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TOWARD ENHANCING TREATMENT FOR PREGNANT SMOKERS: LAYING THE GROUNDWORK FOR THE USE OF COMPLEMENTARY AND ALTERNATIVE MEDICINE APPROACHES

by

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DISSERTATION

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CHAPTER 1 INTRODUCTION

Tobacco is the most widely used drug of abuse during pregnancy (Behnke & Smith, 2013; Substance Abuse and Mental Health Services Administration [SAMHSA], 2011). Smoking during pregnancy leads to significant adverse effects for the developing fetus, in addition to negative outcomes for women and their children (Wakschlag et al., 2003). Although a range of effective treatments exist to treat tobacco dependence and promote long-term abstinence, most pregnant women who smoke during pregnancy neither seek nor receive any kind of treatment (Terplan, McNamara, & Chisolm, 2012). This gap between the need for and receipt of services has substantial and long-term effects on the health of these pregnancies and leads to substantial unnecessary financial burden to the health care system (Andrulis & Hopkins, 2001; Chavkin, 1990). Further, despite efforts to reduce perinatal tobacco use, since 2000 there have been no significant decreases in smoking prevalence among pregnant women in the United States (Tong et al., 2013). The stability of the prevalence of perinatal smoking suggests that efforts to reduce smoking prevalence before and during pregnancy have not been effective (Tong et al., 2013).

Alternative approaches, able to reach and assist a higher proportion of smokers, are needed. Complementary and alternative medicine (CAM) methods—meaning non-mainstream practices or products used as primary treatment or as a complement to mainstream health care (National Center for Complementary and Integrative Health, 2015)—are one possible example of the kind of alternative that is needed. CAM is an emerging approach for treating physical and mental health issues, tobacco and other substance use. CAM methods have gained wider acceptance in the United States within

that last few decades, with mindfulness meditation, yoga, acupuncture, massage, and some herbal supplements, in particular, becoming accepted therapies for a variety of physical and mental health conditions. The prenatal and postpartum periods represent a time of significant physical, psychological, and emotional changes (Da Costa, Larouche, Drista, & Brender, 1999), which have been shown to affect a woman's quality of life and ability to cope with changing roles (Gjerdigen, Froberg, & Fontaine, 1991). Therefore, CAM interventions that influence both mind and body may be especially appealing to and appropriate for pregnant women (Beddoe & Lee, 2008). The use of CAM methods has also become common during pregnancy, perhaps given the hesitancy of some women to take medications while pregnant (Hall, Griffiths, & McKenna, 2011).

CAM approaches may be ideal, low-cost treatments to help pregnant women reduce craving to smoke, manage nicotine withdrawal symptoms, stress and negative mood symptoms, and increase self-efficacy to quit smoking. Compared to conventional approaches that are largely based on a mental health/substance abuse model (and therefore associated with stigma in some communities), CAM approaches may be a more attractive treatment option to many pregnant women, thus increasing the proportion of women who obtain some form of assistance. Further, developing healthier mind-body practices may encourage pregnant and parenting women to make other healthy choices for themselves and their families. To date, however, no published study has examined the use of CAM among pregnant smokers.

The present study therefore seeks to examine factors associated with smoking and smoking cessation during pregnancy among two nationally representative samples of women, with an emphasis on the extent to which CAM approaches are or might be

relevant. It is expected that a better understanding of the characteristics of those women who quit or reduce smoking during pregnancy compared to those who do not will facilitate the design of effective interventions for persistent smokers during the perinatal period. In addition, investigating the conventional mental health and CAM treatment utilization practices among pregnant smokers may suggest future directions for intervention. Details of the proposed study will be described following presentation of the significance, theoretical basis, and rationale for the study.

Smoking among Women

Epidemiological data indicate that 25% of women of reproductive age and 23.6% of men are current smokers (Substance Abuse and Mental Health Administration, 2013). The rate of smoking in the U.S. has generally declined over the last several decades; however, the rate of tobacco use has declined among men by approximately 50% since 1960, whereas among women tobacco use has declined by only 38% (Giovino, 2002). For the first time in history, women are as likely as men to die from diseases caused by smoking (U.S. Department of Health and Human Services, 2014). Importantly, rates are still above national health objectives and these declines appear to have reached a plateau (Centers for Disease Control and Prevention, 2008; Fiore et al., 2008).

Gender differences in tobacco-related mortality and morbidity—particularly with respect to risk for cancer and myocardial infarction—are well-documented, and demonstrate that female smokers are at greater risk for some adverse outcomes compared to male smokers (Schnoll, Patterson, & Lerman, 2007). Although a number of common factors associated with smoking hold for both men and women (e.g.,

depression, nicotine dependence, living with other smokers) there may be risk factors that are especially relevant to treating tobacco use among women. Previous studies have indicated that women may have more difficulty quitting smoking and may face more barriers to smoking cessation than men (Bock et al., 2009; Reynoso, Susabda, & Cepeda-Benito, 2005; Schnoll et al., 2007). For example, women report lower levels of motivation to quit, and lower confidence/self-efficacy. They also perceive greater difficulty with quitting (Etter, Prokhorov, & Perneger, 2002). As a result, it has been suggested that a gender-specific approach to treating tobacco dependence may be most effective for women (Schnoll et al., 2007; Piper, Welsch, Baker, Fox, & Fiore, 2000).

Prevalence of Smoking during Pregnancy

Prenatal smoking is considered a highly stigmatized behavior (Bessa et al., 2010; Kline, Ng, Schittini, Levin, & Susser, 1997; Markovic et al., 2000; Ostrea, Brady, Bause, Raymundo, & Stevens, 1992), which likely hinders attempts to accurately estimate its prevalence. Underreporting of smoking is illustrated in studies that have compared biologically-verified smoking with self-report (Markovic et al., 2000; Russell, Crawford, & Woodby, 2004). Although rates of smoking during pregnancy are likely underestimated due to disclosure issues (England et al., 2007), national surveys suggest that approximately 10-20% of pregnant women smoke at some point during pregnancy (Alshaarawy & Anthony, 2014; SAMHSA, 2007; SAMHSA, 2010; SAMHSA, 2012; Tong et al., 2013) Rates of smoking during pregnancy appear to decline across trimesters, with 21.8% of women in the first trimester, 14.4% of women in their second trimester, and 13.9% of women in their third trimester reporting smoking in the past month

(SAMHSA, 2009). Motivation to quit smoking during pregnancy is typically high (Andres & Day, 2000); in general, approximately half of all pregnant smokers stop for at least part of their pregnancy and nearly all of these women quit either prior to or early in their pregnancy without seeking any formal support or treatment (Bolling, Grant, Hamlyn, & Thornton, 2007). Rates of cessation may differ though, depending on the sample. For example, in a sample of low-income pregnant women receiving prenatal care in rural southern Appalachia, Bailey (2006) found that only 27% of women quit smoking completely by their second to third trimester. Regardless, even in more normative samples, only about 25% of those who quit are able to maintain abstinence throughout their pregnancy (Flick et al., 2006), and two thirds of women who do quit smoking in pregnancy are likely to re-start following the birth of their child (Owen & Penn, 1999). Nearly half of those women who relapse do so within two weeks of delivery (Colman & Joyce, 2003). Thus, a significant subset of pregnant women have greater difficulty in quitting smoking during their pregnancy.

Effects of Prenatal Smoking

The range of health, social, and financial consequences of smoking are well-known, and become even more severe during pregnancy due to the long-term effects of prenatal smoking on a developing fetus (Andres & Day, 2000; Lester, Andreozzi, & Appiah, 2004). Smoking during pregnancy is therefore a maternal behavior with a costly intergenerational impact (Wakschlag et al., 2003). Compared to women who do not smoke, the direct medical costs of a complicated birth are estimated to be 66% higher for smokers, likely due to a greater severity of complications and need for intensive care (Centers for Disease Control and Prevention, 1997; Orleans et al., 2001). Smoking

during pregnancy has been shown to add more than $700 in neonatal costs for each exposed child, for a total annual expenditure of $367 million in the U.S. alone (Adams et al., 2002). Pregnant women who smoke are more likely to experience complications such as ecotopic pregnancy (U.S. Department of Health and Human Services, 2014), placenta previa, placental abruption, and uterine bleeding than pregnant women who are non-smokers (Ananth, Savitz, & Luther, 1996; Cnattingius, 2004). Prenatal smoking has been linked to fetal growth retardation, low birth weight, and sudden infant death syndrome, as well as more long-term cognitive and behavioral deficits (Andres & Day, 2000; Ness et al., 1999; Shea & Steiner, 2008; Stroud et al., 2009). Analysis of over a million births revealed that risk of stillbirth was elevated by nearly 30% among pregnant smokers, with risk being even higher among pregnant smokers over 35 (Aliyu, Salihu, Wilson, Alio, & Kirby, 2008). Compared to nonsmokers, women who smoke during pregnancy are twice as likely to give birth to a low birth weight baby (Ventura et al., 2003). Smoking is a factor in 20% of underweight births, 8% of preterm births, and 5% of perinatal deaths (Orleans et al., 2001).

Further, the effects of smoking extend far beyond the perinatal and neonatal period. Tobacco exposure during the perinatal period has been linked to adverse effects on children, including congenital defects such as orofacial cleft (U.S. Department of Health and Human Services, 2014), asthma, and increased rates of ear infection (U.S. Department of Health and Human Services, 2006). Tobacco exposure is also associated with lasting neurological, behavioral, and learning difficulties, such as greater risk of externalizing behaviors among toddlers (McCormick, 1985; Stene-Larson, Borge, & Vollrath, 2009) and future educational difficulties (McCormick, 1985).

Without question, both the health and financial costs of smoking during pregnancy are significant and lasting.

Pregnancy-Specific Factors Related to Smoking

Sociodemographic factors, pre-pregnancy smoking behaviors and patterns, and mental health symptoms have all been identified as correlates of prenatal smoking.

Sociodemographic Factors

Smoking during pregnancy appears to disproportionately affect women of lower socioeconomic status, women who engage in other adverse health behaviors, and women who are the most heavily nicotine dependent; it is also more prevalent among women with limited resources with which to access treatment (Goldenberg, Klerman, Windsor, & Whiteside, 2000). Rates of persistent smoking are especially high among unmarried, low-income women with limited education (Cornelius, Leech, & Goldschmidt, 2004). Family income in some samples has accounted for approximately 8% of the variance in smoking among pregnant women, with women from families with lower income being more likely to continue smoking during pregnancy (Bailey, 2006). One study found that 22% of low-income women smoked during their third trimester, as opposed to 14% of higher income women (Adams, Melvin, & Raskind-Hood, 2008). Results from a national survey indicated that lower income women were at a 2.8 times greater risk of smoking during pregnancy (Ebrahim, Floyd, Merritt, Decoufle, & Holtzman, 2000). Together these data reveal that low income, pregnant women might be especially in need of smoking cessation interventions (Kahn, Certain, & Whitaker, 2002).

The evidence appears to be mixed with regard to age, race, and ethnicity. Although some investigations suggest that younger women may be more likely to continue smoking during pregnancy (Cornelius et al., 2004; Kratz & Vaughan, 2012), others have found that younger women are more likely to be nonsmokers or to quit smoking during pregnancy (Coleman & Joyce, 2003; Holtrop et al., 2010; Kahn et al., 2002; Ma, Goins, Pbert, & Ockene, 2005). Some findings suggest that European American women are more likely to smoke during pregnancy than those of other racial/ethnic groups (Martin et al., 2008; Muhuri & Gfroerer, 2009), and may be as much as three times more likely to be prenatal smokers (Ebrahim et al., 2000). Hispanic ethnicity has been found to be a protective factor in some investigations (Kratz & Vaughan, 2012). Results among African American women have been conflicting, with some suggesting that African American women are more likely to be nonsmokers (Maxson, Edwards, Ingrahm, & Miranda, 2012) or to quit during pregnancy (Ma et al., 2005), others finding that they are less likely to quit (Ockene et al., 2002), and still others finding no association at all between African American race and prenatal smoking (Kratz & Vaughan, 2012). Recent national estimates show that, among pregnant women between 15 and 44, 21.8% of European American women, 14.2% of African American women, and 6.5% of Hispanic women reported smoking in the past 30 days (SAMHSA, 2012).

Educational attainment may be one of the strongest demographic predictors of prenatal smoking. Data from the National Epidemiological Survey on Alcohol and Related Conditions (NESARC) indicated that educational attainment was the strongest predictor of smoking during pregnancy out of the measured demographic factors.

Compared to women with at least some college education, women with less than a high school education were 7.87 times more likely to smoke during pregnancy, and women with a high school diploma or GED were 2.80 times more likely to smoke (Gilman et al., 2008). It is possible that women with less education may have more limited access to or experience greater barriers to participating in smoking cessation programs, and/or that programs available to them may be less effective (Bonollo et al., 2002; Gilman et al., 2008; Pullon, Webster, McLeod, Benn, & Morgan, 2004).

Consistent with increased risk for smoking in the general population (e.g., Dollar, Homish, Leonard, & Kozlowski, 2009; Homish & Leonard, 2005), close relationships with other smokers, including spouses or romantic partners, relatives, and peers, has been shown to be a risk factor for prenatal and postpartum smoking (Homish, Eiden, Leonard, & Kozlowski, 2012; Lu, Tong, & Oldenburg, 2001). Ma and colleagues (2005) found that, in a sample of pregnant women participating in a smoking cessation trial, having a partner who smokes was associated with smoking at time of delivery. Further, having a partner who smokes and living with other smokers were both associated with increased likelihood of postpartum relapse among those who reported abstinence at delivery (Ma et al., 2005). Among another sample of pregnant women participating in a smoking cessation intervention trial who quit smoking during pregnancy, one of the main risk factors for smoking at 1 month postpartum was having another smoker living in the household; having a partner who continued to smoke during their pregnancy predicted risk of smoking at 12 months postpartum (Simmons, Sutton, Quinn, Meade, & Brandon, 2014). These findings underscore the importance of contextual factors related to smoking maintenance and cessation.

Pregnancy Variables

Pregnancy-related variables including number of prior pregnancies and access to prenatal care have also been examined as potential correlates of prenatal smoking. In a regional sample of rural low-income women, a greater number of prior pregnancies and lack of access to adequate prenatal care were significant predictors of smoking during pregnancy, accounting for nearly 5% and over 12% of the variance in smoking status, respectively, even after controlling for quantity and frequency of smoking. In particular, receipt of intermediate or inadequate prenatal care increased the probability of continued smoking during pregnancy sevenfold (Bailey, 2006). Such pregnancy-specific risk factors may be relevant to designing prevention and intervention efforts for prenatal smoking.

Smoking History and Use Pattern

Smoking history and patterns of use (e.g., quantity and frequency) also appear to predict risk for prenatal smoking. For example, Chen and colleagues (2006) found that smoking onset prior to age 14 was a significant predictor of smoking during pregnancy, such that women who began smoking at age 15 or later were significantly more likely to be abstinent than women who began smoking earlier. Similarly, in a study using data from the NESARC, early onset smoking (by age 14) was significantly associated with smoking during pregnancy, as was smoking at least a pack per day in the year preceding the interview (Gilman et al., 2008). In addition, among a sample of women in southern Appalachia, those who continued to smoke during pregnancy were heavier smokers and had smoked for a longer time compared to those who quit (Bailey, 2006). Taking into account sociodemographic and pregnancy-related factors, the amount of

pre-pregnancy smoking was the single best predictor of persistent smoking during pregnancy in this sample: each quarter-pack of cigarettes smoked per day increased the probability of prenatal smoking by 65%. Length of time smoking accounted for another 6% of the variance in pregnancy smoking status (Bailey, 2006). Thus, it is likely that women who have been heavier smokers for a longer period of time may have more difficulty quitting smoking once they become pregnant.

Alcohol and Other Substance Use

As noted previously, disclosure rates for prenatal smoking are considered underestimates given the stigmatized nature of smoking during pregnancy. Similarly, rates of prenatal alcohol and illicit substance use are expected to be even further hindered by this disclosure bias (Colon, Robles, & Sahai, 2001; Magura & Kang, 1996; Ondersma et al., 2012). Notably, previous investigations have revealed significant comorbidity between smoking and other substance use during pregnancy, with drug and alcohol use being more prevalent among pregnant smokers than pregnant nonsmokers. Data from the 2010 National Survey on Drug Use and Health (NSDUH) survey indicated that 24.2% of pregnant smokers also reported illicit drug use in the past month, compared to only 2.4% of nonsmoking pregnant women (SAMHSA, 2010). Another population-based study conducted in Australia found that 85% of women with a substance use disorder smoked during pregnancy, compared to only 15% of women without a substance use disorder (Burns, Mattick, & Cooke, 2006). Among low-income women receiving Medicaid benefits, alcohol use and drug use in the month prior to learning of pregnancy predicted continued smoking during pregnancy, with odds ratios of 2.81 and 5.32, respectively (Holtrop et al., 2010). Gaalema and colleagues (2013) re-

tested urine specimens of 115 pregnant women who were participating in clinical trials for smoking cessation. Specimens were collected near 10 weeks and 28 weeks gestation. Approximately 34% of specimens collected during the first trimester and 25% of specimens collected around the beginning of the third trimester tested positive for an illicit drug. The most commonly detected illicit drug was marijuana, present in 90% of the positive specimens, followed by opioids (detected in 18% of positive specimens), cocaine (present in 5% of positive specimens), benzodiazepines and methadone, detected in 3% of specimens, respectively. These data indicate that other substance use both during pregnancy and prior to pregnancy are strongly associated with prenatal smoking.

Externalizing Behaviors

Several investigations have focused on antisocial or externalizing behaviors as predictors of prenatal smoking. For example, Kodl and Wakschlag (2004) found that women were more likely to smoke during pregnancy if they had exhibited conduct disorder symptoms as children. Katz and Vaughan (2012) also found that past year legal involvement (e.g., driving under the influence, having been arrested, being on parole or probation) was significantly associated with smoking during the second and third trimesters in a nationally representative sample of women. Further, women with problematic or violent interpersonal relationships, disruptive interpersonal behaviors, (e.g., lying and aggressiveness), and those who admitted to engaging in deviant behaviors (e.g., truancy, stealing, running away from home, arrest history) were more likely to smoke during pregnancy (Wakschlag et al., 2003). Wakschlag and colleagues (2003) suggest that women displaying such externalizing behaviors who are unable to

"suspend their smoking" (DiClemente, Dolan-Mullen, & Windsor, 2000) during pregnancy may also exhibit difficulty modulating their behavior in other domains of life. In other words, the association between persistent prenatal smoking and externalizing behavior may reflect a broader pattern of problematic behavior among women who have demonstrated risk in several domains of adaptive functioning.

Negative Affect, Stress and Mental Health

During the perinatal period, a significant proportion of women experience symptoms of poor mental health, including negative affect, psychological distress, depression and anxiety. One study of pregnant smokers found that approximately 45% had at least one mental health disorder (Goodwin, Keyes, & Simuro, 2007). National estimates indicate that between 7.4% and 12.8% of pregnant women between ages 15 and 44 meet criteria for major depressive disorder, which is similar to estimated rates of depression for non-pregnant adult women (Bennett, Einarson, Taddio, Koren, & Einarson, 2004). Perinatal distress and depression have also been associated with negative infant outcomes, including preterm birth and low birth weight (Li, Liu, & Odouli, 2009; Mancuso, Schetter, Rini, Roesch, & Hobel, 2004).

The association between smoking and negative affect is well-established in both the general population (Grant, Hasin, Chou, Stinson, & Dawson, 2004; Grant et al., 2004b) and among pregnant women (Maxson et al., 2012; Zhu & Valbo, 2002). Depressed women may be as much as four times more likely to smoke during pregnancy (Zhu & Valbo, 2002). In fact, depressive symptoms have been shown to predict prenatal smoking even after controlling for demographic factors and quantity and frequency of smoking (Linares Scott, Heil, Higgins, Badger, & Bernstein, 2009).

Pregnant women using tobacco and other substances are more likely to experience depression than women who remain abstinent (Kuo et al., 2014). Further, studies of treatment-seeking, pregnant women with substance use disorders indicate that 36-40% also meet criteria for comorbid major depressive disorder (Fitzsimons, Tuten, Vaidya, & Jones, 2007; Martin et al., 2009). A more general measure of mental health, psychological distress, is also positively correlated with substance use during pregnancy (Havens, Simmons, Shannon, & Hansen, 2009), with persistent smokers endorsing higher levels of prenatal stress and symptoms of negative affect compared to quitters and nonsmokers (Eiden et al., 2011). Prenatal cigarette smoking has been associated with elevated depression and stress, particularly among low-income women (Bullock, Mears, Woodcock, & Record, 2001; Ludman et al., 2000; Munafo, Heron, & Araya, 2008). Holtrop and colleagues (2010) found that, among low-income pregnant women receiving Medicaid, having a history of mental health issues and experiencing high levels of stress were associated with smoking. Further, compared to non-depressed smokers, smokers with depression are less likely to report confidence in being able to quit (Zhu & Valbo, 2002), which can impact their ability to quit smoking.

Although most studies have examined depressive symptoms, anxiety, or general distress, a few have also looked at other features of negative mood, including anger and hostility. In one study, pregnant smokers reported higher hostile mood and greater maternal hostility than pregnant non-smokers (Schuetze, Lopez, Granger, & Eiden, 2008). Additionally, Eiden and colleagues (2011) examined structural equation models including several facets of negative affect and found that maternal anger, hostility and

aggression accounted for unique variance in persistent prenatal smoking, while depression and stress did not.

In contrast, other studies have failed to find to a clear, direct link between distress or mental health and smoking during pregnancy. For example, Bailey (2006) found that smoking cessation status was not significantly associated with depression history in a regional sample of low-income women. Despite observing associations between mental health history, greater stress and smoking, Holtrop and colleagues (2010) did not find an association between current symptoms of depression and smoking during pregnancy once demographic and other factors were accounted for. These authors posited that nicotine dependence might have played a role in their findings, given the strong relationship between nicotine dependence and depressive symptoms in their sample. In sum, the extent to which negative affect, stress, and/or mental health symptoms impact prenatal smoking remains unclear.

Nicotine Dependence

Nicotine dependence (also called tobacco dependence or tobacco use disorder) is characterized by symptoms such as nicotine craving and withdrawal (American Psychiatric Association, 2013). Nicotine dependence appears to be another robust predictor of persistent smoking during the perinatal period, and--as noted above--may potentially account for the relationship between depression and smoking. In epidemiological studies including the NESARC and the National Comorbidity Study, nicotine dependence has been shown to be highly correlated with depression (Breslau, Novak, & Kessler, 2004; Goodwin et al., 2007; Grant et al., 2004a). Goodwin and colleagues (2007) found that 57.5% of pregnant smokers meeting nicotine dependence

criteria also met criteria for at least one mental disorder, compared to 45.1% of those who were not nicotine dependent. After adjusting for demographic factors and comorbidity, nicotine dependence significantly predicted the odds of having any mental health disorder (OR = 3.3), including any mood disorder (OR = 2.5), major depression (OR = 2.07), dysthymia (OR = 6.9), or panic disorder (OR = 3.1) in the past year; however, among non-nicotine dependent smokers, associations between smoking and mental health disorders became non-significant after accounting for demographic factors. Similarly, Ludman and colleagues (2000) found that stress and depressive symptoms were unrelated to smoking cessation but were related to nicotine dependence and demographic factors. Gilman and colleagues (2008) found that, among current or previous year daily smokers, current year nicotine dependence was associated with a significantly greater likelihood of smoking during pregnancy (OR = 2.63), even after taking into account sociodemographic factors, smoking history, mood or anxiety disorders, and substance use disorders. Importantly, the association between prenatal smoking and mood or anxiety disorders was solely attributable to nicotine dependence. Taken together, these results suggest that nicotine dependence may be among the top mental health barriers to smoking cessation during pregnancy (Gilman et al., 2008).

It is important to note that many of the above factors are also correlated with each other. For example, lower educational attainment is related to younger age at smoking initiation, which may suggest that cessation is more difficult to achieve given the longer duration of smoking history and greater severity of nicotine dependence (Chassin, Presson, Rose, & Sherman, 1996; Gilman et al., 2008; Lindqvist & Aberg,

2001; Pierce & Gilpin, 1996; Siahpush, Heller, & Singh, 2005). Therefore, further investigation is necessary to better understand the complex and interacting risk factors related to prenatal smoking.

Factors Associated with Changes in Smoking During Pregnancy

Smoking cessation during the perinatal period appears to involve slightly different determinants compared to cessation among non-pregnant adults. Cessation for many of the spontaneous pregnant quitters likely reflects a concerted effort to quit smoking for the health of their baby, rather than a step toward a personal, longer-tem intention to quit (Stotts, DiClemente, Carbonari, & Mullen, 1996; Wakschlag et al., 2003). Only a handful of studies have examined the factors that are most strongly associated with changes in smoking during pregnancy, or what factors distinguish quitters from persistent smokers. Further, the few studies in this area have focused primarily on treatment-seeking samples (e.g., Forray, Merry, Lin, Ruger, & Yonkers, 2015; Ma et al., 2005; Wakschlag et al., 2003), and treatment-seekers may be more highly motivated to quit than non-treatment-seekers. In other words, exactly what enables some women to make changes for themselves and their growing families when others are unable to do so is still poorly understood. This deficit in the literature impedes efforts to design effective prevention and intervention programs.

Overall, those who successfully quit during pregnancy appear to be characterized by a less risky constellation of sociodemographic and pre-pregnancy smoking factors compared to persistent smokers; however, these factors are not necessarily appropriate intervention targets. Therefore, identifying factors amenable to change may prove crucial for designing effective interventions aimed at reaching the

subset of pregnant women for whom existing interventions have been inaccessible or unsuccessful. Several potential change-related factors are worth further consideration, including self-efficacy or autonomy, improvement in mental health symptoms, and managing nicotine dependence.

Self-efficacy and the related concept of autonomy have been the focus of several theoretical models of health behavior change and have been considered potential mechanisms of action for established behavioral interventions. Broadly speaking, these models posit that individuals who have confidence or believe that they are able to make behavior changes are more likely to do so (Bandura, 1977; Brandon, Herzog, Werner, & Gwaltney, 2004). For example, in a large prospective cohort study examining psychosocial factors related to pregnancy outcomes, higher self-efficacy was one factor related to decreased odds of being a smoker (Maxson et al., 2012). Given that women often report lower levels of self-efficacy or confidence with regard to quitting smoking (Etter et al., 2002), interventions that boost self-efficacy may be more effective for promoting cessation.

Some have also suggested that women's greater difficulty with cessation may in part be due to differences in negative affect. Women report greater levels of pre-cessation and post-cessation stress (Peiper & Rodu, 2013; Wetter et al., 1999), greater pretreatment depression (Killen, Fortmann, Varady, & Kraemer, 2002; Peiper & Rodu, 2013), and a greater reliance on smoking to manage symptoms of depression and negative affect (Ward, Klesges, Zbikowski, Bliss, & Garvey, 1997; Wetter et al., 1999). Recent analysis of NSDUH data revealed that female smokers may be more vulnerable to depression compared to males; no differences were observed for serious

psychological distress or anxiety disorders (Peiper & Rodu, 2013). Maxson and colleagues (2012) found that higher depression and perceived stress were associated with a greater likelihood of smoking but higher self-efficacy is associated with decreased likelihood of smoking. Therefore, it is plausible that interventions that decrease depression and stress while also enhancing self-efficacy may be more effective for promoting smoking cessation among pregnant women.

Because nicotine dependence is a risk factor for prenatal smoking, as noted above, management of dependence symptoms, including reducing craving and other signs of nicotine withdrawal, is a natural target of smoking cessation interventions. To better characterize nicotine withdrawal and craving among pregnant cigarette smokers, Heil and colleagues (2006) examined ratings of nicotine withdrawal symptoms during the first 5 days of a quit attempt among a small sample of treatment-seeking pregnant smokers participating in a contingency management trial. Compared to those women who were unable to stop smoking or substantially reduce cigarette use, abstainers reported significantly more impatience, anger, and difficulty concentrating. In a rough comparison to other studies of non-pregnant smokers, these authors estimated that pregnant smokers may have elevated baseline levels of withdrawal (Heil, Higgins, Mongeon, Badger, & Bernstein, 2006).

Additionally, biological aspects of nicotine dependence may warrant further investigation to understand the difficulties highly-addicted pregnant women may experience in quitting smoking. Among reproductive-age women, for example, variations in menstrual cycle phase and corresponding hormonal fluctuations have been associated with cigarette craving (Carpenter, Upadhyaya, LaRowe, Saladin, & Brady,

2006; Franklin et al., 2004), as well as tobacco withdrawal and negative affect (Carpenter et al., 2006; Perkins et al., 2000; Weinberger et al., 2015). Thus, smoking cessation may be especially challenging for some women due to complex interactions between underlying biological processes and behavioral determinants of smoking. It is unclear, however, the extent to which hormonal or other physiological changes related to pregnancy may impact or exacerbate nicotine craving (Lynch & Sofuoglu, 2010).

Weight concerns also appear to be a barrier to smoking cessation among women, including pregnant women (Berg, Park, Chang, & Rigotti, 2008; Pomerlau, Brouwer, & Jones, 2000). Compared to men, women endorse greater appetite and weight control expectancies related to smoking (Wetter et al., 1999) and are twice as likely to anticipate post-cessation weight gain (Clark et al., 2006). There is also some evidence to support the concern that women may be more likely to gain weight than men after quitting (Flegal, Troiano, Pamuk, Kuczmarski, & Campbell, 1995). One study examining weight concerns among pregnant smokers found that those with high weight and body concerns gained significantly more weight during their pregnancy compared to those with low concerns; those with high concerns also gained weight in amounts that exceeded the guidelines for recommended weight gain during pregnancy (Pomerlau et al., 2000). Although weight gain is a natural part of pregnancy, some women may fear that quitting will exacerbate weight issues and thus be more hesitant to stop smoking (Berg et al., 2008).

Identifying factors associated with changes in smoking during pregnancy is key to better differentiating who is more likely to quit smoking during pregnancy. Furthermore, better understanding of these change-related factors will also help to

distinguish the treatment needs of those women who have more difficulty quitting smoking. Negative affect associated with nicotine withdrawal or depression and weight concerns may be particularly significant barriers to smoking cessation in the perinatal period, given pregnancy weight gain and perinatal distress and depression. However, the perinatal period may present a unique and opportune time to assess and potentially change behaviors for many women for several primary reasons: (a) women almost invariably choose to participate in at least some prenatal care and are thus easy to reach; (b) interventions at this stage may take advantage of a particularly salient juncture in a woman's life, in which she may be more open to considering behavior change; and (c) any positive change made has the possibility of a dual impact, on the woman's health as well as that of her unborn child. Understanding the treatment needs and preferences of women during the perinatal period is therefore important to effectively target treatment and relapse prevention efforts.

