PREGNANT WOMEN'S PERCEPTION OF SECONDHAND SMOKE EXPOSURE

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Abstract

Background: Birth outcomes including low birth weight, preterm birth, and delayed infant neurodevelopment are associated with secondhand smoke exposure while pregnant. The purpose of the study was to explore pregnant women's perspectives on secondhand smoke exposure to understand their experience and inform recommendations.

Study Design and Methods: Qualitative semistructured interviews were conducted with 15 secondhand smoke-exposed pregnant women in the United States.

Results: Four primary themes were identified: feeling powerless, trapped, and discomfort; enhancing women's self-advocacy and initiative; having conflicting feelings about secondhand smoke exposure; and desiring professional advice and education. Women expressed concern about prenatal secondhand smoke exposure, although they felt unable to request that people refrain from smoking in their presence or personal space. Women's strategies to minimize secondhand smoke exposure often involved their own social isolation. Women described sources of support, educational needs, and desire for practical advice in secondhand smoke avoidance.

Clinical Implications: Findings underscore the role of nurses working with pregnant women living with household members who smoke to educate women about secondhand smoke risks and strategies for avoidance and to enhance women's self-confidence in advocating for themselves to reduce their exposure.

Key words: Pregnancy; Prenatal smoke exposure; Qualitative study; Secondhand smoke exposure; Smoking; Tobacco smoke pollution.

Prenatal secondhand smoke exposure is associated with poor infant health outcomes including low birth weight (Ion et al., 2015), preterm birth (Cui et al., 2016), stillbirth (Hyland et al., 2015), orofacial clefts (Sabbagh et al., 2015), and delayed neurodevelopment (Lee et al., 2019). Secondhand smoke exposure may increase risk of prenatal and postpartum depressive symptoms (Suzuki et al., 2019a) and is associated with discontinuing breastfeeding before 6 months of age (Suzuki et al., 2019b). Secondhand smoke exposure also increases risk of thirdhand smoke exposure, which refers to smoke residue in the environment that may increase children's risk of neurological disorders (Martins-Green et al., 2014).

Population-based research in the United States estimates that 23% of pregnant women experience secondhand smoke exposure, 12% smoke and have secondhand smoke exposure, and 6% smoke during pregnancy (Do et al., 2018). A primary focus of recommendations is specific to reducing firsthand prenatal smoking (American College of Obstetricians and Gynecologists, 2020). Despite smoking restrictions in public places, pregnant women may be exposed to secondhand smoke at home, especially in populations with higher smoking environmental exposure at home such as was found among African American and Native American cultures (Hawkins et al., 2014; Hoshiko et al., 2019). Among nonsmoking pregnant women with secondhand smoke exposure, over 75% had detectable levels of serum cotinine levels indicating high exposure in nonsmoking women (Hoshiko et al., 2019). Over half of pregnant women living with smokers reported not having a complete smoking ban in their homes and cars, or restricting smoking to reduce exposure (Stotts et al., 2014).

Having household members who smoke, particularly partners, is a primary factor in secondhand smoke exposure among pregnant women (Do et al., 2018). Women may face difficulty establishing smoke-free homes, related to uneasiness with requesting that people refrain from smoking around them (Lee et al., 2019). Contributing factors are lack of knowledge about increased risks for adverse outcomes associated with prenatal smoking (Polen et al., 2015), or denial of the effects of secondhand smoke exposure on children (Rosen et al., 2011). Most of the qualitative research exploring secondhand smoke exposure experience among pregnant women was conducted outside the United States (Jackson et al., 2016; Mao & Robinson, 2016; Wang et al., 2014), or was focused on partners (Flemming et al., 2015; Wakefield et al., 1998) without seeking the perception of the pregnant women. Prenatal health providers primarily focus on firsthand smoking with only a small proportion discussing secondhand smoke exposure (Gould et al., 2017). Qualitative exploration of pregnant women's experience with secondhand smoke can inform development of evidence-based educational interventions to reduce prenatal secondhand smoke exposure.

Study Design and Methods

A qualitative phenomenological study was conducted to explore the experience of U.S. pregnant women exposed to secondhand smoke. Fifteen pregnant women were recruited through advertisements in clinic settings and posted on online social media platforms. Interviews were conducted by telephone using a semistructured guide, developed based on responses from previous qualitative research (Jackson et al., 2016; Mao & Robinson, 2016; Wakefield et al., 1998). The interview guide was developed by the principal investigator, who has worked clinically and published in the field of prenatal smoking cessation, and was then reviewed by two clinical experts who work in the field of smoking cessation, one clinician at the principal investigator's university and one clinician-researcher from another university. Interviews were conducted by the researchers, audio-recorded, and professionally transcribed. Saturation was reached with identification of redundant data with the final interviews. Initially, a subset of five individual interviews were independently coded using an inductive approach to identify themes from the narratives by the three members of the research team, and then compared and discussed for the development of the coding manual. The coding manual was used to code the remaining transcripts. Institutional review board approval was obtained prior to initiating the study.

