

Why Do Women Continue to Smoke in Pregnancy?

Abstract

Smoking during pregnancy not only impacts on the woman's health but that of her unborn child. Women who are least likely to stop smoking during pregnancy are of lower age, lower socio-economic status, lower level of education and lower occupational status. Women who continue to smoke during pregnancy feel criticized by society. They feel guilt and personal conflict at not quitting. Lack of long-term positive outcomes from anti-smoking campaigns may be the result of ignorance relating to socio-economically disadvantaged women's life circumstances. Current interventions not only ignore the emotional stressors associated with pregnancy, they do not address the altered physiological processes that occur during pregnancy. Women's taste for tobacco alters during pregnancy as a result of hormonal shifts. Nicotine clearance increases, making the physiological/addictive aspect of quitting during pregnancy more difficult. A review of the literature pertaining to women who continue to smoke throughout pregnancy is presented focusing on smoking rates & behaviours in pregnancy, the physiology of smoking during pregnancy, the demographics of women who continue to smoke during pregnancy and their views on smoking and anti-smoking campaigns and interventions. Women want a woman centred approach when discussing smoking cessation strategies with the health care provider having knowledge of the woman's social situation and viewpoints. Smoking cessation interventions must not be offered in isolation. Health professionals, including midwives are obliged to offer more than lip service to a health issue affecting multiple generations directly and indirectly.

Key Words

Pregnancy, Smoking Cessation, Social Class, Pregnancy Complications, Midwives and Poverty.

Introduction

In line with the general downward trend in smoking, the rates of smoking in pregnancy have also decreased. Smoking is defined as the “inhaling of burning tobacco fumes: an act of smoking a cigarette, cigar, or pipe” (1). For this paper a smoker is defined as a woman who smokes/ed one or more cigarettes at any time during her pregnancy (2). Passive smoking is excluded from this definition.

National figures for 2001 report 27% of all females aged 15-44 years identified as smokers, whilst 23% reported smoking during pregnancy and/or breastfeeding. The latest national data is from 2004 by which time all female had declined to 24% and smoking in pregnancy and/or breastfeeding had declined to 20% (3). Smoking and quit rates in pregnancy are linked to race and socio-economic class. The World Health Organization (4) reports smoking amongst women in the lowest socio-economic band is three times higher than women in the highest band in some countries (4).

The paper begins by presenting an outline of the National Tobacco Strategy, which will form the background for this paper. Then the literature search strategies that were used are summarised. This review paper is primarily focused not on the methodologies of the various research studies, but on the problems of conceptualising the causes and ‘treatments’ of smoking in pregnancy. It is these conceptualisations that guide the intervention strategies that are used in both research and health care practice during childbearing. The interventions that have been tested in research and been found to be most and least effective are identified.

Background

It is estimated that 19,000 Australians die each year from tobacco-induced illnesses (5). The National Tobacco Strategy, 2004-2009 (6) is intended to provide federal, state and territory governments an evidenced-based, co-ordinated, national plan to reduce tobacco smoking in Australia. Smoking, above all other health risk factors, is presented as the national health priority, with the goal of the strategy to reduce social costs and inequities exacerbated by tobacco consumption (6).

It is recommended anti-smoking interventions be based on the best practice guidelines. In relation to quit smoking this means following the “5As” approach in health care practice (7). See table 1 for details of what the levels and strengths of evidence mean for each of the 5 steps.

1. Ask. In order to support persons to quit, we need to identify them as a smoker (evidence II, strength A)
2. Assess. Determine the persons willingness to alter their smoking behaviour (evidence III, strength B)
3. Advise. Inform persons of the dangers of smoking and the benefits of quitting (evidence I, strength A)
4. Assist. Provide assistance targeted at individual's needs and level of readiness to change (no level of evidence provided)
5. Arrange Follow-up. Ensure to arrange to see person again to follow-up quit attempt (evidence I, strength A)

The National Tobacco Strategy is designed to be general in nature; when talking about someone who might quit, the document normally assumes someone who wants to quit for their own benefit. This is not necessarily the case in pregnancy, where health professionals

are advised to focus on the baby's health. Smoking in pregnancy is discussed in the National Tobacco Strategy only in relation to the rates of smoking and the financial burden of premature births to the health system and only in a total of two sentences. There is an outcome indicator aimed at having "fewer infants exposed to tobacco in-utero and after birth" (6, p. 11). The National Tobacco Strategy does not specifically discuss any strategies or allocate any funding towards improving the health of women who smoke in pregnancy. Since the National Tobacco Strategy gives no clear guidance about how to assess and support women who commence pregnancy as a smoker it is necessary to review the relevant research that has been conducted.

