

*Editorial***SMOKING IN RURAL PREGNANT WOMEN: A CALL TO ACTION**

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Decades of research have documented the effects of cigarette smoking on the general population. Smoking is responsible for approximately 20% of deaths in the United States each year (Browning Baker, McNally, & Wewers, 2009). Cigarette smoking is widely accepted as the most prevalent, yet modifiable risk factor to health and well-being (Doescher, Jackson, Jerant, & Hart, 2006). It has been linked to increases in morbidity and mortality. Primary diagnoses related to the morbidity and mortality includes coronary disease, peripheral vascular disease, stroke, respiratory disorders and cancer. Statistics show that male and female smokers die sooner than non-smokers, 14 and 13 years, respectively (Wise & Correia, 2008). The report from Rural Healthy People 2010 gives an estimated cost of tobacco mortality and morbidity treatment of 50-73 billion dollars in medical costs (Stevens, Colwell, & Hutchison, 2010).

The incidence of smoking in America has decreased ever so slightly over the last decade. This decrease is smallest in the younger and rural population groups. Doescher, et al. (2006) reported that not a single rural location met the Healthy People 2010 goal of less than 12% smokers. Findings from the 2007 National Survey on Drug Use and Health show the current rate of smokers in the 18-25 year old group of 36.2%. This was only slightly decreased from the 2006 rate of 38.4%. In the age range 15-44, the rate of smoking was lower in pregnant women (16.4%) than those who were not pregnant (28.4%). The report also stated that smoking rates were higher in individuals with lower levels of income and education and those in the Midwest and Southern portions of the United States. Stevens et al. (2010) reported that men and women in rural areas are more likely to smoke than are their urban counterparts. The higher rate of smoking is credited to delayed access to medical and media resources and lower levels of education.

Smoking is the most common substance used by pregnant women and has the greatest impact on birth weight, a major predictor of poor pregnancy outcomes (Bailey & Byrom, 2007). It has a significant, negative effect on maternal and infant health. The woman is at increased risk for chronic cardiovascular and respiratory complications, and hemorrhage secondary to placental abruption and placenta previa.

The increased risks of poor pregnancy outcomes for the newborn related to smoking include preterm birth, low birth weight, premature rupture of membranes, hypoxia related to placental complications, stillbirths, and neonatal death. Martin, et al (2008) cites low-birth weight (LBW), premature birth, and anomalies as negative outcomes at birth. LBW (<2500 grams) has been identified as a leading cause of neonatal morbidity and mortality in the United States (Bailey & Byrom, 2007). The incidence of LBW has been demonstrated to be positively related to the number of cigarettes smoked (Chan & Sullivan, 2008). Wise and Correia (2008) report that 14% of all preterm infants and 20-30% of all low-birth-weight (LBW) infants are born to women who smoke and that 10% of all infant deaths can be linked to smoking during pregnancy. The effects of these conditions are demonstrated in the learning and developmental problems of children who were born preterm or low-birth-weight (Wise & Correia, 2008). Neurological impairments and delays, attention deficit disorders and psychological problems are

associated with LBW infants (Bailey & Byrom, 2007). Gilman, Breslau, Subramanian, Hitsman, & Koenen (2008) reported long-term consequences including developmental problems, and general deficits in intelligence, academic skills, and cognitive function in infants whose mothers smoked during pregnancy.

There is a direct correlation between healthcare costs for mothers and infants and maternal smoking. The American Lung Association (2007) reported that the costs related to preterm infants born to women who smoked during pregnancy exceeded \$350,000,000 each year. Bailey & Byrom (2007) reported that the costs of caring for children who were LBW are \$5.5-6 billion dollars more for the first fifteen years of life when compared to those born at normal birth weights.

Additional findings have confirmed the extended damage to not only to the woman and her unborn child but also to other young children in the home. The infant of a mother who smokes is at increased risk for chronic respiratory complications including otitis media, asthma, respiratory infections; and gastrointestinal problems such as acid reflux and colic (Gaffney, 2006). An increased risk of sudden infant death syndrome, increased respiratory and ear infections and asthma can be linked with maternal smoking Martin (2008).

Anderson et al. (2006) reported that while the reduction of LBW has been a goal of Healthy People 2010, there has been little progress. Not surprisingly, this problem is once again a goal of Healthy People 2020. This goal is shared by major organizations such as March of Dimes, Association for Womens' Health, Obstetrical and Neonatal Nurses, and the American College of Obstetricians and Gynecologists. For infants of mothers who smoked during pregnancy, the negative effects are usually present at birth and continue to cause health problems throughout life. Smoking cessation is extremely important in pregnancy because pregnancy outcomes related to the newborn improve if the mother stops smoking. This improvement is time-sensitive, with greater improvement in rates associated with cessation prior to or in early pregnancy. Pregnant women who stop smoking in the first 3-4 months of pregnancy have newborns with birth weights that are comparable to those born to women who do not smoke. However, smoking cessation, as late as the beginning of the third trimester of pregnancy, has been shown to decrease the rate of low-birth-weight newborns (Chan & Sullivan, 2008). Smoking is a major modifiable risk factor in rural pregnant women (Bullock, et al. 2009). Low-birth weight is one of the major indicators of neonatal outcomes. Low-birth weight in the newborn has been associated with maternal smoking and low maternal weight gain in rural Appalachia.

