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A Pilot Intervention for Pregnant Women in Sichuan, China on Passive Smoking

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Abstract

Objective—The study aimed to reduce women’s exposure to passive smoking, which has been linked to increased risk of cancer and other diseases. By exploring the knowledge, attitudes and behaviors of pregnant women with regard to secondhand smoke in the home environment, a model for intervention during the pregnancy was designed with the help of the intended beneficiaries and was piloted.

Methods—The study had two phases. Phase 1 included focus group discussions and an iterative process to design an intervention. Phase 2 was the intervention itself, which included a series of motivational and patient communication activities, a resource booklet, clinician counseling, telephone hotline, and regular telephone counseling. Pre- and post-intervention questionnaires were used to measure results.

Results—Post-intervention questionnaires showed a significant increase in knowledge, a change in attitudes towards stronger disapproval, and an increased likelihood of taking assertive action when exposed to secondhand smoke in the family.

Practice Implications—The results of this study point to the fact that there is a need to give emphasis to passive smoking in the home environment and that the women’s pregnancy is an effective conduit to increasing knowledge and bringing about change. The intervention model can become a part of the standard protocol for the care of pregnant women in hospital settings.

Keywords

China; smoking; passive smoking; pregnant women; focus groups; intervention

I. Introduction

Secondhand smoke can cause an adverse effect on the nonsmoker’s cardiovascular system and increase the risk for lung cancer and coronary heart disease [1]. For pregnant women, toxic substances from secondhand smoke cross the placenta to affect the fetus directly, putting the infant at increased risk for neonatal and perinatal morbidity and mortality [1].

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Conflict of Interest The author has no conflict of interest.

Declaration: I confirm all patient/personal identifiers have been removed or disguised so the patient/person(s) described are not identifiable and cannot be identified through the details of the story.

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Most intervention studies have concentrated on helping pregnant women to quit smoking [2] and on helping husbands to quit [3]. Little has been done, however, to help pregnant women increase the chance that they live in smoke-free homes. In-pregnancy smoking cessation programs for husbands have shown to have little sustained effect [4]. It is therefore important that the necessary knowledge and skills are communicated to the pregnant women to reduce exposure to passive smoking. No previous study in this regard can be found in the literature.

This need is keenly felt in China because of a number of epidemiological and social factors. There are 350 million smokers, and 540 million are exposed to secondhand smoke [5,6]. Over 66% of men are smokers, compared with 3.1% of women [5]. Thus, large numbers of women and children are exposed to secondhand smoke. The 1996 National Prevalence Survey found 54.6% of women exposed to secondhand smoke, and a prevalence rate of 60% for women in the reproductive age range [7]. This prevalence rate declined somewhat in the 2002 Prevalence Survey, but was still high at 55 to 58 % for women in the reproductive age range [5]. Both surveys found that 90% of the exposure for women occurred in the home environment. Unlike some countries where smoking has become a social stigma in the last few decades, smoking by men in China is still very much accepted. Women have traditionally accepted the fact that men smoke in their presence [8].

The Shanghai Women's Health Study, a cohort study of over 60,000 women, showed that 83.1% of women were exposed to secondhand smoke at home, at work, or a combination of both [9]. It also found that the prevalence of stroke was elevated among women whose husbands smoked, and increased with the duration of husbands' smoking [10]. Another study found that for Chinese women, exposure to secondhand smoke was related to moderately increased risk for mortality from lung cancer and cardiovascular disease [9].

Because the prevalence of smoking for women is so low in China [5,11], obstetric doctors and nurses do not perceive smoking as a problem for pregnant women. The dangers of passive smoking by pregnant women are easily overlooked. A pilot intervention project was conducted with pregnant women in Chengdu, the capital of Sichuan province in China. The study used a woman's pregnancy as an entrée to communicate knowledge and to motivate pregnant women to take assertive action to reduce their exposure to passive smoking at home. In a society where most families will have only one child, the 9-month window of a woman's pregnancy and the impending arrival of a baby present an important opportunity for a public health intervention. Parents and grandparents are also motivated to ensure the health of the baby. The longer-term goal is maintenance of the smoke-free environment for the newborn, for the young child, and for the whole family.