Smoking in Pregnancy: Literature Search Strategy

Following guidelines set by Rumsey (8) a search on smoking cessation in pregnancy was conducted through the Clinical Information Access Program (CIAP) with CINHALL, MEDLINE, PubMed, the Cochrane library and the Midwifery and Infant Care databases being searched. The MIDIRS database was accessed independently and the SuperSearch database was accessed through the University of Newcastle's electronic library. Individual searches of midwifery and allied health journals were also performed for articles relevant to smoking cessation and pregnancy. Finally, the bibliographies of articles obtained were examined for further relevant articles, publications and books. Key search terms were smok\$, cessation, midwi\$ and pregnancy. Subheadings accessed were pregnancy complications, addiction, social disadvantage, poverty, health behaviour and gender. Over 600,000 hits for smoking in pregnancy were obtained. International papers were included in the search and within this

paper. The focus however, was Australian women and their smoking trends. Only primary research papers were included. The search was limited to:

- Subjects – humans;
- Language – English; and
- Time frame – 1990 to 2006.

1990 was selected as the commencement date for searching as several systematic reviews had been performed during the 90's (9-11). All retrieved articles were assessed individually for relevance. Papers included: all systematic reviews, all individual studies of smoking cessation interventions, all descriptive studies of women's and/or health care workers' views of smoking cessation interventions. Papers that focussed exclusively on passive smoking were excluded.

Effectiveness of Quit Smoking Interventions: Findings of Systematic Review

A systematic review performed in 1994 (10) revealed treatment group quit rates ranging from 4.9% to 31.9%. These figures are similar to figures derived from single studies reported in the past decade with intervention group quit rates ranging from 4.8% to 33.3% (12-18) This means that although smoking cessation research and anti-smoking advice to pregnant women has intensified over the past 2 decades (19) quit rates attributable to interventions by health professionals have remained constant.

The latest systematic review concerning anti-smoking interventions used pooled data from 48 trials (19). These trials used a variety of interventions, which are summarised in table 2. The systematic review reported a statistically significant reduction in smoking with an absolute difference in quit rates of 6.0% (RR=0.94, 95% CI 0.93 to 0.95) (19). This is an increase in quit rates, which equals 6 more smokers per 100 pregnant women who agreed to

participate in a quit smoking intervention actually quitting when compared with a control group who experienced standard care.

Trials using interventions that involved social support coupled with rewards were statistically the most effective (20, 21). One study (21) required participants to select a social supporter (preferably a female non-smoker) to encourage them throughout pregnancy and postpartum in their quit attempt. Both the participant and supporter received financial rewards of a \$50 voucher at various intervals when it was confirmed by urine testing that the participant was bio-chemically free of nicotine. A second study (20) requested all participants seek an adult supporter to accompany them in their quit efforts. Participants were provided with confectionary gum. Bio-chemically validated abstainers received lottery tickets for a prize draw.

Trials (22-34) using “stages of change” theory were least effective in assisting women to quit. Poor outcomes associated with “stages of change” interventions may be explained by the fact that women who smoke during pregnancy use different processing and behavioural coping mechanisms from non-pregnant smokers (35). In relation to quit smoking attempts, women are not as fully engaged during pregnancy with regards to self-efficacy, level of activity processes and the action stage of change (36).

Trials using Nicotine Replacement Therapy (NRT) in pregnancy (37-39) demonstrated no significant advantage over other types of interventions (19). A recent study using NRT in pregnancy was undertaken in Australia, in 2006 (17). Findings reported a 15% quit rate in the intervention group versus 0% in the control group. However, only 25% of the

intervention group complied with treatment protocol and 25% reported adverse reactions to the NRT (17).

