THE RELATIONSHIP BETWEEN SOCIOECONOMIC STATUS, STRESS, AND SUBSTANCE USE AMONG WOMEN OF CHILDBEARING AGE

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1.1 Overview

One of the Healthy People 2010 goals is to reduce substance abuse to protect the health, safety, and quality of life for all, especially children. Substance abuse as defined by the Healthy People 2010 goals includes alcohol use; tobacco use and nicotine dependence; illicit drug use of marijuana, cocaine, heroin, and methamphetamine (Department of Health and Human Services, 2000). In 2005, of those persons aged 12 or older, 66.5% had consumed alcohol, 34.9% had used tobacco products, and 14.4% had used some type of illicit drug. Of those using illicit drugs within the last year, 10.4% used marijuana, 2.3% cocaine, .2% heroin, and .5% methamphetamine (SAMHSA, 2006).

Substance use is associated with many health problems. Alcohol use is associated with high blood pressure, stroke, cardiovascular diseases, liver disease, and neurological damage (Center for Disease Center and Prevention (CDC), 2006a). Cancer, which is the second leading cause of death in the U.S., was among the first diseases to be causally linked to smoking (CDC, 2006b). Smoking also causes coronary heart disease and increases a person’s risk for stroke (CDC, 2006b). Use of illicit drugs (e.g., marijuana, cocaine, heroin, and methamphetamine) is associated with chronic depression, psychosis, and higher risk of contracting human immunodeficiency virus (HIV) (Department of Health and Human Services, 2000). Women face unique health effects from substance use in relation to menstrual and reproductive functions. Evidence also shows that for some substances, like alcohol and tobacco, women may be more vulnerable than men in
regards to both acute and long-term effects (as cited in United Nations Office on Drugs and Crime, 2004).

Substance use has been found to be influenced by both socioeconomic status and stress. Substance use varies across groups of differing socioeconomic status. For example, excessive alcohol consumption is more common among lower educational groups (Droomers, Schrijvers, Karien, van de Mheen, & Mackenbach, 1999). Smoking prevalence is also related to educational level. Women with 9-11 years of education are nearly three times more likely than women with sixteen or more years of education to smoke (CDC, 2006b). Stress has also been found to be associated with substance use. It has been shown that as stress increases, drinking increases as well (Abbey, Smith, & Scott, 1993; Cole, Tucker, & Friedman, 1990). Associations have also been found between a variety of indices of stress and increased risk for smoking uptake. Current smokers report smoking more when stressed and report experiencing more stress than non-smokers (as cited in Kassel, Stroud, & Paronis, 2003). Stress also plays a role in the decision to begin using drugs (Ladwig & Anderson, 1989; Lindenberg, Reiskin, & Gendrop, 1994).

The Stress Process Model developed by Pearlin (1989) provides the opportunity to study the effects the social structure and its stratification based on social and economic class, race and ethnicity, gender, and age has on the stress process. The overarching strategy of social stress research is to identify the many links that join forms of social organization to individual stress. The stress process is continually being influenced by the social structure and its interrelated levels including social stratification, social
institutions, and interpersonal relationships. Therefore, to the extent to which these different systems embody the unequal distribution of opportunities, resources, power, and prestige, a low status within them may in and of itself be a source of stressful life conditions (Pearlin, 1989). Stress is generally divided into two distinct types of stress: eventful stressors and chronic stress. Eventful stressors surface at discrete points in time while chronic stressors may either surface repeatedly or remain over a considerable amount of time. Eventful and chronic stressors may originate from the relatively stable systems of inequality like social class and from the many domains of social and economic organizations (Pearlin, 2002).

Overall, stress could be acting as a mediator between socioeconomic status and substance use. A mediator is a third variable whose function is to represent the mechanism through which the independent variable, in this case socioeconomic status, is able to influence the dependent variable, substance use. Therefore, it is essential to take a closer look into the relationship between socioeconomic status, stress, and substance use.