2. Methods

2.1 Theoretical framework

This intervention has as its theoretical basis the Health Belief Model, which is based on the understanding that a person will take a health-related action if he feels that the negative health condition can be avoided by an action on his part, and that he is capable of doing it [12]. The intervention also draws reference from the social cognitive theory, which posits that belief in one's efficacy to exercise control is a pathway to affect health functioning and looks beyond the individual to emphasize the dynamic, ongoing processes in which personal factors interplay with environmental factors, such as family and peers, and the physical environment [13].

2.2 Study design

This study consisted of two phases. The first phase used focus groups to explore the pregnant women's knowledge and perception of health threats posed by passive smoking, their

understanding of the benefits of decreased exposure, their attitude towards the smokers, and their behavior when exposed to secondhand smoke. It involved these women in the development of targeted concepts and messages. The second phase of the study was the pilot intervention, which consisted of multi-faceted communication activities for the pregnant women. The study used a pretest-posttest design to measure the change in knowledge, attitudes and behaviors about secondhand smoke at home. Figure 1 is a flow diagram of the study.

2.3 Sample

55 participants for the focus groups were recruited from pregnant women attending three Chengdu hospitals for prenatal care. They were nonsmokers and their husbands smoked. 128 nonsmoking pregnant women whose husbands were smokers were recruited for the second phase and followed up for 16 weeks in January to April 2007. Table 1 and 2 give the demographic characteristics of these participants.

2.4 Focus groups and intervention

Two rounds of focus group discussions were held. The first round used open-ended questions to explore knowledge, attitudes and behaviors, and to gather ideas about the issues women encounter at home. These findings were used to design a pilot intervention. A second round of focus group discussions tested these messages and concepts with the same participants.

In the intervention phase, multi-faceted communication activities were held with the sample recruited. The first contact was an event at the hospitals which included motivational speeches by authoritative figures from the hospital, video show to communicate knowledge, role play exercises to practice tactics to be used, and games to instill a feeling of efficacy. They were also given a resource booklet to use at home. The home resource booklet used simple and pictorial terms to communicate knowledge and teach skills.

As the focus groups found that advice from clinicians carry a lot of weight, the hospital records of women in the sample were marked to identify them as participants in this study. This facilitated a systematic reinforcement of the messages by clinicians when the women attended for antenatal checkups. A telephone hotline was put in place for counseling and reinforcement. Biweekly telephone consultations were conducted by the researcher during the intervention period, and a round-up event pulled participants together to share their experiences.

A pre-intervention questionnaire was administered at the beginning of January 2007 and a post-intervention questionnaire was administered at the end of April 2007.

3. Results

3.1 Focus groups findings

Themes and ideas that emerged from these discussions are grouped into personal, interpersonal, environmental and social domains and presented in Table 3. The women seemed to accept the skepticism their husbands and other family members had about the harm of secondhand smoke, and did not think that they could do anything about ensuring a smoke-free environment at home. They perceived even less chance that something could be done at the workplace.

Many of the issues that emerged from the discussions were similar to general impressions about the social and cultural backdrop of the entrenched problem of smoking, the status of women in the society and at home, and the prevailing barriers to a smoke-free environment. The focus groups highlighted the importance of empowering women with increased knowledge and skills to interact in the dynamics of the family environment. Participants were asked to identify concepts and messages that resonated with them. Based on the analysis of data from the focus

groups, the focus of the intervention would be to increase the women's sense of self-efficacy so that they can be effective in reducing their exposure to secondhand smoke regardless of the smoking status of their spouse or family members.