Smoking Behaviours in the Childbearing Period

The majority women who commence pregnancy as smokers attempt to alter their smoking habits. Most women decrease their smoking, although some women report increasing their smoking as a result of increased stress associated with the current pregnancy, additional mothering role and the guilt of not being able to quit smoking (40). Overall there is little change in smoking rates long-term. Only 20% to 30% of women who commence pregnancy as smokers abstain for a period of their pregnancy. Half of the women who do manage to abstain for the pregnancy, relapse within six months of having birthed and 70% have relapsed within the first twelve months (41). These figures are comparable to those of other developed countries such as America (14, 42-44) Canada (45), Sweden (46) and England (47). This means that current anti-smoking interventions in pregnancy are not very effective in achieving either short or long term quitting.

Socio-Economic Disadvantage and Smoking

Socio-economic factors and smoking are closely correlated (48-60). Women who sustain quitting during pregnancy are more likely to report having a positive social environment, including being married or in a stable co-habiting relationship. They are likely to have been older when they first commenced smoking. Women who successfully quit have higher formal educational qualifications. They have a lower number of existing children and their partners and significant others are more likely to be non-smokers. They are more likely to have had a low-level pre-pregnant nicotine intake. (46, 61-66).

In contrast, women who continue to smoke are more likely to be poor and less likely to participate in positive health-promoting behaviours in pregnancy (67). They are also less likely to initiate or maintain breastfeeding (68). Some women have reported prematurely ceasing breast-feeding so they can resume smoking without judgement by others (69, 70). Women who smoke in pregnancy are less likely to feel personally responsible for the health outcomes of their fetus (67). Weight gain during pregnancy and the social pressure to regain pre-pregnancy stature after birthing also impact on smoking and relapse rates (69, 71-73).

Smoking is viewed by socio-economically disadvantaged smokers as one of the best ways to take a break from daily hardships, deal with stress, the responsibilities of caring for others and controlling their emotions (70, 71, 74). The additional stressors associated with quitting whilst pregnant are seen as too demanding so that pregnancy is often seen as a time where it is more difficult to quit (75). Women frequently smoke because remaining abstinent is challenging, particularly during pregnancy (64). The constant physiological and psychological effort required to remain smoke free following birth requires women to expend additional emotional energy they may not possess. Additional stressors for women who are socio-economically disadvantaged include greater incidence of disruptive home or neighbourhood environments, lack of transport, which compounds feelings of isolation, and lack of social support. Women who are economically disadvantaged and socially unsupported face parenting challenges in isolation and report smoking to relieve anxiety and depression (74).

The Physiology of Smoking and Pleasure/Addiction

People who smoke cite the personal benefits of continued smoking. They say that mood, anxiety, and stress can be improved or relieved by smoking. People who smoke claim concentration and arousal is enhanced following a cigarette (76, 77). Research supports that visual perception, motor function and cognitive functioning is improved following a cigarette (76, 77).

The pleasure that smoking provides is mediated by nicotine which is delivered to the Central Nervous System within 10-20 seconds of inhalation (78). Nicotine activates nicotinic acetylcholine receptors (nAChRs) in the brain. Initially nAChR activation produces a cascade of actions resulting in a dose dependant increase in dopamine levels (77). Dopamine is a neurotransmitter that is associated with the pleasure system. Dopamine release provides feelings of pleasure and satisfaction thus reinforcing behaviour that created the dopamine release. Any experience or ingested chemical that produces a sense of well-being or satisfaction will activate the release of dopamine (79). Repetition of the initiating behaviour, in this case, smoking, strengthens the feelings of gratification or the “feel good” sensation associated with the behaviour. Dopamine is a key regulator of behavioural adaptation and anticipatory processes (80) and appears to be involved in all addictive behaviour (81). Women of lower socio-economic status may have less internal and/or external sources of “feel good” experiences that are capable of activating dopamine releases (79). Nicotine can provide women experiencing hypo-satisfaction with a surge of dopamine thereby delivering a short-term feeling of satisfaction(79).