Results

Fifteen women who were pregnant and lived with a smoker were interviewed (Table 1). Three women did not smoke, eight women quit smoking when they became pregnant, and the remaining four women continued to smoke during pregnancy, with three reducing their smoking. Among the household members who smoked, 11 were partners and four were other household members. Five women had rules against smoking in their homes. Four primary themes were identified: feeling powerless, trapped, and discomfort; enhancing women's self-advocacy and initiative; having conflicting feelings about secondhand smoke exposure; and desiring professional advice and education.

Feeling Powerless, Trapped, and Discomfort

The theme of women's expression of feeling powerless, trapped, and uncomfortable about secondhand smoke exposure included subthemes such as refraining from overstepping personal boundaries, emotional distress, and physical discomfort. Women shared their hesitation in asking people to quit smoking or at least not to smoke around them, with general statements of, *I don't like stepping on toes* and *I don't feel comfortable asking people... It's not my place to do that.* They did not want to offend or impose their beliefs on their family members or friends, especially for those who were addicted to smoking. This feeling was repeated with a sense of resignation to step away from the smoker, *It's better for me to just move away. I can't make someone else stop smoking... It's just easier if I remove myself from the room.*

Women experienced emotional distress when faced with people who smoked in their home or in their presence. They described feeling trapped in the house or the car when someone was smoking and they could not leave

the situation, *When I am riding in the car, then there is not really a way to get out and get away from them.* Feeling powerless to affect change was exacerbated for women who did not own their home or car, placing them at the mercy of others regarding their prenatal exposure. These experiences resulted in anxiety and fear of encountering smokers while lacking the confidence or ability to ask them not to smoke. Some women were upset by other people's smoking behavior around pregnant women, *Gets me mad when I see the people that don't have consideration. They see a pregnant woman and they light up their cigarettes right in front of them.*

When in the presence of smokers, women reported physical discomfort and symptoms such as nausea and difficulty breathing. Some women were sensitive to smells including the smell of smoking which triggered nausea and vomiting, as described by one woman, *When I am in the car, I have to roll down the window or else I gag. It upsets me more when I am getting up in the morning and I have that nausea or on a bumpy car ride then I am more nauseous.* Feelings of discomfort and concern about physical risks were pronounced among women with asthma and those with children who had respiratory problems, *I have a rescue inhaler when I need for my asthma… it's more challenging now with my 2-year-old who has been on nebulizer treatments after she had a respiratory infection when she was 1 year old.*

Enhancing Women's Self-Advocacy and Initiative

Women's self-advocacy and initiative in reducing their secondhand smoke exposure and the responses of people around them was discussed. Some women could rely on established rules against smoking in their homes, as exemplified by a couple women, *I don't let smoking happen in my house*, and, *There are rules against smoking indoors, those are always the rules in the house.* Some women felt confident requesting that family and friends refrain from smoking in their presence, *I definitely told people that if you got to smoke, you smoke outside. I've sent [people] outside or told them not to smoke.*

Not all the women were in the position of setting rules against smoking and were unable to prevail upon people to reduce their exposure, even after asking, *I was like, "I'm expecting so I'm not able to be in second-hand smoke. I have to ask you to put that out or I have to leave," and they moved the ashtray two feet from me and continued to smoke so I had to leave.* Some relied on recommendations from their health care providers or showed written materials to household members to educate them of the risks of secondhand smoke exposure. Most of the women described physically removing themselves from an environment in which they were exposed to secondhand smoke, with some admitting that they felt *isolated.* Other measures to reduce exposure included opening windows and wearing masks in the presence of people who smoked. In extreme situations, women moved away geographically, *We moved… the neighbors would always smoke and it would come through the window.*

TABLE 1. DESCRIPTIVE CHARACTERISTICS OF PARTICIPANTS ($N = 15$)

Characteristics	% (n) or mean ± SD
Age	29.9 ± 5.7
Married or living with partner	80.0 (12)
Number of children	1.4 ± 1.3
Gestational week	23.1 ± 8.4
Highest level of education	
High school	53.3 (8)
Some college	33.3 (5)
College degree	13.3 (2)
Residence	
Rural	46.7 (7)
Urban	40.0 (6)
Suburban	20.0 (3)
Smoked prior to pregnancy	80.0 (12)
Quit smoking during pregnancy	53.3 (8)
Smoked during pregnancy	26.7 (4)
Reduced smoking during pregnancy ($n = 4$)	75.0 (3)
Household member who smokes	
Partner	73.3 (11)
Other	80.0 (12)
Rules against smoking in home (yes)	33.3 (5)

