the seven studies had an inclusion criterion. Bottorff et al.<sup>15</sup> recruited women that would represent a range of experiences with partners that smoked daily, occasionally, never or were ex-smokers. Pletsch et al.<sup>14</sup> specified recruitment of women over 18 years of age and having quit smoking before their first ante-natal visit. Finally, Nichter et al.<sup>2</sup> recruited women who were less than 28 weeks pregnant when they participated in the study and were of low-income. The four remaining studies had only one inclusion criterion for participation, that women were smokers.<sup>1,12,13,16</sup>

See Table 1

## **Discussion**

The aim of this review was to evaluate qualitative studies that have investigated the psychological and social factors around women attempting to quit smoking during pregnancy. Although there were differences in the methods used and data analysis, two consistent findings that emerge across the studies

were 'control' and 'health risks to self and baby'. Additional findings illustrated that women face barriers, whether from family and friends and personal issues such as willpower, highlighting that smoking is more than a physical addiction. Smoking is embedded in these women's whole lives, from behavioural routine to interactions with their partners; and purely addressing the biological mechanism of addiction is not sufficient.

Abrahamsson et al.<sup>1</sup> constructed a model with three dimensions, control, reflections and defence. It was concluded that self-efficacy was dependent on the level of control women had over their smoking behaviour. This varied from a range of, total lack of control, to total control. The more self-efficacy a woman had the more control she exhibited over her smoking behaviour.<sup>1</sup> Haslam and Draper<sup>12</sup> and Tod<sup>13</sup> also concluded that taking control was necessary to quit smoking. This lack of control and low level of self-efficacy can be understood in terms of women who make multiple quit attempts. These women are aware they need to make smoking behaviour changes but lack the self-efficacy needed to take control over their smoking.<sup>1</sup> This was further illustrated in the study conducted by Tod<sup>13</sup> who found women stated the belief that being able to progress from cutting down to quitting needed additional willpower, which women felt was not possible for them. In contrast to this, Nichter et al.<sup>2</sup> explored whether a primiparous pregnancy rather than a multiparous pregnancy was more influential than control. However, this was not observed and the amount of control the women had over their immediate environment was concluded the most influencing factor in quitting.

Nichter et al.<sup>2</sup> felt that previous studies tended to classify women into two groups, quitters and non-quitters giving no acknowledgment to women who engaged in either harm reduction or made multiple quit attempts. Therefore, Nichter et al.<sup>2</sup> suggested reclassifying women into three groups; quitter's, harm reducers and shifter's. This reclassification leads to a better understanding of these women as it demonstrated that women were conscious of their smoking behaviour during pregnancy and often attempted to make some changes. However, the recognition of cutting down or harm reducing is not always a positive one as it can lead to apathy over the need to change smoking behaviour. Health professionals now appear to be accepting cutting down or harm reduction as sufficient instead of quitting.<sup>16</sup> The message health professionals should convey needs to be clearer and consistent for all pregnant women. Cutting down however is not an effective method as compensatory smoking usually occurs.<sup>2,16</sup> Additionally, myths and misconceptions surrounding smoking still need addressing, such as women's perception of 'light' branded cigarettes as being safer to smoke. Additionally, doctors' advice to pregnant women was that stress from quitting had an equally damaging effect on the foetus as smoking, therefore some women interpreted this to mean that smoking in small amounts was safer than attempting to quit.<sup>2</sup>

Women demonstrated their belief that health professionals' advice was affected by their own smoking status. Consequently, women in Hotham et al's.<sup>16</sup> study reported being wary of the advice offered to them as they felt being a health professional that smoked contradicted the necessity to abstain. The

smoking status of health professionals may be one reason why cutting down is sometimes seen as acceptable, as it would be difficult for health professionals to advise abstinence if they were visibly smokers.<sup>16</sup> Research has been conducted on the delivery of health professionals' cessation advice and the subsequent influence on pregnant women.<sup>17,18</sup> Abrahamsson et al.<sup>1</sup> found that a factor to change smoking behaviour was the social presentation of smoking behaviour. This related to how defensive women become when challenged, for example, by health professionals about their smoking.<sup>1</sup> If a pregnant woman has little or no defence reactions then it can be concluded that she is open to the idea of change.