1.2 Statement of the Problem- Substance Use

1.2.1 General Health Effects of Substance Use

It is important to consider the extent of substance use in the United States and the variety of serious health and social problems substance use is associated with. In 2005, 66.5% of persons aged 12 or older had consumed alcohol within the last year. Within the past month, 22.7% of persons aged 12 or older participated in binge alcohol use (e.g., drinking five or more drinks on the same occasion on at least 1 day in the past 30 days) with 6.6% of these binge drinkers being classified as heavy alcohol users (e.g., drinking
five or more drinks on the same occasion on each of 5 or more days in the past 30 days) (SAMHSA, 2006). When looking at gender differences in the frequency of alcohol use, fewer women than men drink (National Institute on Alcohol Abuse and Alcoholism, 2005). Of men aged 12 or older, 70.3% consumed alcohol within the last year. Within the past month, 30.5% of men aged 12 or older had participated in binge alcohol use with 10.3% of these binge drinkers being classified as heavy alcohol users. However, women did not follow too far behind in alcohol use with 62.8% of women aged 12 or older consuming alcohol within the last year. Within the past month, 15.2% of women aged 12 or older had participated in binge alcohol use with 3.1% of these binge drinkers being classified as heavy alcohol users (SAMHSA, 2006).

Binge drinking has been identified as an indicator for the development of chronic disease and is one of the three leading causes of preventable death (CDC, 2004). Binge drinking is associated with many health problems, including but not limited to: unintentional injuries such as car crash, falls, burns, drowning; intentional injuries like sexual assault, domestic violence, firearm injuries; alcohol poisoning, sexually transmitted infections, unintended pregnancy, children born with Fetal Alcohol Syndrome, high blood pressure, stroke, cardiovascular diseases, liver disease, neurological damage, sexual dysfunction, and poor control of diabetes (CDC, 2006a). The hazards of heavy alcohol consumption are also well known and include, but are not limited to: increased risk of liver cirrhosis, cancers of the upper gastrointestinal tract, hypertension, injury, violence, and death (Dietary Guidelines, 2005).
Tobacco use is the leading preventable cause of death in the United States, causing approximately 440,000 premature deaths each year (National Institute on Drug Abuse, 2006a). However, in 2005, 34.9% of persons aged 12 and older used tobacco products within the past year. When looking at gender differences in the frequency of tobacco use, 42.3% of men and 28.0% of women aged 12 or older used tobacco products within the past year (SAMHSA, 2006). Cancer, which is the second leading cause of death, was among the first diseases to be casually linked to smoking. Smoking causes almost 80% of lung cancer deaths in men and 90% of lung cancer deaths in women. Smoking causes cancer of the pharynx, larynx, bladder, esophagus, kidney, cervix, pancreas, lung, and stomach. Smoking also causes coronary heart disease, which is the leading cause of death in the U.S. Cigarette smokers are 2-4 times more likely to develop coronary heart disease than nonsmokers. Cigarette smoking also doubles a person’s risk for stroke. Use of tobacco products is associated with many health problems including but not limited to those afore mentioned (CDC, 2006b).

Illicit drug use of marijuana, cocaine, heroin, and methamphetamine is the last of the substances included in the substance abuse definition provided in the Healthy People 2010 goals (Department of Health and Human Services, 2000). Of persons 12 years or older, 14.4% used some type of illicit drug in the past year, with 10.4% having used marijuana, 2.3% cocaine, .2% heroin, and .5% methamphetamine. When looking at males 12 years or older, 16.9% used some type of illicit drug in the past year, with 13.1% having used marijuana, 3.0% cocaine, .2% heroin, and .6% methamphetamine. Use of illicit drugs by women aged 12 or older is lower than men with 12.1% using some type of
illicit drug in the last year, with 7.9% having used marijuana, 1.6% cocaine, .1% heroin, and .4% methamphetamine (SAMHSA, 2006). Use of these illicit drugs is associated with serious consequences, including but not limited to: illness, chronic depression, psychosis, injury, disability, death, domestic violence, and crime. Drug users also have higher risks of contracting syphilis, gonorrhea, hepatitis, tuberculosis, and human immunodeficiency virus (HIV) (Department of Health and Human Services, 2000).

1.2.2 Health Effects of Substance Use in Women

When looking at the physiological effects of substances, information on gender differences is limited. However, evidence does show that for some substances, like alcohol and tobacco, women may be more vulnerable than men in regards to both acute and long-term effects (United Nations Office on Drugs and Crime, 2004).