Currently Available Treatments for Smoking and their Limitations

Given the immense health and financial impact of perinatal smoking, considerable efforts have been made to design effective screening and treatment. Importantly, a range of effective treatments exist to treat tobacco dependence and promote long-term abstinence (Fiore et al., 2008). These treatments when utilized successfully have been associated with small but significant overall reductions in smoking, low birth weight, and premature birth (Lumley, Oliver, Chamberlain, & Oakley, 2004). Smoking cessation interventions have also been tailored for specific subgroups. For the significant proportion of smokers struggling with current or past depression, adding a psychosocial mood management component to smoking cessation treatment

is recommended and has been shown to increase long-term cessation rates (van der Meer, Willemsen, Smit, & Cuijpers, 2013). Antidepressants including buproprion and nortriptyline (though not SSRIs or MAOIs) have also been shown to facilitate long-term smoking cessation in controlled trials, but only a few trials have included pregnant women (Hughes, Stead, Hartmann-Boyce, Cahill, & Lancaster, 2014). However, although a number of interventions have been shown to be efficacious for smoking during pregnancy (Lumley et al, 2004), including brief (Ferreira-Borges, 2005; Ondersma et al., 2012) and computer-based interventions (Ondersma et al., 2011), there is no obvious gold standard currently available for pregnant smokers (Goldenberg et al., 2000). Additionally, evidence-based treatments remain particularly underutilized by low-education populations (Fiore et al., 2008).

Many pregnant women in the U.S. are eligible for Medicaid (Andrulis & Hopkins, 2001) or have expanded access to treatment due to the Affordable Care Act (Johnson, 2010), and should therefore encounter fewer barriers to treatment related to cost or insurance coverage; however, in reality, a significant proportion of pregnant women do not obtain treatment when needed. Available approaches also fail to significantly improve quit rates among pregnant women (Hebert, 2004), with sustained quit rates for some effective approaches rarely exceeding 20% (Wen, Miller, Lazev, Fang, & Hernandez, 2012). Further, available approaches also fail to even reach most women who are in need of treatment for a variety of reasons. For example, psychosocial smoking cessation programs are often delivered in multiple sessions and typically involve professional counseling and ongoing support. However, drop-out rates are high and treatment sessions are frequently rescheduled or missed, particularly among

underserved women (Wen et al., 2012). Therefore, it can be difficult to adequately assess the effectiveness of smoking cessation interventions for some pregnant women, and interventions that are effective may not be as potent if only a portion of the treatment is delivered (Wen et al., 2012). Overall, most women who smoke during pregnancy neither seek nor receive treatment (Goldenberg et al., 2000). Among reproductive-aged women who use drugs or alcohol, pregnant women are more likely to need treatment, but they are not more likely to actually receive it (Terplan et al., 2012). Thus, there is a general unmet need for treatment among pregnant women using substances, including cigarettes.

Time and costs associated with training (Baer et al., 2004; Miller & Mount, 2001) and implementation (Chapin & Root, 2004) are also a frequently cited barrier to treatment. For example, physician time constraints have been a consistent barrier to implementation of recommended guidelines among obstetricians/gynecologists (e.g., Chapin & Root, 2004). One analysis suggested that primary care physicians attempting to comply with just the A and B recommendations of the United States Preventive Services Task Force (ask about tobacco and provide augmented pregnancy-tailored counseling for women who smoke; U.S. Preventive Services Task Force, 2009) would need to spend an additional 4.4 hours per working day to do so (Yarnall, Pollak, Ostbye, Krause, & Michener, 2003). Further, despite evidence of modest efficacy, even when interventions are implemented, existing interventions do not consistently lead to subsequent reductions in smoking among pregnant patients (Lancaster, Silagy, & Fowler, 2000).

Regarding pharmacological interventions for smoking cessation like nicotine replacement therapy (NRT), evidence from existing studies is somewhat mixed and difficult to interpret considering that compliance has been poor. Conclusions about the safety of pharmacological interventions during pregnancy are also risky due to insufficient data (Bauld & Coleman, 2009). It is possible that some women may be reluctant to seek out pharmacological interventions such as NRT or antidepressant medication during pregnancy or may believe that natural or holistic therapies provide safer alternatives to pharmacological interventions (Adams et al., 2009; Nordeng & Havnen, 2004; Lapi et al., 2008; Holst, Wright, Haavik, & Nordeng, 2009).

Overall, despite the existence of treatments that efficaciously treat tobacco dependence during pregnancy, these interventions do not fully meet the needs of health care providers or their patients. Moreover, in line with treatment principles suggested by the National Institute on Drug Abuse, no single treatment is likely to be appropriate for everyone (Heil, Linares Scott, & Higgins, 2009; National Institute on Drug Abuse, 2009); therefore, pregnant smokers are in need of alternative treatment options for smoking cessation.

Complementary and Alternative Treatments

The National Center for Complementary and Integrative Health (NCCIH) is the branch of the National Institutes of Health that oversees research on a wide range of health practices that are often referred to as mind-body or CAM techniques, including (but not limited to) acupuncture, massage therapy, contemplative practice (i.e. meditation, mindfulness), yoga, relaxation exercises, tai chi and qi gong, chiropractic, herbs or other natural products, traditional healers, Reiki or healing touch, Ayurveda,

traditional Chinese medicine, homeopathy, naturopathy, and hypnotherapy (NCCIH, 2015). CAM practices have been used for health promotion as well as treatment (Clarke, Black, Stussman, Barnes, & Nahin, 2015; Davis, West, Weeks, & Sirovich, 2011). Some insurance plans may at least partially cover provider-based CAM treatments; however, costs associated with CAM usage are generally paid out-of-pocket.

As of 2007, results from the National Health Interview Study (NHIS) indicated that over 15% of the general population (an estimate of more than 17 million people) reported utilizing a provider-based CAM treatment (e.g., acupuncture, Ayurveda, biofeedback, chiropractic care, energy therapy, hypnosis, massage, and naturopathy) within the past 12 months, reflecting an increase of nearly 3% from 2002. Of those who endorsed utilizing provider-based CAM treatments, 19.4% (or over 1 million) were current smokers. The results of this survey suggested that smokers used CAM approaches in roughly the same proportions as nonsmokers, and that their sociodemographic characteristics reflected a moderate level of education and higher incomes compared to typical smoking populations (Hamm, Muramoto, Howerter, Floden, & Govindarajan, 2014).

CAM approaches or mind-body therapies may hold promise as a treatment option for pregnant smokers. In healthy women, such approaches have been found to help lower stress, improve sleep, and reduce pain (Beddoe & Lee, 2008). Women also appear to be greater consumers of CAM approaches (Upchurch et al., 2007); however, there have been no thorough examinations conducted to investigate the characteristics of individuals who are more likely to access or be interested in CAM treatments.

Furthermore, although the use of CAM interventions has grown considerably in the last several decades, rigorous studies demonstrating the effectiveness of these approaches are considerably lacking. The limited evidence that does exist suggests that such treatments, when used correctly, are efficacious for a number of physical and mental health issues, including smoking and other substance use and stress.

Despite a lack of adequate research support for CAM treatments, data indicate that pregnant women in the U.S. are already using a variety of mind-body treatments to enhance well-being and manage distress, and that some prenatal care providers are already referring pregnant patients to yoga classes, massage therapists, and other CAM practitioners (Wang et al., 2005). Interest in CAM approaches may reflect a growing preference for utilizing a more "holistic" approach to healthcare and not necessarily dissatisfaction with conventional treatment approaches (e.g., Adams et al., 2009; Gaffney & Smith, 2004; Hall et al., 2011). Additionally, preference for CAM approaches may also be related to traditional cultural practices, but the evidence is not clear (e.g., Hall et al., 2011).

Though few studies have examined who is more likely to use CAM, some have found that those who have higher education (Chuang et al., 2009) or those who used CAM prior to pregnancy (Holst et al., 2009) may be more likely to consider using CAM during their pregnancy. Unfortunately, due in part to the dearth of rigorous research on CAM treatments, evidence-based guidance and safety information are not clearly available to consumers. This is of particular concern during the perinatal period due to potential maternal and fetal harms when treatments are used inappropriately (Pallivalapila et al., 2015). Therefore, much CAM that is currently practiced during

pregnancy is not considered to be evidence-based (Anderson & Johnson, 2005). Several common CAM approaches are reviewed below.

Acupuncture and Acupressure

Acupuncture is a traditional Chinese medicine therapy utilizing fine needles that are inserted into the skin at specific points in the body. It has gained increasing interest as a treatment for a variety of physical and mental health issues. A national cross-sectional survey conducted in 2002 revealed that lifetime and past year usage of acupuncture was approximately 4% and 1%, respectively. Of the 1% of past year users, 52% were women (Burke, Upchurch, Dye, & Chyu, 2006). However, patterns of acupuncture use are not yet well understood (Smith & Cochrane, 2009).

Acupuncture and acupressure (a similar treatment that uses stimulation of specific points in the body without the use of needles) have been evaluated as potential CAM treatments for smoking cessation (e.g., White, Rampes, Liu, Stead, & Campbell, 2014; White & Taylor, 2014) and depression (e.g., Stub, Alraek, & Liu, 2011). In particular, some have suggested that these treatments may be effective for smoking cessation by reducing nicotine withdrawal symptoms; however, these studies were uncontrolled (White et al., 2014). A recent *Cochrane Review* of acupuncture and related treatments for smoking cessation suggested possible short-term effects (White et al., 2014). Specifically, of 16 studies that compared acupuncture to sham acupuncture, acupuncture was shown to have a small short-term effect (RR = 1.22, 95% CI 1.08-1.38). Compared to existing conventional treatments, though, acupuncture was less effective than NRT and not superior to psychological interventions in the short- or long-term. Systematic review of 38 studies failed to demonstrate consistent, unbiased

evidence that these treatments provided sustained smoking cessation for six or more months; however, the majority of studies included had methodological problems. Overall, no firm conclusions could be drawn about the effectiveness of acupuncture and related treatments for smoking cessation (White et al., 2014). To date, no study has systematically examined the use of acupuncture during the perinatal period for smoking cessation.

Research on acupuncture for the treatment of various pregnancy- and childbirth-related health issues has also continued to grow. Smith and Cochrane (2009) conducted a systematic review of studies on acupuncture treatment during the perinatal period to treat nausea, emotional distress, back pain, labor pain, and breech presentation. This review determined that evidence supporting the use of acupuncture during pregnancy varied by the indication, with strongest evidence for the benefit of acupuncture or acupressure in treating for pregnancy-related nausea. In a randomized trial of acupuncture for depression, 150 pregnant women were randomly assigned to acupuncture specific for depression (12 treatment sessions of acupuncture to specifically address depression over an 8-week period), acupuncture not specific for depression/control acupuncture over the same time period, and Swedish massage (Manber et al., 2010). Compared to the combined control groups, the acupuncture for depression intervention group reported a greater decrease in depressive symptoms and a greater response rate, as measured by the Hamilton Rating Scale for Depression.

Smith and Cochrane (2009) also concluded that the quality of research on acupuncture appears to be improving. In designing quality research studies on acupuncture, finding a suitable control for acupuncture is an often-cited challenge

(Smith & Cochrane, 2009; White et al., 2014). Since findings from some controlled trials have found insufficient evidence supporting the efficacy of acupuncture when compared to sham or control acupuncture, some have attributed any reported acupuncture findings to a placebo effect (Smith & Cochrane, 2009). Notably, regardless of exact mechanisms, these treatments appear to be popular and safe when applied correctly (White et al., 2014). Overall, evidence for the use of acupuncture as a treatment is mixed, and efficacy may depend on the indication. Although there is little support for acupuncture as a treatment for smoking cessation, there appears to be stronger evidence supporting acupuncture as a treatment for pregnancy-related nausea and possibly for perinatal depression. More rigorous research is therefore necessary in order to help reach definitive conclusions.

Massage Therapy

Massage therapy has been associated with a range of benefits, including pain reduction, decreases in depression, weight gain in preterm infants, and enhanced attentiveness and immune system functioning (Field, 2014). However, scant evidence is available on the use of massage therapy for tobacco and other substance use. A pilot study by Hernandez-Reif and colleagues (1999) evaluated the effect of self-massage of the hand or ear on anxiety and withdrawal symptoms among a sample of 20 smokers interested in smoking cessation. Compared to those in the control group, those who utilized the 5-minute massage practice during craving episodes reported lower anxiety, fewer withdrawal symptoms, and improved mood. At the end of the 4-week study, those in the self-massage group also reported a significant reduction in the number of cigarettes smoked per day; however, no biological indicators of smoking were used.

These results suggest that further investigation is warranted regarding the use of massage therapy to aid smoking cessation.

A handful of studies examining massage during the perinatal period have revealed that it may promote reductions in depression, anxiety, pain, and prematurity rates (Field et al., 1999; Field, Diego, Hernandez-Reif, Schanberg, & Kuhnm 2004; Field, Diego, Hernandez-Reif, Deeds, & Figueiredo, 2009). For example, one study demonstrated that, compared to a control group that received only routine prenatal care, pregnant women who received a 20-minute massage therapy intervention twice weekly for 12 weeks showed improvements in depression, anxiety and physical pain, as well as greater relationship satisfaction. Additionally, infants of women in the massage group had greater gestational age and birth weight than infants of women in the control group (Field, Diego, Medina, Delgado, & Hernandez, 2012). In another study by Field and colleagues (2004), pregnant women with depression who received a 20-minute massage intervention from their significant others twice per week for 12 weeks during their second to third trimesters had fewer symptoms of depression and lower cortisol levels compared to relaxation and treatment-as-usual groups. The massage group also experienced fewer obstetric and postnatal complications.

In sum, massage therapy appears to offer benefits to women and their infants, particularly with regard to reduced depression and anxiety and enhanced infant outcomes. No study has yet to examine, though, whether massage therapy may be useful for promoting smoking cessation during pregnancy. In comparison to the acupuncture literature, there appears to be somewhat stronger evidence supporting

massage therapy as a treatment aid for smoking cessation and perinatal depression, for example, perhaps due to the more rigorous studies conducted by Field and colleagues.

Herbal and Dietary Supplements

A nearly endless list of herbal and dietary supplements have been purported to treat a variety of physical and mental health issues. The Dietary Supplement Health and Education Act (DSHEA) of 1994 changed the classification of herbal medicines to dietary supplements, allowing their sale without prior efficacy or safety testing, and therefore dismissing manufacturers of the requirement to report serious adverse events to the U.S. Food and Drug Administration (FDA, 2015; Marcus & Snodgrass, 2005). Therefore, herbs and dietary supplements are not approved or regulated by the FDA, which makes many healthcare professionals hesitant to recommend them to the general public and particularly to pregnant women (Marcus & Snodgrass, 2005).

Research has only recently begun to examine the efficacy and safety of using such supplements. Herbs and supplements, such as ginger, raspberry leaf, blue cohosh, castor oil, evening primrose oil, and St. John's Wort (Hypericum perforatum), have been used for a variety of pregnancy-related complaints, including nausea/vomiting, sleep, stress or to induce labor (Dante, Bellei, Neri, & Facchinetti, 2014). Despite the uncertainty about safety and lack of adequate supporting evidence, use of herbal medicines and dietary supplements during and throughout pregnancy is not uncommon, particularly outside of the US. However, estimates of use vary widely; for example, one observational study from an urban hospital in the Midwest estimated that 4.1% of pregnant patients used herbal or alternative remedies (Refuerzo et al., 2005). In another survey study, 51% respondents from an antenatal clinic in Australia

reported using herbal medicines daily during the second and third trimesters (Maats & Crowther, 2002). Another sample of Norwegian women found that 36% had used herbal medicines during pregnancy, and the proportion of women using herbal medicines during pregnancy increased through the first, second, and third trimesters. The most commonly used herbal medicines in this sample included Echinacea, iron-boosting herbs, ginger, chamomile, and cranberry. Of particular concern, 39% reported using herbs that were considered either potentially harmful or that lacked safety information (Nordeng & Havnen, 2004). These findings underscore the need to better understand the safety and efficacy of herbal and dietary supplements for pregnant women, especially because women are using them regardless of available information.

Several reviews have focused on the use of herbs and supplements for depression, anxiety, and stress. St. John's Wort in particular has received significant attention as an herbal antidepressant for mild to moderate depression, and has been shown to be of comparable efficacy to a number of common pharmaceutical antidepressants (Schulz, 2002). Data also reveal that St. John's Wort appears to be safe during pregnancy and breastfeeding, but the efficacy of St. John's Wort for treating depressive symptoms has not yet been demonstrated among pregnant women (Dante et al., 2014). Another review investigating the use of various herbs and supplements for anxiety disorders, including passionflower, kava, L-lysine, L-arginine, magnesium, and St. John's Wort, concluded that herbal and dietary supplements may be an effective method for treating anxiety without serious side effects. Out of the 24 studies that investigated CAM monotherapies or combination treatments for anxiety and related disorders, 21 were randomized controlled trials (RCT), including 18 double-blind RCTs.

Of the 21 RCTs, 15 (or 71%) demonstrated a positive effect for herbs or supplements with only mild to moderate side effects; however, authors also noted that positive effects may be due to a placebo effect. The strongest evidence reviewed regarding herbal medicine as a treatment for anxiety was in support of supplements containing passionflower or kava, or combinations of L-Lysine and L-arginine; less evidence was available for magnesium and St. John's Wort (Lakhan & Viera, 2010).

A few studies have also evaluated the efficacy of St. John's Wort for smoking cessation. One randomized, blinded, placebo-controlled trial of 118 smokers found that St. John's Wort did not promote smoking abstinence or attenuate withdrawal symptoms (Sood et al., 2010). These results indicate that St. John's Wort is not indicated for smoking cessation. Other herbs and dietary supplements may promote smoking cessation, but firm conclusions cannot be drawn given the dearth of research in this area.

Chiropractic

Chiropractic, including spinal manipulation therapy, is one of the most commonly used CAM techniques (Shelley, Clark, & Caulfield, 2015), and is often utilized as a treatment for low back pain (Rubinstein, Terwee, Assendelft, de Boer, & van Tulder, 2013; Rubinstein, van Middlekoop, Assendelft, de Boer, & van Tulder, 2011). Despite claims by chiropractors that chiropractic treatment is efficacious in treating a wide range of health issues, including low back pain, migraines, headaches, neck pain, ADHD, asthma, infertility, and pregnancy-related discomfort (Shelley et al., 2015), many have determined that evidence is insufficient to make such claims. Two *Cochrane Review* articles indicated that chiropractic was no more effective than other interventions in

relieving low back pain (Rubenstein et al., 2011; Rubenstein et al., 2013), and others have also observed a similar lack of convincing evidence for chiropractic treatment overall (e.g., Ernst & Posadzki, 2011; Posadzki & Ernst, 2011).

Regarding use of chiropractic during pregnancy, a handful of studies have examined the use of spinal manipulation for low back pain associated with pregnancy. In a review of several studies, Stuber and Smith (2008) concluded that chiropractic treatment appears to be associated with improved outcomes in pregnancy-related low back pain. However, given the low-to-moderate quality of evidence and study design issues such as lack of control groups or randomization, it is not possible to make firm statements regarding the efficacy or safety of chiropractic care during pregnancy. Overall, research on chiropractic care during pregnancy is lacking, and existing studies appear to have methodological limitations. Furthermore, no known research has examined links between chiropractic, mental health and smoking cessation. Therefore, at present, research does not support the use of chiropractic treatment during pregnancy, particularly for smoking cessation or perinatal depression or distress.

Mindfulness

The emergence of and research support for third-wave cognitive behavioral therapies—mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1990), acceptance and commitment therapy (ACT; Hayes, Strosahl, Wilson, 1999), dialectical behavior therapy (DBT; Linehan, 1993), mindfulness-based cognitive therapy (MBCT; Segal, Williams & Teasdale, 2002), and mindfulness-based relapse prevention (MBRP; Witkiewitz, Marlatt, & Walker, 2005)— have helped to legitimize mindfulness as a treatment for a variety of physical and mental health disorders, including chronic pain,

stress, depression, anxiety, substance use disorders, borderline personality disorder, and eating disorders (Hayes et al., 2011). Mindfulness, according to Kabat-Zinn (1994, p.4), means "paying attention in a particular way; on purpose, in the present moment, and nonjudgmentally." One particular third-wave CBT program, mindfulness-based stress reduction (MBSR), helped to introduce the West to mind-body and contemplative practices as a treatment approach. MBSR consists of practices including seated meditation, body scans, everyday mindfulness activities (e.g., walking, eating), and yoga, as well as psychoeducation, group discussion, and homework (Kabat-Zinn, 2005; Hayes et al., 2011). Mindfulness-based cognitive therapy (MBCT) and mindfulness-based relapse prevention (MBRP) integrate the more general approach of MBSR but adapt and refine practices and teachings for dealing with depression, anxiety, and craving and relapse associated with substance use disorders.

The use of meditation to treat smoking and substance use disorders is not novel. However, there has been a lack of substantial or rigorous research on meditation and addictions (Breslin, Zack, & McCain, 2002; Marlatt & Marques, 1977; Witkiewitz et al., 2005). Several studies from the 1970's describe using transcendental meditation with substance users with promising results (Benson, 1975; Marcus, 1974; Marlatt & Marques, 1977). For example, meditation and exercise were found to be equally effective in curbing daily drinking (Murphy, Pagano, & Marlatt, 1986). Marlatt and colleagues used mindfulness as the basis of an extension of their relapse prevention cognitive behavioral treatment; they suggest that mindfulness-based relapse prevention (MBRP) may help to disrupt the system of craving and resulting habitual use by providing increased awareness and acceptance of craving as a response to

environmental cues, positive outcome expectancies, and motivation to engage in an addictive behavior that provides positive and negative reinforcement. In particular, they conceived of mindfulness practice as a form of counterconditioning, whereby metacognitive awareness and relaxation replace the rewards associated with engaging in drug use. Further, they emphasized the value of MBRP as an alternative to other more cost-prohibitive treatments, like CBT, contingency management, 12-step programs, and motivational enhancement therapy (Witkiewitz et al., 2005).

Importantly, mindfulness-based third-wave interventions like MBRP differ from conventional CBT for addiction in that conventional approaches emphasize avoiding cues and diverting attention from cravings (Fiore et al., 2000; Lando, McGovern, Barrios, & Etringer, 1990). However, because triggers are omnipresent, avoidance can be difficult. Additionally, distraction or diverting attention requires significant cognitive effort, which is often depleted by strong affective states (Brewer, Elwafi, & Davis, 2012). Mindfulness-based interventions, on the other hand, tend to emphasize approaching triggers and cravings with present moment awareness and acceptance or nonjudgment (Bishop et al., 2004).

Several studies have examined the efficacy of mindfulness techniques for smoking cessation. A recent study found that even a brief, single session of mindfulness meditation can have a significant impact on smoking over a week later (Bowen & Marlatt, 2009). Brewer and colleagues (2012) found that compared to treatment as usual, individuals smoking a pack a day on average who received an 8-session mindfulness training intervention showed a significantly greater reduction in cigarette use during treatment and maintained those gains at 3-month follow-up. A recent meta-

analysis also found support for the use of mindfulness and other mind-body practices as an alternative, drug-free treatment for smoking cessation, despite the small number of studies available (only 4 for mindfulness) and methodological issues with the studies reviewed (Carim-Todd, Mitchell, & Oken, 2013). In sum, initial evidence supports the use of mindfulness as a component of smoking cessation treatment; however, more rigorous clinical trials are needed.

Yoga

Yoga is an ancient health and spiritual tradition that consists of a range of different practices, including postures (*asana*), meditation (*dhyana*), breathing exercises (*pranayama)*, moral and ethical behavior (*yama*), self-discipline (*niyama*), sensory awareness (*pratyahara*), concentration (*dharana*), and deep meditative awareness (*samadhi*). There are various yogic styles, including Hatha, Iyengar, Ashtanga, and Kundalini, but most incorporate some form of posture, breath, and meditation. Although yoga has ancient roots, the practical use of yoga for the purposes of physical fitness and treating health difficulties appears to have only gained prominence within that last century (Alter, 2004; Evans, Tsao, Sternlieb, & Zeltzer, 2009). It is estimated that between 2002 and 2007, 6.1% of adults in the US practiced yoga (Barnes, Bloom, & Nahin, 2008). Additionally, yoga has been increasingly used as a treatment for physical and mental health conditions. However, despite its growing popularity and acceptance as a treatment, a systematic model of the mechanisms through which yoga impacts an individual's physical, mental, and spiritual functioning has yet to be investigated. Evans and colleagues (2009) suggest a biopsychosocial model of yoga, which is compatible with our existing conceptualization of well-being from a Western medicine perspective.

In particular, their proposed biopsychosocial model focused on activation of physical systems (e.g., musculoskeletal, cardiopulmonary, autonomic nervous and endocrine systems), psychological benefits (e.g., enhanced coping, self-efficacy, and positive affect), and spiritual mechanisms (e.g., acceptance, mindful awareness) that are triggered by yoga (Evans et al., 2009).

Compared to other forms of physical activity, yoga offers an alternative strategy to treating physical and mental health problems. In particular, various forms of yoga have been used for chronic pain management, stress reduction, mood symptom management, and relapse prevention (Bock et al., 2012; Mehta & Sharma, 2010; Ross & Thomas, 2010; Smith, Hancock, Blake-Mortimer, & Eckert, 2007; Varambally & Gangadhar, 2012). Several studies have also examined the use of various forms of yoga practice in managing symptoms of tobacco addiction and withdrawal, ranging from single session laboratory studies to multiple session adjunct interventions. For example, in a single-session laboratory study individuals who participated in 30 minutes of hatha yoga reported decreased craving to smoke, increased positive affect, and decreased negative affect (Elibero, Van Rensburg, & Drobes, 2011). In another pilot study, patients in a residential substance use treatment program participated in 5 sessions of yoga and breath awareness practice, in which cigarette smoking was neither encouraged nor discouraged, experienced statistically significant shifts in their intention to quit smoking, with 30% moving from pre-contemplation to contemplation (McIver, O'Halloran, & McGartland, 2004). Bock and colleagues (2012) examined the feasibility and efficacy of vinyasa yoga as a complementary treatment for smoking cessation among a sample of women receiving group-based CBT. Compared to a control sample of women receiving

a general health and wellness program and CBT, women randomized to receive yoga had a greater rates of abstinence at the end of treatment (OR = 4.56) and at 6-months after treatment (OR = 1.54). Those who participated in the yoga supplement also reported reduced anxiety and increased perceived health and well-being compared to controls. In addition to these individual studies, a recent meta-analysis concluded that there is at least initial support for yoga as a treatment for smoking cessation (Carim-Todd et al., 2013).

Yoga has become popular as a way to help women cope with the significant physical and mental or emotional changes that they experience during and following pregnancy (Beddoe & Lee, 2008), which themselves present risks to fetal and maternal health. For example, stress and negative mood during pregnancy have been associated with a variety of adverse maternal and infant outcomes (Bonari, Bennett, Einarson, & Koren, 2004; Wadhwa, Sandman, & Garite, 2001), including low birth-weight, reduced gestation and pre-term birth (Alvarado, Medina, & Aranda, 2002), lower Apgar scores (Pagel, Smilkstein, Regen & Montano, 1990), and smaller head circumference (Lou et al., 1994). Stressful pregnancies have also been predictive of prenatal substance use (Nelson et al., 2003), more difficult labor and delivery (Nielsen et al., 2000), and postpartum depression (Da Costa, Larouche, Drista, & Brender, 2000).

During the prenatal period, yoga has been used to reduce stress, general negative affect, perinatal depression, physical pain, and to help women prepare for labor and delivery. Unfortunately, rigorous trials demonstrating the effectiveness of prenatal yoga are lacking. Despite the dearth of empirical support, informal survey evidence indicates that prenatal yoga is appealing to pregnant women. For example,

83% of women who were surveyed at a hospital day program reported an interest in trying prenatal yoga. In particular, women identified several common reasons for their interest in prenatal yoga, including reducing stress, depression and anxiety symptoms, and participating in an exercise program (Battle, Howard, & Castaneda, 2010).

In addition, there have been a handful of studies published on prenatal yoga that provide initial support for its efficacy in improving birth outcomes. One study of first-time mothers who participated in 6, 1-hour prenatal yoga sessions found that those who participated in the yoga program reported higher levels of comfort during labor and 2 hours post-labor and less subjective labor pain, compared to controls. In addition, women in the yoga condition had a shorter duration of the first stage of labor and total time in labor (Chuntharapat et al., 2008).

In a study focusing on pregnancy outcomes, Narendran and colleagues (2005) examined the efficacy of daily yoga practice versus moderate physical activity (walking for 30 minutes twice a day) on pregnancy outcome. Compared to women in the walking group, women who practiced yoga daily (beginning at 18 to 20 weeks gestation until the end of pregnancy) had significantly lower rates of preterm birth and significantly fewer complications, including intrauterine growth restriction and pregnancy-induced hypertension. Further, women in the yoga group also gave birth to infants of significantly higher birth weight. These findings provide preliminary support for the acceptability of prenatal yoga, as well as the use of yoga during the prenatal period to improve birth outcomes.

In considering the available evidence, yoga appears to have potential as a treatment for smoking cessation during the perinatal period. Furthermore, yoga seems

to be an important component in established mindfulness approaches. For example, the pairing of mindfulness and yoga practices is emphasized in existing treatments for stress and chronic pain conditions (mindfulness-based stress reduction; Kabat-Zinn, 1990), depression and anxiety (mindfulness-based cognitive therapy; Segal et al., 2002), and addiction (mindfulness-based relapse prevention; Witkiewitz et al., 2005). To date, three prior studies have examined a mindfulness yoga program for pregnant women, and all demonstrated that mindfulness yoga may be an effective treatment for reducing distress and managing mood and anxiety symptoms, including stress and negative affect (Vietin & Astin, 2008), anxiety (Beddoe, Yang, Kennedy, Weiss, & Lee, 2009), and depressive symptoms (Muzik, Hamilton, Rosenblum, Waxler, & Hadi, 2012). Reductions in physical pain across pregnancy were also observed (Beddoe et al., 2009). In addition, Muzik and colleagues (2012) found a significant increase in maternal-fetal attachment among women at risk for perinatal depression who participated in a mindfulness yoga program. Together, these studies indicate that the combination of mindfulness and yoga practiced during pregnancy can increase stress tolerance and sleep quality, and decrease psychological distress, and chronic pain intensity, which is particularly powerful during prenatal period, when womens' bodies are subject to physical and emotional changes, including stress and pain (Muzik et al., 2012). However, the effectiveness of prenatal mindfulness yoga for treating tobacco or other substance dependence has yet to be examined.