Awareness of the meaning of smoking is portrayed as how reflective women were concerning being pregnant, being a smoker and the effects on the baby's well-being. Abrahamsson et al.<sup>1</sup> stated that if women were fully aware of the effects of smoking and the impact it had on the unborn baby, they were more likely to be receptive to behaviour change. Nevertheless, this was not always reflected in the reviewed studies, as knowledge of risks did not necessarily lead to quitting. There is a distinctive difference between knowledge and action, in that women can understand the knowledge in factual terms but remain detached from the emotional aspect that allows reflection, which leads to action. This is seen in Tod's<sup>13</sup> study which demonstrated that participants were aware of smoking facts, however, they minimized the associated risks for both themselves and their unborn babies and this did not lead to quitting.<sup>13</sup> Furthermore, if women had experienced previous uncomplicated pregnancies, this strengthened the denial in



necessitating changes to smoking behaviour. Haslam and Draper<sup>12</sup> also found there was for most women an awareness of risks, but this added no extra motivation to quit.

Bottorff et al.<sup>15</sup> illustrated just how influential the immediate environment can be on women's success when quitting and demonstrated that couples interactions change during pregnancy for women regardless of whether or not their partner smokes. In women whose partners were non-smokers, quitting reduced conflict and created a more peaceful environment. Partners were supportive and the reduction in conflict became a motivating factor in remaining abstinent. Cessation was generally not discussed with these partners who mistakenly believed women found stopping smoking easy. Women who smoked and whose partners smoked disclosed how 'policing' the house to make sure the partners' smoking occurred outside was a constant drain. Their partners described the women as 'nags' if they requested help with cessation and showed little interest in quitting with them but often resorted to monitoring and restricting the women's smoking.<sup>15</sup> The majority of partners put pressure on the women to cut down or quit. This suggests that even at home women are marginalised and exposed to stigma and pressure regarding their smoking. Therefore, in terms of refuge, women have nowhere to escape from the daily stress and pressure of smoking, and this can only add to their feelings of being ashamed and guilty about their smoking behaviour.

Recruitment was reported as challenging with difficulties in securing participants found in some studies.<sup>13,15,16</sup> A study by Tod<sup>13</sup> found only eighteen

out of three hundred women returned invitations to participate with a final total of eleven women being interviewed. This suggests that women may be ashamed, and experience guilt about their smoking behaviour during pregnancy.<sup>13</sup> Consequently, trying to engage with these women to participate in research is difficult. Due to recruitment difficulties, opportunity samples are often used. This can present itself with problems as women who participate could be biased and therefore be representative of a population of women more receptive to behaviour change or already partaking in some form of harm reduction.

Offering telephone interviews is one option when recruitment is difficult. Tod<sup>13</sup> emphasised the use of telephone interviews which enabled women from areas of deprivation to participate; however, the study questioned the reliance of this method compared to face-to-face interviews. Tod<sup>13</sup> felt that adopting telephone interviewing hindered in-depth probing. However, telephone interviewing could have the potential with sensitive issues to yield more honesty as anonymity is greater.

Investment into improving health promotion and cessation programmes is vast in terms of money, time and effort.<sup>19</sup> In spite of this, the United Kingdom, United States and Australian government targets to reduce the number of women smoking still remains challenging for health professionals. Drawing on qualitative research will add to our understanding of how to better support pregnant women when developing health promotion and cessation programmes. Although qualitative studies have been conducted in this area, research is still lacking. There appears to be a lack of inductive investigation into the challenges women

face when making a decision about changing smoking behaviour and how to implement this change successfully. In a recent review by Ebert and Fahy<sup>20</sup> recommendations were made for an increase in qualitative research into the relationship formed between the midwife and pregnant woman and how this had a crucial bearing on the women's smoking behaviour. More research needs to be conducted to expand existing knowledge and understanding of these complex and challenging issues, which can be used to develop effective cessation programmes.

Unfortunately, women tend to view quitting as something they should only do for the pregnancy. Maintaining abstinence post-natally is well documented as being very demanding for women. The relapse rate post-natally has been recorded as high as 60%.<sup>16</sup> Further research therefore needs to explore the impact of giving educational material to pregnant women which emphasises associated disadvantages and risks for the foetus from pregnancy through to teenage years and not just the ante-natal phase. This may reduce the short-term thinking of quitting only for the pregnancy and begin to benefit families' longevity health.