1.2.2.1 Alcohol

Besides the health effects of alcohol consumption previously mentioned, there are more health consequences women are susceptible to. Women actually absorb more alcohol than men due to different body chemistry and structure. Pound for pound, women have less water in their bodies than men so when alcohol passes through the digestive tract and is dispersed through the water in the body, the more water that is available, the more diluted the alcohol will become (National Institute on Alcohol Abuse and Alcoholism, 2005). Therefore, women have higher blood alcohol levels than men even when consuming the same amount of alcohol, causing effects to occur more quickly and last longer. As a result, women are more vulnerable to the long-term effects of alcohol on their health (CDC, 2006c). For example, the risk of cirrhosis of the liver and
other alcohol-related liver diseases is higher for women than for men (Loft, Olesen, & Dossing, 1987). It is known that excessive drinking could result in shrinkage of the brain resulting in memory loss. However, women are more vulnerable than men to the damaging effects excessive alcohol use has on the brain, which tends to appear even when excessive drinking is done in shorter periods (Hommer, Momenan, Kaiser, & Rawlaing, 2001; Mann, Batra, Gunthner, & Schroth, 1992). Excessive drinking also puts women at an increased risk of damaging the heart more so than men, even when drinking at lower levels (Urbano-Marquez, Estruch, Fernandez-Sola, Nicola, Pare, & Rubin, 1995). It should be noted though that men do face higher rates of alcohol related death and hospitalizations than women. This occurrence is been found to exist because men are more likely to take more risks than women, such as driving fast or without a seatbelt, so when combined with excessive drinking, the risk of injury or death increases (CDC, 2006d).

Another health effect of alcohol use unique to women includes increased risk of breast cancer. This risk actually increases as the amount of alcohol use increases (Secretary of Health and Human Services, 2000; Smith-Warner, Spiegelman, Yaun, van den Brandt, Folsom, Goldbohm, Graham, Holmberg, Howe, Marshall, Miller, Potter, Speizer, Willett, Wolk, & Hunter, 1998; Thun, Peto, Lopez, Monaco, Henly, Health, & Doll, 1997). A woman’s menstrual cycle may also be disrupted by excessive drinking, along with the increased risk of infertility, stillbirth, miscarriage, and premature delivery (Mendelson & Mello, 1988; Wilsnack, Klassen, Wilsnack, 1984). Women who binge drink are also more likely to have multiple sexual partners and unprotected sex, which
puts them at an increased risk of sexually transmitted infections and unintended pregnancy (Naimi, Lipscomb, Brewer, & Gilbert, 2003; Thomas, Brodine, Shaffer, Shafer, Boyer, Putnam, & Schachter, 2001). Binge drinking is also a risk factor for sexual assault (CDC, 2006c).

It is known that women who drink during their pregnancy increase their risk for having a child with Fetal Alcohol Spectrum Disorders (FASD), with the most severe form being Fetal Alcohol Syndrome (FAS). The effects of FASD can range from facial dysmorphology, neurodevelopmental abnormalities, growth restriction, mental retardation, psychosocial problems, and behavioral abnormalities (American Academy of Pediatrics, 2000; Sokol, Delaney-Black, & Nordstrom, 2003). No current data supports the concept of a "safe level" of alcohol consumption by pregnant women below which no damage will occur to the fetus (American Academy of Pediatrics, 2000). However, FASD is completely preventable if a woman does not drink while being pregnant or while she may become pregnant, but unfortunately, about 1 in 20 women drink excessively before finding out that they are pregnant (Floyd, Decoufle, & Hungerford, 1999). Women who drink alcohol during pregnancy are also more likely to have a baby die from Sudden Infant Death Syndrome, with an increased risk if a woman binge drinks during the first trimester of pregnancy (Iaysu, Randall, Welty, Hsia, Kinney, Mandell, McClain, Randall, Habbe, Wilson, & Willinger, 2003). Excessively drinking during the first trimester of pregnancy is also associated with an increased risk of miscarriage (Kesmodel, Wisborg, Olsen, Henriksen, & Sechler, 2002).
1.2.2.2 Tobacco

Lung cancer is the leading cause of cancer death among U.S. women, and about 90 percent of all lung cancer deaths among women are attributable to smoking. Lung cancer actually surpassed breast cancer as the leading cause of cancer death among women in 1987. In women, tobacco use is also a major cause of cancers of the oropharynx and bladder. Its use also increases the risk for liver, colorectal, and cervical cancer as well as cancers of the pancreas, kidney, larynx, and esophagus. Tobacco use is a major cause of coronary heart disease in women. There is an increased risk of stroke, subarachnoid hemorrhage, death from ruptured abdominal aortic aneurysm, and peripheral vascular atherosclerosis for women who smoke. A primary cause of chronic obstructive pulmonary disease among women is cigarette smoking (National Center for Chronic Disease Prevention and Health Promotion, 2006).