Limitations of Existing Research on CAM and Smoking Cessation during Pregnancy

Despite growing evidence supporting the efficacy of CAM approaches for a variety of physical and mental health issues, including smoking, published studies suffer

from a number of limitations, leaving important gaps in the literature. Adams and colleagues (2009) identified several areas left unexplored, including: 1) nationally representative studies using large-scale samples in order to better characterize CAM users, prevalence rates, and types of CAM treatments used; 2) better understanding of the decision-making process and the extent of communication between women, their families, and their healthcare providers; 3) insight into perceived risks and the impact of these risks on use of CAM treatments; 4) longitudinal examination of CAM usage throughout and between pregnancies; 5) cross-cultural experiences with CAM approaches; and 6) focus on the therapeutic encounter between women, healthcare providers, and CAM practitioners to facilitate communication and improve women's health outcomes.

Similarly, research and guidelines for clinical practice regarding the use of CAM for smoking cessation is hindered by insufficient evidence. A recent meta-analysis concluded that--although CAM approaches appear to help promote smoking cessation--there is still a scarcity of rigorous studies, and existing studies are hampered by methodological issues, including small sample sizes, limited study design, lack of treatment fidelity monitoring, lack of objective study outcomes, and lack of control conditions (Carim-Todd et al., 2013).

CAM Treatments for Prenatal Smoking and Distress

As described above, there are few currently recommended approaches to smoking cessation for pregnant women, and none reach a majority of those in need of treatment. The limited impact of existing conventional approaches may reflect a lack of understanding of the characteristics and treatment needs of those women who have the

most difficulty quitting. It is therefore necessary to improve upon treatment approaches and access for women who continue to smoke during pregnancy. CAM techniques appear to be increasingly gaining interest in the general population. Although adequate research regarding the efficacy of CAM treatments for physical and mental health issues (including smoking cessation and managing perinatal distress) is lacking, such treatments have the potential to fill an important treatment gap. Examining the use of conventional mental health and CAM treatments among pregnant smokers may help us to better understand their needs and preferences. Further, a closer examination of the characteristics of those who use these approaches may be useful in designing and implementing interventions in healthcare and community settings.

Aims and Hypotheses

The primary goal of the present study is to explore the characteristics and treatment utilization practices of two national samples of pregnant smokers in order to better understand the unique treatment needs and preferences of pregnant smokers in the United States. Analyses will place special emphasis on the prevalence of and factors related to CAM use within this population. The present study will use data from the National Survey on Drug Use and Health (NSDUH) and the National Health Interview Survey (NHIS) in order to examine the following questions:

Using the NSDUH sample:

1) ***What are the characteristics of pregnant women who quit smoking during their pregnancy compared to those who do not?***

Although this aim is exploratory, it is hypothesized that pregnant women who are persistent smokers are more likely to be older, Caucasian, of lower

socioeconomic status, smokers for a longer period of time, and to report greater distress, lower perceived risk of smoking, and criminal justice involvement.

Using both the NSDUH and NHIS samples:

2)   ***What are the rates of complementary and alternative health (CAM) treatment utilization among pregnant smokers, and how have trends changed across time?***

It is hypothesized that CAM treatment utilization will be low, but that trends will indicate an increase across years.

3)   ***What are the characteristics of pregnant smokers who have utilized CAM treatments?***

This is another exploratory aim. However, based on previous studies, it is hypothesized that pregnant smokers who use CAM treatments will report higher levels of education and higher family income.

CHAPTER 2 METHOD

Survey and Sample Descriptions

National Survey on Drug Use and Health (NSDUH)

The present study used a subset of data from the 2004-2013 NSDUH. Initiated in 1971 and conducted on a yearly basis since 1990, the NSDUH collects information from a random sample of more than 70,000 individuals, providing cross-sectional, national estimates of alcohol and drug use for non-institutionalized U.S. civilians aged 12 and older. NSDUH employs independent, multistage area probability sampling for all 50 states and the District of Columbia with oversampling of certain subpopulations (e.g., ages 12-17, African Americans, Hispanic/Latinos) in order to yield nationally representative estimates (SAMHSA, 20014). Survey years 2004-2013 were the focus of the current project because a question regarding use of alternative mental health treatment, including acupuncture, herbal medicine, massage therapy, and chiropractic adjustment was added to the survey beginning in 2004.

A total of 8,895 pregnant women (age 12-44) participated in the NSDUH during these survey years. All pregnant women who participated between 2004 and 2013 and reported smoking within the past year were included in analyses (N = 3,252). Further, a subset of pregnant smokers who also reported using alternative mental health treatment were included in analyses focusing on smoking and CAM use (N = 251).

National Health Interview Survey (NHIS)

The present study also used a subset of data from the 2002, 2007, and 2012 National Health Interview Survey (NHIS). Similar to the NSDUH, the NHIS surveys the civilian, non-institutionalized U.S. population. Initiated in 1956, the NHIS is a cross-

sectional survey conducted annually by the National Center for Health Statistics (NCHS) with the purpose of collecting information on the health of the U.S. population. The NHIS employs a complex sampling design (multistage area probability design) that is redesigned after every decennial census to obtain a representative sampling of approximately 87,500 individuals from households in all 50 states and the District of Columbia, and includes oversampling of African American, Hispanic, and Asian individuals (CDC, 2015).

Since 2002 the NHIS has included a special supplemental section on CAM utilization every 5 years; therefore, the present study examined the three waves of the NHIS that have included CAM questions to date (2002, 2007, and 2012). A total of 992 pregnant women over the age of 17 participated in the NHIS during these survey years. All women who were pregnant and smoking at the time that they participated in the survey were included (N = 106). Data for each participant who completed either the 2002, 2007, or 2012 Alternative Health/Complementary and Alternative Medicine supplements was matched to the corresponding Sample Adult Core and Family surveys (CDC, 2002, 2007, 2012). Only those respondents who completed all survey sections were included in analyses.

Procedure

Data Collection

All NSDUH data were collected face-to-face by trained interviewers using computer-assisted personal interviews (CAPI) and audio computer-assisted self-interviews (ACASI). The use of these approaches is believed to enhance response

validity and disclosure on sensitive topics (SAMHSA, 2014). Data files for the years 2004 through 2013 are publicly available and were obtained via the Inter-University Consortium for Political and Social Research (ICPSR). The sponsor removed identifying information from all data files to insure anonymity of participants.

All NHIS data were collected through face-to-face household interviews conducted by trained interviewers from the U.S. Bureau of the Census. Interviews occur continuously throughout the year. The NHIS questionnaire uses CAPI administered via laptop with interviewers entering responses into the computer during the interview (CDC, 2015). Data files for the years 2002, 2007, and 2012 are publicly available and were obtained through the ICPSR (for years 2002 & 2007) and the CDC (for 2012 only).

NSDUH Measures

See Appendices A-K for all NSDUH measures.

Sociodemographic variables. The publicly available NSDUH dataset included information on a range of demographic variables such as, respondent sex, age, race, ethnicity, marital status, number of children living in the household, highest level of education completed, employment status, family income and receipt of government assistance (e.g., social security income, food stamps, cash assistance).

Pregnancy. All females aged 12-44 were asked whether they are currently pregnant ("Are you currently pregnant?"), and if so, how far along they are in their pregnancy ("How many months pregnant are you?"). Although month of pregnancy was not included in the publicly available dataset, trimester was included as a recoded variable.

Perceived general health. A single item was used to assess respondents' perceived quality of general health: "This question is about your overall health. Would you say your health in general is: excellent, very good, good, fair, or poor?"

Smoking

Onset, frequency, recency. Respondents who endorsed ever smoking were queried further about their smoking, including the age at which they first smoked a cigarette, the age at which they first smoked daily, the age that they last smoked a cigarette, whether they had ever smoked 100 cigarettes, and, if currently smoking, how often and how much they smoke. Past month and past year cigarette use were also available.

Change in smoking. Change or cessation in smoking was not directly queried in the NSDUH survey. Therefore, this outcome variable was created by determining whether pregnant women are current smokers (i.e., have smoked in the past 30 days) or have recently quit smoking (i.e., have smoked in the past year but not in the past 30 days), and recoding these responses into a dichotomous variable.

Perceived risk of smoking. A single item addressed perceived risk of heavy cigarette smoking: "How much do people risk harming themselves physically and or in other ways when they smoke 1 or more packs of cigarettes per day?"

Plan to return to or continue smoking. One item asked respondents whether they plan to be smoking in the next year: "Do you think you'll smoke in the next 12 months?"

Nicotine Dependence Syndrome Scale (NDSS; Shiffman, Hickcox, Gnys, Paty, & Kessel, 1995; Shiffman, Waters, & Hickox, 2004). The NDSS is a 19-item measure of dependence on nicotine, specifically in cigarettes, that focuses on five aspects of

dependence: smoking drive (i.e., the compulsion to smoke caused by nicotine craving and withdrawal symptoms), nicotine tolerance, continuous smoking, behavioral priority (i.e., preference to smoke rather than engage in other reinforcing activities), and stereotypy (i.e., fixed patterns of smoking). Out of the 19 items, 17 were used to calculate an average score of overall nicotine dependence (Shiffman et al., 2004). For respondents who answered 16 of the 17 NDSS nicotine dependence questions, imputation using the 16 answered items as covariates in a weighted least squares regression model was implemented; as a result, an NDSS score was only calculated for those individuals who had responses to all 17 nicotine dependence items after imputation. Respondents were categorized as nicotine dependent if their NDSS score was greater than or equal to 2.75 (SAMHSA, 2014).

Nicotine craving. Two NDSS items related to nicotine craving ("When you don't smoke for a few hours, you start to crave cigarettes."; "You sometimes have strong cravings for a cigarette where it feels like you're in the grip of a force you can't control.") were used to assess craving.

Smoking cessation self-efficacy. A single NDSS item related to self-efficacy/autonomy ("You feel a sense of control over your smoking — that is, you can "take it or leave it" at any time.") was used to assess smoking cessation self-efficacy.

Fagerström Test for Nicotine Dependence (FTND; Heatherton, Kozlowski, Frecker, & Fagerstrom, 1991). The FTND is a 6-item self-report measure of smoking behaviors and nicotine dependence. It is a widely-used and valid measure of nicotine dependency (Pomerleau, Carton, Lutzke, Flessland & Pomerleau, 1994). The NSDUH utilized the one item from this measure that has been shown to discriminate dependent

from nondependent smokers (SAMHSA, 2014): "How soon after you wake up do you have your first cigarette?" Respondents endorsing either "Within the first 5 minutes after you wake up" or "Between 6 and 30 minutes after you wake up" were categorized as nicotine dependent.

Alcohol and other substance use. A main focus of the NSDUH is to thoroughly assess the use and misuse of alcohol, illicit substances, and prescription medication. Therefore, items regarding lifetime, past year, and current use of a range of substances were included, as were items assessing *DSM-IV* criteria for substance abuse and dependence.

Distress and psychopathology

The mental health module of the NSDUH is designed to collect data on serious psychological distress and major depression. Questions related to serious psychological distress and major depressive disorder were added to the NSDUH survey beginning in 2005. Therefore data for these mental health indicators was only available for those who completed the survey between 2005 and 2013 (SAMHSA, 2014).

K6 (Furukawa, Kessler, Slade, & Andrews, 2003; Kessler et al., 2003). The K6 is a well-validated, brief screener for nonspecific psychological distress. The K6 was used to measure serious psychological distress in two time periods: 1) in the past 30 days, and 2) during a month in the past year in which they felt more depressed, anxious, or emotionally stressed than in the past month. Only those who indicated that in the past year there was a worse month than the past 30 days were asked about the worst month in the past year. Respondents with a total K6 score of 13 or greater were classified as having had serious psychological distress (SAMHSA, 2014).

Major depression. DSM-IV criteria were used to determine whether respondents met criteria for a major depressive episode in their lifetime and within the past year.

Anxiety. Respondents were asked whether they have ever had an anxiety disorder and whether a doctor had indicated to them that they had an anxiety disorder in the past 12 months.

Externalizing and Risky Behavior

Criminality. Items related to criminal justice involvement included: "Not counting major traffic violations, have you ever been arrested and booked for breaking the law?"; "In the past 12 months have you been arrested for driving under the influence of alcohol or drugs?" Respondents were also asked whether they had been arrested and charged with driving under the influence of alcohol or illicit drugs. Regarding probation status: "Were you on probation at any time during the past 12 months?"

Risk taking. In addition, items related to the frequency of seeking out and engaging in risky behavior were included: "How often do you get a real kick out of doing things that are a little dangerous?" "How often do you like to test yourself by doing something a little risky?" Another indicator of risk-taking, seatbelt usage, was also assessed: "How often do you wear a seatbelt when you ride in the front passenger seat of a car?" "How often do you wear a seatbelt when you drive a car?"

Treatment utilization

Conventional mental health and substance use treatment. A series of items assessing the past year usage of various forms of conventional mental health and substance use treatment were included in the mental health treatment utilization and substance use treatment sections, respectively. Instructions for mental health treatment

emphasized that respondents not include episodes of substance use treatment, and instructions for substance use treatment emphasized that "questions deal with treatment for alcohol and drug problems, not including cigarettes."

Reasons for not receiving treatment. In addition to asking respondents about treatment they did receive, respondents were asked about reasons they did not receive treatment, including barriers to treatment, such as lack of insurance coverage and perceived lack of need for treatment. Questions pertaining to mental health treatment and substance use treatment are asked separately.

CAM treatment. In addition to questions related to the use of conventional mental health and substance use treatment options, the NSDUH survey asked whether respondents have used an alternative mental health treatment in the past 12 months, specifically for help with a mental health problem. Response options for this item included visiting four common CAM treatment providers: acupuncturist, chiropractor, herbalist, and massage therapist.

NHIS Measures

See Appendices L-P for all NHIS measures.

Sociodemographic variables. The NHIS included a range of demographic characteristics, including age, race, ethnicity, marital status, employment status, and family income.

Pregnancy. A single item was included in the Sample Adult Core survey regarding current pregnancy ("Are you currently pregnant?"). Trimester or month of pregnancy was not assessed.

Smoking. Smoking status was identified by responses to questions in the Sample Adult Core survey: 1) "Have you smoked at least 100 cigarettes in your entire life?" and 2) "Do you now smoke cigarettes every day, some days, or not at all?" For current smokers, questions related to quantity and frequency of cigarette smoking in the past 30 days were included: "On how many days in the past 30 did you smoke a cigarette?" "On average, when you smoked during the past 30 days, about how many cigarettes did you smoke a day?" "On average, how many cigarettes do you now smoke a day?" In addition, one item assessed age of regular smoking initiation ("How old were you when you first started to smoke fairly regularly?").

Quit status ("How long has it been since you quit smoking cigarettes?") and past year quit attempts ("During the past 12 months, have you stopped smoking for more than one day because you were trying to quit smoking?") were also included.

Alcohol use. Several items related to alcohol use were included in the NHIS, including quantity and frequency of past year alcohol use and binge drinking.

Mental health. Respondents were asked whether a doctor or other health professional had ever told them that they had depression or other mental health disorders. Those who endorsed that they had been told they had either depression or other mental health disorders were asked a follow up question to determine whether this occurred during the past 12 months.

K6 (Furukawa et al., 2003; Kessler et al., 2003). As noted above, the K6 is a brief measure of psychological distress. In the NHIS, respondents were asked how often they had experienced the 6 symptoms of psychological distress during the past 30 days.

CAM utilization. In comparison to the NSDUH CAM questions, the NHIS primarily asked about the use of CAM in general, rather than treatment for a specific purpose (i.e., mental health or substance use); however, respondents also had the option to indicate whether they used a treatment for a specific health problem. Respondents were asked about whether they utilized a range of CAM treatments, including yoga, meditation/mindfulness practices, tai chi, qi gong, Pilates, acupuncture, Ayurveda, biofeedback, chiropractic care, massage, energy healing therapy, chelation therapy, craniosacral therapy, naturopathy, hypnosis, traditional healers, homeopathic treatments, and herbs or supplements. For the present study, yoga, meditation/mindfulness practices, acupuncture, chiropractic, herbs or supplements, and massage were examined because they: 1) represent some of the more commonly available and utilized CAM treatments; 2) have been the focus of previous empirical investigation; and 3) and may be relevant to pregnant smokers. Those who endorsed using a particular CAM treatment were asked a series of follow-up questions, including whether they used that treatment in the past 12 months and how many times they used the treatment in the past 12 months. For some CAM treatments, additional follow-up questions were also included.

Respondents who endorsed use of CAM treatments were also asked about health benefits they associated with CAM treatments, including being motivated to cut back or stop drinking alcohol or cut back or quit smoking cigarettes, reducing stress or relaxing, sleeping better, feeling better emotionally, coping better with health problems, and improving health overall. Additionally, respondents were queried about their reasons for choosing CAM treatments (e.g., medications "caused side effects;" "it's

natural;" "it focuses on the whole person, mind, body, and spirit;" "it was part of your upbringing") and whether they had discussed the use of CAM with their health care provider.

Conventional treatment utilization. The NHIS does not include specific items related to conventional mental health and substance use treatment. However, respondents ere asked if they had seen "a mental health professional such as a psychiatrist, psychologist, psychiatric nurse, or clinical social worker" in the past 12 months.

Analyses

All analyses were conducted using SPSS version 22.0; the complex samples add-on component will be utilized as appropriate. Imputations and recodes for the NSDUH and NHIS data were conducted by the Research Triangle Institute (RTI) and National Center for Health Statistics (NCHS), respectively, and were provided in the publicly available data files. In cases where imputation was conducted, missing data were either logically assigned according to responses to other survey questions when appropriate, or replaced via statistical imputation with non-missing values (SAMHSA, 2014; CDC 2002, 2007, 2012). As recommended by RTI and NCHS, final annual survey weights were used for both the NSDUH and NHIS data in order to support national-level estimates. Subpopulation analyses with sample sizes that fell below 200 (i.e., substance use treatment barriers for NSDUH sample, CAM use in both the NSDUH and NHIS samples) did not take into account complex sample design features (West, personal communication, May 21, 2015).

Broadly, analyses fell into three groups: (a) descriptive analyses summarizing sample characteristics and prevalence rates; (b) logistic regression analyses to examine factors related to cessation in perinatal smoking; and (c) logistic regression analyses to investigate factors related to CAM utilization.

Sample description and prevalence rates

Descriptive analyses were used to better understand sample characteristics, to investigate prevalence rates across study waves of prenatal smoking, mental health issues, and other substance use, and to explore utilization rates of conventional mental health and substance use treatment and CAM treatment across the study waves. For population-level estimates, 95% confidence intervals are also reported.

Analyses of factors associated with smoking cessation during pregnancy

Associations between potential factors related to prenatal smoking (e.g., sociodemographic factors, smoking patterns, substance use, mental health, and externalizing) were first examined prior to conducting regression analyses. Those factors that were significantly related to smoking were included initially in separate univariate logistic regression models to predict the dichotomous outcome of cessation in smoking during the past year. Only those variables associated with the outcome were included in the multivariate logistic regression model to determine the factors most strongly associated with cessation in perinatal smoking.

Analyses of factors associated with CAM usage

Separate, unweighted univariate logistic regression models examined characteristics associated with CAM usage among pregnant smokers (e.g., sociodemographic factors, smoking patterns, mental health). Subsequently, those

variables associated with lifetime (NHIS) and past year (NSDUH and NHIS) CAM usage were included in multivariate regression models to determine the relative importance of variables associated with CAM utilization. Due to the smaller sample sizes for CAM use, some factors were combined (e.g., alcohol and illicit drug dependence combined into substance use dependence) where appropriate. Further, given the ratio of sample size relative to the number of predictors, stepwise logistic regression was used to estimate adjusted associations between key variables and CAM use in multivariate models.

CHAPTER 3 RESULTS

In this study, we analyzed data from two national multi-year surveys with the broad aim of better understanding the treatment needs and preferences of pregnant smokers. First, the prevalence rate of smoking among pregnant women across study waves was estimated. Next, we examined characteristics of current smokers compared to former smokers. Then, utilization of conventional treatment and CAM treatment was also examined, including estimating prevalence of treatment utilization and examining the characteristics of pregnant smokers who utilized CAM. It was predicted that a number of sociodemographic factors, smoking history and patterns, and mental health symptoms would be associated with quitting smoking during pregnancy. It was also predicted that pregnant smokers would endorse the use of CAM, and that, although rates would be low, there would be a trend toward increasing rates across study years. Finally, it was also predicted that sociodemographic and potentially mental health and smoking-related factors would be associated with CAM use.

Description of NSDUH sample

See Table 1 for NSDUH sample characteristics. A total of 3,252 pregnant women age 12-44 who had smoked in the past year participated in the NSDUH across the 2004 to 2013 survey years. Of these 3,252 respondents, 1,920 were current smokers who had smoked in the past 30 days, while 1,332 had smoked in the past 12 months, but not the past 30 days. Approximately 50% of pregnant past-year smokers were between 18 and 25 (95% CI = 57.7, 53.9). Pregnant women who endorsed smoking were primarily White. Overall, current smokers appeared to be more socially disadvantaged than former smokers. Current smokers were predominantly unmarried, while former smokers

were equally likely to be either married or unmarried. Among pregnant women who reported smoking in the past year, fewer current smokers were college graduates compared to former smokers. In addition, nearly half of those pregnant women who were currently smoking received some form of government assistance, whereas just below 30% of pregnant former smokers received any government assistance. Former smokers reported a higher rate of current employment compared to current smokers. A greater proportion of current smokers reported a total annual family income of less than $20,000 compared to former smokers and living below the poverty threshold in greater rates. Conversely, a greater proportion of former smokers reported a total annual family income of more than $75,000.

Regarding general health, a greater proportion of pregnant former smokers reported their overall health to be "Excellent" or "Very Good", compared to current smokers. Measures of mental health revealed that current smokers experienced greater distress and symptoms of poor mental health. Pregnant current smokers endorsed higher rates of past month and past year serious psychological distress compared to former smokers. The odds of having had serious psychological distress in the past month were more than 2.5 times greater for current smokers (OR = 2.58; 95% CI = 1.55, 4.31), and the odds of having had serious psychological distress in the past year were almost twice as great for current smokers (OR = 1.88; 95% CI = 1.48, 2.39). Current and former smokers endorsed similar rates of lifetime major depression, with approximately 20% meeting criteria for depression within their lifetime. However, former smokers had decreased odds of having had depression in the past year (OR = 0.65; 95% CI = 0.42, 0.99). A similar difference was observed for anxiety disorders. Current

smokers had a 1.5 times greater odds of having received a diagnosis of an anxiety disorder from a doctor or medical professional in their lifetime. Current smokers also had nearly double the odds of an anxiety disorder diagnosis within the past year (OR = 1.96; 95% CI = 1.31, 2.94).

Estimates of alcohol and illicit drug use were also examined. The odds of having had a drink within the past month were 36% greater for current smokers compared to former smokers (OR = 1.36; 95% CI = 1.01, 1.84). The odds of binge drinking (i.e., drinking five or more drinks on the same occasion) in the past month were 3 times greater for current smokers (OR = 3.08; 95% CI = 2.07, 4.57), with 11.5% of current smokers reporting past month binge drinking compared to 4.1% of former smokers. There were no significant differences between current and former smokers with regard to past year alcohol abuse or dependence. Compared to former smokers, current smokers had a 3.1 times greater odds of having used illicit drugs within the past month (OR = 3.14; 95% CI = 2.16, 4.58). An equal proportion of current and former smokers met criteria for past year illicit substance abuse, but a greater proportion of current smokers met criteria for past year illicit substance dependence (OR = 1.68; 95% CI = 1.24, 2.30).

Finally, facets of externalizing and risky behavior, including criminal justice involvement, driving while intoxicated, and risk seeking, were examined. Currently smoking pregnant women were at increased odds of ever having been arrested (OR = 1.53; 95% CI = 1.18, 1.99) and having been on probation in the past year (OR = 1.94; 95% CI = 1.31, 2.87). There was no significant difference between current and former smokers with regard to driving under the influence of alcohol or drugs within the past

year. On two items related to risky behaviors, current smokers endorsed greater engagement in risky behaviors to "test" themselves (OR = 1.5; 95% CI = 1.13, 2.12), but there was no difference between current and former smokers in terms of getting a kick out of doing something dangerous. Finally, current smokers were less likely to wear a seatbelt, whether as a driver (OR = 0.42; 95% CI = 0.31, 0.57) or passenger (OR = .44; 95% CI = 0.34; 0.58).

Description of NHIS sample

See Table 2 for NHIS sample characteristics. A total of 106 pregnant women age 18 and up who were currently smoking participated in the NHIS in 2002, 2007, and 2012. Of these 106 pregnant women, 79 reported smoking every day and 27 reported smoking some days. The mean age of pregnant smokers was 26.96 (SD = 6.09). Pregnant smokers who participated in the NHIS were primarily White, non-Hispanic and married or living with a partner. Approximately 35% had completed high school or received a GED. About half of the sample indicated that they were currently employed, with over 50% reporting an annual family income of less than $35,000. Just under a quarter were on some form of government assistance, and over 75% had health insurance coverage.

Among the pregnant smokers in the NHIS sample, the majority reported that their physical health was "Excellent" or "Very Good," and that their general health was about the same compared to last year. In terms of mental health, pregnant smokers who participated in the NHIS were highly distressed, with 90% meeting the cutoff for past month serious psychological distress. Approximately 30% indicated that they had been

frequently anxious or depressed in the past year. In addition, 17.2% of pregnant smokers in the NHIS endorsed moderate to heavy alcohol use in the past year.

Smoking prevalence

Across the NSDUH waves, past 30-day smoking prevalence appeared to fluctuate slightly, ranging from 13.3% (2012; 95% CI = 10.9, 16.2) to 19.6% (2010; 95% CI = 16.1, 23.7), but remained generally stable with a 16% (95% CI = 14.9, 17.2) prevalence rate across all waves. See Figure 1. Among all pregnant women, an examination of smoking prevalence by trimester across the study waves demonstrated a decrease across trimesters: 22.3% (95% CI = 19.8, 24.9) in the first trimester, 13.8% (95% CI = 12.2, 15.6) in the second trimester, and 12.2% (95% CI = 10.6, 14.1) in the third trimester of pregnancy (see Figure 2). Within the pregnant, current smoker subset, 43.9% (95% CI = 39.9, 48.0) were in their first trimester, 30.5% (95% CI = 27.3, 34.0) in their second trimester, and 25.5% (95% CI = 22.3, 29.0) were in their third trimester. Finally, within the pregnant, former smoker subset, 24.6% (95% CI = 21.0, 28.5) were in their first trimester, 41.7% (95% CI = 37.1, 46.4) were in their second trimester, and 33.7% (95% CI = 29.6, 38.1) were in their third trimester.

The mean age of beginning daily smoking was 16.14 (95% CI = 17.42, 18.31) for current smokers and 17.86 (95% CI = 15.91, 16.37) for former smokers. In terms of early onset of regular cigarette use, current smokers had a 2.4 times greater odds of being an early onset regular smoker (by age 14) compared to former smokers (OR = 2.41; 95% CI =1.80, 3.23). In terms of smoking risk perception, most women considered regular heavy smoking (e.g., one or more packs per day) to be of great risk.

On average, most current smokers smoked 6 to 15 cigarettes per day (36.2%; 95% CI = 33.0, 39.5). Just under a third of current smokers smoked 2 to 5 cigarettes per day on average (29.0%; 95% CI = 25.9, 32.3). Nearly two-thirds (65.5%; 95% CI =62.5, 68.4) of current smokers met criteria for nicotine dependence within the past month. When nicotine dependence among current smokers was examined by trimester, 73.6% (95% CI = 68.9, 77.9) of women in their third trimester met past month criteria for nicotine dependence, while 64.3% (95% CI = 58.0, 70.2) of second trimester and 61.5% (95% CI = 56.2, 66.5) of first trimester women met nicotine dependence criteria. Regarding a specific feature of nicotine dependence, craving, 25.4% (95% CI = 22.5, 28.5) of current smokers reported little to no craving for cigarettes. Notably, 32.1% (95% CI = 28.8, 35.7) strongly indicated that they felt in control of their smoking, whereas 21.9% (95% CI = 19.5, 24.5) reported feeling as though they were not in control of their smoking.

Compared to the NSDUH, the prevalence rate of past-30-day prenatal smoking in the NHIS was slightly lower. However, similar to the NSDUH, the prevalence rate in the NHIS appeared to fluctuate across study years (see Figure 3), dropping from an estimated 11.6% (95% CI = 8.5, 15.6) in 2002 to 8.1% (95% CI = 5.2, 12.4) in 2007, and then increasing to 10.7% (95% CI = 7.1, 15.9) in 2012; across the 3 waves, prenatal smoking prevalence was estimated to be 10.1% (95% CI = 8.0, 12.6). Notably, the percentage of pregnant former smokers and never smokers also appeared to fluctuate (see Figure 4). Among pregnant women who had ever been regular smokers (i.e., those who had ever smoked 100 cigarettes), the rate of current smoking appeared to decrease slightly, ranging from an estimated 43.3% in 2002 to 36.1% in 2012. The

majority of former smokers quit smoking within the past year (51.1%). The mean age at which current smokers began regularly smoking was 15.92 (SD = 3.33). On average, pregnant smokers who participated in the NHIS smoked 12.64 (SD = .029) cigarettes per day, with a modal number of 10 cigarettes smoked per day.

Factors associated with smoking cessation during pregnancy

Unadjusted logistic regression analyses revealed that many factors were significantly associated with smoking cessation during pregnancy, with the strongest factors being greater levels of education, higher annual family income, absence of past month serious psychological distress, past month binge drinking, and past year illicit drug use. Age, lifetime major depression diagnosis, alcohol use disorders, and past year DUI were not associated with perinatal smoking cessation. See Table 3 for unadjusted odds ratios.