Public information programs designed to increase the awareness of the danger of smoking and smoking cessation programs have resulted in decreases in smoking rates in the general population. The effectiveness of smoking cessation programs designed for pregnant women have been limited, especially with women who are heavier smokers, lower educated, lower income levels, and have many smokers in the woman's social network (Bullock et al. 2009). Approximately 60% of mothers who smoke prior to pregnancy will continue to smoke during the pregnancy (Martin et al. 2008). Although pregnancy has been shown to be a time of increased readiness to change, only about 30% of women who smoke will quit when pregnancy is confirmed (Wise & Correia, 2008). Only 18-25 % quit smoking before the first antepartal visit, another 12% will quit later in pregnancy. Many relapse later possibly due to the stressors of potential or actual motherhood (MacLean et al. 2002).

Cessations programs targeted to the general population abound with varying degrees of success. Commonly used components of the programs may include group and individual

counseling sessions, informational handouts and videos, behavioral reinforcements and pharmacologic therapies. Some success has been demonstrated as the percentage of women who smoke during pregnancy has decreased. A review of pregnancy outcomes data from the United States earlier this decade details that while some pregnant women will reduce their risks for poor outcomes by modifying behaviors, a significant percentage do not (Anderson et al. 2006). Most women who smoked before pregnancy and quit, returned to smoking during the first year postpartum (Gaffney, 2006). This places the infant in the home at risk from second-hand smoke and increases the likelihood that the mother will smoke in future pregnancies.

The rates of smoking by women living in rural areas are higher than their urban counterparts (Browning, 2009; Cronk, 1997). Women in rural areas are at risk for increased rates of poor pregnancy outcomes associated with smoking. Alexy et al. (1997) reported that women in rural areas are more likely to be African-American, single, less educated, with a lower income than women in urban areas. The percentage of teen pregnancies is higher in rural areas. Each of these characteristics is associated with increased risk for poor pregnancy outcomes. It has been suggested that rural geographic residence may place a pregnant woman at risk for poor pregnancy outcomes due to the type and extent of services that are available. It has been suggested that lower socioeconomic status places the woman at greater risk for continued smoking in pregnancy due to less information about the health risks, fewer social supports to quit, and less access to cessation services (Browning et al. 2009). Although the rural population is significantly more economically disadvantaged, the expenditures per capita by the federal government are much less than in urban areas (Alexy, 1997). Bailey & Byrom (2007) reported nearly 40% of rural women in their study had less than adequate prenatal care, compared to a national average of 25%. Almost one-half of the pregnant women smoked, more than four times the national average.

Barriers to smoking cessation, especially during pregnancy, have clustered around several health disparities. Smoking during pregnancy is concentrated in women with lower levels of education, especially those with less than a high-school education (Gilman, 2008). Younger women have a higher rate of LBW and poor pregnancy outcomes (Chan & Sullivan, 2008). In rural areas, women are more likely to smoke and there are fewer interventions due to decreased access to care and fewer facilities funded to encourage cessation. Barriers such as access to care and related health education may be accentuated by cultural and geographical barriers. Social support has been shown to be a contributor to successful smoking cessation; however the degree of support for cessation is directly related to whether or not the support person smokes. With the higher rates of smoking among the general population in rural areas, pregnant women in rural areas are at risk for decreased social support to stop smoking (Martin, 2008). The incidence of smoking during pregnancy was increased if the woman was not married, was depressed, had lower levels of income or had used other substances including alcohol. Some studies have also demonstrated less motivation toward cessation in those women who described their pregnancies as unwanted or mistimed (Martin, 2008). Anderson et al. reported that the lack of health insurance appeared to be a factor in decreased risk factors in pregnant women (2006). The Rural Healthy People 2010 report (Stevens et al., 2010) cites a lack of resources, transportation, decreased healthcare coverage, less income to pay for care, lack of informational sources related to smoking and cessation programs and decrease access to providers as major barriers to cessation.

Physicians and nurses are in a unique position to influence smoking rates by addressing prevention, health promotion, and advocacy in women of childbearing age and those who are

pregnant (Moore, 2003). For a variety of reasons, neither nurses nor other healthcare providers have consistently addressed smoking cessation with pregnant patients (Moore, 2003). The best strategy to improve pregnancy outcomes is to identify and reduce associated risk factors. Health care providers must ask women if they smoke, determine readiness to quit, offer educational information and offer cessation programs and encouragement into each visit. Smoking cessation programs should be incorporated into routine care along with more emphasis on preconception health promotion strategies. Improved cessation rates for women of childbearing age, and women who are pregnant should be priority goals for research and care providers. Another needed goal is to reduce the number of women who resume smoking after pregnancy. The time spent in counseling and educational sessions would cost very little compared to the benefits to these women and their infants and families.

Cigarette smoking has long been recognized as a negative health behavior that results in great cost to the individual, the family and society. The effects are great in the rural areas of our country where smoking rates are higher for both the general population and pregnant women. Decreased access to care and health-related information and programs is a major barrier to reversing the damage to this population. Healthcare providers must join with others in the community to reach, teach, and help pregnant women in rural areas reduce this risk to the health of them and their families.

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