Having Conflicting Feelings about Secondhand Smoke Exposure

Conflicting feelings and lack of knowledge about secondhand smoke exposure ranged from understanding prenatal risks to neutrality or unawareness of any influence on pregnancy. One woman said, *I'm not super concerned about it* or *I feel like nobody thinks it's that big of a deal.* Women's understanding may have been influenced by their partners' knowledge and attitude, as described by one of the women, *My boyfriend didn't even know that there were negative effects of second smoke. He said it only affects the person that was smoking.*

Women who were aware of and knowledgeable about the risk of health consequences associated with secondhand smoke expressed an effort to avoid smokers. One concerned pregnant woman stated, *It can increase SIDS risk as well as the risk of premature births, stillbirth, or low birth weight, and that significant exposure can cause more issues like a woman smoking herself, is my understanding of second-hand smoke… if it's constant exposure, then it can be pretty bad.* Another woman attributed a previous stillbirth to her former partner's smoking. *My previous ex smoked near me regularly, and he did not care. That's how I ended up with a stillborn son.*

In contrast, other women did not consider the risks associated with secondhand smoke exposure and were

Nurses should empower women's self-confidence and advocacy on how to avoid secondhand smoke.

therefore unconcerned about prenatal exposure for themselves and their developing fetus. One woman said, *My son is perfectly fine and I was around second-hand smoke during that pregnancy as well. He wasn't preterm, not low birth weight, meets all of his milestones, so I don't think it's that bad.* Women who grew up in a culture of unrestricted smoking were more accepting of secondhand smoke exposure and claimed that they had not observed adverse infant health outcomes among family and friends who were exposed to secondhand smoke in pregnancy, thereby dismissing prenatal risks of exposure. Ambivalence was expressed by one woman; *I think that there is no solid evidence about smoking in pregnancy... So smoking is not good but it's not one of the worst things on the list. There are worse.*

Among four women who smoked during pregnancy and three with a history of smoking, they expressed discomfort asking others to quit, although those who quit felt a sense of accomplishment in their own achievement of quitting. There was hesitancy among women with a history of smoking to ask people to refrain from smoking as they were sympathetic to the difficulty of quitting. Those who were still smoking were concerned that they may appear inconsistent and insincere, *It's kind of hypocritical to try and tell somebody not to do something you're doing... it's definitely uncomfortable to talk about somebody quitting when I can't quit myself.*

Desiring Professional Advice and Education

Women described their experience with and desire for professional advice. Some women were taught risks of secondhand smoke exposure, whereas others felt that they were not given enough information about smoking cessation and secondhand smoke avoidance during pregnancy. For most of the women who smoked prior to or in the beginning of pregnancy, their health care providers were diligent in advising them to quit smoking and offered strategies for smoking cessation, *They talked to me a lot about the risks of being exposed to smoking, even before pregnancy.* Some women quit smoking after receiving advice from their health care providers, *My doctor had told me about possibly going into premature labor, that kind of freaked me out... I'm only 24 weeks so that really freaked me out, and I quit.* Yet, the discussion about smoking cessation was often brief as described by one woman, *They don't say anything, just let me do whatever. They're just like, It's something that you do. It is what it is.* Other women described the limited information they received was relegated to the provision of written materials or brochures without active and persistent engagement in a conversation about risks, strategies, and approaches, *I have had some papers that were handed out to me about smoking and the risk that smoking can cause, the risk that smoking has for your baby. I don't think there was anything about stopping or stopping others from smoking... I haven't had anybody discuss it with me.*

For pregnant women who were not smokers or who had quit, there was limited conversation, if any, about avoidance of secondhand smoke exposure, *They just asked if I smoked and I said "no."* Pregnant women felt that health care providers focused on refraining from firsthand smoking, *Since I don't smoke, I don't think they feel like it's an issue*, without addressing their home environment as a locus of secondhand smoke exposure.

Women expressed their preferred methods of learning about secondhand smoke exposure reduction and smoking cessation including continued encouragement and discussion with a *softer* and nonjudgmental approach. They desired clear and relevant informational resources regarding risks of secondhand smoke, *I would love to see a reference of study of the statistics, the babies exposed premature, exposed to second-hand smoke are at this percentage risk based on this study. So studies that I'd link that would be accepted... knowing the risks would be helpful... if there are resources, maybe I could share.* to dispel *so much different information.* The women also wanted individualized, accessible, and practical methods to avoid smoking exposure. Lacking information from health care providers, some of the women searched online or found resources, as one woman described, *Honestly, [they said] nothing. Everything I've read is from my baby books.* Seeking information on their own, some of the women recalled educational venues including a high school program, *Through the D.A.R.E. program that they used to have at school... with second-hand smoke.*