Variables related to smoking cessation in pregnancy were included in adjusted analyses. The overall adjusted logistic regression model was significant and accounted for between 29.5% (Cox and Snell R^2) and 39.9% (Nagelkerke R^2) of the variance in smoking cessation during pregnancy. In the full model, several factors were no longer significantly associated with smoking cessation: receipt of government assistance, age onset of regular smoking, serious psychological distress (past year and past month), past year major depression, lifetime anxiety disorder, past month and past year illicit drug use, past year substance dependence, arrest history, probation status, risky behavior, conventional treatment utilization, and unmet need for mental health treatment. The strongest factors associated with smoking cessation in the overall model

included greater education, Hispanic ethnicity, and absence of past month binge drinking or past year anxiety disorder diagnosis. See Table 3 for adjusted odds ratios.

Prevalence rates of conventional treatment utilization

Approximately one-fifth of pregnant past-year smokers reported engaging in conventional mental health or substance use treatment within the past year (20.2%; 95% CI = 18.1, 22.4). Currently smoking pregnant women from the NSDUH survey reported greater likelihood of having sought conventional treatment within the past year as compared to former smokers (OR = 1.77; 95% CI = 1.35, 2.31). Further, current smokers were more likely to report an unmet need for mental health treatment (OR = 2.06; 95% CI = 1.45, 2.92). There was not a significant difference between current and former smokers with regard to a substance use treatment gap, or needing treatment but not receiving it (see Table 1).

Respondents indicated a variety of reasons for seeking treatment, as well as a variety of barriers to seeking or receiving treatment. Among the 649 pregnant past-year smokers who sought mental health treatment in the past 12 months, 81% (95% CI = 76.1, 85.1) indicated that they decided on their own to seek treatment; another 13.6% (95% CI = 9.9, 18.3) of remaining treatment seekers sought mental health treatment because someone else thought they should. Finally, 5.4% (95% CI = 3.9, 7.5) sought mental health treatment because they were ordered to get treatment. Regarding perceived barriers to receiving mental health treatment, current and former smokers endorsed similar reasons for not receiving treatment with a few exceptions. A greater proportion of former smokers indicated that an insurance deficit, such as insurance not covering any treatment or not covering enough of the cost of treatment, prevented them

from receiving treatment. The most common barriers to mental health treatment for both current and former smokers included being unable to afford it, not knowing where to go for treatment, and believing they could handle the problem without treatment. See Table 4 for perceived barriers to conventional mental health treatment.

Response rates for perceived barriers to substance use treatment were low (unweighted count = 58). For current smokers, the most common reason for not seeking substance use treatment was that they were not ready to stop using, followed by being unable to afford it or not having insurance and not wanting others to find out. For former smokers, the most common reasons for not seeking substance use treatment included being unable to afford treatment or not having insurance coverage, transportation difficulties, and fear that their neighbors would have a negative opinion of them. See Table 5 for perceived barriers to conventional substance use treatment.

Within the NHIS sample, just over a tenth of pregnant smokers indicated that they had seen a mental health professional within the past year (see Table 2). A greater proportion of daily smokers (12.8%) reported that they had seen a mental health professional in the past year compared to regular (but not daily) smokers (8.8%).

Prevalence rates of past year CAM utilization

Among pregnant NSDUH participants who endorsed smoking within the past year, 251 responded to items related to alternative mental health treatment, including 156 who received treatment from several CAM practitioners (acupuncturist, chiropractor, herbalist, massage therapist). Compared to conventional treatment, fewer pregnant past-year smokers reported engaging in alternative mental health treatment within the past year. Within the larger sample of pregnant women who have smoked

within the past year, the prevalence of CAM use was 6.9%: 5.6% among current smokers, and 8.5% of former smokers utilized CAM in the past year. Across NSDUH survey waves there appeared to be some variability in CAM treatment use. Overall, prevalence rates for any CAM use among pregnant, past year smokers varied between an estimated 3.7% (95% CI =1.9, 7.4) at the lowest in 2007 to 10.8% (95% CI = 3.7, 27.5) at the highest in 2011. See Figure 5.

Of those pregnant women who sought treatment from alternative mental health treatment, current smokers were at lower odds of having seen a CAM practitioner for alternative mental health treatment within the past year compared to former smokers (OR = 0.54; 95% CI = 0.32, 0.91). Chiropractic care was the most commonly utilized CAM treatment among current smokers (29.0%), whereas massage was the most commonly utilized CAM treatment among former smokers (48.4%). See Table 6 and Figure 6 for use rates for each CAM modality. Some reported utilizing more than one CAM approach: 18.5% of former smokers and 4.9% of current smokers sought treatment from practitioners of 2 different CAM modalities in the last year; 0.7% of current smokers used 3 of the 4 CAM approaches.

NSDUH participants predominantly chose conventional mental health or substance use treatment (17.6%; 95% CI = 15.5, 19.9). Nearly 5% sought solely CAM treatment (4.7%; 95% CI = 3.0, 7.2). However, a small proportion of pregnant, past year smokers utilized both conventional mental health or substance use treatment as well as CAM treatment (2.6%; 95% CI = 1.7, 3.9). Although current smokers were greater users of conventional treatment, and former smokers were greater users of CAM treatment,

there was no difference in smoking status among those using both conventional and CAM approaches.

Compared to the NSDUH sample, a greater proportion of pregnant smokers who participated in the NHIS reported engaging in CAM use: 27.2% of pregnant current smokers endorsed using CAM in their lifetime, with 19.1% reporting CAM use within the past year. Herbs and supplements were the most commonly used CAM approach within the past year, with 9.5% reporting past year use of herbs and supplements, followed by meditation (7.9%) and deep breathing exercises (6.3%). Deep breathing exercises (including as part of yoga or meditation practice) was the most common CAM practice smokers had ever used, with 16.5% reporting that they had ever tried deep breathing exercises; deep breathing was followed by meditation (12.0%) and herbs and supplements (10.5%).

Across NHIS study waves, there was a slight decrease in the lifetime prevalence of CAM use, dropping from 31.3% in 2002 to 25.5% in 2012. However, increases were observed for several CAM approaches: yoga, acupuncture, and herbs and supplements (see Figure 7). For past year CAM use, there appeared to be an increase from 19.5% in 2002 to 26.1% in 2007, but past year CAM use dropped to 19.2% in 2012. In examining CAM treatments separately, increases across study waves in past year use were observed for yoga, meditation, and massage. See Figure 8.

Unfortunately, survey items regarding reasons for using CAM had poor response rates (1.8%). However, among those who responded to these items, the most commonly reported reason for using CAM was to reduce stress levels or help with

relaxation, followed by general wellness or disease prevention, improving overall health or to feel better, and improving relationships with others.

Factors associated with CAM use

Characteristics associated with CAM use were examined within the NSDUH (past year CAM use) and NHIS (lifetime and past year CAM use) samples. Separate logistic regressions were first conducted to examine whether factors were related to CAM. Within the NSDUH, logistic regression analyses revealed that many factors were associated with greater likelihood of past year CAM use, with the strongest factors including: higher annual family income (greater than $50,000), being married, White racial status, non-reliance on government assistance, and absence of past year serious psychological distress or mental health problems. Trimester of pregnancy, age, education, perceived health, perceived risk of regular smoking, past month alcohol and illicit drug use, past year illicit drug use, alcohol and illicit drug abuse, seatbelt use, risky behavior, and past year DUI were not significantly associated with past year CAM use.

Factors significantly associated with past year CAM use in univariate analyses were included in the full model. The overall adjusted logistic regression model was significant and accounted for between 27.4% (Cox and Snell R^2) and 37.0% (Nagelkerke R^2) of the variance in past year CAM use. Two factors were retained in the adjusted model, with non-reliance on government assistance and absence of past year serious psychological distress, depression, or anxiety being associated with greater likelihood of past year CAM use. See Table 7 for unadjusted and adjusted odds ratios.

In the NHIS sample, separate logistic regression analyses indicated that none of the factors examined were significantly associated with both lifetime and past year CAM

use. Higher income, greater education, Hispanic ethnicity, and abstinence from alcohol were among the strongest predictors of lifetime CAM use. All factors were entered into a stepwise logistic regression in order to determine whether any significant factors would emerge in an adjusted model. The overall adjusted logistic regression model of factors associated with lifetime CAM use was significant and accounted for between 13.4% (Cox and Snell R^2) and 18.9% (Nagelkerke R^2) of the variance in lifetime CAM use. Several factors were retained in the adjusted model, with greater education and abstinence from alcohol emerging as factors most strongly associated with lifetime CAM use in the adjusted model. Notably, age onset of regular smoking was also retained in the full model; however, the direction of the association changed, such that onset of regular smoking after age 15 was associated with a lower likelihood of lifetime CAM use. Considering the sample size restrictions, though, these results should be interpreted with caution. See Table 9 for unadjusted and adjusted odds ratios for lifetime CAM use among NHIS participants.

Among the univariate factors associated with past year CAM use, White racial status, greater education, higher income, past month serious psychological distress, and past year depression or anxiety were several of the factors strongly associated with past year CAM use. As with lifetime CAM use, all factors were included in the adjusted model despite being nonsignificant in univariate comparisons. The overall adjusted logistic regression model of factors associated with past year CAM use was nonsignificant, and no factors were retained in the overall model. See Table 8 for unadjusted odds ratios for past year CAM use among NHIS participants.

CHAPTER 4 DISCUSSION

The present study sought to investigate the characteristics and treatment utilization practices of pregnant smokers who participated in two cross-sectional national surveys, in order to better understand their treatment needs and preferences. The estimated prevalence rate of prenatal smoking between 2002 and 2013 based on both samples was between 8 and 20%, with somewhat lower estimates among the NHIS participants. Estimated smoking prevalence rates appeared to be somewhat stable across these years and did not appear to reflect a decline in the prevalence of prenatal smoking. This highlights the urgency of considering alternate and possibly more broadly acceptable intervention approaches.

Compared to current smokers, former smokers were more likely to be in their second or third trimester of pregnancy, of African American or Hispanic descent, college educated, employed, and earning a higher annual family income. Former smokers also reported better health, greater seatbelt use, and were less likely to have used alcohol in the past month or to have been diagnosed with an anxiety disorder in the past year. Notably, former smokers also reported that they perceived regular, heavy smoking to be of greater risk to one's health. Although former smokers were less likely to have experienced serious psychological distress, engaged in risky behaviors, been arrested or on probation in the past year, or used illicit drugs in the past month, these factors did not remain significant in the full model. Prior studies emphasized a link between distress or mental health problems and persistent smoking, but these relationships did not appear to be as strong within the present sample.

Within the NSDUH sample, both current and former smokers endorsed distress, major depression, and anxiety, with some comparisons reaching statistical significance and suggesting that current smokers were more distressed; however, once other factors were taken into consideration, many of these associations were no longer significant. A similar pattern was observed for substance use: once other factors were accounted for, only abstinence from alcohol within the past month was associated with smoking cessation. Factors such as nicotine dependence, craving, and smoking self-efficacy could not be compared between current and former smokers. Among current smokers, however, over 65% were nicotine dependent (particularly those in the third trimester), approximately 75% reported experiencing craving, and over 20% felt that they were not in control of their smoking. Overall, the results of the present study support the general finding from previous investigations that current smokers are more high-risk across a number of sociodemographic domains. Importantly, though, these results also highlight factors that may be well-suited as intervention targets, such as psychoeducation about smoking risk and prenatal alcohol use, general health and safety promotion, managing nicotine craving, and boosting smoking self-efficacy. It is possible that CAM treatments may be well-suited to address several of these targets, including general health promotion, managing craving, and improving self-efficacy.

A second aim was to estimate the rates of CAM use among pregnant smokers, and to explore how rates have changed across time. Pregnant current and former smokers endorsed conventional and CAM treatment use. Use of conventional treatment was more common than use of CAM among NSDUH participants, whereas use of CAM was more common than use of conventional treatment among NHIS participants;

however, it is likely that this difference is driven by methodological differences in how the two surveys administer treatment utilization questions. With regard to specific CAM modalities, seeking treatment within the past year from a chiropractor or massage therapist were most common within the NSDUH sample, whereas NHIS participants reported that herbs and supplements, meditation, and deep breathing exercises were the most common CAM approaches used within the past year.

Interestingly, among NSDUH participants, current smokers were greater consumers of conventional treatment, whereas formers smokers were greater consumers of CAM as a form of alternative mental health treatment. Further, a small proportion of participants also endorsed both conventional and CAM treatment use within the past year, which may suggest that some pregnant smokers are open to trying a variety of approaches to help meet their treatment goals. It is not clear from the present data why individuals made these treatment decisions. Thus, these findings underscore the need to better understand how treatment preferences drive decisions to seek specific treatments. Regardless, these findings also demonstrate that pregnant smokers are interested in CAM approaches and that many are already using CAM as a form of mental health treatment or for general health promotion.

NSDUH respondents also identified a number of barriers to seeking conventional treatment for mental health and substance use. The cost of treatment emerged as a common barrier to both mental health and substance use treatment. Other barriers included fears about how others would respond, not knowing where to go for treatment, not being ready for treatment, and feeling as though they could handle the problem

without treatment. It is unclear whether similar barriers would prevent women from seeking CAM treatments.

In terms of trends in the prevalence of CAM treatment use among pregnant smokers across survey years, our prediction of increased CAM use over time was not supported by the data. Instead, it appeared that the prevalence of CAM use was variable across study years in both the NSDUH and NHIS with no evidence of a linear trend. Considering trends of increasing use observed in the general population, including smokers (Hamm et al., 2014), it is possible that this fluctuation in rates of CAM use among pregnant smokers may be reflective of uncertainty about the safety and efficacy of these modalities during pregnancy. However, within the NHIS sample, there appeared to be increases across study years for specific treatments. In particular, rates of participation in yoga (both lifetime and past year), acupuncture (lifetime), herbs and supplements (lifetime), meditation (past year), and massage (past year) appeared to increase between 2002 and 2012 among pregnant smokers.

Analyses examining factors related to CAM use among pregnant smokers were underpowered due to limited sample sizes. These analyses were conducted without using sample weights in order to facilitate interpretation, given that applying weights appeared to result in artificially inflated significance values for all factors but did not generally change the magnitude of odds ratios. Despite these restrictions, a number of factors were found to be associated with CAM use among pregnant smokers in both samples, including White race, having greater levels of education and higher annual family income (a finding that is consistent with previous research in this area; Chuang et al., 2009). Interestingly, among the NSDUH sample, lower distress or better mental

health was associated with greater likelihood of CAM use; in contrast, higher distress or poor mental health was associated with *greater* likelihood of CAM use among the NHIS sample. This difference may reflect variability in the measurement of distress, mental health, and/or CAM use within these surveys.

Limitations

The overall purpose of the NSDUH and NHIS surveys is to provide a general, cross-sectional snapshot of the substance use, mental health, and physical health of the U.S. non-institutionalized population. Due to the cross-sectional nature of the NSDUH and NHIS, conclusions about causality cannot be made. Further, although these study designs allows for generalizability of this study's results to the U.S. population, they also present some limitations. For example, certain subgroups, such as individuals who are incarcerated, are not included in these surveys. This could result in an underestimation of smoking, substance use, and mental health problems among incarcerated pregnant women. Further, these surveys were not designed specifically for the subpopulation of pregnant smokers, and therefore the choice of variables was restricted to those included in the NSDUH and NHIS surveys. Thus, there are several relevant factors that were not included or further assessed in these surveys.

Notably, smoking cessation during pregnancy—a primary focus of this study—could only be assessed using the proxy measure of past 30-day cigarette use. As a result, it was not possible to directly determine the point at which smokers may have quit, and it is possible that some past year smokers may have quit prior to becoming pregnant. It was also not possible to explore whether there were differences between current and formers smokers with regard to several smoking-related factors (namely,

nicotine dependence, craving, smoking self-efficacy, and average number of cigarettes smoked per day), since these items were not administered unless respondents endorsed past month cigarette use. Further, neither survey assesses smoking cessation treatment; it is therefore uncertain whether some women may have sought or benefitted from smoking cessation treatment.

In addition, questions related to CAM use in the NSDUH were embedded within the alternative mental health treatment section. Consequently, the sample size for these items was limited to those who sought alternative treatment for mental health issues and responded to these items. As a result, it is possible that the prevalence of CAM use within the NSDUH sample was underestimated. Despite pooling several waves of each survey together, the sample size for some analyses within both samples was also small, which prevented further exploration of certain aspects of treatment utilization and CAM use. Finally, although the NSDUH makes efforts to minimize self-report bias and enhance disclosure of stigmatized behaviors by using ACASI, the NHIS relies on only face-to-face interviews. However, regardless of methods to minimize bias, data from both surveys are based solely on participant self-report; thus, behaviors such as prenatal smoking, substance use, mental health issues and criminal justice involvement may be underreported.

Conclusions and future directions

Prenatal smoking prevalence estimates appear to be somewhat stable based on nationally representative survey data, which suggests that prevention and intervention efforts are not reaching enough at-risk women. Overall, the present study found several potentially modifiable factors that may help to distinguish between women who are at

greater risk for persistent smoking during pregnancy, including smoking risk perception, current alcohol use, and factors related to nicotine dependence (e.g., craving, self-efficacy). Notably, at least two of these (craving and self-efficacy) have been shown to be amenable to CAM approaches (e.g., Gwaltney et al., 2002; Vidrine et al., 2009; Witkiewitz et al., 2005; Witkiewitz & Bowen, 2010). Further, this study also demonstrated that a sizeable proportion of pregnant smokers are interested/already accessing alternative treatments. Further, although CAM use appeared to be somewhat lower in lower SES and (in some cases) depressed or anxious women, it was nevertheless reported by at least 25% of women in these subgroups. They may thus be a broadly acceptable approach for pregnant smokers, particularly if barriers such as cost and accessibility are addressed.

Future investigations should further examine pregnancy-related factors that may be associated with smoking as well as CAM use, such as receipt of prenatal care, whether the pregnancy was planned, or the presence of pregnancy complications. Additionally, further exploration of the intended reasons or goals for seeking out CAM—including whether women use CAM to assist with smoking cessation or manage mental health symptoms—is necessary in order to better understand motivations for pursuing CAM, and whether women are pursing CAM instead of or in addition to conventional treatment.

Several access-related issues remain to be addressed. As noted, this study found that pregnant women, including pregnant smokers, are seeking out CAM treatment at moderate and stable rates. However, further research is needed not only to validate the use of these treatments for a variety of physical and mental health issues,

but also to guide treatment recommendations and to confirm that such treatments can be used safely during pregnancy. In particular, pilot studies and larger scale randomized clinical trials are required to provide a foundation for the use of CAM in general and for specific subpopulations such as pregnant women, whether as a standalone or adjunct to conventional evidence-based treatment approaches. In addition, as previous authors have noted (e.g., Pallivalapila et al., 2015), the lack of regulatory oversight is a significant concern surrounding some CAM treatments. For example, evidence-based treatment guidelines for practitioners of other CAM modalities such as acupuncture, chiropractic care, and yoga would help to ensure that women who pursue these approaches during pregnancy can do so safely.

Table 1

NSDUH Sample Characteristics

Sociodemographic Characteristics	Total (n = 3,252)		Current Smokers (n = 1,920)		Former Smokers (n = 1,332)		p
	%	95% CI	%	95% CI	%	95% CI	
Trimester							
First	35.5%	[32.8, 38.3]	43.9%	[39.9, 48.0]	24.6%	[21.0, 28.5]	.000
Second	35.4%	[32.5, 38.4]	30.5%	[27.3, 34.0]	41.7%	[37.1, 46.4]	
Third	29.1%	[26.5, 31.8]	25.5%	[22.3, 29.0]	33.7%	[29.6, 38.1]	
Age							
12 to 17	5.3%	[4.5, 6.2]	5.3%	[4.2, 6.5]	5.4%	[4.0, 7.0]	.063
18 to 25	50.8%	[47.7, 53.9]	53.4%	[49.5, 57.4]	47.3%	[43.0, 51.7]	
26 and older	43.9%	[40.7, 47.2]	41.3%	[37.2, 45.5]	47.3	[42.7, 52.0]	
Race/Ethnicity							
Non-Hispanic White	70.7%	[67.9, 73.3]	73.9%	[70.2, 77.3]	66.4%	[62.5, 70.1]	.000
Non-Hispanic Afr. Amer.	13.6%	[11.5, 16.0]	13.7%	[11.4, 16.4]	13.3%	[10.2, 17.3]	
Non-Hispanic Other Race	4.7%	[3.5, 6.3]	4.8%	[3.3, 7.1]	4.5%	[3.1, 6.4]	
Hispanic	11.1%	[9.7, 12.7]	7.5%	[5.7, 9.9]	15.8%	[13.1, 18.8]	
Marital Status							
Never married	50.8%	[47.7, 53.9]	54.6%	[50.4, 58.7]	45.9%	[41.4, 50.4]	.000
Married	37.6%	[34.5, 40.8]	30.2%	[26.4, 34.2]	47.3%	[42.8, 51.8]	
Widowed, divorced, separated	11.6%	[9.9, 13.6]	15.3%	[12.5, 18.5]	6.8%	[4.7, 9.8]	
Education							
Less than HS	27.8%	[25.6, 30.0]	33.1%	[30.2, 36.1]	20.8%	[18.0, 24.0]	.000
HS graduate or GED	35.2%	[32.7, 37.9]	37.5%	[33.9, 41.3]	32.2%	[28.3, 36.4]	
Some college	26.0%	[23.2, 29.1]	25.1%	[21.5, 29.2]	27.2%	[23.4, 31.1]	
College graduate	11.0%	[9.2, 13.0]	4.3%	[2.7, 6.6]	19.8%	[16.5, 23.5]	
Employment Status							
Currently employed	48.4%	[45.5, 51.4]	52.8%	[49.7, 56.0]	57.3%	[52.7, 61.8]	.000
Not currently employed	51.6%	[48.6, 54.5]	47.2%	[44.0, 50.3]	42.7%	[38.2, 47.3]	
Annual Family Income							
Less than $20,000	35.0%	[32.5, 37.6]	42.5%	[39.2, 45.8]	25.2%	[21.4, 29.3]	.000
$20,000 to $49,999	35.8%	[33.2, 38.5]	37.8	[34.7, 41.0]	33.1%	[29.1, 37.4]	
$50,000 to $74,999	14.6%	[12.9, 16.3]	12.0%	[10.0, 14.4]	17.9%	[15.5, 20.6]	
$75,000 or more	14.7%	[12.6, 17.0]	7.8%	[6.0, 9.9]	23.8%	[19.7, 28.5]	
Government Assistance							
Yes	40.2%	[38.0, 42.3]	48.5%	[45.3, 51.7]	29.2%	[25.5, 33.1]	.000
No	59.8%	[57.7, 62.0]	51.5%	[48.3, 54.7]	70.8%	[66.9, 74.5]	
Health Status							
Fair or Poor	8.5%	[7.1, 10.1]	11.2%	[9.1, 13.9]	4.8%	[3.4, 6.8]	.000

	%	95% CI	%	95% CI	%	95% CI	p
Good	30.1%	[27.7, 32.6]	35.1%	[31.7, 38.5]	23.6%	[20.4, 27.3]	
Very Good	36.9%	[34.3, 39.6]	35.0%	[31.5, 38.6]	39.4%	[35.5, 43.5]	
Excellent	24.5%	[21.9, 27.7]	18.7%	[15.9, 21.8]	32.1%	[28.0, 36.4]	
Regular Smoking Onset							
By age 14	20.1%	[18.0, 22.5]	25.1%	[21.8, 28.7]	12.2%	[10.1, 14.7]	.000
Age 15 or older	79.9%	[77.5, 82.0]	74.9%	[71.3, 78.2]	87.8%	[85.3, 89.9]	
Smoking Risk Perception							
No or slight risk	11.7%	[10.1, 13.4]	14.8%	[12.9, 16.9]	7.6%	[5.2, 11.0]	.000
Moderate risk	27.5%	[25.1, 30.0]	32.1%	[28.6, 35.7]	21.4%	[18.8, 24.3]	
Great risk	60.9%	[58.2, 63.5]	53.1%	[49.6, 56.6]	71.0%	[67.4, 74.4]	
SPD, Past Year*							
No	78.6%	[76.5, 80.5]	74.1%	[71.1, 76.9]	84.3%	[81.7, 86.7]	.000
Yes	21.4%	[19.5, 23.5]	25.9%	[23.1, 28.9]	15.7%	[13.3, 18.3]	
SPD, Past Month*							
No	89.7%	[87.2, 91.8]	86.2%	[82.6, 89.2]	94.2%	[91.0, 96.3]	.000
Yes	10.3%	[8.2, 12.8]	13.8%	[10.8, 17.4]	5.8%	[3.7, 9.0]	
MDE, Past Year*							
No	88.6%	[86.4, 90.4]	86.7%	[83.5, 89.3]	91.0%	[87.7, 93.4]	.043
Yes	11.4%	[9.6, 13.6]	13.3%	[10.7, 16.5]	9.0%	[6.6, 12.3]	
MDE, Lifetime*							
No	80.0%	[76.8, 82.8]	79.9%	[76.3, 83.0]	80.1%	[75.0, 84.4]	.937
Yes	20.0%	[17.2, 23.2]	20.1%	[17.0, 23.7]	19.9%	[15.6, 25.0]	
Anxiety Disorder, Past Year							
No	89.5%	[87.4, 91.4]	86.9%	[83.7, 89.6]	92.9%	[90.5, 94.7]	.001
Yes	10.5%	[8.6, 12.6]	13.1%	[10.4, 16.3]	7.1%	[5.3, 9.5]	
Anxiety Disorder, Lifetime							
No	84.5%	[82.2, 86.5]	82.2%	[79.0, 85.0]	87.4%	[84.1, 90.1]	.020
Yes	15.5%	[13.5, 17.8]	17.8%	[15.0, 21.0]	12.6%	[9.9, 15.9]	
Alcohol Use, Past Month							
No	82.6%	[80.6, 84.4]	80.7%	[78.1, 83.1]	85.1%	[81.6, 88.0]	.042
Yes	17.4%	[15.6, 19.4]	19.3%	[16.9, 21.9]	14.9%	[12.0, 18.4]	
Binge Drinking, Past Month							
No	91.7%	[90.2, 93.0]	88.5%	[86.2, 90.4]	95.9%	[94.3, 97.1]	.000
Yes	8.3%	[7.0, 9.8]	11.5%	[9.6, 13.8]	4.1%	[2.9, 5.7]	
Alcohol Abuse							
No	93.6%	[92.2, 94.8]	93.4%	[91.2, 95.0]	94.0%	[91.7, 95.7]	.648
Yes	6.4%	[5.2, 7.8]	6.6%	[5.0, 8.8]	6.0%	[4.3, 8.3]	
Alcohol Dependence							
No	92.8%	[91.3, 94.0]	92.7%	[90.8, 94.2]	92.8%	[90.4, 94.7]	.910
Yes	7.2%	[6.0, 8.7]	7.3%	[5.8, 9.1]	7.2%	[5.3, 9.6]	
Illicit Drug Use, Past Year							

No	63.5%	[61.3, 65.6]	59.9%	[56.8, 63.0]	68.1%	[64.7, 71.4]	.001
Yes	36.5%	[34.4, 38.7]	40.1%	[37.0, 43.2]	31.9%	[28.6, 35.3]	
Illicit Drug Use, Past Month							
No	87.1%	[85.6, 88.5]	82.2%	[79.9, 84.3]	93.6%	[91.2, 95.3]	.000
Yes	12.9%	[11.5, 14.4]	17.8%	[15.7, 20.1]	6.4%	[4.7, 8.8]	
Illicit Drug Abuse							
No	97.7%	[96.9, 98.3]	97.7%	[96.5, 98.5]	97.7%	[96.4, 98.5]	.947
Yes	2.3%	[1.7, 3.1]	2.3%	[1.5, 3.5]	2.3%	[1.5, 3.6]	
Illicit Drug Dependence							
No	92.0%	[90.6, 93.2]	90.4%	[88.4, 92.1]	94.1%	[92.4, 95.4]	.001
Yes	8.0%	[6.8, 9.4]	9.6%	[7.9, 11.6]	5.9%	[4.6, 7.6]	
Ever Arrested							
No	72.1%	[69.7, 74.5]	68.5%	[65.3, 71.5]	76.9%	[72.8, 80.4]	.002
Yes	27.9%	[25.5, 30.3]	31.5%	[28.5, 34.7]	23.1%	[19.6, 27.2]	
Probation Status							
No	92.9%	[91.4, 94.2]	91.2%	[88.8, 93.1]	95.2%	[93.6, 96.5]	.001
Yes	7.1%	[5.8, 8.6]	8.8%	[6.9, 11.2]	4.8%	[3.5, 6.4]	
DUI							
No	79.3%	[76.6, 81.8]	79.8%	[77.0, 82.4]	78.6%	[74.5, 82.2]	.551
Yes	20.7%	[18.2, 23.4]	20.2%	[17.6, 23.0]	21.4%	[17.8, 25.5]	
Risky Behavior							
No	84.8%	[83.0, 86.4]	82.4%	[80.0, 84.6]	87.9%	[84.9, 90.4]	.006
Yes	15.2%	[13.6, 17.0]	17.6%	[15.4, 20.0]	12.1%	[9.6, 15.1]	
Seatbelt Use							
Never, seldom, sometimes	24.6%	[22.4, 26.9]	31.0%	[27.7, 34.5]	16.2%	[13.6, 19.2]	.000
Always	75.4%	[73.1, 77.6]	69.0%	[65.5, 72.3]	83.8%	[80.8, 86.4]	
MH or SU Treatment							
No	79.8%	[77.6, 81.9]	76.0%	[72.9, 78.9]	84.8%	[81.8, 87.4]	.000
Yes	20.2%	[18.1, 22.4]	24.0%	[21.1, 27.1]	15.2%	[12.6, 18.2]	
Unmet MH Treatment Need							
No	89.1%	[87.1, 90.7]	86.2%	[83.4, 88.6]	92.8%	[90.5, 94.5]	.000
Yes	10.9%	[9.3, 12.9]	13.8%	[11.4, 16.6]	7.2%	[5.5, 9.5]	
SU Treatment Gap							
No	82.3%	[80.4, 84.1]	81.9%	[79.2, 84.3]	82.8%	[79.8, 85.5]	.637
Yes	17.7%	[15.9, 19.6]	18.1%	[15.7, 20.8]	17.2%	[14.5, 20.2]	
CAM Use,							
No alternative MH treatment	90.3%	[87.5, 92.5]	90.9%	[87.6, 93.3]	89.6%	[85.8, 92.5]	.017
No CAM use	2.8%	[2.0, 4.0]	3.5%	[2.4, 5.2]	1.9%	[1.2, 2.9]	
Yes	6.9%	[4.8, 9.7]	5.6%	[3.5, 8.7]	8.5%	[5.8, 12.4]	

Note. CI = confidence interval; Afr. Amer. = African American; SPD = serious psychological distress; MDE = major depressive episode; DUI = driving under the influence of alcohol or drugs; MH = mental health; SU = substance use; CAM = complementary and alternative medicine.