What Women Feel about Smoking in Pregnancy

Although women say that smoking provides relief from their daily stressors, they feel embarrassment and self-loathing about smoking (70). Pregnant women feel vulnerable to social pressure (82). They feel constantly judged by others and guilty from the time their pregnancy is confirmed (40, 69). Women have been found to feel shame at their own lack of motivation to abstain from smoking and disturbed by the anti-smoking propaganda constantly thrust upon them whilst pregnant (69). Social pressures to conform to the image of a “good mother” by not smoking externally motivates women to modify their smoking behaviour (83). Some women feel so much anxiety and pressure associated with pregnancy that they continue to smoke at their existing rate or increase their tobacco intake as the pregnancy progresses (40).

Women who continue to smoke whilst pregnant conduct a self-risk assessment, either consciously or unconsciously (84). Women report smoking is less harmful than the possible outcomes of not smoking e.g. some women state that smoking buffers their children from the woman's anger (85). Smoking allows the woman a brief, pleasurable break from the stressful situations in which they live. The health risks associated with smoking are abstract and distant in relation to the immediate gratification experienced with smoking (86).

Women's views on smoking cessation interventions

The views of women who continue to smoke in pregnancy haven't specifically been canvassed in relation to smoking cessation intervention research. Eighty two percent (82%) of women believe that behaviourally based support strategies would benefit them most in their attempt to quit smoking. However, behaviourally based methods have been found to

be one of the least effective methods (19). Behaviouristic interventions view the act of smoking as a stimulus that is reinforced following a positive or pleasant response (discussed above) (87). Women say they would welcome behaviourist interventions aimed at changing their smoking behaviour (88). In spite of what they say however, only 5% of women use behaviourally based support programs when they are offered. The poor uptake may be due to support being offered regardless of the woman's readiness to quit or because the long-term internally motivated rewards are not as rewarding as the short-term satisfaction derived from the physical and psychological act of smoking (89).

Seventy seven percent (77%) of women believe self help materials would be beneficial (89). The appeal of Self-help materials may indicate the number of women who would prefer health professionals handed out information and left the decision up to the woman, without further scrutiny and related embarrassment. Women believe that without self-determination and will power it is not possible to quit, regardless of the support offered (74). They said that shifting the focus of health to themselves from that of their fetus strengthened their determination to maintain abstinence (69). Face-to-face support sessions with additional assistance such as exercise programs and buddy systems involving close friends encouraging their quit efforts was thought by women to be beneficial (89). These views are somewhat supported by Donatelle et al., (21) and Walsh et al. (20) who implemented support coupled with reward, incentive based interventions. What portion of the success rates was attributable to social support, separate to financial and/or reward incentives is not known. A review of social support interventions in 2000, revealed that "buddy supporters" may be of benefit to potential quitters within the context of a delineated smoking clinic. Social support, however, was not found to be of benefit in community settings (90).

Women's views on smoking cessation advice

Women generally believe decisions and responsibilities regarding health behaviours are the responsibility of the individuals concerned (40, 91). Very few women feel that health care professionals influence their smoking behaviour. There are, of course, conflicting voices as not all women think the same. Some women believe their doctors to be the most appropriate authority figure to provide smoking cessation information and that midwives should be the link person to other forms of support (40). Other studies reveal that women feel midwives played an important role in their motivation to stop or reduce tobacco intake during pregnancy. A woman-centred approach, with the health care provider having knowledge of the woman's social situation and viewpoints, was said to be helpful (69).

Some women are critical of health professionals who benignly advise them to stop rather than strongly recommending that they quit (40). These women believe this negates the severity of the situation and lessens the motive to quit. Other women, particularly the most socially disadvantaged ones, may cease attending antenatal clinics if they feel judged or embarrassed about their lifestyle (92). Some women complain that worrying about smoking increases their stress and anxiety, making quitting more difficult and/or increasing their smoking (69). Most women do not like to feel harassed into quitting. This view is supported by a group of non-pregnant women who smoke. They believe the relationship between themselves and the doctor was damaged when smoking advice was discussed at each visit (91).

Some women expect the topic of smoking to be introduced during their antenatal care, sustained throughout the whole of their pregnancy and be delivered by a person whom they

respect and with whom they have formed a relationship (40). Although women consider midwives to be nagging if the subject is discussed each visit, most women still feel it would be helpful (69). Women believe that identifying as a non-smoker rather than a temporary abstainer helps their quit efforts but it may also mask women who relapse and smoke in pregnancy (35, 36).