Women also face unique health effects from smoking in relation to menstrual and reproductive functions. Women who smoke are at an increased risk of conception delay, infertility, ectopic pregnancy, spontaneous abortion, and earlier onset of menopause (National Center for Chronic Disease Prevention and Health Promotion, 2006). Smoking during pregnancy is associated with an increased risk for abruptio placentae (e.g. the placenta separates from the uterus), premature rupture of membranes, placenta previa (e.g. abnormal location of the placenta with potential to cause massive hemorrhaging during delivery), and risk for preterm delivery. The risk for perinatal mortality, including stillbirths and neonatal deaths, along with the risk for Sudden Infant Death Syndrome (SIDS) is higher for infants of women who smoke during pregnancy. Finally, infants
who are born to women who smoke during pregnancy have a lower average birth weight and are more likely to be small for gestational age when compared to infants of women who do not smoke while they are pregnant. Women who smoke are also less likely to breastfeed their infants than non-smoking women (National Center for Chronic Disease Prevention and Health Promotion, 2005).

1.2.2.3 Illicit Drugs

In terms of health effects, the literature does not indicate gender differences in illicit drug users, with the exception of heroin use. Adverse health effects of the use of marijuana include the impairment of the immune system’s ability to fight disease, the potential to promote cancer of the lungs and other parts of the respiratory tract, and the increased risk of heart attack (National Institute on Drug Abuse, 2006b). Complications associated with the use of cocaine include disturbances in heart rhythm, heart attacks, strokes, seizures, headaches, chest pain, respiratory failure, and gastrointestinal complication like nausea and abdominal pain. Malnutrition is also a problem that many chronic cocaine users face due to the tendency of cocaine to decrease appetite (National Institute on Drug Abuse, 2006c). Cocaine use in women has also been found to disrupt the menstrual cycle and affect fertility (United Nations Office on Drugs and Crime, 2004). The use of heroin is associated with some serious health conditions, which include fatal overdose, collapsed veins, spontaneous abortion, infection of the heart lining and valves, abscesses, cellulitis, liver disease, and pulmonary complications (National Institute on Drug Abuse, 2006d). Women who inject opioids, such as heroin, are at an increased risk for HIV infection and also experience higher mortality rates than men.
Similar to cocaine, heroine also interferes with a woman's menstrual cycle (as cited in United Nations Office on Drugs and Crime, 2004). Methamphetamine use causes blood pressure and heart rate to increase, which can produce strokes. Its use can also lead to irritability, insomnia, confusion, anxiety, paranoia, aggressiveness, tremors, convulsions, extreme anorexia, respiratory problems, and cardiovascular collapse (National Institute on Drug Abuse, 2006e).

1.3 Literature Review- Stress

1.3.1 The History of Stress Research

Historically, stress research has been concerned with the causes of stress and the mediation and outcomes of stress. For those researching the causes of stress, attention is generally divided between life events as stressors and the enduring, persistent stressors, referred to as chronic strains. Life event stressors, otherwise known as eventful stressors, surface at discrete points in time while chronic stressors may either surface repeatedly or remain over a considerable amount of time (Pearlin, 2002). The pioneer in researching life event stressors, Hans Selye, provided the theoretical foundation for events research (Pearlin, 1989). Selye (1956) proposed the link between stress and health problems (Kenney, 2000). Holmes and Rahe (1967) then went on to develop the Social Readjustment Rating Scale used for identifying, measuring, and carrying out life events research. This tool assumed that all eventful experiences, such as jail time or house foreclosure were potentially stressful and the degree to how stressful they were varied with the magnitude of readjustment that was required by each specific event (Holmes & Rahe, 1967).
The early research into life events was successful in demonstrating relationships between the scope of eventful change and assorted indicators of health (Pearlin, 1989). These conclusions led to the theory that major life events increased the likelihood of illness (Kenney, 2000). Lazarus and Folkman (1984) went another step further and theorized that an individual’s appraisal or perception of a stressor as a challenge or threat, while also taking into consideration whether one’s overall demands exceeded resources, then determined how one would respond to the stressor. Later, effects of daily hassles, or chronic strains, on health problems were explored by Lazarus and colleagues (Kenney, 2000).