*Sample size for NSDUH waves 2005-2013 = 2,894 total (1,705 current smokers, 1,189 former smokers).

Table 2

NHIS Sample Characteristics

Sociodemographic Characteristics	Total (n = 106)*	Everyday Smokers (n = 79)*	Some Days Smokers (n = 27)*	*p*
Age				
18 to 25	31.3%	29.7%	37.0%	.000
26 and older	67.9%	70.3%	63.0%	
Race				
White	84.2%	85.4%	80.5%	.000
African American	9.0%	5.7%	18.9%	
Other Race	6.8%	8.9%	0.6%	
Hispanic Ethnicity				
No	91.6%	97.1%	74.7%	.000
Yes	8.4%	2.9%	25.3%	
Marital Status				
Never married	12.7%	14.6%	7.0%	.000
Living with partner	31.4%	31.2%	32.0%	
Married	44.8%	42.5%	52.0%	
Widowed, divorced or separated	11.1%	11.8%	9.1%	
Education				
Less than HS	4.8%	5.8%	1.6%	.000
HS, no diploma	26.8%	27.3%	25.2%	
HS graduate or GED	34.9%	33.4%	39.4%	
Some college	20.7%	19.0%	26.0%	
College graduate	12.9%	14.6%	7.8%	
Employment Status				
Currently employed	46.6%	44.8%	52.9%	.000
Not currently employed	52.9%	55.2%	47.1%	
Annual Family Income				
$0 to $34,999	50.1%	54.5%	48.0%	.000
$35,000 to $74,999	36.6%	39.1%	37.6%	
$75,000 or more	7.7%	6.4%	14.4%	

Government Assistance				
No	77.8%	73.2%	91.8%	.000
Yes	22.2%	26.8%	8.2%	
Health Insurance Coverage				
Covered	77.0%	80.0%	67.6%	.000
Not covered	23.0%	20.0%	32.4%	
Health Status				
Fair or Poor	9.6%	11.6%	3.8%	.000
Good	29.8%	31.3%	25.4%	
Very Good	40.5%	37.4%	50.1%	
Excellent	20.0%	19.7%	20.7%	
Regular Smoking Onset				
By age 14	29.6%	37.1%	6.9%	.000
Age 15 or older	70.4%	62.9%	93.1%	
SPD, Past Month				
No	9.9%	10.2%	8.9%	.000
Yes	90.1%	89.8%	91.1%	
Frequently Depressed or Anxious				
No	71.0%	71.1%	70.6%	.018
Yes	29.0%	28.9%	29.4%	
Alcohol Use Status				
Lifetime abstainer	7.4%	8.6%	3.9%	.000
Former drinker	28.6%	26.0%	37.0%	
Current infrequent drinker	22.7%	23.8%	19.7%	
Current light drinker	23.7%	23.6%	24.5%	
Current moderate to heavy drinker	17.2%	18.0%	14.8%	
Seen a Mental Health Professional				
No	88.0%	87.2%	91.2%	.000
Yes	11.8%	12.8%	8.8%	

Note. SPD = serious psychological distress.
* Unweighted count.

Table 3

Odds Ratios and Confidence Intervals for Smoking Cessation During Pregnancy

Variable	Unadjusted		Adjusted[a]	
	OR	95% CI	*OR*	95% CI
Trimester				
First	Ref		Ref	
Second	2.44	[1.81, 3.29]	3.23	[1.88, 5.54]
Third	2.36	[1.74, 3.22]	2.88	[1.92, 4.55]
Race/Ethnicity				
Non-Hispanic White	Ref		Ref	
Non-Hispanic African American	1.08	[0.77, 1.52]	2.30	[1.21, 4.37]
Non-Hispanic Other Race	1.03	[0.65, 1.64]	1.73	[0.83, 3.63]
Hispanic	2.33	[1.52, 3.57]	4.71	[2.31, 9.61]
Marital Status				
Never married	Ref		Ref	
Married	1.87	[1.46, 2.39]	1.25	[0.79, 1.99]
Widowed, divorced, separated	0.53	[0.33, 0.88]	0.47	[0.25, 0.91]
Education				
Less than HS	Ref		Ref	
HS graduate	1.36	[1.04, 1.79]	1.59	[0.88, 2.90]
Some college	1.72	[1.29, 2.30]	1.58	[0.87, 2.90]
College graduate	7.32	[4.19, 12.76]	5.51	[2.01, 15.11]
Annual Family Income				
Less than $20,000	Ref		Ref	
$20,000-$49,999	1.48	[1.11, 1.97]	1.13	[0.66, 1.92]
$50,000-$75,000	2.51	[1.88, 3.36]	1.47	[0.90, 2.40]
$75,000 and up	5.21	[3.41, 7.96]	2.89	[1.21, 6.91]
Employment Status				
Not currently employed	Ref		Ref	
Currently employed	1.50	[1.22, 1.85]	1.54	[1.04, 2.27]
Government Assistance				
No	Ref		Ref	
Yes	2.29	[1.79, 2.93]	1.30	[0.77, 2.19]

Health Status				
Fair or Poor	Ref		Ref	
Good	1.57	[0.96, 2.58]	2.40	[1.00, 5.02]
Very Good	2.62	[1.65, 4.17]	2.63	[1.25, 5.54]
Excellent	4.00	[2.53, 6.34]	3.83	[1.71, 8.58]
Regular Smoking Onset				
By age 14	Ref		Ref	
Age 15 or later	2.41	[1.80, 3.23]	1.21	[0.73, 1.99]
Smoking Risk Perception				
No or slight risk	Ref		Ref	
Moderate risk	1.30	[0.82, 2.08]	1.37	[0.75, 2.48]
Great risk	2.61	[1.69, 4.04]	2.72	[1.65, 4.49]
SPD, Past Year (2005-2013)				
No	Ref		Ref	
Yes	0.53	[0.42, 0.68]	1.02	[0.51, 2.06]
SPD, Past Month (2005-2013)				
No	Ref		Ref	
Yes	0.39	[0.23, 0.65]	0.78	[0.29, 2.09]
MDE, Past Year (2005-2013)				
No	Ref		Ref	
Yes	0.65	[0.42, 1.00]	0.88	[0.40, 1.92]
Anxiety Disorder, Past Year				
No	Ref		Ref	
Yes	0.51	[0.34, 0.77]	0.23	[0.08, 0.64]
Anxiety Disorder, Lifetime				
No	Ref		Ref	
Yes	0.66	[0.47, 0.94]	1.93	[0.93, 4.01]
Alcohol Use, Past Month				
No	Ref		Ref	
Yes	0.73	[0.54, 0.99]	0.47	[0.22, 0.99]
Binge Drinking, Past Month				
No	Ref		Ref	
Yes	0.33	[0.22, 0.48]	0.31	[0.12, 0.80]

Illicit Drug Use, Past Year	Ref		Ref	
No	0.32	[0.22, 0.46]	0.94	[0.56, 1.59]
Yes				
Illicit Drug Use, Past Month				
No	Ref		Ref	
Yes	0.70	[0.57, 0.86]	0.51	[0.24, 1.07]
Illicit Drug Dependence, Past Year				
No	Ref		Ref	
Yes	0.59	[0.44, 0.81]	1.92	[0.77, 4.28]
Ever Arrested				
No	Ref		Ref	
Yes	0.66	[0.51, 0.85]	1.06	[0.67, 1.67]
Probation Status, Past Year				
No	Ref		Ref	
Yes	0.52	[0.35, 0.77]	0.89	[0.43, 1.85]
Risky Behavior				
No	Ref		Ref	
Yes	0.65	[0.47, 0.89]	0.94	[0.54, 1.61]
Seatbelt Use				
Never, seldom or sometimes	Ref		Ref	
Always	2.33	[1.78, 3.05]	2.24	[1.36, 3.68]
Treatment, Past Year				
No	Ref		Ref	
Yes	0.57	[0.43, 0.74]	0.68	[0.38, 1.23]
Unmet Treatment Need				
No	Ref		Ref	
Yes	0.49	[0.34, 0.69]	1.21	[0.57, 2.58]

Note. OR = odds ratio; CI = confidence interval; SPD = serious psychological distress; MDE = major depressive episode.

[a]Adjusted model goodness-of-fit (Wald X^2 (37, 60) = 343.67, $p < .001$).

Table 4

Perceived Barriers to Mental Health Treatment

Barrier	Total		Current Smokers (n = 229)*		Former Smokers (n = 104)*		
	%	95% CI	%	95% CI	%	95% CI	*p*
Fear of neighbors' negative opinion	10.6	[6.3, 17.2]	11.5	[6.1, 20.8]	8.3	[3.4, 18.7]	.542
Fear of negative effect on job	4.8	[2.0, 11.0]	3.7	[0.9, 14.1]	7.4	[3.1, 16.6]	.413
Didn't want others to find out	7.6	[4.1, 13.5]	5.7	[3.1, 10.3]	12.2	[3.8, 32.4]	.259
Insurance didn't cover it at all	2.2	[1.0, 4.7]	0.6	[0.2, 1.7]	6.1	[2.3, 15.1]	.000
Insurance didn't pay enough	8.8	[4.9, 15.4]	4.4	[1.5, 12.5]	19.7	[10.4, 34.3]	.013
Didn't know where to go	20.1	[13.5, 28.9]	18.1	[11.3, 27.7]	25.1	[13.6, 41.5]	.341
Confidentiality concerns	10.2	[6.4, 15.8]	9.2	[4.7, 17.2]	12.8	[7.0, 22.1]	.479
Fear of being committed or medicated	17.5	[12.2, 24.9]	15.7	[9.9, 24.2]	22.4	[12.1, 37.7]	.356
Didn't think treatment was needed	3.6	[2.0, 6.1]	3.4	[1.7, 6.4]	4.0	[1.7, 8.8]	.741
Couldn't afford cost	48.7	[41.7, 55.8]	47.1	[38.5, 55.9]	52.6	[39.7, 65.2]	.509
Thought problem could be handled without treatment	19.7	[13.8, 27.2]	16.1	[10.4, 24.0]	28.7	[15.9, 46.3]	.118
Didn't think treatment would help	6.1	[3.3, 11.1]	4.5	[2.2, 8.9]	10.2	[3.8, 24.7]	.170
Didn't have time	11.0	[7.2, 16.5]	9.3	[5.2, 16.0]	15.3	[7.9, 27.3]	.252
No transportation, too far away, not convenient	3.6	[2.0, 6.3]	3.2	[1.5, 6.8]	4.6	[1.6, 12.5]	.259

* Unweighted counts.

Table 5

Perceived Barriers to Substance Use Treatment

Barrier	Total	Current Smokers (n = 41)*	Former Smokers (n = 17)*	p
Fear of neighbors' negative opinion	14.7%	13.0%	21.4%	.000
Fear of negative effect on job	10.5%	13.1%	0%	.000
Didn't want others to find out	18.5%	21.5%	6.4%	.000
Insurance didn't cover treatment	8.4%	8.1%	9.8%	.006
No program had preferred treatment type	0.0%	0.1%	0%	.326
Not ready to stop using	27.5%	30.7%	20.1%	.000
No openings in programs	2.9%	3.6%	0%	.000
Didn't know where to go	18.9%	18.9%	18.9%	.496
Didn't think treatment was needed	1.4%	0.1%	6.4%	.000
Couldn't afford cost or no insurance	26.1%	24.4%	32.6%	.000
Thought problem could be handled without treatment	0.9%	1.0%	0.4%	.005
Didn't have time	0.3%	0.4%	0%	.001
No transportation, too far away, not convenient	10.1%	6.8%	23.0%	.000

* Unweighted counts.

Table 6

Past Year CAM Use Among Alternative Mental Health Treatment Seekers (NSDUH)

CAM Treatment Provider	Total (n =251)	Current Smokers (n = 143)*	Former Smokers (n = 108)*	p
Acupuncturist	8.3%	9.2%	7.2%	.000
Chiropractor	35.3%	29.0%	42.5%	.000
Herbalist	4.1%	6.0%	2.0%	.000
Massage therapist	36.3%	25.9%	48.4%	.000
All CAM approaches	70.9%	61.3%	82.1%	.000

Note. CAM = complementary and alternative medicine.
*Unweighted counts.

Table 7

Odds Ratios and Confidence Intervals for Past Year CAM Use (NSDUH)

Variable	Unadjusted		Adjusted[a]	
	OR	95% CI	*OR*	95% CI
Race/Ethnicity				
Non-Hispanic White	Ref			
Non-Hispanic African American	0.15	[0.06, 0.40]	--	--
Non-Hispanic Other Race	0.47	[0.18, 1.22]		
Hispanic	0.42	[0.20, 0.89]		
Marital Status				
Not married	Ref		--	--
Married	2.52	[1.41, 4.50]		
Annual Family Income				
Less than $20,000	Ref			
$20,000-$49,999	2.24	[1.21, 4.15]	--	--
$50,000-$75,000	3.56	[1.46, 8.72]		
$75,000 and up	3.62	[1.64, 8.00]		
Employment Status				
Not currently employed	Ref		--	--
Currently employed	0.30	[0.18, 0.51]		
Government Assistance				
No	Ref		Ref	
Yes	0.18	[0.10, 0.31]	0.13	[0.06, 0.29]
Smoking, Past Month				
No	Ref		--	--
Yes	0.54	[0.32, 0.91]		
MH and/or SPD, Past Year (2005-2013)				
No	Ref		Ref	
Yes	0.20	[0.11, 0.38]	0.26	[0.11, 0.60]
SPD, Past Month (2005-2013)				
No	Ref		--	--
Yes	0.26	[0.11, 0.62]		

MDE and/or Anxiety Disorder, Lifetime				
No	Ref		--	--
Yes	0.36	[0.20, 0.63]		
Substance Dependence, Past Year				
No	Ref		--	--
Yes	0.38	[0.21, 0.68]		
Ever Arrested				
No	Ref		--	--
Yes	0.52	[0.30, 0.88]		
Probation Status, Past Year				
No	Ref		--	--
Yes	0.29	[0.12, 0.71]		
Treatment, Past Year				
No	Ref		--	--
Yes	0.22	[0.12, 0.37]		
MH or SU Treatment Gap				
No	Ref		--	--
Yes	0.42	[0.25, 0.70]		

Note. OR = odds ratio; CI = confidence interval; CAM = complementary and alternative medicine; Ref = reference category; SPD = serious psychological distress; MDE = major depressive episode; MH = mental health; SU = substance use.
[a]Adjusted model goodness-of-fit: X^2 (1, 2) = 44.78, *p* < .001.

Table 8

Odds Ratios and Confidence Intervals for Past Year CAM Use (NHIS)

Variable	Unadjusted	
	OR	95% CI
Age		
18 to 25	Ref	
26 and older	0.95	[0.36, 2.49]
Race		
White	Ref	
African American	0.21	[0.03, 1.67]
Other Race	0.27	[0.03, 2.22]
Hispanic Ethnicity		
No	Ref	
Yes	0.83	[0.22, 3.23]
Marital Status		
Never married	Ref	
Living with partner	0.37	[0.08, 1.82]
Married	1.08	[0.31, 3.69]
Widowed, divorced, separated	0.55	[0.12, 2.43]
Education		
College graduate	Ref	
Some college	0.90	[0.23, 3.52]
HS graduate or GED	0.29	[0.07, 1.15]
HS, no diploma	0.35	[0.09, 1.40]
Less than HS	0.28	[0.03, 2.90]
Employment Status		
Currently employed	Ref	
Not currently employed	0.47	[0.18, 1.20]
Annual Family Income		
Less than $34,999	Ref	
$35,000 to $74,999	0.71	[0.23, 2.19]
$75,000 or more	3.27	[0.60, 17.91]

Government Assistance		
No	Ref	
Yes	0.84	[0.31, 2.27]
Health Insurance Coverage		
Covered	Ref	
Not covered	0.47	[0.13, 1.76]
Health Status		
Very Good to Excellent	Ref	
Fair to Good	1.49	[0.60, 3.70]
Smoking Frequency		
Some days	Ref	
Everyday	1.03	[0.36, 2.95]
Regular Smoking Onset		
By age 14	Ref	
Age 15 or older	0.51	[0.20, 1.32]
Cigarettes Per Day		
16 or more	Ref	
6 to 15	1.06	[0.34, 3.33]
1 to 5	0.53	[0.15, 1.90]
SPD, Past Month		
No	Ref	
Yes	2.84	[0.34, 23.59]
Frequently Depressed or Anxious, Past Year		
No	Ref	
Yes	1.73	[0.67, 4.42]
Alcohol Use Status		
Current drinker	Ref	
Former drinker or lifetime abstainer	1.04	[0.41, 2.66]

Note. OR = odds ratio; CI = confidence interval; CAM = complementary and alternative medicine; SPD = serious psychological distress. No factors were retained in the multivariate model using stepwise logistic regression; therefore, adjusted ORs are not reported.

Table 9

*Odds Ratios and Confidence Intervals for Lifetime CAM Use (NHIS)*

Variable	Unadjusted		Adjusted[a]	
	OR	95% CI	*OR*	95% CI
Age				
18 to 25	Ref		--	--
26 and older	1.05	[0.43, 2.58]		
Race				
White	Ref		--	--
African American	0.32	[0.07, 1.54]		
Other Race	0.43	[0.09, 2.12]		
Hispanic Ethnicity				
No	Ref		--	--
Yes	1.95	[0.62, 6.19]		
Marital Status				
Never married	Ref			
Living with partner	0.99	[0.25, 3.87]	--	--
Married	1.16	[0.34, 3.98]		
Widowed, divorced, separated	0.85	[0.21, 3.43]		
Education				
College graduate	Ref			
Some college	0.94	[0.24, 3.58]	0.79	[0.18, 3.44]
HS graduate or GED	0.30	[0.08, 1.10]	0.17	[0.04, 0.81]
HS, no diploma	0.31	[0.08, 1.21]	0.16	[0.03, 0.80]
Less than HS	0.46	[0.07, 3.14]	0.39	[0.05, 3.20]
Employment Status				
Currently employed	Ref		--	--
Not currently employed	0.76	[0.32, 1.78]		
Annual Family Income				
Less than $34,999	Ref		--	--
$35,000 to $74,999	0.95	[0.36, 2.52]		

	OR	CI	OR	CI
$75,000 or more	2.37	[0.44, 12.81]		
Government Assistance				
No	Ref		--	--
Yes	1.20	[0.49, 2.90]		
Health Insurance Coverage				
Covered	Ref		--	--
Not covered	1.13	[0.41, 3.11]		
Health Status				
Very Good to Excellent	Ref		--	--
Fair to Good	1.12	[0.48, 2.60]		
Smoking Frequency				
Some days	Ref		--	--
Everyday	1.21	[0.45, 3.25]		
Regular Smoking Onset				
By age 14	Ref		Ref	
Age 15 or older	1.67	[0.69, 4.06]	0.40	[0.14, 1.15]
Cigarettes Per Day				
16 or more	Ref		--	--
6 to 15	0.55	[0.19, 1.56]		
1 to 5	0.36	[0.12, 1.12]		
SPD, Past Month				
No	Ref		--	--
Yes	1.79	[0.36, 8.93]		
Frequently Depressed or Anxious, Past Year			--	--
No	Ref			
Yes	1.79	[0.75, 4.29]		
Alcohol Use Status				
Current drinker	Ref			
Former drinker or lifetime abstainer	2.04	[0.86, 4.82]	3.24	[1.17, 9.00]

Note. OR = odds ratio; CI = confidence interval; CAM = complementary and alternative medicine; SPD = serious psychological distress.
[a]Adjusted model goodness-of-fit: $X^2 (1, 6) = 13.61$, $p < .05$.

Figure 1

NSDUH Smoking Prevalence Rates Among Pregnant Women by Year
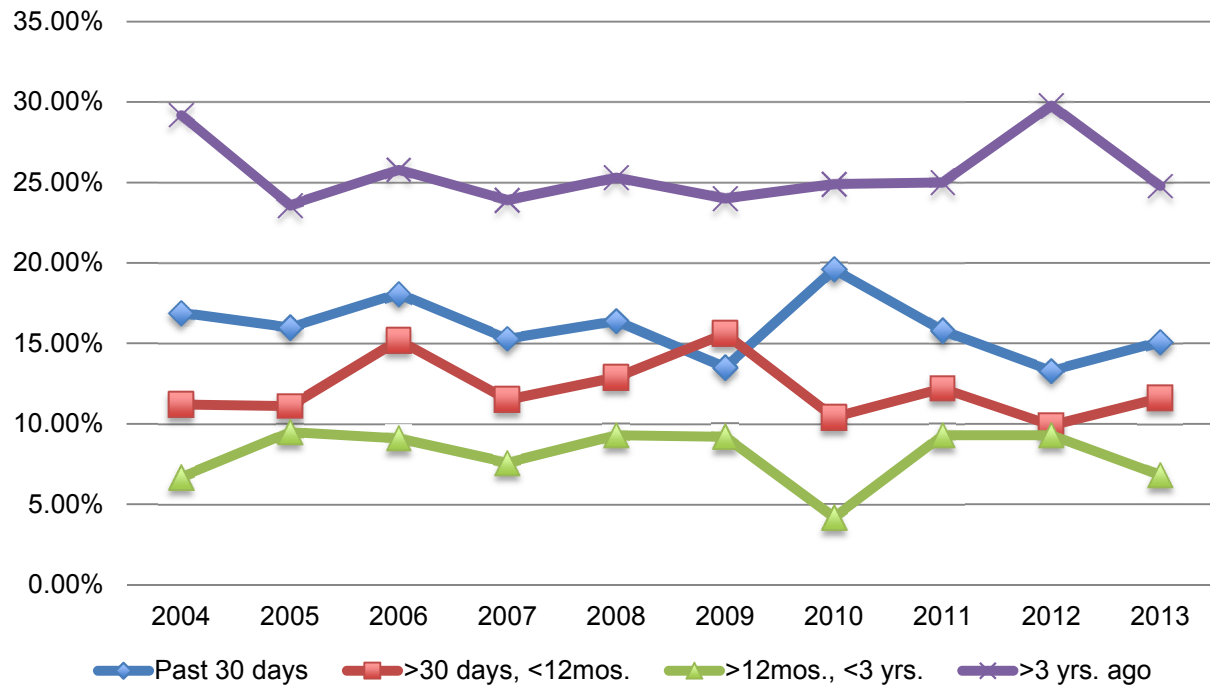
Note: Never-smokers not included.
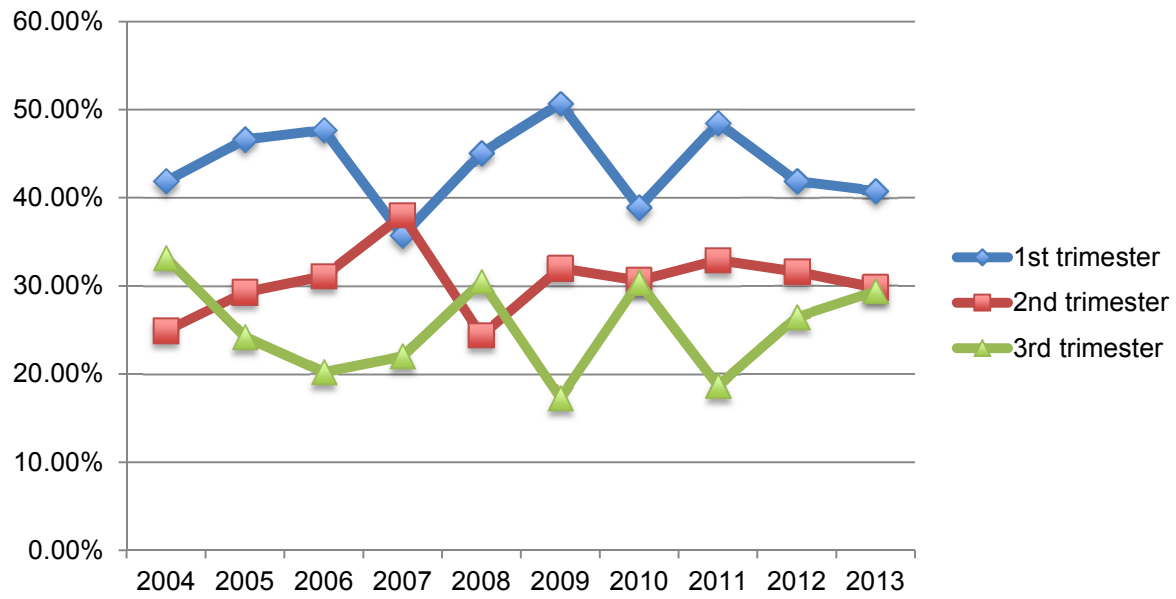
Figure 2

Current Smokers by Trimester Across NSDUH Survey Years
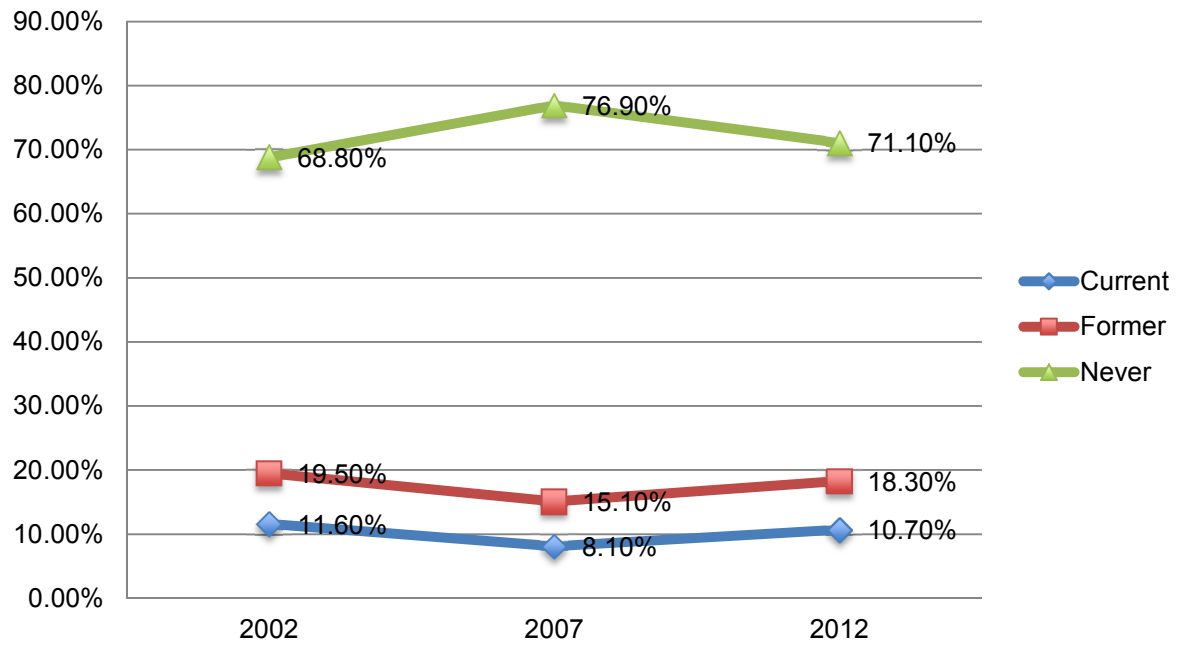
Figure 3

Smoking Prevalence Across NHIS Years

Figure 4

Smoking Frequency Among Pregnant Women Who Were Ever Regular Smokers,
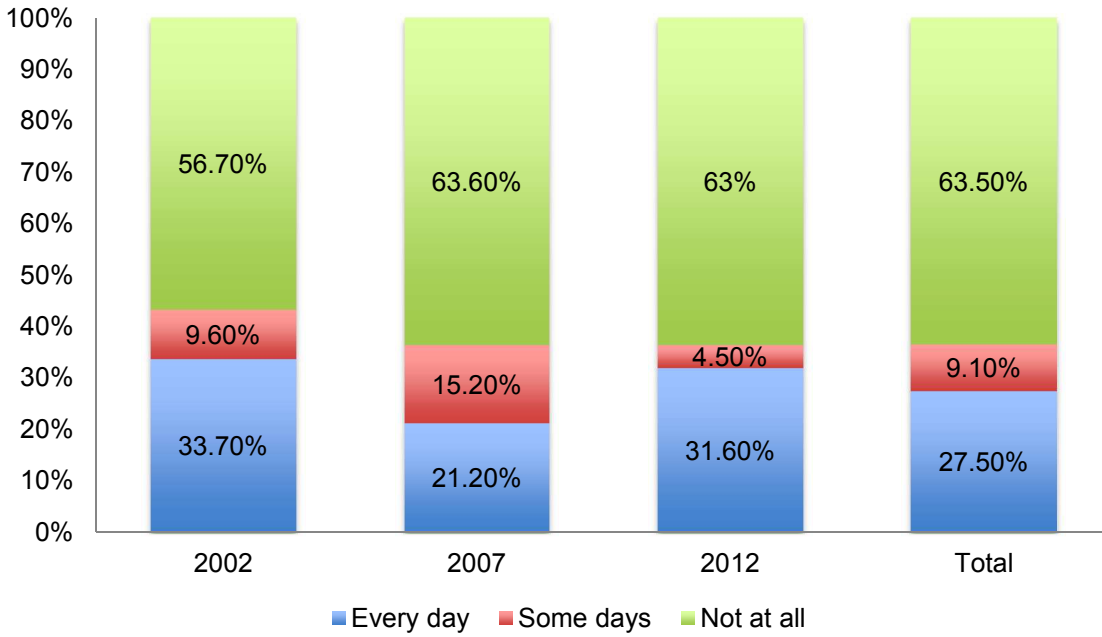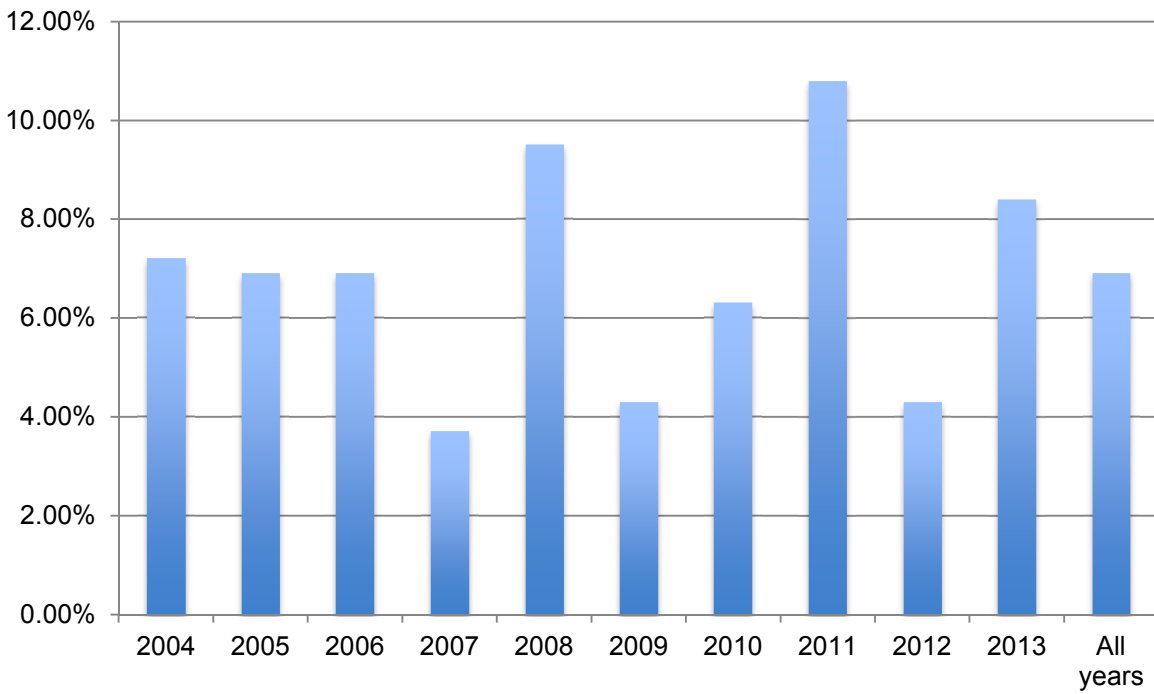
Across NHIS Years