Future research also needs to recognise that most interventions are inaccessible to the majority of these women as they face numerous psychological and social barriers to reach the point of commencing a quit. Subsequently, these women often experience failed quit attempts which negatively impact further on their psychological well-being. There needs to be an improved understanding from midwives around addiction which leads to a greater empathy to support

instead of prejudging pregnant women.<sup>13</sup> Additionally, an individual tailored approach is necessary that includes small manageable goals with intense support to reach them.<sup>13</sup> The social context of smoking and quitting needs more emphasis in cessation services as social pressure often results in relapse.<sup>1</sup> Better multi-disciplinary support between doctors, midwives and health visitors is needed to offer the best support to these women.<sup>13</sup> Research should continue to investigate the barriers women face when attempting to quit smoking during pregnancy, and women centred interventions need to be developed that address both the social and psychological challenges.

The challenges and difficulties of quitting smoking during pregnancy have been documented; ranging from personal willpower to influence of friends and family. The overall conclusion revealed through this review is that women felt pressure to quit smoking and faced common barriers to successful quitting, these being 'control' and 'health risks to self and baby'. Therefore, implementing of new interventions to appropriately support these women are necessary.

## References

1. Abrahamsson A, Springett J, Karlsson L., Ottosson T. Making sense of the challenge of smoking cessation during pregnancy: a phenomenographic approach. *Health Education Research Theory & Practice* 2005;**20**(3):367-378.
2. Nichter M, Nichter M, Muramoto M, *et al.* Smoking among low-income pregnant women: An ethnographic analysis. *Health Education & Behaviour* 2007;**34**(5):748-764.
3. Haslam C, Draper E, Goyder E. The pregnant smoker: a preliminary investigation of the social and psychological influences. *Journal of Public Health Medicine* 1997;**19**(2):187-192.
4. Bull L., Burke R, Walsh S, Whitehead E. Smoking in pregnancy and parenthood: what is the role of depression, anxiety and nicotine addiction? *Early Child Development and Care*; 2003;**173**(2-3):349-356.
5. Department of Health. Smoking Kills. A White Paper on Tobacco; Uk 1998.
6. Laws P, Hilder L. *Australia's mothers and babies 2006*. Sydney: AIHW National Perinatal Statistics Unit; 2008.
7. National Tobacco Strategy, 2004-2009: The Strategy Ministerial Council on Drug Strategy; 2004.
8. Healthy People 2010 Midcourse Review. US: Tobacco Use 27
9. Lindqvist R, Aberg H. Who stops smoking during pregnancy? *Acta Obstet Gynecol Scand* 2001; **80**:137-141.

10. Bull L., Burke R, Walsh S, Whitehead E. Social attitudes towards smoking in pregnancy in East Surrey: A qualitative study of smokers, former smokers and non-smokers. *Journal of Neonatal Nursing* 2007;**13**:100-106.
11. Lyons E, Coyle A. (Eds.). *Analysing qualitative data in psychology*. UK: Sage Publications Ltd: 2007.
12. Haslam C, Draper E. A qualitative study of smoking during pregnancy. *Psychology, Health & Medicine* 2001;**6**(1):95-99.
13. Tod A. Barriers to smoking cessation in pregnancy: a qualitative study. *British Journal of Community Nursing* 2003;**8**(2): 56-64.
14. Pletsch P, Thornton Kratz A. Why do women stop smoking during pregnancy? Cigarettes taste and smell bad. *Health Care for Women International* 2004;**25**:671-679.
15. Bottorff J, Kalaw C, Johnson J, Stewart M, Greaves L, Carey J. Couple dynamics during women's tobacco reduction in pregnancy and postpartum. *Nicotine & Tobacco Research* 2006;**8**(4):499-509.
16. Hotham E, Atkinson E, Gilbert A. Focus groups with pregnant smokers: barriers to cessation, attitudes to nicotine patch use and perceptions of cessation counselling by care providers. *Drug and Alcohol Review* 2002;**21**:163-168.
17. Bull L. Smoking cessation intervention with pregnant women and new parents (part 2): A focus group study of health visitors and midwives working in the UK. *Journal of Neonatal Nursing* 2007;**13**:179-185.
18. McLeod D, Benn C, Pullon S, et al. The midwife's role in facilitating smoking behaviour change during pregnancy. *Midwifery* 2003;**19**:285-297.

19. Kelley K, Bond R, Abraham C. Effective approaches to persuading pregnant women to quit smoking: A meta-analysis of intervention evaluation studies. *British Journal of Health Psychology* 2001;**6**: 207-228.
20. Ebert L, Fahy K. Why do women continue to smoke in pregnancy? *Women and Birth* 2007;**20**:161-168.