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REVIEW

A Review of the Relationships Among Psychosocial Stress, Secondhand Smoke, and Perinatal Smoking

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ABSTRACT

Objective: To summarize and evaluate the recently published literature in which the relationships among psychosocial stress, smoking, and exposure to secondhand smoke during the perinatal period are examined, and to describe the characteristics and demographics of the samples.

Data Sources: Electronic databases MEDLINE, Academic Search Complete, CINAHL, Psychology and Behavioral Sciences Collection, and PsychINFO. In addition, hand searches of reference lists supplemented the electronic search.

Study Selection: English language, peer-reviewed studies published between 2010 and 2015 on the relationships of self-reported or perceived stress, smoking, and secondhand smoke exposure during pregnancy and postpartum were included. Twenty-four studies met the inclusion criteria.

Data Extraction: Data that specified the relationships among smoking, stress, and secondhand smoke exposure during pregnancy and postpartum were extracted from the studies. A table matrix, available as supplemental material, to summarize the literature and sample characteristics and demographics was created.

Data Synthesis: Evidence from the included studies supported an association between psychosocial stress specific to pregnancy or from other sources and smoking or smoking relapse during pregnancy or in the postpartum period. In the studies in which it was included, exposure to secondhand smoke was cited as a barrier to abstinence.

Conclusion: It is probable that women who persistently smoke in pregnancy experience elevated stress. Further research with longitudinal designs and inclusion of secondhand smoke as a variable are needed.

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Smoking is the most preventable cause of morbidity and mortality in mothers and infants (Centers for Disease Control and Prevention, 2007). The use of tobacco during pregnancy has well-known detrimental effects on a mother and fetus, including a 20% to 80% greater chance of pregnancy loss, 1.2 to 1.6 relative risk of preterm birth, 1.4 to 2.4 relative risk of placental abruption, 1.5 to 3.0 relative risk of placenta previa, and 2.0 to 3.0 relative risk of sudden infant death syndrome (Einarson & Riordan, 2009; Holtrop et al., 2010; Tong et al., 2013).

Although the prevalence of smoking during pregnancy is slowly decreasing, it remains a major health concern (Tong et al., 2013). The most recent data from the Pregnancy Risk Assessment Monitoring System (PRAMS) for 2011 indicated an overall rate of smoking during the 3 months before pregnancy of 22.6%, with a range of 10.6% in New York City to 44.8% in West Virginia. Of the women who indicated that they had smoked during the 3 months before pregnancy, 55.3% reported that they had quit during pregnancy (Centers for Disease Control and Prevention, 2011), with the greatest percentage of quitters in New York City (82.2%), and the fewest in West Virginia (35.3%). The earlier a woman chooses to quit, the better, because many of the complications, such as placental abruption and placenta previa, appear to be nicotine-dose related (Einarson & Riordan, 2009).

Secondhand tobacco smoke adds to the nicotine exposure of a woman who smokes or is attempting to cut down or quit and is also a problem for nonsmokers. Whether it is active or

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Few of the reviewed articles confirmed self-reported smoking status with a biological measure.

passive in nature, tobacco is the most common substance of abuse during pregnancy worldwide. There is also evidence that prenatal exposure to passive smoke can result in lower birth weight and an increased incidence of preterm birth. After birth, the effects on the child include an increased frequency of respiratory infections and asthma (Joya et al., 2014).

Stress is an inevitable occurrence in daily life, and smoking is cited as an important stress management method by more than 72% of smokers, regardless of sex. Use of smoking as a way to self-medicate for negative mood, though, seems to be more prevalent in women (Croghan et al., 2006). Smokers often report that smoking helps relieve feelings of stress, but the stress relief smokers attribute to cigarette smoking may actually occur as a result of a reversal of the symptoms of acute nicotine withdrawal (Parrott, 1995). It is unfortunate that these withdrawal symptoms can increase the experience of everyday stress (Parrott, 1995; Parrott & Murphy, 2012). In the 2011 PRAMS data, a far lower percentage of women reported *no stress* in West Virginia (21.6%), a state with a greater percentage of smoking behavior, than the percentage of women in New York City (37.1%) who reported *no stress*. This seems to support claims of the use of smoking as a stress management method. The influence of exposure to secondhand smoke on perceived stress is unknown.

Pregnancy, independent of the typical stress experienced on a day-to-day basis, can be a time of increased stress. Women may experience stress from a variety of pregnancy-related concerns, such as physical symptoms, bodily changes, relationship and parenting concerns, and anxiety about labor and birth (Lobel et al., 2008). Although limited to the perinatal period, the experience of pregnancy-specific stress may add to the stress burden of a woman.

The purpose of this review was to examine and evaluate the recent literature about relationships among perceived maternal psychosocial stress, smoking behaviors, and exposure to secondhand smoke during pregnancy and the postpartum period.

Methods

Literature Search Strategy

A search for published, peer-reviewed, English language, primary research articles was conducted using the electronic databases Academic Search Complete, MEDLINE, CINAHL, Psychology and Behavioral Sciences Collection, and PsychINFO. Inclusion criteria were quantitative or qualitative research studies on the relationships among self-reported, perceived, or psychosocial stress and smoking or exposure to secondhand tobacco smoke during pregnancy or the postpartum period. The search was limited to current, peer-reviewed, English language literature published between 2010 and 2015 to reflect the most contemporary knowledge. Use of the search terms *pregnant, pregnancy, OR postpartum; self-reported stress OR perceived stress OR stress, psychological; and smoke OR smoker OR SHS OR passive smoke OR environmental smoke OR tobacco smoke pollution* yielded 143 articles. After deletion of exact duplicates returned by the search, 97 articles remained. Titles and abstracts were then screened for suitability, leaving 32 articles for full text review. After the full text review, 22 articles remained that met inclusion criteria. Two additional studies were identified from references found within the articles during review, resulting in 24 articles for inclusion. A diagram of the decision-making process is illustrated in Figure 1.

Data Extraction and Synthesis

A matrix table was developed, and data relevant to the relationships of perceived stress and smoking or secondhand smoke exposure during pregnancy and the postpartum period were extracted from the 24 studies. The evidence was evaluated and interpreted according to methods described by Pyrczak (2008). For a summary of all included studies, see Supplemental Table S1.

Results

Characteristics of the Studies Reviewed

The common purpose of the studies was to examine or describe the relationships among smoking behaviors during pregnancy and/or the postpartum period and psychosocial factors such as perceived stress. Women were recruited from prenatal clinics, obstetrics and gynecology clinics, obstetric in-patient units, unnamed agencies serving women and children (Special Supplemental Nutrition Program for Women, Infant and Children's Program [i.e., WIC] is named in one study), or had taken part in

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