Figure 5

Prevalence Rate of Any CAM Use Across NSDUH Study Years

Figure 6

Prevalence Rate of CAM Modalities Among Alternative Mental Health Treatment Seekers Across NSDUH Study Years
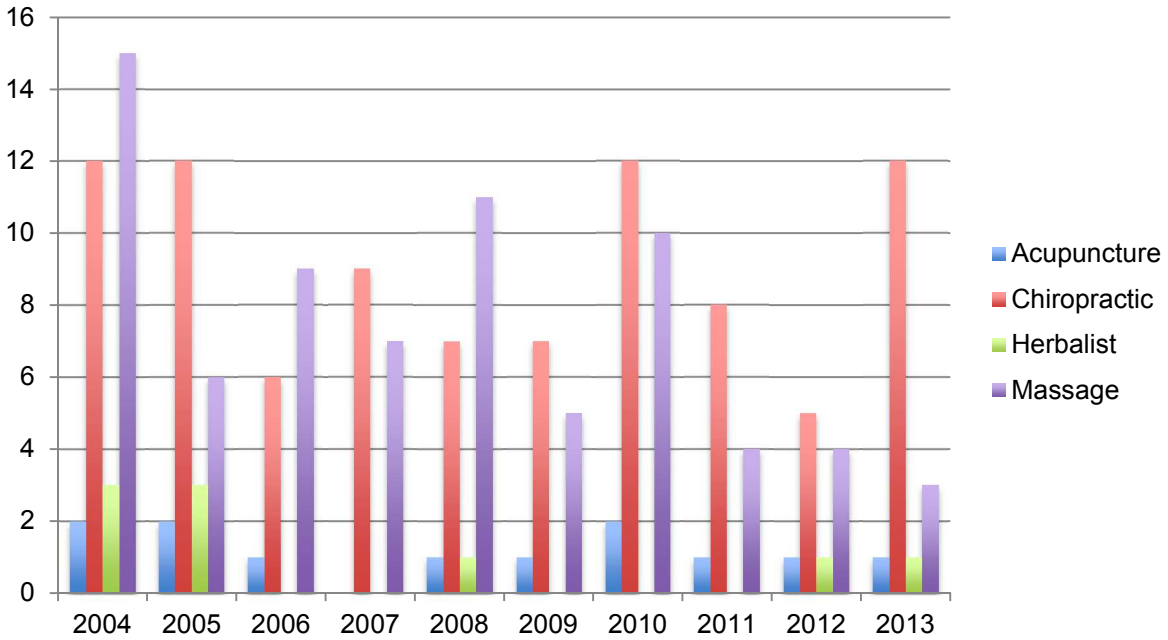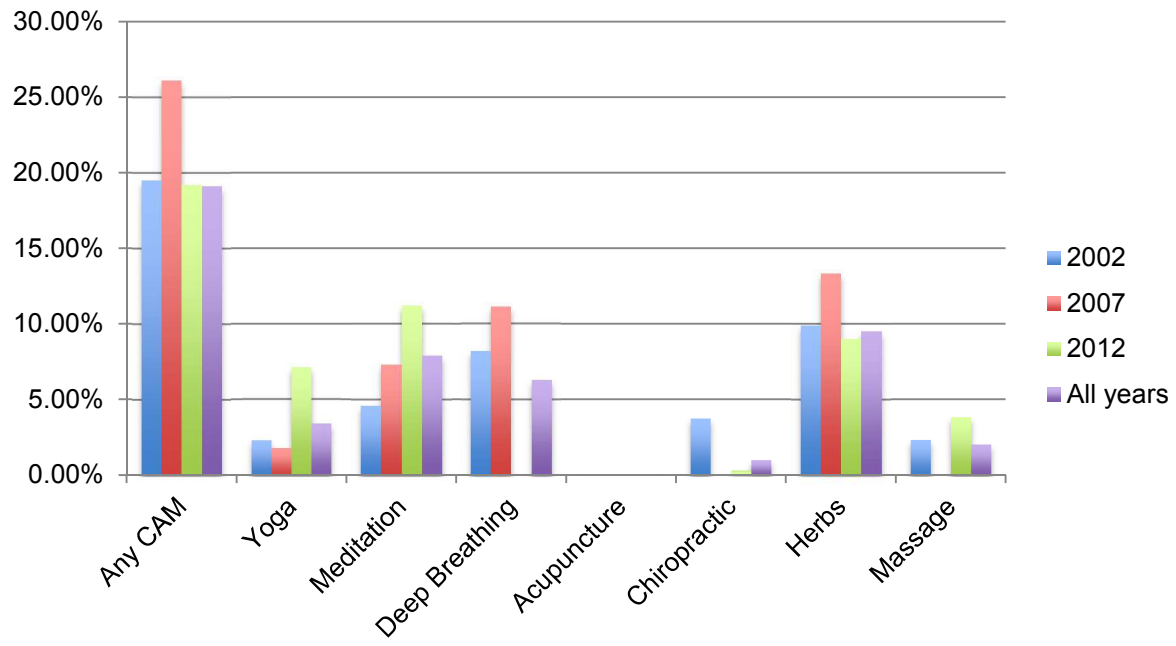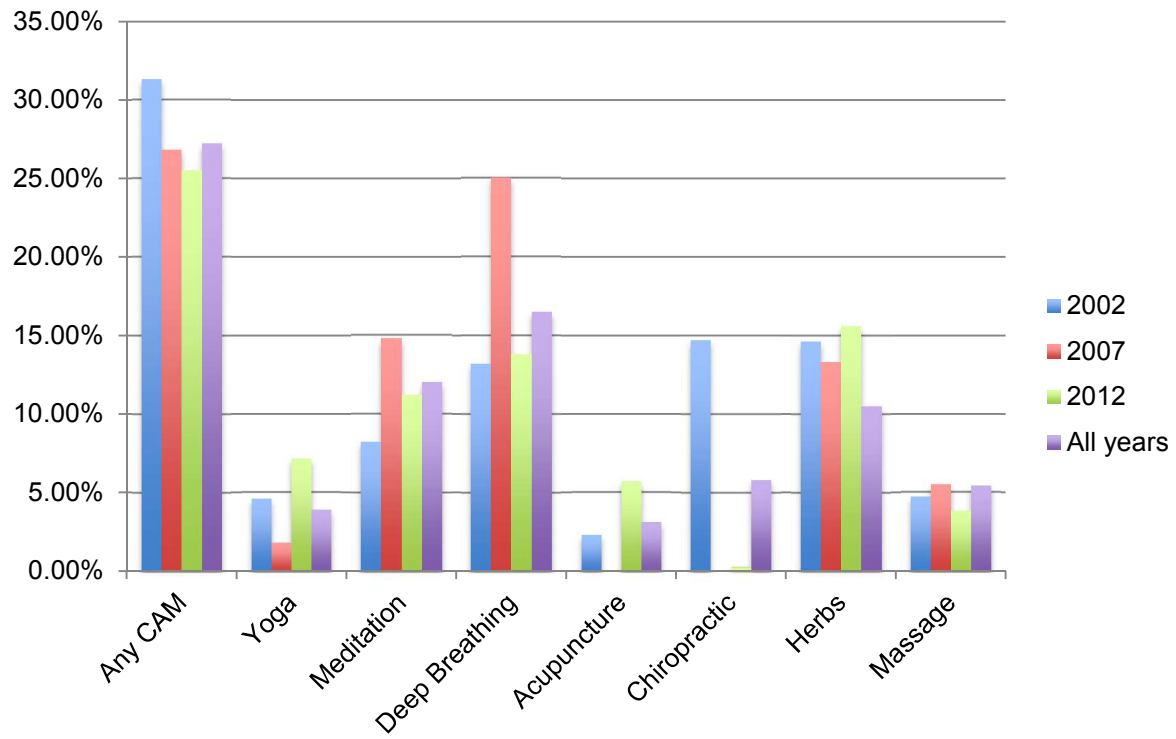
Figure 7

Past Year Prevalence Rate of CAM Use Across NHIS Study Years

Figure 8

Lifetime Prevalence Rate of CAM Use Across NHIS Study Years

APPENDIX A

NSDUH Demographic Items

What is your date of birth? __/__/____

That would make you [CALCAGE] years old. Is this correct?

1 YES

2 NO

Are you of Hispanic, Latino, or Spanish origin or descent?

1 YES

2 NO

Which of these groups describes you?

1 WHITE

2 BLACK OR AFRICAN AMERICAN

3 AMERICAN INDIAN OR ALASKA NATIVE (AMERICAN INDIAN INCLUDES

NORTH AMERICAN,

CENTRAL AMERICAN, AND SOUTH AMERICAN INDIANS)

4 NATIVE HAWAIIAN

5 GUAMANIAN OR CHAMORRO

6 SAMOAN

7 OTHER PACIFIC ISLANDER

8 ASIAN (INCLUDING: ASIAN INDIAN, CHINESE, FILIPINO, JAPANESE,

KOREAN, AND VIETNAMESE)

9 OTHER (SPECIFY)

Are you now married, widowed, divorced or separated, or have you never married?

1 MARRIED

2 WIDOWED

3 DIVORCED OR SEPARATED

4 HAVE NEVER MARRIED

What is the highest grade or year of school you have completed?

0 NEVER ATTENDED SCHOOL

1 1ST GRADE COMPLETED

2 2ND GRADE COMPLETED

3 3RD GRADE COMPLETED

4 4TH GRADE COMPLETED

5 5TH GRADE COMPLETED

6 6TH GRADE COMPLETED

7 7TH GRADE COMPLETED

8 8TH GRADE COMPLETED

9 9TH GRADE COMPLETED

10 10TH GRADE COMPLETED

11 11TH GRADE COMPLETED

12 12TH GRADE COMPLETED

13 COLLEGE OR UNIVERSITY / 1ST YEAR COMPLETED

14 COLLEGE OR UNIVERSITY / 2ND YEAR COMPLETED

15 COLLEGE OR UNIVERSITY / 3RD YEAR COMPLETED

16 COLLEGE OR UNIVERSITY / 4TH YEAR COMPLETED

17 COLLEGE OR UNIVERSITY / 5TH OR HIGHER YEAR COMPLETED

This question is about your overall health. Would you say your health in general is excellent, very good, good, fair, or poor?

 1 EXCELLENT

 2 VERY GOOD

 3 GOOD

 4 FAIR

 5 POOR

Are you currently pregnant?

 1 Yes

 2 No

How many months pregnant are you? _____

Medicaid is a public assistance program that pays for medical care for low income and disabled persons. The Medicaid program in [STATE FILL] is also called [MEDIFILL]. Are you covered by Medicaid?

 1 YES

 2 NO

These next questions are about the kinds and amounts of income that you receive. These questions refer to the calendar year [CURRENT YEAR - 1] rather than to the past 12 months that were referred to in some earlier questions. The calendar year [CURRENT YEAR - 1] would be from January 1st, [CURRENT YEAR - 1], through December 31st, [CURRENT YEAR - 1].

In [CURRENT YEAR - 1], did you receive Social Security or Railroad Retirement payments?

1 YES

2 NO

In [CURRENT YEAR - 1], did you receive income from wages or pay earned while working at a job or business?

1 YES

2 NO

In [CURRENT YEAR - 1], did you receive Supplemental Security Income or SSI?

1 YES

2 NO

In [CURRENT YEAR - 1], did you receive food stamps?

1 YES

2 NO

At any time during [CURRENT YEAR - 1], even for one month, did you receive any cash assistance from a state or county welfare program such as [TANFFILL]?

1 YES

2 NO

In [CURRENT YEAR - 1], because of low income, did you receive any other kind of welfare or public assistance, such as help with getting a job, placement in education or job training programs, or help with transportation, child care, or housing?

1 YES

2 NO

Next, we would like to know about the total family income from all sources during [CURRENT YEAR - 1]. Before taxes and other deductions, was the total combined

family income during [CURRENT YEAR - 1] more or less than 20,000 dollars?

1 $20,000 OR MORE

2 LESS THAN $20,000

Of these income groups, which category best represents your total combined family

income during [CURRENT YEAR – 1] before taxes and other deductions.

1 LESS THAN $1,000 (INCLUDING LOSS)

2 $1,000 - $1,999

3 $2,000 - $2,999

4 $3,000 - $3,999

5 $4,000 - $4,999

6 $5,000 - $5,999

7 $6,000 - $6,999

8 $7,000 - $7,999

9 $8,000 - $8,999

10 $9,000 - $9,999

11 $10,000 - $10,999

12 $11,000 - $11,999

13 $12,000 - $12,999

14 $13,000 - $13,999

15 $14,000 - $14,999

16 $15,000 - $15,999

17 $16,000 - $16,999

18 $17,000 - $17,999

19 $18,000 - $18,999

20 $19,000 - $19,999

The next questions are about working. Did you work at a job or business at any time last week? By last week, I mean the week beginning on Sunday, [STARTDATE] and ending on Saturday, [ENDDATE].

1 YES

2 NO

Even though you did not work at any time last week, did you have a job or business?

1 YES

2 NO

Do you usually work 35 hours or more per week at all jobs or businesses?

1 YES

2 NO

Please look at this card and tell me which one of these reasons best describes why you did not have a job or business last week. Just give me the number.

1 LOOKING FOR WORK

2 ON LAYOFF AND NOT LOOKING FOR WORK

3 KEEPING HOUSE OR CARING FOR CHILDREN FULL TIME

4 GOING TO SCHOOL/TRAINING

5 RETIRED

6 DISABLED FOR WORK

7 DIDN'T WANT A JOB

8 SOME OTHER REASON

Now, think about the past 12 months, from [DATEFILL] through today. Did you work at a job or business at any time during the past 12 months?

    1 YES

    2 NO

APPENDIX B

NSDUH Cigarette Use

Have you ever smoked part or all of a cigarette?

1 Yes

2 No

If one of your best friends offered you a cigarette, would you smoke it?

1 Definitely Yes

2 Probably Yes

3 Probably Not

4 Definitely Not

At any time during the next 12 months do you think you will smoke a cigarette?

1 Definitely Yes

2 Probably Yes

3 Probably Not

4 Definitely Not

How old were you the first time you smoked part or all of a cigarette? _____

Now think about the past 30 days – that is, from [DATEFILL] up to and including today.

During the past 30 days, have you smoked part or all of a cigarette?

1 Yes

2 No

How long has it been since you last smoked part or all of a cigarette?

1 More than 30 days ago but within the past 12 months

2 More than 12 months ago but within the past 3 years

3 More than 3 years ago

During the past 30 days, that is, since [DATEFILL], on how many days did you smoke part or all of a cigarette? # OF DAYS: _____

On the [_____] days you smoked cigarettes during the past 30 days, how many cigarettes did you smoke per day, on average?

1 Less than one cigarette per day

2 1 cigarette per day

3 2 to 5 cigarettes per day

4 6 to 15 cigarettes per day (about ½ pack)

5 16 to 25 cigarettes per day (about 1 pack)

6 26 to 35 cigarettes per day (about 1 ½ packs)

7 More than 35 cigarettes per day (about 2 packs or more)

Has there ever been a period in your life when you smoked cigarettes every day for at least 30 days?

1 Yes

2 No

How old were you when you first started smoking cigarettes every day? AGE: _____

Have you smoked at least 100 cigarettes in your entire life?

1 Yes

2 No

APPENDIX C

Nicotine Dependence Syndrome Scale

(NDSS; Shiffman, Hickcox, Gnys, Paty, & Kessel, 1995)

Think about your use of cigarettes during the past 30 days as you answer these next questions.

1. After not smoking for a while, you need to smoke in order to feel less restless and irritable.

1. Not at all true

2. Somewhat true

3. Moderately true

4. Very true

5. Extremely true

2. When you don't smoke for a few hours, you start to crave cigarettes.

1. Not at all true

2. Somewhat true

3. Moderately true

4. Very true

5. Extremely true

3. You sometimes have strong cravings for a cigarette where it feels like you're in the grip of a force you can't control.

1. Not at all true

2. Somewhat true

3. Moderately true

    4. Very true

    5. Extremely true

4. You feel a sense of control over your smoking — that is, you can "take it or leave it" at any time.

    1. Not at all true

    2. Somewhat true

    3. Moderately true

    4. Very true

    5. Extremely true

5. You tend to avoid places that don't allow smoking, even if you would otherwise enjoy them.

    1. Not at all true

    2. Somewhat true

    3. Moderately true

    4. Very true

    5. Extremely true

6. Do you have any friends who do not smoke cigarettes?

    1. Yes

    2. No

7. There are times when you choose not to be around your friends who don't smoke because they won't like it if you smoke.

    1. Not at all true

    2. Somewhat true

3. Moderately true

4. Very true

5. Extremely true

8. Even if you are traveling a long distance, you would rather not travel by airplane because you would not be allowed to smoke.

1. Not at all true

2. Somewhat true

3. Moderately true

4. Very true

5. Extremely true

9. You sometimes worry that you will run out of cigarettes.

1. Not at all true

2. Somewhat true

3. Moderately true

4. Very true

5. Extremely true

10. You smoke cigarettes fairly regularly throughout the day.

1. Not at all true

2. Somewhat true

3. Moderately true

4. Very true

5. Extremely true

11. You smoke about the same amount on weekends as on weekdays.

1. Not at all true

2. Somewhat true

3. Moderately true

4. Very true

5. Extremely true

12. You smoke just about the same number of cigarettes from day to day□It's hard for you to say how many cigarettes you smoke per day because the number often changes.

1. Not at all true

2. Somewhat true

3. Moderately true

4. Very true

5. Extremely true

13. It's normal for you to smoke several cigarettes in an hour, then not have another one until hours later.

1. Not at all true

2. Somewhat true

3. Moderately true

4. Very true

5. Extremely true

14. The number of cigarettes you smoke per day is often influenced by other things– how you are feeling, or what you are doing for example.

1. Not at all true

2. Somewhat true

    3. Moderately true

    4. Very true

    5. Extremely true

15. Your smoking is not affected much by other things. For example, you smoke about the same amount whether you're relaxing or working, happy or sad, alone or with others.

    1. Not at all true

    2. Somewhat true

    3. Moderately true

    4. Very true

    5. Extremely true

16. Since you started smoking, the amount you smoke has increased.

    1. Not at all true

    2. Somewhat true

    3. Moderately true

    4. Very true

    5. Extremely true

17. Compared to when you first started smoking, you need to smoke a lot more now in order to be satisfied.

    1. Not at all true

    2. Somewhat true

    3. Moderately true

    4. Very true

    5. Extremely true

18. Compared to when you first started smoking, you can smoke much, much more now

before you start to feel anything.

    1. Not at all true

    2. Somewhat true

    3. Moderately true

    4. Very true

    5. Extremely true

APPENDIX D

NSDUH Alcohol and Other Substance Use

ALCOHOL

These questions are about drinks of alcoholic beverages. Throughout these questions, by a "drink," we mean a can or bottle of beer, a glass of wine or a wine cooler, a shot of liquor, or a mixed drink with liquor in it. We are not asking about times when you only had a sip or two from a drink.

Have you ever, even once, had a drink of any type of alcoholic beverage? Please do not include times when you only had a sip or two from a drink.

    1 Yes

    2 No

How long has it been since you last drank an alcoholic beverage?

    1 Within the past 30 days — that is, since [DATEFILL]

    2 More than 30 days ago but within the past 12 months

    3 More than 12 months ago

Now think about the past 12 months, from [DATEFILL] through today. We want to know how many days you've had a drink of an alcoholic beverage during the past 12 months. What would be the easiest way for you to tell us how many days you drank alcoholic beverages?

    1 Average number of days per week during the past 12 months

    2 Average number of days per month during the past 12 months

3 Total number of days during the past 12 months

[IF PREVIOUS ITEM = 3 OR DK/REF] On how many days in the past 12 months did you drink an alcoholic beverage? TOTAL # OF DAYS: _____

[IF PREVIOUS ITEM = 2 OR ALYRAVE = DK/REF] On average, how many days did you drink an alcoholic beverage each month during the past 12 months? AVG # OF DAYS PER MONTH: _____

[IF PREVIOUS ITEM = 1 OR ALMONAVE = DK/REF] On average, how many days did you drink an alcoholic beverage each week during the past 12 months? AVG # OF DAYS PER WEEK: _____

Think specifically about the past 30 days, from [DATEFILL], up to and including today. During the past 30 days, on how many days did you drink one or more drinks of an alcoholic beverage? # OF DAYS: _____

On the [#DAYS] days that you drank during the past 30 days, how many drinks did you usually have each day? Count as a drink a can or bottle of beer; a wine cooler or a glass of wine, champagne, or sherry; a shot of liquor or a mixed drink or cocktail. # OF DRINKS: _____

During the past 30 days, that is, since [DATEFILL], on how many days did you have 5 or more drinks on the same occasion? By 'occasion,' we mean at the same time or within a couple of hours of each other. # OF DAYS: _____

Have you ever had 4 or more drinks on the same occasion?

　　1 Yes

　　2 No

During the past 30 days, that is, since [DATEFILL], on how many days did you have 4 or more drinks on the same occasion? # OF DAYS: _____

MARIJUANA

The next questions are about marijuana and hashish. Marijuana is also called pot or grass. Marijuana is usually smoked, either in cigarettes, called joints, or in a pipe. It is sometimes cooked in food. Hashish is a form of marijuana that is also called "hash." It is usually smoked in a pipe. Another form of hashish is hash oil.

Have you ever, even once, used marijuana or hashish?

     1 Yes

     2 No

How long has it been since you last used marijuana or hashish?

     1 Within the past 30 days — that is, since [DATEFILL]

     2 More than 30 days ago but within the past 12 months

     3 More than 12 months ago

[IF PREVIOUS ITEM = 1 - 2] Now think about the past 12 months, from [DATEFILL] through today. We want to know how many days you've used marijuana or hashish during the past 12 months.

What would be the easiest way for you to tell us how many days you've used it?

     1 Average number of days per week during the past 12 months

     2 Average number of days per month during the past 12 months

     3 Total number of days during the past 12 months

[IF PREVIOUS ITEM = 3 OR DK/REF] On how many days in the past 12 months did you use marijuana or hashish? TOTAL # OF DAYS: _____

[IF PREVIOUS ITEM = 2] On average, how many days did you use marijuana or hashish each month during the past 12 months? AVERAGE # OF DAYS PER MONTH: _____

[IF PREVIOUS ITEM = 1] On average, how many days did you use marijuana or hashish each week during the past 12 months? AVERAGE # OF DAYS PER WEEK: _____

Think specifically about the past 30 days, from [DATEFILL] up to and including today. During the past 30 days, on how many days did you use marijuana or hashish?

NUMBER OF DAYS: _____

COCAINE

These questions are about cocaine, including all the different forms of cocaine such as powder, 'crack,' free base, and coca paste.

Have you ever, even once, used any form of cocaine?

> 1 Yes

> 2 No

How long has it been since you last used any form of cocaine?

> 1 Within the past 30 days -- that is, since [DATEFILL]

> 2 More than 30 days ago but within the past 12 months

> 3 More than 12 months ago

Now think about the past 12 months, from [DATEFILL] through today. We want to know

how many days you've used cocaine during the past 12 months.

What would be the easiest way for you to tell us how many days you've used it?

    1 Average number of days per week during the past 12 months

    2 Average number of days per month during the past 12 months

    3 Total number of days during the past 12 months

[IF PREVIOUS ITEM = 3] On how many days in the past 12 months did you use cocaine? TOTAL # OF DAYS: _____

[IF PREVIOUS ITEM = 2] On average, how many days did you use cocaine each month during the past 12 months? AVERAGE # OF DAYS PER MONTH: _____

[IF PREVIOUS ITEM = 1] On average, how many days did you use cocaine each week during the past 12 months? AVERAGE # OF DAYS PER WEEK: _____

Think specifically about the past 30 days, from [DATEFILL] up to and including today.

During the past 30 days, on how many days did you use cocaine? # OF DAYS: _____

The next questions are about 'crack', that is cocaine in rock or chunk form, and not the other forms of cocaine.

Have you ever, even once, used 'crack'?

    1 Yes

    2 No

How long has it been since you last used 'crack'?

    1 Within the past 30 days -- that is, since [DATEFILL]

    2 More than 30 days ago but within the past 12 months

3 More than 12 months ago

Now think about the past 12 months, from [DATEFILL] through today. We want to know how many days you've used 'crack' during the past 12 months.

What would be the easiest way for you to tell us how many days you've used it?

1 Average number of days per week during the past 12 months

2 Average number of days per month during the past 12 months

3 Total number of days during the past 12 months

[IF PREVIOUS ITEM = 3] On how many days in the past 12 months did you use 'crack'?

TOTAL # OF DAYS: _____

[IF PREVIOUS ITEM = 2] On average, how many days did you use 'crack' each month during the past 12 months? AVERAGE # OF DAYS PER MONTH: _____

[IF PREVIOUS ITEM = 1] On average, how many days did you use 'crack' each week during the past 12 months? AVERAGE # OF DAYS PER WEEK: _____

Think specifically about the past 30 days, from [DATEFILL] up to and including today.

During the past 30 days, on how many days did you use 'crack'? # OF DAYS: _____

HEROIN

These next questions are about heroin.

Have you ever, even once, used heroin?

1 Yes

2 No

How long has it been since you last used heroin?

1 Within the past 30 days -- that is, since [DATEFILL]

2 More than 30 days ago but within the past 12 months

3 More than 12 months ago

Now think about the past 12 months, from [DATEFILL] through today. We want to know how many days you've used heroin during the past 12 months.

What would be the easiest way for you to tell us how many days you've used it?

1 Average number of days per week during the past 12 months

2 Average number of days per month during the past 12 months

3 Total number of days during the past 12 months

[IF PREVIOUS ITEM = 3] On how many days in the past 12 months did you use heroin?

TOTAL # OF DAYS: _____

[IF PREVIOUS ITEM = 2] On average, how many days did you use heroin each month during the past 12 months? AVERAGE # OF DAYS PER MONTH: _____

[IF PREVIOUS ITEM = 1] On average, how many days did you use heroin each week during the past 12 months? AVERAGE # OF DAYS PER WEEK: _____

Think specifically about the past 30 days, from [DATEFILL] up to and including today. During the past 30 days, on how many days did you use heroin? # OF DAYS: _____

HALLUCINOGENS

The next questions are about substances called hallucinogens. These drugs often cause people to see or experience things that are not real. A list of some common hallucinogens is shown below. These and many other substances that people use as hallucinogens are often known by street names, and we can't list them all. Please take a moment to look at the substances listed below so you know what kind of drugs the next

questions are about.

LSD, also called 'acid'

PCP, also called 'angel dust' or phencyclidine

Peyote

Mescaline

Psilocybin

'Ecstasy', also called MDMA

Have you ever, even once, used LSD, also called "acid"?

1 Yes

2 No

Have you ever, even once, used PCP, also called 'angel dust' or phencyclidine?

1 Yes

2 No

Have you ever, even once, used peyote?

1 Yes

2 No

Have you ever, even once, used mescaline?

1 Yes

2 No

Have you ever, even once, used psilocybin, found in mushrooms?

1 Yes

2 No

Have you ever, even once, used 'Ecstasy', also known as MDMA?

1 Yes

2 No

How long has it been since you last used [LSFILL]?

1 Within the past 30 days -- that is, since [DATEFILL]

2 More than 30 days ago but within the past 12 months

3 More than 12 months ago

Now think about the past 12 months, from [DATEFILL] through today. We want to know how many days you've used [LSFILL] during the past 12 months.

What would be the easiest way for you to tell us how many days you've used it?

1 Average number of days per week during the past 12 months

2 Average number of days per month during the past 12 months

3 Total number of days during the past 12 months

[IF PREVIOUS ITEM = 3] On how many days in the past 12 months did you use [LSFILL]? TOTAL # OF DAYS: _____

[IF PREVIOUS ITEM = 2] On average, how many days did you use [LSFILL] each month during the past 12 months? AVERAGE # OF DAYS PER MONTH: _____

[IF PREVIOUS ITEM = 1] On average, how many days did you use [LSFILL] each week during the past 12 months? AVERAGE # OF DAYS PER WEEK: _____

Think specifically about the past 30 days, from [DATEFILL] up to and including today.