Instead of researching stress with an “either-or” mentality and focusing either on life events or on chronic strains, Pearlin (1989, 2002) viewed these two types of stress as a dynamic process in which events can indirectly create strains, just as chronic strains can cause stressful events while both strains and events provide meaningful contexts for each other. For example, consider divorce as a life-event. This event could cause one increased economic hardship, which could result in chronic strain. However, before divorce occurred, the strain of marital conflict could have led to divorce. The meaningful context around the divorce must also be taken into consideration as well because considering the prior circumstances of marital strife, the same transitional event, essentially divorce, that led to economic hardship might be considered liberating so the economic deprivation is not viewed as nearly as stressful as the previous condition of marriage. Therefore, it cannot be assumed that significant stressors occur singly.
Instead, clusters of stressors tend to develop, with each cluster being made up of a variety of events and strains (Pearlin, 1989).

1.3.2 The Stress Process Model

To fully construct a view of stress as a dynamic and evolving process, the Stress Process Model was developed (Pearlin, 2002). This model incorporates three core elements: stressors, moderators, and outcomes. Stressors are the problems, threats, or hardships that challenge people’s adaptive capacities. Moderators are the personal and social resources that people can use to contain, regulate, or ameliorate the effects of the stressors. Outcomes refer to the effects of the stressors, which are observed after the moderating resources are considered (Pearlin, 2002). These core elements of the stress process are continually being influenced by the social structure and its interrelated levels including social stratification, social institutions, and interpersonal relationships.

Essentially, the structural contexts of people’s lives are not separate from the stress process but are instead fundamental to the process. Therefore, to the extent to which these different systems embody the unequal distribution of opportunities, resources, power, and prestige, a low status within them may in and of itself be a source of stressful life conditions (Pearlin, 1989).

The Stress Process Model developed by Pearlin provides the opportunity to study the effects the social structure and its stratification based on social and economic class, race and ethnicity, gender, and age has on the stress process. Instead of controlling for social background factors, it is crucial that these circumstances be considered at all levels of the stress process from the social factors that bear on the kinds of stressors people are
exposed to, the social and personal resources to which people have access, and finally, the behavioral, emotional, and physical disorders stress is manifested through (Pearlin, 1989).

1.3.3 Socioeconomic Status and Stress

Individuals of low socioeconomic status (SES) are more likely to experience undesirable life events than those who are more socially advantaged (McLeod & Kessler, 1990). When looking at the components of SES, the component that is most consistently associated with exposure to undesirable life events is income (McLeod & Kessler, 1990). However, financial constraints are not solely responsible for SES differences related to the vulnerability to undesirable life events. Although income is the strongest determinant of how many life events an individual experiences, the reactions towards the life events are governed by occupational status and education as well (McLeod & Kessler, 1990).

Women of lower educational groups experience long-lasting difficulties with material stressors, which relate to disadvantages inherent in society that an individual has no choice but to be exposed to. Examples of material stressors that occur to women of lower educational groups include housing problems, material deprivation, financial problems, and equivalent income (e.g., the total net household income divided by the number of individuals depending on that income with more weight given to adults) (Droomers, Schrijvers, Stronks, van de Mheen, & Mackenback, 1999).

Exposure to material stressors repeatedly or over a considerable amount of time would contribute to chronic stress, particularly the status strain type. Status strains are hardships or problems that arise directly from an individual’s placement in stratified
social structures (Pearlin, 2002). Economic deprivation increases one’s exposure to stressors, which then limits personal and social resources for dealing with stressors, thus channeling the expression of stress outcomes towards specific behaviors such as alcohol abuse (Pearlin, 2002; Droomers, Schrijvers, Stronks, van de Mheen, & Mackenback, 1999).

1.3.4 Stress and Substance Use

1.3.4.1 Alcohol

The most persistent and influential psychological theory, which originated in the 1940s and 1950s, in relation to the causes of alcoholism and problem drinking as well as the determinants of alcohol consumption postulates that alcohol reduces tension and lessens the stress response (Ragland & Ames, 1996). In 1944, the Yale Summer School of Alcohol Studies held a series of lectures, which made the claim of stress and anxiety reduction as one of the most important, if not the most important, determinant of alcohol consumption (as cited in Ragland & Ames, 1996). Soon after the lectures, studies with animals showed that when tension was produced using the approach-avoidance paradigm the experimental neurosis could be mitigated with alcohol (Masserman, Jacques, & Nicholson 1945; Masserman & Yum 1946; Ragland & Ames, 1996). Conger’s classic article followed in 1956, which provided a systematic theory, based on the tension-reducing properties of alcohol and the involvement of the drinking response as a learned behavior (Ragland & Ames, 1996).