Women who were concerned about prenatal secondhand smoke exposure were eager to learn about and receive information about reducing their exposure to educate household members. One woman expressed her desire for information, *Like the effect that it has on your health. And ways to communicate it with somebody... Anything that is related to that and the effect they have because it has a lot of negative effects on you and your kids. Like I*

tell my boyfriend, "I brought them to the world healthy and you're trying to get them unhealthy now?" Women also felt that they would benefit from learning to enhance their self-confidence in asking people not to smoke in their proximity or in their homes, *[I need to learn] ways to explain to other people about the risks of smoking around pregnant women, so that they will know. Then they can understand why it's important not to smoke around pregnant women... so that they would care to protect pregnant women and their baby from smoke... I also need to learn how to stand up for myself about this.*

Discussion

The theme, *feeling powerless, trapped, and discomfort*, is consistent with a key theme from a large qualitative study that women sensed helplessness in negotiating smoke-free homes (Jackson et al., 2016), particularly if they were not the primary decision-maker. Inability to advocate for themselves was a source of discomfort, with some women even describing feeling trapped. In contrast, some of the women asserted their position against smoking in their homes or in their proximity, demonstrating women's self-advocacy and initiative, as described by the theme *enhancing women's self-advocacy and initiative.* Women described discomfort asking people not to smoke around them, especially if they had a history of smoking in *having conflicting feelings about secondhand smoke exposure*. Cultural and social barriers, lack of self-efficacy, and lack of awareness were found as risk factors for pregnant women to overcome secondhand smoke exposure at home (Sharma & Khapre, 2021).

There were various approaches to avoiding secondhand smoke exposure including having rules in the home, asking people not to smoke near them, opening windows, and leaving the situation. For nearly all women, a common strategy to avoid secondhand smoke exposure was to withdraw from social settings, even at home (Mazloomy Mahmoodabad et al., 2019). This strategy distances women from social engagement and causes isolation among pregnant women. Another approach was explaining to other people about the risks they pose when smoking around a pregnant woman. To acquire this knowledge, women expressed the need for professional advice, education on the topic, and training to bolster their self-confidence in advocating for a smoke-free setting.

The theme *desiring professional advice and education* focused on knowledge, awareness, and risk perception about secondhand smoke exposure was similarly identified in a thematic synthesis and systematic review aimed at exploring barriers, motivators, and enablers of smoke-free homes (Passey et al., 2016). In a qualitative study, researchers found that pregnant women lacked knowledge about risks of prenatal secondhand smoke exposure and advice from their health professionals (Jackson et al., 2016). Women in our study spoke about their educational needs, including information and empowerment to ask people not to smoke in their homes or in their proximity.

Limited intervention research has focused on reducing prenatal secondhand smoke exposure (Dherani et al., 2017; Nwosu et al., 2020; Tong et al., 2015). Our study highlights the need for nurses to educate pregnant women and their families about risks of secondhand smoke and to offer practical strategies to reduce their exposure. Insight from participants on their perceptions, experiences, barriers, and needs regarding secondhand smoke exposure can be used by nurses to develop approaches to educate and empower this population.

A limitation of the study is that most of the participants had a history of smoking, potentially reflecting a selection bias. Inclusion of women from five different states supports transferability of the findings. Future research should include collection of data on the ethnic and cultural diversity of pregnant women to understand their experience of secondhand smoke exposure and develop more culturally relevant approaches to care.

CLINICAL IMPLICATIONS

- *Ask:* During prenatal care visits, nurses should ask women about their smoking behavior and secondhand smoke exposure in their environment.
- *Assess:* Nurses should assess the knowledge of women and their partners about risks of firsthand and secondhand smoke exposure for mother–infant dyads.
- *Advise:* Nurses should advise pregnant women and their partners in strategies to mitigate secondhand smoke exposure in their homes and environments.
- *Advocate:* Based on the educational needs of the women and cultural context, nurses should empower women to be self-advocate, gaining confidence in asking people not to smoke in their presence.
- *Assure:* Nurses should assure women seek additional support and information in secondhand smoke mitigation efforts.

Note. Adapted from Agency for Healthcare Research and Quality (2012).

Clinical Nursing Implications

From early pregnancy and throughout prenatal care, nurses should ask pregnant women about their firsthand and secondhand smoke exposure, offer education for pregnant women and their partners about risks of secondhand smoke exposure, and support mitigation efforts, with respectful consideration of cultural context. Through education and provision of resources, nurses can empower women to feel confident in asking people not to smoke around them or in their home or car. Inquiry into secondhand smoke exposure and suggestions for avoidance should occur throughout the pregnancy. Clinical guidelines should be developed and incorporated into regular prenatal care to increase health care providers' assessment, awareness, education, and mitigation of secondhand smoke exposure. ✣

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