During the past 30 days, on how many days did you use [LSFILL]? NUMBER OF

DAYS: _____

INHALANTS

These next questions are about liquids, sprays, and gases that people sniff or inhale to get high or to make them feel good. We are not interested in times when you inhaled a substance accidentally — such as when painting, cleaning an oven, or filling a car with gasoline. The questions use the word 'inhalant' to include all the things listed below, as well as any other substances that people sniff or inhale for kicks or to get high. Take a moment to look at the substances listed below so you know what kinds of liquids, sprays, and gases these questions are about.

Amyl nitrite, 'poppers,' locker room odorizers, or 'rush'

Correction fluid, degreaser, or cleaning fluid

Gasoline or lighter fluid

Glue, shoe polish, or toluene

Halothane, ether, or other anesthetics

Lacquer thinner, or other paint solvents

Lighter gases, such as butane or propane

Nitrous oxide or 'whippits'

Spray paints

Other aerosol sprays

Have you ever, even once, inhaled amyl nitrite, 'poppers,' locker room odorizers, or 'rush' for kicks or to get high?

1 Yes

2 No

Have you ever, even once, inhaled correction fluid, degreaser, or cleaning fluid for kicks or to get high?

1 Yes

2 No

Have you ever, even once, inhaled gasoline or lighter fluid for kicks or to get high?

1 Yes

2 No

Have you ever, even once, inhaled glue, shoe polish, or toluene for kicks or to get high?

1 Yes

2 No

Have you ever, even once, inhaled halothane, ether, or other anesthetics for kicks or to get high?

1 Yes

2 No

Have you ever, even once, inhaled lacquer thinner or other paint solvents for kicks or to get high?

1 Yes

2 No

Have you ever, even once, inhaled lighter gases, such as butane or propane for kicks or to get high?

1 Yes

2 No

Have you ever, even once, inhaled nitrous oxide or 'whippits' for kicks or to get high?

1 Yes

2 No

Have you ever, even once, inhaled spray paints for kicks or to get high?

    1 Yes

    2 No

Have you ever, even once, inhaled some other aerosol spray for kicks or to get high?

    1 Yes

    2 No

How long has it been since you last used any inhalant for kicks or to get high?

    1 Within the past 30 days – that is, since [DATEFILL]

    2 More than 30 days ago but with the past 12 months

    3 More than 12 months ago

Now think about the past 12 months, from [DATEFILL] through today. We want to know how many days you've used an inhalant of any kind for kicks or to get high during the past 12 months.

What would be the easiest way for you to tell us how many days you've done this?

    1 Average number of days per week during the past 12 months

    2 Average number of days per month during the past 12 months

    3 Total number of days during the past 12 months

[IF PREVIOUS ITEM = 3] On how many days in the past 12 months did you use an inhalant of any kind for kicks or to get high? TOTAL # OF DAYS: _____

[IF PREVIOUS ITEM = 2] On average, how many days did you use an inhalant of any kind for kicks or to get high each month during the past 12 months?

AVERAGE # OF DAYS PER MONTH: _____

[IF PREVIOUS ITEM = 1] On average, how many days did you use an inhalant of any

kind for kicks or to get high each week during the past 12 months? AVERAGE # OF DAYS PER WEEK: _____

Think specifically about the past 30 days, from [DATEFILL] up to and including today. During the past 30 days, on how many days did you use any inhalant for kicks or to get high? NUMBER OF DAYS: _____

PAIN RELIEVERS

These questions are about the use of pain relievers. We are not interested in your use of "over-the-counter" pain relievers such as aspirin, Tylenol, or Advil that can be bought in drug stores or grocery stores without a doctor's prescription. Card A shows pictures of some different kinds of prescription pain relievers and lists the names of some others. These pictures show only pills, but we are interested in your use of any form of prescription pain relievers that were not prescribed for you or that you took only for the experience or feeling they caused.

Have you ever, even once, used any of these pain relievers when they were not prescribed for you or that you took only for the experience or feeling they caused?

   1 Yes

   2 No

How long has it been since you last used any prescription pain reliever that was not prescribed for you or that you took only for the experience or feeling it caused?

   1 Within the past 30 days — that is, since [DATEFILL]

   2 More than 30 days ago but within the past 12 months

   3 More than 12 months ago

Now think about the past 12 months, from [DATEFILL] through today. We want to know how many days you've used any prescription pain reliever that was not prescribed for you or that you took only for the experience or feeling it caused during the past 12 months.

What would be the easiest way for you to tell us how many days you used a prescription pain reliever in either of these ways?

1 Average number of days per week during the past 12 months

2 Average number of days per month during the past 12 months

3 Total number of days during the past 12 months

[IF PREVIOUS ITEM = 3] On how many days in the past 12 months did you use any prescription pain reliever that was not prescribed for you or that you took only for the experience or feeling it caused? TOTAL # OF DAYS: _____

[IF PREVIOUS ITEM = 2] On average, how many days each month during the past 12 months did you use any prescription pain reliever that was not prescribed for you or that you took only for the experience or feeling it caused? AVG # OF DAYS PER MONTH: _____

[IF PREVIOUS ITEM = 1] On average, how many days each week during the past 12 months did you use any prescription pain reliever that was not prescribed for you or that you took only for the experience or feeling it caused? AVG # OF DAYS PER WEEK: _____

TRANQUILIZERS

These next questions ask about the use of tranquilizers. Tranquilizers are usually

prescribed to relax people, to calm people down, to relieve anxiety, or to relax muscle spasms. Some people call tranquilizers 'nerve pills.' Card B shows pictures of some different kinds of prescription tranquilizers. These pictures show only pills, but we are interested in your use of any form of prescription tranquilizers that were not prescribed for you or that you took only for the experience or feeling they caused.

Have you ever, even once, used any of these tranquilizers when they were not prescribed for you or that you took only for the experience or feeling they caused?

    1 Yes

    2 No

How long has it been since you last used any prescription tranquilizer that was not prescribed for you or that you took only for the experience or feeling it caused?

    1 Within the past 30 days — that is, since [DATEFILL]

    2 More than 30 days ago but within the past 12 months

    3 More than 12 months ago

Now think about the past 12 months, from [DATEFILL] through today. We want to know how many days you've used any prescription tranquilizer that was not prescribed for you or that you took only for the experience or feeling it caused during the past 12 months.

What would be the easiest way for you to tell us how many days you used a prescription tranquilizer in either of these ways?

    1 Average number of days per week during the past 12 months

    2 Average number of days per month during the past 12 months

    3 Total number of days during the past 12 months

[IF PREVIOUS ITEM = 3] On how many days in the past 12 months did you use any prescription tranquilizer that was not prescribed for you or that you took only for the experience or feeling it caused? TOTAL # OF DAYS: _____

[IF PREVIOUS ITEM = 2] On average, how many days each month during the past 12 months did you use any prescription tranquilizer that was not prescribed for you or that you took only for the experience or feeling it caused? AVG # OF DAYS PER MONTH: _____

[IF PREVIOUS ITEM = 1] On average, how many days each week during the past 12 months did you use any prescription tranquilizer that was not prescribed for you or that you took only for the experience or feeling it caused? AVG # OF DAYS PER WEEK: _____

STIMULANTS

These next questions ask about the use of drugs such as amphetamines that are known as stimulants, 'uppers,' or 'speed.' People sometimes take these drugs to lose weight, to stay awake, or for attention deficit disorders. We are not interested in the use of "over-the-counter" stimulants such as Dexatrim or No-Doz that can be bought in drug stores or grocery stores without a doctor's prescription. Card C shows pictures of some different kinds of prescription stimulants and lists the names of some others. These pictures show only pills, but we are interested in your use of any form of prescription stimulants that were not prescribed for you or that you took only for the experience or feeling they caused.

Have you ever, even once, used any of these stimulants when they were not prescribed

for you or that you took only for the experience or feeling they caused?

1 Yes

2 No

How long has it been since you last used any prescription stimulant that was not prescribed for you or that you took only for the experience or feeling it caused?

1 Within the past 30 days — that is, since [DATEFILL]

2 More than 30 days ago but within the past 12 months

3 More than 12 months ago

Now think about the past 12 months, from [DATEFILL] through today. We want to know how many days you've used any prescription stimulant that was not prescribed for you or that you took only for the experience or feeling it caused during the past 12 months. What would be the easiest way for you to tell us how many days you used a prescription stimulant in either of these ways?

1 Average number of days per week during the past 12 months

2 Average number of days per month during the past 12 months

3 Total number of days during the past 12 months

[IF PREVIOUS ITEM = 3] On how many days in the past 12 months did you use any prescription stimulant that was not prescribed for you or that you took only for the experience or feeling it caused? TOTAL # OF DAYS: _____

[IF PREVIOUS ITEM = 2] On average, how many days each month during the past 12 months did you use any prescription stimulant that was not prescribed for you or that you took only for the experience or feeling it caused? AVG # OF DAYS PER MONTH: _____

[IF PREVIOUS ITEM = 1] On average, how many days each week during the past 12 months did you use any prescription stimulant that was not prescribed for you or that you took only for the experience or feeling it caused? AVG # OF DAYS PER WEEK: _____

SEDATIVES

These next questions ask about the use of sedatives or barbiturates. These drugs are also called "downers" or "sleeping pills." People take these drugs to help them relax or to help them sleep. We are not interested in the use of "over-the-counter" sedatives such as Sominex, Unisom, Nytol, or Benadryl that can be bought in drug stores or grocery stores without a doctor's prescription. Card D shows pictures of some different kinds of prescription sedatives and lists the names of some others. These pictures show only pills, but we are interested in your use of any prescription sedatives that were not prescribed for you, or that you took only for the experience or feeling they caused.

Have you ever, even once, used any of these sedatives when they were not prescribed for you or that you took only for the experience or feeling they caused?

    1 Yes

    2 No

How long has it been since you last used any prescription sedative that was not prescribed for you or that you took only for the experience or feeling it caused?

    1 Within the past 30 days — that is, since [DATEFILL]

    2 More than 30 days ago but within the past 12 months

3 More than 12 months ago

Now think about the past 12 months, from [DATEFILL] through today. We want to know how many days you've used any prescription sedative that was not prescribed for you or that you took only for the experience or feeling it caused during the past 12 months. What would be the easiest way for you to tell us how many days you used a prescription sedative in either of these ways?

1 Average number of days per week during the past 12 months

2 Average number of days per month during the past 12 months

3 Total number of days during the past 12 months

[IF PREVIOUS ITEM = 3] On how many days in the past 12 months did you use any prescription sedative that was not prescribed for you or that you took only for the experience or feeling it caused? TOTAL # OF DAYS: _____

[IF PREVIOUS ITEM = 2] On average, how many days each month during the past 12 months did you use any prescription sedative that was not prescribed for you or that you took only for the experience or feeling it caused? AVG # OF DAYS PER MONTH: _____

[IF PREVIOUS ITEM = 1] On average, how many days each week during the past 12 months did you use any prescription sedative that was not prescribed for you or that you took only for the experience or feeling it caused? AVG # OF DAYS PER WEEK: _____

APPENDIX E

NSDUH Risk Section

How often do you get a real kick out of doing things that are a little dangerous?

1 Never

2 Seldom

3 Sometimes

4 Always

How often do you like to test yourself by doing something a little risky?

1 Never

2 Seldom

3 Sometimes

4 Always

How often do you wear a seatbelt when you ride in the front passenger seat of a car?

1 Never

2 Seldom

3 Sometimes

4 Always

How often do you wear a seatbelt when you drive a car?

1 Never

2 Seldom

3 Sometimes

4 Always

5 I don't drive

APPENDIX F

NSDUH Substance Dependence and Abuse

Think about your use of alcohol during the past 12 months as you answer these next questions. During the past 12 months, was there a month or more when you spent a lot of your time getting or drinking alcohol?

　　1 Yes

　　2 No

During the past 12 months, was there a month or more when you spent a lot of time getting over the effects of the alcohol you drank?

　　1 Yes

　　2 No

During the past 12 months, did you try to set limits on how often or how much alcohol you would drink?

　　1 Yes

　　2 No

Were you able to keep to the limits you set, or did you often drink more than you intended to?

　　1 Usually kept to the limits set

　　2 Often drank more than intended

During the past 12 months, did you need to drink more alcohol than you used to in order to get the effect you wanted?

　　1 Yes

　　2 No

During the past 12 months, did you notice that drinking the same amount of alcohol had less effect on you than it used to?

    1 Yes

    2 No

During the past 12 months, did you want to or try to cut down or stop drinking alcohol?

1 Yes

2 No

[IF PREVIOUS ITEM = 1] During the past 12 months, were you able to cut down or stop drinking alcohol every time you wanted to or tried to?

    1 Yes

    2 No

[IF EITHER OF THE PREVIOUS TWO ITEMS = 2] During the past 12 months, did you cut down or stop drinking at least one time?

    1 Yes

    2 No

Please look at the symptoms listed below. During the past 12 months, did you have 2 or more of these symptoms after you cut back or stopped drinking alcohol?

        • Sweating or feeling that your heart was beating fast

        • Having your hands tremble

        • Having trouble sleeping

        • Vomiting or feeling nauseous

        • Seeing, hearing, or feeling things that weren't really there

        • Feeling like you couldn't sit still

• Feeling anxious

• Having seizures or fits

1 Yes

2 No

Please look at the symptoms listed below. During the past 12 months, did you have 2 or more of these symptoms at the same time that lasted for longer than a day after you cut back or stopped drinking alcohol?

• Sweating or feeling that your heart was beating fast

• Having your hands tremble

• Having trouble sleeping

• Vomiting or feeling nauseous

• Seeing, hearing, or feeling things that weren't really there

• Feeling like you couldn't sit still

• Feeling anxious

• Having seizures or fits

1 Yes

2 No

During the past 12 months, did you have any problems with your emotions, nerves, or mental health that were probably caused or made worse by drinking alcohol?

1 Yes

2 No

[IF PREVIOUS ITEM = 1] Did you continue to drink alcohol even though you thought drinking was causing you to have problems with your emotions, nerves, or mental

health?

      1 Yes

      2 No

[IF EITHER OF THE PREVIOUS TWO ITEMS= 2] During the past 12 months, did you have any physical health problems that were probably caused or made worse by drinking alcohol?

      1 Yes

      2 No

[IF PREVIOUS ITEM = 1] Did you continue to drink alcohol even though you thought drinking was causing you to have physical problems?

      1 Yes

      2 No

This question is about important activities such as working, going to school, taking care of children, doing fun things such as hobbies and sports, and spending time with friends and family. During the past 12 months, did drinking alcohol cause you to give up or spend less time doing these types of important activities?

      1 Yes

      2 No

Sometimes people who drink alcohol have serious problems at home, work or school — such as:

          • neglecting their children

          • missing work or school

          • doing a poor job at work or school

• losing a job or dropping out of school

During the past 12 months, did drinking alcohol cause you to have serious problems like this either at home, work, or school?

1 Yes

2 No

During the past 12 months, did you regularly drink alcohol and then do something where being drunk might have put you in physical danger?

1 Yes

2 No

During the past 12 months, did drinking alcohol cause you to do things that repeatedly got you in trouble with the law?

1 Yes

2 No

During the past 12 months, did you have any problems with family or friends that were probably caused by your drinking?

1 Yes

2 No

[IF PREVIOUS ITEM = 1] Did you continue to drink alcohol even though you thought your drinking caused problems with family or friends?

1 Yes

2 No

For each of the drugs of abuse below that respondents endorsed using in the past 12 months, respondents are asked the following:

- Marijuana or hashish

- Cocaine or crack

- Heroin

- Hallucinogens

- Inhalants

- Prescription pain relievers

- Prescription tranquilizers

- Prescription stimulants

- Prescription sedatives

Think about your use of _____ during the past 12 months as you answer these next questions. During the past 12 months, was there a month or more when you spent a lot of your time getting or using _____?

1 Yes

2 No

[IF PREVIOUS ITEM = 2] During the past 12 months, was there a month or more when you spent a lot of your time getting over the effects of the _____ you used?

1 Yes

2 No

During the past 12 months, did you try to set limits on how often or how much _____ you would use?

1 Yes

2 No

[IF PREVIOUS ITEM = 1] Were you able to keep to the limits you set, or did you often use _____ more than you intended to?

1 Usually kept to the limits set

2 Often used more than intended

During the past 12 months, did you need to use more _____ than you used to in order to get the effect you wanted?

1 Yes

2 No

[IF PREVIOUS ITEM =2] During the past 12 months, did you notice that using the same amount of _____ had less effect on you than it used to?

1 Yes

2 No

During the past 12 months, did you want to or try to cut down or stop using _____?

1 Yes

2 No

[IF PREVIOUS ITEM = 1] During the past 12 months, were you able to cut down or stop using _____ every time you wanted to or tried to?

1 Yes

2 No

During the past 12 months, did you have any problems with your emotions, nerves, or mental health that were probably caused or made worse by your use of _____?

1 Yes

2 No

[IF PREVIOUS ITEM = 1] Did you continue to use _____ even though you thought it was causing you to have problems with your emotions, nerves, or mental health?

1 Yes

2 No

[IF EITHER OF THE PREVIOUS 2 ITEMS = 2] During the past 12 months, did you have any physical health problems that were probably caused or made worse by your use of _____?

1 Yes

2 No

[IF PREVIOUS ITEM = 1] Did you continue to use _____ even though you thought it was causing you to have physical problems?

1 Yes

2 No

This question is about important activities such as working, going to school, taking care of children, doing fun things such as hobbies and sports, and spending time with friends and family. During the past 12 months, did using _____ cause you to give up or spend less time doing these types of important activities?

1 Yes

2 No

Sometimes people who use _____ have serious problems at home, work or school — such as:

 • neglecting their children

> • missing work or school

> • doing a poor job at work or school

> • losing a job or dropping out of school

During the past 12 months, did using _____ cause you to have serious problems like this either at home, work, or school?

> 1 Yes

> 2 No

During the past 12 months, did you regularly use _____ and then do something where using marijuana or hashish might have put you in physical danger?

> 1 Yes

> 2 No

During the past 12 months, did using _____ cause you to do things that repeatedly got you in trouble with the law?

> 1 Yes

> 2 No

During the past 12 months, did you have any problems with family or friends that were probably caused by your use of _____?

> 1 Yes

> 2 No

Did you continue to use _____ even though you thought it caused problems with family or friends?

> 1 Yes

> 2 No

APPENDIX G

NSDUH Special Topics

The next questions are about encounters with the police or the court system.

Not counting minor traffic violations, have you ever been arrested and booked for breaking the law? Being 'booked' means that you were taken into custody and processed by the police or by someone connected with the courts, even if you were then released.

    1 Yes

    2 No

Not counting minor traffic violations, how many times during the past 12 months have you been arrested and booked for breaking a law? _____

In the past 12 months, were you arrested and booked for driving under the influence of alcohol or drugs?

    1 Yes

    2 No

Were you on probation at any time during the past 12 months?

    1 Yes

    2 No

Were you on parole, supervised release, or other conditional release from prison at any time during the past 12 months?

    1 Yes

2 No

During the past 12 months, have you driven a vehicle while you were under the influence of a combination of alcohol and illegal drugs used together?

1 Yes

2 No

During the past 12 months, have you driven a vehicle while you were under the influence of alcohol?

1 Yes

2 No

During the past 12 months, have you driven a vehicle while you were under the influence of illegal drugs?

1 Yes

2 No

APPENDIX H

K6 (Furukawa, Kessler, Slade, & Andrews, 2003; Kessler et al., 2003)

During the past 30 days, about how often did you feel nervous?

　　1 All of the time

　　2 Most of the time

　　3 Some of the time

　　4 A little of the time

　　5 None of the time

During the past 30 days, about how often did you feel hopeless?

　　1 All of the time

　　2 Most of the time

　　3 Some of the time

　　4 A little of the time

　　5 None of the time

During the past 30 days, about how often did you feel restless or fidgety?

　　1 All of the time

　　2 Most of the time

　　3 Some of the time

　　4 A little of the time

　　5 None of the time

During the past 30 days, about how often did you feel so sad or depressed that nothing

could cheer you up?

　　1 All of the time

2 Most of the time

3 Some of the time

4 A little of the time

5 None of the time

During the past 30 days, about how often did you feel that everything was an effort?

1 All of the time

2 Most of the time

3 Some of the time

4 A little of the time

5 None of the time

During the past 30 days, about how often did you feel down on yourself, no good or

worthless?

1 All of the time

2 Most of the time

3 Some of the time

4 A little of the time

5 None of the time

The last questions asked about how you have been feeling during the past 30 days.

Now think about the past 12 months. Was there a month in the past 12 months when

you felt more depressed, anxious, or emotionally stressed than you felt in the past 30

days?

1 Yes

2 No

[IF YES TO PREVIOUS ITEM] Think of one month in the past 12 months when you were the most depressed, anxious, or emotionally stressed. During that month, how often did you feel nervous?

    1 All of the time

    2 Most of the time

    3 Some of the time

    4 A little of the time

    5 None of the time

During that same month when you were at your worst emotionally, how often did you feel hopeless?

    1 All of the time

    2 Most of the time

    3 Some of the time

    4 A little of the time

    5 None of the time

During that same month when you were at your worst emotionally, how often did you feel restless or fidgety?

    1 All of the time

    2 Most of the time

    3 Some of the time

    4 A little of the time

    5 None of the time

During that same month when you were at your worst emotionally, how often did you

feel so sad or depressed that nothing could cheer you up?

    1 All of the time

    2 Most of the time

    3 Some of the time

    4 A little of the time

    5 None of the time

During that same month when you were at your worst emotionally, how often did you feel that everything was an effort?

    1 All of the time

    2 Most of the time

    3 Some of the time

    4 A little of the time

    5 None of the time

During that same month when you were at your worst emotionally, how often did you feel down on yourself, no good, or worthless?

    1 All of the time

    2 Most of the time

    3 Some of the time

    4 A little of the time

    5 None of the time

APPENDIX I

NSDUH Anxiety and Depression

Which, if any, of these conditions did a doctor or other medical professional tell you that you had in the past 12 months?

1 Anxiety disorder

2 Asthma

3 Bronchitis

4 Cirrhosis of the liver

5 Depression

6 Diabetes

7 Heart disease

8 Hepatitis

9 High blood pressure

10 HIV/AIDS

11 Lung cancer

12 Pancreatitis

13 Pneumonia

14 Sexually transmitted disease, such as chlamydia, gonorrhea, herpes or syphilis

15 Sinusitis

16 Sleep apnea

17 Stroke

18 Tinnitus

19 Tuberculosis

20 Ulcer or ulcers

95 None of the above - I have not had any of these conditions in the past 12 months

ADULT DEPRESSION

[Questions administered only to respondents 18 years of age and older]

ASC21 Have you ever in your life had a period of time lasting several days or longer when most of the day you felt sad, empty or depressed?

    1 Yes

    2 No

ASC22 [IF ASC21 = 2] Have you ever had a period of time lasting several days or longer when most of the day you were very discouraged about how things were going in your life?

    1 Yes

    2 No

ASC23 [IF ASC22 = 2] Have you ever had a period of time lasting several days or longer when you lost interest in most things you usually enjoy like work, hobbies, and personal relationships?

    1 Yes

    2 No

AD01 [IF ASC21 =1] During times when you felt sad, empty, or depressed most of the day, did you ever feel discouraged about how things were going in your life?

1 Yes

2 No

AD01a [IF AD01 = 1] During the times when you felt sad, empty, or depressed, did you ever lose interest in most things like work, hobbies, and other things you usually enjoy?

1 Yes

2 No

AD01b [IF AD01 = 2] During the times when you felt sad, empty, or depressed, did you ever lose interest in most things like work, hobbies, and other things you usually enjoy?

1 Yes

2 No

AD02 [IF ASC22 = 1] During times when you felt discouraged about how things were going in your life, did you ever lose interest in most things like work, hobbies, and other things you usually enjoy?

1 Yes

2 No

AD09 [IF ASC23= 1] Did you ever have a period of time like this that lasted most of the day nearly every day for two weeks or longer?

1 Yes

2 No

DEFINE FEELFILL:

IF (AD01a = 1), THEN FEELFILL = "were sad, discouraged, or lost interest in most things"

IF (AD01a = 2), THEN FEELFILL = "were sad or discouraged"

IF (AD01b = 1), THEN FEELFILL = "were sad or lost interest in most things"

IF (AD02 = 1), THEN FEELFILL = "were discouraged or lost interest in most things"

IF (AD02 = 2 OR DK/REF), THEN FEELFILL = "were discouraged about the way things were going in your life"

IF (AD09 = 1), THEN FEELFILL = "lost interest in most things"

ELSE, FEELFILL = BLANK

DEFINE FEELNOUN:

IF (AD01a = 1), THEN FEELNOUN = "sadness, discouragement, or lack of interest"

IF (AD01a = 2 OR DK/REF), THEN FEELNOUN = "sadness or discouragement"

IF (AD01b = 1), THEN FEELNOUN = "sadness or lack of interest"

IF (AD01b = 2 OR DK/REF), THEN FEELNOUN = "sadness"

IF (AD02 = 1), THEN FEELNOUN = "discouragement or lack of interest"

IF (AD02 = 2 OR DK/REF), THEN FEELNOUN = "discouragement"

IF (AD09 = 1), THEN FEELNOUN = "lack of interest in most things"

ELSE FEELNOUN = BLANK

DEFINE NUMPROBS

IF AD01a NE BLANK OR AD01b = 1 OR AD02 = 1, THEN NUMPROBS = "these problems"

IF AD01b = (2 OR DK/REF) OR AD02 = (2 OR DK/REF) OR AD09 = 1, THEN NUMPROBS = "this problem"

ELSE NUMPROBS = BLANK

DEFINE WASWERE:

IF AD01a NE BLANK OR AD01b = 1 OR AD02 = 1, THEN WASWERE = "were"

IF AD01b = (2 OR DK/REF) OR AD02 = (2 OR DK/REF) OR AD09 = 1, THEN

WASWERE = "was"

ELSE WASWERE = BLANK

AD12 [IF AD01a NE BLANK OR AD01b NE BLANK OR AD02 NE BLANK] Think about

the times when you [FEELFILL]. Did you ever have a period of time like this that lasted

most of the day, nearly every day, for two weeks or longer?

> 1 Yes
>
> 2 No

AD16 [IF AD09 = 1 OR AD12 = 1] Think of times lasting two weeks or longer when

[NUMPROBS] with your mood [WASWERE] most severe and frequent. During those

times, how long did your [FEELNOUN] usually last?

> 1 Less than 1 hour
>
> 2 At least 1 hour but no more than 3 hours
>
> 3 At least 3 hours but no more than 5 hours
>
> 4 5 hours or more

AD17 [IF AD16 = 2, 3, OR 4] Still thinking of times lasting two weeks or longer when

[NUMPROBS] with your mood [WASWERE] most severe and frequent, how severe was

your emotional distress during those times?

> 1 Mild
>
> 2 Moderate
>
> 3 Severe
>
> 4 Very severe

AD18 [IF AD16 = 2, 3, OR 4] Again, think of times lasting two weeks or longer when [NUMPROBS] with your mood [WASWERE] most severe and frequent.

How often, during those times, was your emotional distress so severe that nothing could cheer you up?

      1 Often

      2 Sometimes

      3 Rarely

      4 Never

AD19 [IF AD16 = 2, 3, OR 4] Once again, please think of times lasting two weeks or longer when [NUMPROBS] with your mood [WASWERE] most severe and frequent.

How often, during those times, was your emotional distress so severe that you could not carry out your daily activities?

      1 Often

      2 Sometimes

      3 Rarely

      4 Never

AD21 [IF AD16 = (2, 3, OR 4) AND NOT (AD17 = 1 AND AD18 = 4 AND AD19 = 4) AND (ASC21=1 OR ASC22=1 OR ASC23=1) AND AD09 NE (2) People who have problems with their mood often have other problems at the same time. These problems may include things like changes in:

          • sleep

          • appetite

          • energy

- the ability to concentrate and remember

- feelings of low self-worth

Did you ever have any of these problems during a period of time when you [FEELFILL] for two weeks or longer?

1 Yes

2 No

AD22 [IF AD21 = 1] Think again about these other problems we just mentioned. They include things like changes in

- sleep

- appetite

- energy

- the ability to concentrate and remember

- feelings of low self-worth

Please think of a time when you [FEELFILL] for two weeks or longer and you also had the largest number of these other problems at the same time. Is there one particular time like this that stands out in your mind as the worst one you ever had?

1 Yes

2 No

AD22c [IF AD22 = 2 OR DK/REF] Then think of the most recent time when you [FEELFILL] for two weeks or longer and you also had the largest number of these other problems at the same time.

DEFINE TIMEFILL:

IF AD22a NE BLANK, THEN TIMEFILL = 'worst'

IF AD22c NE BLANK, THEN TIMEFILL = 'most recent'

AD24a [IF AD22a NE BLANK] In answering the next questions, think about the period of time when your [FEELNOUN] and other problems were the worst.

[IF AD22c NE BLANK] In answering the next questions, think about the most recent period of time when you [FEELFILL] and had other problems at the same time. During that time, did you feel sad, empty, or depressed most of the day nearly every day?

    1 Yes

    2 No

AD24c [IF AD22a NE BLANK OR AD22c NE BLANK] During that [TIMEFILL] period of time, did you feel discouraged about how things were going in your life most of the day nearly every day?

    1 Yes

    2 No

AD24e [IF AD22a NE BLANK OR AD22c NE BLANK] During that [TIMEFILL] period of time, did you lose interest in almost all things like work and hobbies and things you like to do for fun?

    1 Yes

    2 No

AD24f [IF AD22a NE BLANK OR AD22c NE BLANK] During that [TIMEFILL] period of time, did you lose the ability to take pleasure in having good things happen to you, like winning something or being praised or complimented?

1 Yes

2 No

AD26a [IF ANY AD24a – AD24f = 1] The next questions are about changes in appetite and weight.

[IF AD22a NE BLANK] In answering the next questions, think about the period of time when your [FEELNOUN] and other problems were the worst.

[IF AD22c NE BLANK] In answering the next questions, think about the most recent period of time when you [FEELFILL] and had other problems at the same time.

Did you have a much smaller appetite than usual nearly every day during that time?

1 Yes

2 No

AD26b [IF AD26a = 2] Did you have a much larger appetite than usual nearly every day?

1 Yes

2 No

AD26c [IF AD26a = 2] Did you gain weight without trying to during that [TIMEFILL] period of time?