From a tension-reduction point of view, alcohol use is viewed as a way to relieve stressful feelings, therefore regulating the stress response. It is also understood that as
stress increases, drinking increases as well (Abbey, Smith, & Scott, 1993; Cole, Tucker, & Friedman, 1990). People who believe that alcohol relieves stress are more likely to report drinking alcohol to cope with their problems, so an individual's general expectations of the effects of alcohol are closely linked to personal motives for drinking (Smith, Abbey, & Scott, 1993). Both chronic stress and stress caused by life events have been found to be related to alcohol abuse. Evidence points towards a relationship between alcohol use and the occurrence of life events (Veenstra, Lemmens, Friesema, Garretsen, Knotterus, & Zwietering, 2006). Women actually attribute their drinking to stressful events more frequently than men (Lex, 1990).

With these foundations in place, there has been a tremendous increase in studies involving various forms of stress constructs and alcohol behavior. However, this proliferation of studies does not mean that a cumulative body of knowledge has come out of the accrued amount of research (Ragland & Ames, 1996). In contrast, an inconsistent and complex pattern of results has formulated, but one general consensus has formed, alcohol can have a dampening effect on what is known as the stress response (Ragland & Ames, 1996). The continuation of studies of stress and alcohol by different fields and across different groups and settings will contribute to forming a critical understanding of the psychosocial factors that contribute to alcohol abuse, which will provide an empirical and theoretical base for effective interventions (Ragland & Ames, 1996).

1.3.4.2 Tobacco

Associations have been found between a variety of indices of stress and smoking uptake (Kassel, Stroud, & Paronis, 2003). Much of this research has focused on
adolescents because a vast majority of smokers initiate smoking as adolescents, however, this is not to say that all of them do (Kassel, Stroud, & Paronis, 2003). Therefore, in studies conducted with adolescents, negative life events (Koval & Pederson, 1999; Siqueira, Diab, Bodian, & Rolnitzky, 2000) and chronic and acute stressors (Koval & Pederson, 1999) have been found to increase the risk for initiating smoking. Adolescents who experience stress are not only at an increased risk to begin smoking, but are also at a heightened risk to progress to becoming a regular smoker (Kassel, Stroud, & Paronis, 2003).

Smokers in the maintenance stage of smoking, which is characterized by patterns of regular use ranging from weekend to daily smoking, report experiencing more stress than nonsmokers (Jorm, Rodgers, Jacomb, Christensen, Henderson, & Korten, 1999; Kassel, Stroud, & Paronis, 2003; Kirkcaldy, Cooper, Brown, & Althanasou, 1994; Melemed, Kushner, Strauss, & Vigiser, 1997; Naquin & Gilber, 1996; Vollrath, 1998). Smokers report that they smoke more when they are stressed (Kassel, Stroud, & Paronis, 2003). To be more precise, smoking rates covary with negative life events, stress, and negative mood, meaning the more reported stress and negative mood, the more cigarettes are smoked (Conway, Vickers, Ward, & Rahe, 1981; Hellerstedt & Jeffrey, 1997; Kassel, Stroud, Paronis, 2003; Odgen & Mitandabari, 1997; Steptoe, Wardle, Pollard, Canaan, & Davies, 1996).

1.3.4.3 Illegal Drugs

In stress-coping models of substance abuse, various drugs are considered to serve as a coping function by facilitating general mood regulation (Kassel, Stroud, & Paronis,
As a means of regulating their mood and coping with stress, some people use an assortment of psychoactive drugs including alcohol (Cooper, Russell, Skinner, & Windle, 1992), tobacco (Ikard, Green, & Horn, 1969), marijuana (Schafer & Brown, 1991), and cocaine (Jaffe & Kilbey, 1994). When considering initiation of drug use, stress, specifically life events and current concerns, plays a role in the decision to begin using drugs (Ladwig & Anderson, 1989; Lindenberg, Reiskin, & Gendrop, 1994). For women currently using drugs, stressful life events are significantly associated with drug use (Hagan, 1988; Lindenberg, Reiskin, & Gendrop, 1994).

1.4 Purpose and Hypotheses

The purpose of this study is to estimate the associations between socioeconomic status, stressors (particularly eventful stressors and chronic stressors), and substance use among women of childbearing age. The hypotheses that were formulated based on previous literature are as follows:

Hypothesis 1: Women of higher SES will experience fewer eventful stressors than women of lower SES.

Hypothesis 1a: There will be a negative relationship between education and eventful stressors among women of childbearing age.

Hypothesis 1b: There will be a negative relationship between income and eventful stressors among women of childbearing age.
Hypothesis 2: Women of higher SES will experience less chronic stress than women of lower SES.