Discussion and Conclusion

Research on the effectiveness of quit smoking campaigns in pregnancy indicates a relatively low level of success, with the most recent systematic review showing a 6% increase in quit rates for women in the intervention arms of RCTs. Relapse rates remain high and delivery of smoking cessation advice is mixed in relation to content and intensity. Though the National Tobacco Strategy 2004-2009 argues that “Tobacco use, more than any other single factor, contributes to the gap in healthy life expectancy” (6, p.1) no strategies specific to pregnant smokers are presented.

The experiences of women in relation to being subjected to quit smoking interventions in pregnancy have been mixed. Some women feel it is reasonable for health professionals to address their smoking behaviour with them whilst others feel unhappy about it. The development of mutually respectful and trusting relationships may be disturbed by inconsistencies in messages and actions delivered by midwives in relation to health care issues such as smoking. In at least one study women who were socially-economically disadvantaged reported ceasing attendance at the antenatal clinic after feeling criticised by midwives (92).

In our view the midwifery partnership requires midwives to take a woman-centred approach. By contrast the quit smoking campaigns and the way that research has been conducted is baby-centred with the woman who smokes seen as the perpetrator of 'bad' behaviour.

Pregnant women who smoke access health services for pregnancy related issues, not smoking issues. Health care professionals, nonetheless, use the visit as a 'teachable moment' regarding smoking cessation (93). The discrepancy in reasons for the antenatal interaction no doubt explains why health professionals aren't very effective in changing women's smoking behaviour. In line with the woman-midwife partnership, the woman should plan the mode and focus of quit interventions. Health care workers, specifically midwives, must support the woman to maintain her own general health and well-being without focusing exclusively on the benefits for the baby (94). Midwives should address smoking from a perspective that includes the broader socio-political context.

Midwives and other health care workers must be invited to express their needs and concerns with regards to providing pregnant women smoking cessation advice; thus qualitative research is required. Women should feel their views on smoking and health strategies are valued so they provide researchers and health care workers with knowledge regarding the best ways to talk about smoking in pregnancy in ways that support the woman-midwife partnership and are not seen as cursory, critical or patronising. Until health professionals can gain these types of insights and work in partnership with women in a mutually respectful manner the question is why would women stop smoking?

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Table 1.1 Levels of evidence

Levels of evidence	
Level I	Evidence obtained from systematic review of relevant randomised controlled trials
Level II	Evidence obtained from one or more well-designed, randomised controlled trials
Level III	Evidence obtained from well-designed, non-randomised controlled trials; or from well-designed cohort or case control studies
No evidence	After searching no evidence was found relevant to general practice on the issue being considered.
Strength of recommendation	
A	There is good evidence to support the recommendation
B	There is fair evidence to support the recommendation

Source: NHMRC handbook How to Assess the Evidence: Assessment and application of scientific evidence (95).

Table 2 Smoking Cessation Intervention Strategies in Research

Intervention	Strategies Implemented/Tried
1. Changing attitudes	Educational and motivational strategies aimed at changing attitudes, knowledge and behaviours of health professionals with respect to smoking cessation.
2. Combinations	A combination of two or more of the intervention strategies
3. The provision of information	Information about smoking and pregnancy and the harmful effects of tobacco use on the baby, woman and/or family members
4. Direct advice to stop smoking	Advice about smoking cessation strategies without supplemental materials or services offered
	Advice about smoking cessation support services and strategies with reinforcement at each subsequent visit
	Advice about smoking cessation support services and strategies with supplemental materials and or services offered
Supplementation of advice consisted of one or more of the following:	
a.	Individualised counselling based on 'stages of change'
b.	Group counselling
c.	Provision of peer support
d.	Documentation of progress in smoking cessation attempts and validation of self-reported smoking behaviour at subsequent visits by means of bio-chemical means.
e.	Direct feedback of the negative effects of smoking on the fetus by means of measuring fetal heart rates, fetal movements and fetal breathing movements
f.	Direct feedback of positive information regarding fetal development associated with changes in smoking status
g.	Telephone follow-up with reinforcement of quitting advice and quit strategies
h.	Nicotine replacement therapy
i.	Rewards and incentives - money, vouchers, confectionary, prizes