Using the narratives and anecdotes which emerged from the focus groups, participants articulated a succinct theme that encapsulated this feeling of empowerment and self-efficacy: A Smoke-free Home Starts with Me. Major barriers identified in the focus groups related to knowledge, skills and the physical environment. Addressing these concerns, a resource booklet was designed for use at home. Besides communicating knowledge, the resource booklet depicted the common situations which focus group findings showed that the women did not know how to react to. For example, as the focus groups found that women were anxious not to compromise family harmony, the suggestions for what to do and say helped to ease their anxiety and convinced them that it was possible to take action without causing any loss of harmony.

3. 2 Pre and post-intervention scores

To assess whether the pregnant women's knowledge had increased, the questionnaire included four knowledge variables, as shown in Table 4: knowledge of harmful components of secondhand smoke, knowledge of diseases caused by secondhand smoke, knowledge of harm of secondhand smoke to pregnancy, and knowledge of the benefits of a smoke-free family. Participants were also asked what their attitude was when exposed to secondhand smoke during their pregnancy. Responses were grouped into "strongly dislike" and "neutral and indifferent". The questionnaire asked what actions the women took when exposed to secondhand smoke from the husband and from other family members. Their responses were divided into two categories: "assertive action", when they asked the smoker to quit or to stop smoking in their presence, and "passive action", when they left the room, went to open windows, or just tolerated the secondhand smoke and took no action at all.

Participants' post-intervention scores were significantly higher than their pre-intervention scores, indicating a significant increase in knowledge, changes in attitudes towards stronger disapproval, and an increased likelihood of taking assertive action when exposed to secondhand smoke in the family. Participants with some knowledge of the harmful components of secondhand smoke increased from 32.7% to 92.2% ($P < .01$), while those with some knowledge of the diseases caused by secondhand smoke increased from 19.5% to 74.2% ($P < .01$). Approximately 38% of the participants started the program with some knowledge of the harm of secondhand smoke to the pregnancy and the fetus, and this figure improved to 73.4% after the intervention ($P < .01$). Most participants already were aware of the benefits of a smoke-free environment at home. The high pre-intervention percentage of 82.8% improved even higher to 95.3% ($P < .05$).

The percentage of participants who disliked and strongly disliked being exposed to secondhand smoke increased from 50.7% before the intervention to 82.8% after the intervention ($P < .01$). Before the intervention, a high percentage of the participants reported that they were likely to take assertive action when exposed to secondhand smoke from their husband. The high percentage of 92.2% increased to 98.4% after the intervention ($P < .05$). When the source of exposure was other family members, the likelihood of assertive action was 56.2% at the pre-intervention period, lower than when the source of secondhand smoke was the husband. But this percentage increased to 86.7% after the intervention ($P < .01$). See Table 4.

4. Discussion and conclusions

4.1 Discussion

No research can be found in the literature specifically designed to study pregnant women's knowledge, attitudes and behaviors with regard to secondhand smoke. This study identified key challenges that pregnant women face in changing men's smoking behaviors at home. The focus group results showed that they had a feeling of powerlessness and low self-efficacy. Therefore, the intervention model focused on empowering them by communicating to them the knowledge of passive smoking and cancer and other illnesses, and the skills to interact with smokers in their presence. Participatory design was a powerful approach to identify the specific barriers and ways to overcome them through an intervention.

This study is limited by the fact that the sample recruited was a convenience sample and therefore may not be representative. Logistical difficulties precluded a comparison group, and the sample size was small. Further research with a larger sample size is needed to ascertain the validity of these findings. There was also no evaluation of the relative effectiveness of the different components of the intervention model. This may be an area for further research.

Despite the limitations, the study provides important qualitative and initial quantitative results for diverse pregnant women engaged with maternity hospitals. A larger scale study is being conducted in the Henan province by the China Association on Tobacco Control which uses the intervention model in this study and includes a comparison group.

4.2 Conclusions

Exposure to secondhand smoke is a significant problem for women in China, and there are many barriers to women taking action for their own well-being. The participatory nature in the design of the model for patient communication makes it possible to get to a level of specificity that helped the women acquire the necessary knowledge, gain confidence and be more effective. Using the women's pregnancy was a convenient and effective conduit to reach the intended beneficiaries.