Hypothesis 2a: There will be a negative relationship between education and chronic stress among women of childbearing age.

Hypothesis 2b: There will be a negative relationship between income and chronic stress among women of childbearing age.

Hypothesis 3: Greater frequency of eventful stressors is associated with higher levels of substance use.

Hypothesis 4: Greater chronic stress is associated with higher levels of substance use.

Hypothesis 5: Eventful stressors and chronic stress mediate the relationship between SES and substance use.

Hypothesis 5a: Eventful stressors mediate the relationship between education and substance use.

Hypothesis 5b: Eventful stressors mediate the relationship between income and substance use.

Hypothesis 5c: Chronic stress mediates the relationship between education and substance use.
Hypothesis 5d: Chronic stress mediates the relationship between income and substance use.
CHAPTER 2
METHODS

2.1 Procedure and Sample

To investigate the proposed hypotheses, secondary data was analyzed from a cross-sectional study of women of childbearing age, 14-44 years. Data were obtained using an anonymous self-administered survey (Baruffi, Gartrell, & Wood, 2000). This project was approved by the Institutional Review Board of the University of Hawai‘i.

The sampling design consisted of a representative group of both private and public clinics from all 4 counties in the state of Hawai‘i, which were selected in three stages. In the first stage, all publicly supported clinics and private service providers who offer pregnancy testing and prenatal care services were included. In the second stage, providers who reported serving at least 50 women per month for initial prenatal care visits or pregnancy testing were selected, narrowing the sample to 13 clinics of which 11 agreed to participate in the study. In the final stage of sampling, recruitment quotas for institutions participating were calculated to ensure enrollment in the study of at least 1000 women during the data collection period. The participants in the study (n=1,163) included all women who presented for pregnancy testing or early stage prenatal services in the 11 participating institutions and who agreed to complete the questionnaire (Baruffi, Gartrell, & Wood, 2000). Table 1 provides the demographic characteristics of the study sample in regards to age, ethnicity, education, and income.
Table 1. Demographic Characteristics of the Sample

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>1,163</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Age (yrs)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14-17</td>
<td>75</td>
<td>6.5%</td>
</tr>
<tr>
<td>18-24</td>
<td>441</td>
<td>37.9%</td>
</tr>
<tr>
<td>25-34</td>
<td>416</td>
<td>35.8%</td>
</tr>
<tr>
<td>35-44</td>
<td>177</td>
<td>15.2%</td>
</tr>
<tr>
<td>Missing</td>
<td>54</td>
<td>4.6%</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>269</td>
<td>23.1%</td>
</tr>
<tr>
<td>Hawaiian</td>
<td>244</td>
<td>21.0%</td>
</tr>
<tr>
<td>Filipino</td>
<td>214</td>
<td>18.4%</td>
</tr>
<tr>
<td>Japanese</td>
<td>106</td>
<td>9.1%</td>
</tr>
<tr>
<td>Other Asian</td>
<td>42</td>
<td>3.6%</td>
</tr>
<tr>
<td>All Other</td>
<td>198</td>
<td>17.1%</td>
</tr>
<tr>
<td>Missing</td>
<td>90</td>
<td>7.7%</td>
</tr>
<tr>
<td><strong>Education (yrs)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 or less</td>
<td>83</td>
<td>7.1%</td>
</tr>
<tr>
<td>12</td>
<td>291</td>
<td>25.0%</td>
</tr>
<tr>
<td>13-15</td>
<td>407</td>
<td>35.0%</td>
</tr>
<tr>
<td>16 or more</td>
<td>311</td>
<td>26.8%</td>
</tr>
<tr>
<td>Missing</td>
<td>71</td>
<td>6.1%</td>
</tr>
<tr>
<td><strong>Family Income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-$9,000</td>
<td>172</td>
<td>14.8%</td>
</tr>
<tr>
<td>$10,000-$29,000</td>
<td>302</td>
<td>26.0%</td>
</tr>
<tr>
<td>$30,000-$49,000</td>
<td>218</td>
<td>18.7%</td>
</tr>
<tr>
<td>$50,000-$79,000</td>
<td>162</td>
<td>13.9%</td>
</tr>
<tr>
<td>$80,000 or more</td>
<td>81</td>
<td>7.0%</td>
</tr>
<tr>
<td>Missing</td>
<td>228</td>
<td>19.6%</td>
</tr>
</tbody>
</table>
2.2 Instrument

The questionnaire that was administered to the study participants was an expanded version of the Hawai'i 1996 Gallup Study’s self-administered questionnaire to include more socio-demographic characteristics, risk factors in women’s health, and indicators of health status. This instrument was pilot tested on two different populations to ensure that the survey was clear and understandable to women similar to those who would be in the sample population. The first population included volunteer women of reproductive age (n=10) at the University of Hawai'i. The second group included clients (n=10) at the OB-GYN clinic at the Waianae Coast Comprehensive Health Center. An expert review was also performed by professionals in the field of women’s health that comprised part of the staff (n=5) from the Kokua Kalihi Valley Health Center (Baruffi, Gartrell, & Wood, 2000).