1 Yes

2 No

AD26c1 [IF AD26c = 1 AND (AD22a ≤ 21 OR AD22c ≤ 21)] Did you gain weight without trying to because you were growing?

1 Yes

2 No

AD26c2 [IF AD26c = 1 AND AD26c1 NE YES AND QD01 = 9] Did you gain weight

without trying to because you were pregnant?

    1 Yes

    2 No

AD26d [IF AD26c = 1 AND AD26c1 NE YES AND AD26c2 NE YES] How many pounds

did you gain? Please enter your answer as a whole number. # OF

POUNDS:_____

AD26e [IF (AD26a = 1 OR AD26c=(2 OR DK/REF)] Did you lose weight without trying

to?

    1 Yes

    2 No

AD26e1 [IF AD26e = 1] Did you lose weight without trying to because you were sick or

on a diet?

    1 Yes

    2 No

AD26f [IF AD26e1 = 2 OR DK/REF] How many pounds did you lose? Please enter your

answer as a whole number. # OF POUNDS:_____

AD26g [IF AD26a NE BLANK]

[IF AD22a NE BLANK] Again, please think about the period of time when your

[FEELNOUN] and other problems were the worst.

[IF AD22c NE BLANK] Again, please think about the most recent period of time when

you [FEELFILL] and had other problems at the same time.

Did you have a lot more trouble than usual falling asleep, staying asleep, or waking too

early nearly every night during that [TIMEFILL] period of time?

    1 Yes

    2 No

AD26h [IF AD26g = 2 OR DK/REF] During that [TIMEFILL] period of time, did you sleep a lot more than usual nearly every night?

    1 Yes

    2 No

AD26j [IF AD26a NE BLANK] During that [TIMEFILL] period of time, did you feel tired or low in energy nearly every day, even when you had not been working very hard?

    1 Yes

    2 No

AD26l [IF AD26a NE BLANK] Did you talk or move more slowly than is normal for you nearly every day?

    1 Yes

    2 No

AD26m [IF AD26l = 1] Did anyone else notice that you were talking or moving slowly?

    1 Yes

    2 No

AD26n [IF AD26l = 2 OR DK/REF] Were you so restless or jittery nearly every day that you paced up and down or couldn't sit still?

    1 Yes

    2 No

AD26o [AD26n = 1] Did anyone else notice that you were restless?

1 Yes

2 No

AD26p [IF AD26a NE BLANK] The next questions are about changes in your ability to concentrate, and your feelings about yourself.

[IF AD22a NE BLANK] Again, in answering these questions, think about the period of time when your [FEELNOUN] and other problems were the worst.

[IF AD22c NE BLANK] Again, in answering these questions, think about the most recent period of time when you [FEELFILL] and had other problems at the same time.

During that [TIMEFILL] time, did your thoughts come much more slowly than usual or seem confused nearly every day?

1 Yes

2 No

AD26r [IF AD26a NE BLANK] Did you have a lot more trouble concentrating than usual nearly every day?

1 Yes

2 No

AD26s [IF AD26a NE BLANK] Were you unable to make decisions about things you ordinarily have no trouble deciding about?

1 Yes

2 No

AD26u [IF AD26a NE BLANK] Did you feel that you were not as good as other people nearly every day?

1 Yes

2 No

AD26v [IF AD26u = 1] Did you feel totally worthless nearly every day?

1 Yes

2 No

AD26aa [IF AD26a NE BLANK] The next questions are about thoughts of death or suicide.

[IF AD22a NE BLANK] Again, in answering these questions, think about the period of time when your [FEELNOUN] and other problems were the worst.

[IF AD22c NE BLANK] Again, in answering these questions, think about the most recent period of time when you

[FEELFILL] and had other problems at the same time.

Did you often think a lot about death, either your own, someone else's, or death in general?

1 Yes

2 No

AD26bb [IF AD26a NE BLANK] During that period, did you ever think that it would be better if you were dead?

1 Yes

2 No

AD26cc [IF AD26a NE BLANK] Did you think about committing suicide?

1 Yes

2 No

AD26dd [IF AD26cc = 1] Did you make a suicide plan?

    1 Yes

    2 No

AD26ee [IF AD26cc = 1] Did you make a suicide attempt?

    1 Yes

    2 No

You mentioned having some of the problems I just asked you about. During that [TIMEFILL] period of time, how much did your [FEELNOUN] and these other problems interfere with your work, your social life, or your personal relationships?

    1 Not at all

    2 A little

    3 Some

    4 A lot

    5 Extremely

AD28a [IF AD28 NE (BLANK OR 1)] During that [TIMEFILL] period of time, how often were you unable to carry out your daily activities because of these problems with your mood?

    1 Often

    2 Sometimes

    3 Rarely

    4 Never

AD38 [IF AD28 NE BLANK] In the past 12 months, did you have a period of time when you felt [FEELNOUN] for two weeks or longer while also having some of the other

problems we asked about?

1 Yes

2 No

APPENDIX J

NSDUH Mental Health Treatment Utilization

These next questions are about treatment and counseling for problems with emotions, nerves or mental health. Please do not include treatment for alcohol or drug use.

During the past 12 months, have you stayed overnight or longer in a hospital or other facility to receive treatment or counseling for any problem you were having with your emotions, nerves, or mental health?

    1) Yes

    2) No

Where did you stay overnight or longer to receive mental health treatment or counseling during the past 12 months?

    1) A private or public psychiatric hospital

    2) A psychiatric unit of a general hospital

    3) A medical unit of a general hospital

    4) Another type of hospital

    5) A residential treatment center

    6) Some other type of facility

The list below includes some of the services where people can get outpatient treatment or counseling for problems with their emotions, nerves, or mental health. During the past 12 months, did you receive outpatient treatment or counseling for any problem you were having with your emotions, nerves, or mental health at any of the places listed below? Please do not include treatment for alcohol or drug use.

- An outpatient mental health clinic or center

- The office of a private therapist, psychologist, psychiatrist, social worker, or counselor that was not part of a clinic.

- A doctor's office that was not part of a clinic

- An outpatient medical clinic

- A partial day hospital or day treatment program

- Some other place

  1) Yes

  2) No

Where did you receive outpatient mental health treatment or counseling during the past 12 months?

  1) An outpatient mental health clinic or center

  2) The office of a private therapist, psychologist, psychiatrist, social worker, or counselor that was not part of a clinic.

  3) A doctor's office that was not part of a clinic

  4) An outpatient medical clinic

  5) A partial day hospital or day treatment program

  6) Some other place

APPENDIX K

NSDUH Substance Use Treatment Utilization

During the past 12 months, did any doctor or other health care professional ask, either in person or on a form, if you:

a. Smoke cigarettes or use any other tobacco products? 1. Yes 2. No

b. Drink alcohol? 1. Yes 2. No

c. Use illegal drugs? 1. Yes 2. No

During the past 12 months, did any doctor or other health care professional advise you to quit smoking cigarettes or quit using any other tobacco products?

1 Yes

2 No

Please think about all of the talks you have had with a doctor or other health care professional during the past 12 months when you answer this question. Choose the statement or statements below that describe any discussions you may have had in person with a doctor or other health professional about your alcohol use.

1. The doctor asked how much I drink.

2. The doctor asked how often I drink.

3. The doctor asked if I have any problems because of my drinking.

4. The doctor advised me to cut down on my drinking.

5. The doctor offered to give me more information about alcohol use and treatment for problems with alcohol use.

95 The doctor didn't discuss my alcohol use with me in the past 12 months.

During the past 12 months, did any doctor or other health care professional talk to you

about your use of [FILLMARIJUANA/COCAINE/CRACK/HEROIN/INHALANTS/

HALLUCINOGENS/METHAMPHETAMINE]?

> 1 Yes
>
> 2 No

These next questions deal with treatment for alcohol and drug problems, not including

cigarettes. Please report treatment or counseling designed to help you reduce or stop

your alcohol or drug use. Please include detoxification and any other treatment for

medical problems associated with your alcohol or drug use.

Have you ever received treatment or counseling for your use of alcohol or any drug, not

counting cigarettes?

> 1 Yes
>
> 2 No

[IF PREVIOUS ITEM = 1] During the past 12 months, that is, since [DATEFILL], have

you received treatment or counseling for your use of alcohol or any drug, not counting

cigarettes?

> 1 Yes
>
> 2 No

[IF PREVIOUS ITEM = 1] During the past 12 months when you received treatment, was

the treatment for alcohol use only, drug use only, or both alcohol and drug use?

> 1 Alcohol use only
>
> 2 Drug use only
>
> 3 Both alcohol and drug use

DEFINE TXFILL1:

IF PREVIOUS ITEM= 1, TXFILL1 = alcohol use

IF PREVIOUS ITEM = 2, TXFILL1 = drug use

IF PREVIOUS ITEM = 3 OR DK/REF, TXFILL1 = alcohol or drug use

During the past 12 months, have you received treatment for your [TXFILL1] in a hospital overnight as an inpatient?

    1 Yes

    2 No

During the past 12 months, have you received treatment for your [TXFILL1] in a residential drug or alcohol rehabilitation facility where you stayed overnight?

    1 Yes

    2 No

During the past 12 months, have you received treatment for your [TXFILL1] in a drug or alcohol rehabilitation facility as an outpatient?

    1 Yes

    2 No

During the past 12 months, have you received treatment for your [TXFILL1] in a mental health center or facility as an outpatient?

    1 Yes

    2 No

During the past 12 months, have you received treatment for your [TXFILL1] in an emergency room?

    1 Yes

2 No

During the past 12 months, have you received treatment for your [TXFILL1] in a private

doctor's office?

1 Yes

2 No

During the past 12 months, have you received treatment for your [TXFILL1] in a prison

or jail?

1 Yes

2 No

During the past 12 months, have you received treatment for your [TXFILL1] in a self-

help group such as Alcoholics Anonymous or Narcotics Anonymous?

1 Yes

2 No

During the past 12 months, have you received treatment for your [TXFILL1] in some

other place besides these that have been listed?

1 Yes

2 No

Please type in a description of the place where you received treatment or counseling for

your [TXFILL1] other than the places just mentioned. _____

Are you currently receiving treatment or counseling for your [TXFILL1]?

1 Yes

2 No

During the past 12 months, did you need treatment or counseling for your alcohol or

drug use?

    1 Yes

    2 No

During the past 12 months, did you need additional treatment or counseling for your alcohol or drug use?

    1 Yes

    2 No

During the past 12 months, for which of the following drugs did you need additional treatment or counseling? [TXFILL2]

    1 Alcohol

    2 Marijuana or hashish

    3 Cocaine or 'crack'

    4 Heroin

    5 Hallucinogens

    6 Inhalants

    7 Prescription pain relievers

    8 Prescription tranquilizers

    9 Prescription stimulants

    10 Prescription sedatives

    11 Some other drug

During the past 12 months, did you make an effort to get treatment or counseling for your use of [TXFILL2]?

    1 Yes

2 No

Which of these statements explain why you did not get the treatment or counseling you needed for your use of [TXFILL2]?

1 You had no health care coverage, and you couldn't afford the cost.

2 You did have health care coverage, but it didn't cover treatment for [TXFILL2], or didn't cover the full cost.

3 You had no transportation to a program, or the programs were too far away, or the hours were not convenient.

4 You didn't find a program that offered the type of treatment or counseling you wanted.

5 You were not ready to stop using [TXFILL2].

6 There were no openings in the programs.

7 You did not know where to go to get treatment.

8 You were concerned that getting treatment or counseling might cause your neighbors or community to have a

negative opinion of you.

9 You were concerned that getting treatment or counseling might have a

negative effect on your job.

10 Some other reason or reasons.

[IF PREVIOUS ITEM = 10] Which of these statements explain why you did not get the treatment or counseling you needed for your use of [TXFILL2]?

1 You didn't think you needed treatment at the time.

2 You thought you could handle the problem without treatment.

3 You didn't think treatment would help.

4 You didn't have time (because of job, childcare, or other commitments).

5 You didn't want others to find out that you needed treatment.

6 Some other reason or reasons.

APPENDIX L

NHIS Demographic Items

How old are you? _____

Are you now married, widowed, divorced, separated, never married, or living with a

partner?

      1 Married

      2 Widowed

      3 Divorced

      4 Separated

      5 Never Married

      6 Living with partner

The next few questions are about employment status.

Which of the following were you doing last week?

      1 Working for pay at a job or business

      2 With a job or business but not at work

      3 Looking for work

      4 Working, but not for pay, at a family-owned job or business

      5 Not working at a job or business and not looking for work

Did you receive income in [last calendar year] from wages and salaries?

      1 Yes

      2 No

Did you receive income in [last calendar year] from self-employment including business

and farm income?

      1 Yes

2 No

Did [you receive Supplemental Security Income (SSI)?

1 Yes

2 No

At any time during [last calendar year], even for one month, did you receive any CASH assistance from a state or county welfare program, such as (* fill specific program name)?

1 Yes

2 No

At any time during [last calendar year], did you receive any OTHER kind of welfare assistance such as help with getting a job, placement in education or job training programs, or help with transportation or child care?

1 Yes

2 No

Did you receive income from child support?

1 Yes

2 No

Did you receive income from other sources such as alimony, contributions from family/others, VA payments, Worker's Compensation, or unemployment compensation?

1 Yes

2 No

What is your best estimate of your total income from all sources, before taxes, in [last

calendar]? _____

Was your total family income from all sources less than [fill based on poverty threshold] or [fill based on poverty threshold] or more?

    1 Less than [$10,500/$11,500/$13,500/$15,000/$18,000/$23,000/$27,000]

    2 [$10,500/$11,500/$13,500/$15,000/$18,000/$23,000/$27,000] or more

Is this house/apartment owned or being bought, rented, or occupied by some other arrangement by you or someone in your family?

    1 Owned or being bought

    2 Rented

    3 Other arrangement

Are you paying lower rent because the Federal, State, or local government is paying part of the cost?

    1 Yes

    2 No

At any time during [last calendar year], did you receive food stamp benefits?

    1 Yes

    2 No

At any time during [last calendar year] did you receive benefits from the WIC program, that is, the Women, Infants and Children program?

    1 Yes

    2 No

APPENDIX M

NHIS Cigarette Use

These next questions are about cigarette smoking.

Have you smoked at least 100 cigarettes in your ENTIRE LIFE?

    1 Yes

    2 No

How old were you when you FIRST started to smoke fairly regularly? _____

Do you NOW smoke cigarettes every day, some days or not at all?

    1 Every day

    2 Some days

    3 Not at all

[If not currently smoking] How long has it been since you quit smoking cigarettes?

_____

[If currently smoking] On the average, how many cigarettes do you now smoke a day?

_____

On how many of the PAST 30 DAYS did you smoke a cigarette? _____

On the average, when you smoked during the PAST 30 DAYS, about how many

cigarettes did you smoke a day? _____

During the PAST 12 MONTHS, have you stopped smoking for more than one day

BECAUSE YOU WERE TRYING TO QUIT SMOKING?

    1 Yes

    2 No

APPENDIX N

NHIS Alcohol Use

These next questions are about drinking alcoholic beverages. Included are liquor such as whiskey or gin, beer, wine, wine coolers, and any other type of alcoholic beverage

In ANY ONE YEAR, have you had at least 12 drinks of any type of alcoholic beverage?

    1 Yes

    2 No

In the past year, how often did you drink any type of alcoholic beverage? How many days per week, per month or per year did you drink? _____

In the PAST YEAR, on those days that you drank alcoholic beverages, on the average, how many drinks did you have? _____

In the PAST YEAR, on how many DAYS did you have 5 or more drinks of any alcoholic beverage? _____

How many days per week, per month or per year did you have 5 or more drinks in a single day? _____

APPENDIX O

NHIS Mental Health (includes K6; Furukawa et al., 2003; Kessler et al., 2003)

Have you EVER been told by a doctor or other health professional that you had

...Phobia or fears?

1 Yes

2 No

DURING THE PAST 12 MONTHS have you had

...Phobia or fears?

1 Yes

2 No

Have you EVER been told by a doctor or other health professional that you had

...Attention Deficit Hyperactivity Disorder (ADHD) or Attention Deficit Disorder

(ADD)?

1 Yes

2 No

Have you EVER been told by a doctor or other health professional that you had

…Bipolar Disorder?

1 Yes

2 No

Have you EVER been told by a doctor or other health professional that you had

…Depression?

1 Yes

2 No

DURING THE PAST 12 MONTHS have you had

…Depression?

1 Yes

2 No

Have you EVER been told by a doctor or other health professional that you had

…Other mental health disorders?

1 Yes

2 No

DURING THE PAST 12 MONTHS have you had

…Other mental health disorders?

1 Yes

2 No

DURING THE PAST 12 MONTHS, have you had

…Excessive use of alcohol or tobacco?

1 Yes

2 No

DURING THE PAST 12 MONTHS, have you had

…Substance abuse, other than alcohol or tobacco?

1 Yes

2 No

DURING THE PAST 12 MONTHS, have you

…Frequently felt anxious, nervous, or worried?

1 Yes

2 No

DURING THE PAST 12 MONTHS, have you

…Frequently felt stressed?

1 Yes

2 No

DURING THE PAST 30 DAYS, how often did you feel

... So sad that nothing could cheer you up?

1 ALL of the time

2 MOST of the time

3 SOME of the time

4 A LITTLE of the time

5 NONE of the time

During the PAST 30 DAYS, how often did you feel

... Nervous?

1 ALL of the time

2 MOST of the time

3 SOME of the time

4 A LITTLE of the time

5 NONE of the time

During the PAST 30 DAYS, how often did you feel

... Restless or fidgety?

1 ALL of the time

2 MOST of the time

3 SOME of the time

4 A LITTLE of the time

5 NONE of the time

During the PAST 30 DAYS, how often did you feel

... Hopeless?

1 ALL of the time

2 MOST of the time

3 SOME of the time

4 A LITTLE of the time

5 NONE of the time

During the PAST 30 DAYS, how often did you feel

...That everything was an effort?

1 ALL of the time

2 MOST of the time

3 SOME of the time

4 A LITTLE of the time

5 NONE of the time

During the PAST 30 DAYS, how often did you feel

...Worthless?

1 ALL of the time

2 MOST of the time

3 SOME of the time

4 A LITTLE of the time

5 NONE of the time

We just talked about a number of feelings you had during the PAST 30 DAYS.

Altogether, how MUCH did these feelings interfere with your life or activities: a lot,

some, a little, or not at all?

1 A lot

2 Some

3 A little

4 Not at all

DURING THE PAST 12 MONTHS, have you seen or talked to any of the following

health care providers about your own health?

...A mental health professional such as a psychiatrist, psychologist, psychiatric nurse, or

clinical social worker.

1 Yes

2 No

APPENDIX P

NHIS Complementary and Alternative Medicine Utilization

Have you EVER used any of these therapies for your health?

Chiropractic or Osteopathic Manipulation?

　　1 Yes

　　2 No

Have you EVER seen a provider or practitioner for chiropractic or osteopathic

manipulation for yourself?

DURING THE PAST 12 MONTHS, did you see a practitioner for chiropractic or

osteopathic manipulation?

DURING THE PAST 12 MONTHS, use chiropractic or osteopathic manipulation?

Do you know the exact number of times you saw a practitioner for

chiropractic/osteopathic manipulation in the past 12 months?

　　1 Yes

　　2 No

DURING THE PAST 12 MONTHS, how many times did you see a practitioner for

chiropractic/osteopathic manipulation? _____

Massage?

　　1 Yes

　　2 No

Have you EVER seen a provider or practitioner for massage for yourself?

　　1 Yes

　　2 No

DURING THE PAST 12 MONTHS, did you see a practitioner for massage?

1 Yes

2 No

DURING THE PAST 12 MONTHS, did you use massage?

1 Yes

2 No

Do you know the exact number of times you saw a practitioner for massage in the past 12 months?

1 Yes

2 No

DURING THE PAST 12 MONTHS, how many times did you see a practitioner for massage? _____

Acupuncture?

1 Yes

2 No

Have you EVER seen a provider or practitioner for acupuncture for yourself?

1 Yes

2 No

DURING THE PAST 12 MONTHS, did you see a practitioner for acupuncture?

1 Yes

2 No

DURING THE PAST 12 MONTHS, did you use acupuncture?

1 Yes

2 No

Do you know the exact number of times you saw a practitioner for acupuncture in the past 12 months?

1 Yes

2 No

DURING THE PAST 12 MONTHS, how many times did you see a practitioner for acupuncture? _____

Herbs or supplements

Herbs or other non-vitamin supplements are pills, capsules, tablets, or liquids that have been labeled as a DIETARY SUPPLEMENT. This does NOT include vitamin or mineral supplements, homeopathic treatments, or drinking herbal or green teas.

Have you EVER taken any herbal or other non-vitamin supplements listed on this card for yourself?

1 Yes

2 No

DURING THE PAST 12 MONTHS, have you taken any herbal or other non-vitamin supplements listed on this card for yourself?

1 Yes

2 No

01 Combination herb pill

02 Acai (pills, gelcaps)

03 Bee Pollen and other Bee products

04 Chondroitin

05 Co-enzyme Q10 (CoQ10)

06 Cranberry (pills or capsules)

07 Digestive Enzymes (lactaid)

08 Echinacea

09 Fish Oil or omega 3 or DHA fatty acid or EPA fatty acid supplements

10 Garlic supplements (pills, gelcaps)

11 Ginkgo Biloba

12 Ginseng

13 Glucosamine

14 Green tea pills (not brewed tea) or EGCG (pills)

15 Melatonin

16 Milk Thistle (silymarin)

17 MSM (Methylsulfonylmethane)

18 Probiotics or Prebiotics

19 SAM-e

20 Saw Palmetto

21 Valerian

22 Other herbs or non-vitamin supplements

Did you take any of these DURING THE PAST 30 DAYS?

1 Yes

2 No

Have you ever seen a practitioner for herbs or other non-vitamin supplements?

1 Yes

2 No

DURING THE PAST 12 MONTHS, did you see a practitioner for herbs or other non-vitamin supplements?

1 Yes

2 No

Do you know the exact number of times you saw a practitioner for herbs or other non-vitamin supplements in the past 12 months?

1 Yes

2 No

DURING THE PAST 12 MONTHS, how many times did you see a practitioner for herbs or other non-vitamin supplements? _____

Meditation

Have you EVER used meditation, guided imagery, or progressive relaxation?

1 Yes

2 No

Have you EVER used any of the following for your own health or treatment?

Mantra Meditation, including Transcendental Meditation ®, Relaxation Response, and Clinically Standardized Meditation?

1 Yes

2 No

Mindfulness meditation, including Vipassana (vih-PAS-sah-nah), Zen Buddhist

meditation, Mindfulness-based Stress Reduction, and Mindfulness-based

Cognitive Therapy

    1 Yes

    2 No

Spiritual meditation including Centering Prayer and Contemplative Meditation

    1 Yes

    2 No

Guided imagery

    1 Yes

    2 No

Progressive relaxation

    1 Yes

    2 No

DURING THE PAST 12 MONTHS, did you use...

Mantra Meditation, including Transcendental Meditation ®, Relaxation Response,

and Clinically Standardized Meditation?

    1 Yes

    2 No

Mindfulness meditation, including Vipassana (vih-PAS-sah-nah), Zen Buddhist

meditation, Mindfulness-based Stress Reduction, and Mindfulness-based

Cognitive Therapy

    1 Yes

    2 No

Spiritual meditation including Centering Prayer and Contemplative Meditation?

> 1 Yes
>
> 2 No

Guided imagery?

> 1 Yes
>
> 2 No

Progressive relaxation?

> 1 Yes
>
> 2 No

DURING THE PAST 12 MONTHS, which of these did you use the most?

> 1 Mantra meditation
>
> 2 Mindfulness meditation
>
> 3 Spiritual meditation
>
> 4 Guided imagery
>
> 5 Progressive relaxation

Did you do breathing exercises as part of meditation? Breathing exercises may involve actively controlling the way air is drawn in, or the rate or depth of breathing.

> 1 Yes
>
> 2 No

DURING THE PAST 12 MONTHS, did you see a practitioner or take a class for meditation?

> 1 Yes
>
> 2 No

Do you know the exact number of times you saw a practitioner or took a class for meditation in the past 12 months?

    1 Yes

    2 No

DURING THE PAST 12 MONTHS, how many times did you see a practitioner or take a class for meditation? _____

Have you EVER practiced any of the following?

    ...Yoga?

DURING THE PAST 12 MONTHS, did you practice Yoga for yourself?

    1 Yes

    2 No

Did you do breathing exercises as part of Yoga? Breathing exercises may involve actively controlling the way air is drawn in, or the rate or depth of breathing.

    1 Yes

    2 No

Did you do meditation as part of Yoga?

    1 Yes

    2 No

DURING THE PAST 12 MONTHS, did you take a Yoga class or in some way receive formal training? Attending only one session does not count.

    1 Yes

    2 No

Do you know the exact number of times you saw an instructor for Yoga in the past 12 months?

    1 Yes

    2 No

DURING THE PAST 12 MONTHS, how many times did you see an instructor for Yoga?

_____

Did you see a practitioner for/use [modality] for any of these reasons?

    For general wellness or general disease prevention?

        1 Yes

        2 No

    To improve your energy?

        1 Yes

        2 No

    To improve your immune function?

        1 Yes

        2 No

    To improve your athletic or sports performance?

        1 Yes

        2 No

    To improve your memory or concentration?

        1 Yes

        2 No

Did seeing a practitioner for/using [modality] motivate you to:

Eat healthier?

1 Yes

2 No

Eat more organic foods?

1 Yes

2 No

Cut back or stop drinking alcohol?

1 Yes

2 No

Cut back or stop smoking cigarettes?

1 Yes

2 No

Exercise more regularly?

1 Yes

2 No

Did {seeing a practitioner for/using [modality] lead to any of these outcomes?

Give you a sense of control over your health?

1 Yes

2 No

Help to reduce your stress level or to relax?

1 Yes

2 No

Help you to sleep better?

> 1 Yes

> 2 No

Make you feel better emotionally?

> 1 Yes

> 2 No

Make it easier to cope with health problems?

> 1 Yes

> 2 No

Improve your overall health and make you feel better?

> 1 Yes

> 2 No

Improve your relationships with others?

> 1 Yes

> 2 No

Improve your attendance at a job or school]?

> 1 Yes

> 2 No

DURING THE PAST 12 MONTHS, did you see a practitioner for/use [modality] for one or more specific health problems, symptoms, or conditions?

> 1 Yes

> 2 No

Did you receive any of the following medical treatments for [condition]?

Prescription medications?

    1 Yes

    2 No

Over-the-counter medications?

    1 Yes

    2 No

Surgery?

    1 Yes

    2 No

Physical therapy?

    1 Yes

    2 No

Mental health counseling?

    1 Yes

    2 No

DURING THE PAST 12 MONTHS, did you see a practitioner for/use [modality] for any of these reasons?

These medical treatments were too expensive?

    1 Yes

    2 No

[modality] combined with these medical treatments would help you?

    1 Yes

    2 No

These medical treatments do not work for the health problem you want to treat or prevent?

     1 Yes

     2 No

[Prescription medications/Over the counter medications/Prescription or over-the-counter medications] cause side effects?

     1 Yes

     2 No

You can do it on your own?

     1 Yes

     2 No

It is natural?

     1 Yes

     2 No

It focuses on the whole person, mind, body, and spirit?

     1 Yes

     2 No

It treats the cause and not just the symptoms?

     1 Yes

     2 No

It was part of your upbringing?

     1 Yes

     2 No

Did you {see a practitioner for/use [modality] because it was recommended by any of the following people?

    A medical doctor?

        1 Yes

        2 No

    A family member?

        1 Yes

        2 No

    A friend?

        1 Yes

        2 No

    A co-worker?

        1 Yes

        2 No

Not including the practitioner you saw for] [fill2: modality] DURING THE PAST 12 MONTHS, did you let your personal health care provider know about your use of [fill3: modality]?

    1 Yes

    2 No

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ABSTRACT

TOWARD ENHANCING TREATMENT FOR PREGNANT SMOKERS: LAYING THE GROUNDWORK FOR THE USE OF COMPLEMENTARY AND ALTERNATIVE MEDICINE APPROACHES

by

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Tobacco is the most widely used drug of abuse during pregnancy. Despite efforts to reduce perinatal tobacco use, its prevalence has remained steady over at least the past decade, suggesting that efforts to reduce smoking prevalence before and during pregnancy have not been effective. Although a range of effective treatments exist, most pregnant smokers neither seek nor receive any kind of treatment. Complementary and alternative medicine (CAM) treatments may be ideal as alternative, low-cost approaches capable of reaching and assisting a greater proportion of pregnant women with smoking cessation. This study examined characteristics and treatment utilization practices of pregnant smokers in two national samples —the National Survey on Drug Use and Health and the National Health Interview Survey—in order to better understand the unique treatment needs and preferences of pregnant smokers, and to explore the prevalence and predictors of CAM use within this population. Results suggest that smoking in pregnancy is stable, but that several potentially modifiable factors that may help identify women who are at greater risk for persistent smoking during pregnancy,

including smoking risk perception, current alcohol use, and factors related to nicotine

dependence. Findings of this study also demonstrated that a sizeable proportion of

pregnant smokers are already accessing CAM treatments, particularly among those of

greater socioeconomic status. Further research is needed not only to validate the use of

CAM treatments, but also to guide safety and treatment recommendations during

pregnancy.

AUTOBIOGRAPHICAL STATEMENT

Amy M. Loree received her B.A. in Psychology and Women's Studies from the University of Michigan in Ann Arbor, MI. She completed a doctoral program in Clinical Psychology at Wayne State University in Detroit, MI and her clinical internship at the Yale University School of Medicine in New Haven, CT. She will begin a postdoctoral fellowship focused on research and clinical training in addiction treatment at the VA Connecticut Healthcare System in West Haven, CT. Amy's research interests have primarily focused on interventions to prevent child maltreatment among high-risk women and families, including those affected by substance use and trauma. She is particularly interested in the use of brief, motivational interventions and complementary and alternative medicine techniques (such as yoga and mindfulness). In addition to her primary research interests, Amy has been involved in a variety of other research projects, including studies focused on a computerized intervention for kinship caregivers, alcohol use and coping among women with a history of childhood sexual abuse, prescription opiate abuse and trauma among chronic pain patients, and a brief, computer-based motivational intervention to augment home visiting. Outside of school and work, Amy has a regular yoga and meditation practice and is a registered yoga teacher.