4.3 Practice implication

This study suggests that the pilot intervention is a promising approach that health care institutions and health care providers can use to help educate and empower pregnant women to reduce passive smoking at home and in the workplace. In order to reach a wider population, the intervention model could be adopted at other maternity hospitals and could become part of the standard protocol for the care of pregnant women in hospital settings.

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Figure 1.
Flow Diagram of Study Design

Table 1
Demographic Characteristics of Participants in Focus Groups (n = 55)

Demographic characteristics	%
Age (years)	
25 and under	29.4
26 – 30	56.9
over 30	13.7
Educational standard of women	
< high school	25.5
high school	43.6
> high school	30.9
Educational standard of husband	
< high school	21.5
high school	27.5
> high school	51.0
Monthly family income in previous year (RMB)	
<1000	3.7
1000 – 2999	38.9
3000 – 5000	22.2
>5000	35.2

Table 2
Demographic Characteristics of Pregnant Women Participating in Pilot Intervention (n = 128)

Demographic characteristics	%
Age (years)	
25 and under	38.3
26 – 30	48.4
over 30	13.3
Educational standard of women	
< high school	10.2
high school	36.2
> high school	53.6
Educational standard of husband	
< high school	11.7
high school	27.3
> high school	61.0
Monthly family income in previous year (RMB)	
<1000	6.4
1000 – 2999	39.2
3000 – 5000	36.0
>5000	18.4

Table 3

Recurring Themes in Focus Group Discussions

	Personal issues	Interpersonal issues	Environmental factors at home	Environmental factors outside home	Social consideration
KNOWLEDGE & BELIEFS	Unfamiliar with the concept of SHS*	Husband & other family members lack knowledge	No supportive environment to discuss issue of smoking	Cigarettes often available	Smoking part of culture and social life
	Anecdotal evidence of good health as well as illness for baby & mother in households with smokers	Belief that SHS okay for fetus, because protected inside mother	Small apartment makes it difficult	Help for quitting smoking not available	Ritual for relaxation or social interaction
	Little knowledge of the diseases caused by SHS to infant, to women, or to pregnancy	Belief that passive smoking problem more to do with discomfort or annoyance to the nonsmoker than real health risks	Relatives/in-laws are often smokers	No educational materials on harms of SHS	
	Little knowledge of "smoke-free" benefits	More concerned about exposing newborn baby	Husband's urge to smoke & unsuccessful quit attempts	Coworkers smoke all the time	
ATTITUDES	Harmony at home is important	Deference to husband and father-in-law, supervisor, boss		Boss smokes	
	Need to be understanding of husband	Should have respect for smoker's rights too		Not much compliance with no-smoking signs	Negative messages are not well received by smokers
	Embarrassing to assert oneself	Husband's skepticism about SHS		No control over other people's smoking	Resistance to change prevailing
	Feeling of helplessness & futility	Smoking relieves husband's anxiety from work & about pregnancy			
	Feeling of inability to bring about any change			Need more smoke-free areas	

* SHS: Secondhand Smoke

Table 4

Pre- and post- intervention changes (n = 128)

	Pre %	Post %	chi sq	P value
Knowledge of SHS* harmful components				
little or no	67.3	7.8	105.69	<. 01
some	32.7	92.2		
Knowledge of diseases caused by SHS				
little or no	80.5	25.8		
some	19.5	74.2	98.40	<. 01
Knowledge of harm of SHS to pregnancy				
little or no	62.2	26.6		
some	37.8	73.4	64.01	<. 01
Knowledge of benefits of a smoke-free family environment				
little or no	17.2	4.7		
some	82.8	95.3	33.24	<. 01
Attitude towards SHS				
neutral or indifferent	49.3	17.2		
dislike or strongly dislike	50.7	82.8	29.92	<. 01
Action when exposed to SHS from husband				
passive	7.8	1.6		
assertive action	92.2	98.4	5.6	<. 05
Action when exposed to SHS from other family members				
passive	43.8	13.3		
assertive action	56.2	86.7	32.21	<. 01

* SHS: Secondhand Smoke