The questionnaire has been included as an appendix (Appendix). Specific questions from the questionnaire were used to test the proposed hypotheses. They include number 9 in Section A, number 3 in Section B, and numbers 3, 6, 7, 12 in Section C.

2.2.1 Measures

2.2.1.1 Socioeconomic Status

For this study, education and income were the two indicators chosen to represent socioeconomic status. Education was defined as the number of years of education completed. Two questions concerning education level were included in the survey. The first question asked what the highest grade level, beginning at kindergarten up to 12\textsuperscript{th}
grade, was completed, and then the second question asked how many years of education beyond high school were completed. The sum of the two responses to these questions, ranging from “0” to “22 or more”, were the values assigned to the education variable. Income was defined as the approximate annual family or household income. The response values began with “$0 to less than $10,000” and continued in increments of $10,000 up to $80,000. After $80,000, income values increased to increments of $20,000 starting at “$80,000 to less than $100,000” and then up to $140,000. A response of “$140,000 or more” was available for those respondents whose incomes exceeded $140,000. Respondents could have also supplied the response “Don’t Know,” which was recoded into a missing value.

2.2.1.2 Eventful Stressors

Eventful Stressors was operationalized with the use of an index that asks how many of eight different life events occurred during the past year. These life events include: a serious accident or illness; trouble with the law; serious problems with relationships; respondent moved or someone moved in or out of the household; major financial problems or crisis; someone in the respondent’s family was robbed or attacked; an unwanted pregnancy, abortion, or miscarriage; someone in the respondent’s family lost a job or had major problems at work. These items were answered by a “yes” or “no” response. The number of items a respondent answered “yes” to were summed for a total response value ranging from 0-8.
2.2.1.3 Chronic Stress

Chronic stress was measured on a 5-pt. Likert-type scale addressing how stressful daily activities have been for the past two weeks. This item ranged from 1 (not at all stressful) to 5 (extremely stressful).

2.2.1.4 Substance Use

Substance use was indicated using a matrix question format indicating how often each of the following substances was used in the past 12 months: alcohol, tobacco, marijuana/hashish, cocaine/crack, methamphetamine, heroine/methadone/opiates. Originally, a 7-pt. scale assessing how often each of the six substances was used included the following responses and their corresponding codes: every day (6), every few days (5), about once a week (4), every few weeks (3), about once a month (2), every few months (1), and none in the past 12 months (0). These values were recoded to reflect a scale range from zero (no use) to one (every day of the week). Therefore, the value for the response “every few months” is .0110, which was computed by dividing 4 by 365, representing four days in a year. The value for the response “about once a month” is .0333 and was computed by dividing 1 by 30, representing one day a month. The next response category “every few weeks” has a value of .0714, determined by dividing 1 by 14, representing one day per two weeks. The response “about once a week” has a corresponding value of .1429, found by dividing 1 by 7, standing for one day per week. The value for the response “every few days” is .5, representing half of a week, and finally, “every day” has a value of 1 for every day of the week.
2.2.1.5 Potential Confounding Variables

Five questions were identified as being potential confounding variables in the study. These variables included pregnancy status, ethnicity, age, employment status, and marital status. In relation to pregnancy status, there is a substantial difference in alcohol use between women who are pregnant and those who are not. In 2003-2004, 11.2% of pregnant women consumed alcohol during their pregnancy while 52.8% of non-pregnant women consumed alcohol (SAMHSA, 2005a). Considering that 43.3% of the study sample was pregnant at the time of response, pregnancy status could be a potential confounding variable. The next possible confounding variable that was identified was ethnicity. Rates of abuse or dependence on alcohol or illicit drugs among women aged 18 years or older vary among ethnic groups with the highest rates among American Indians or Alaska Natives (19.9%), followed by whites (6.3%), African Americans (4.5%), Hispanics (4.4%), and Asians (3.4%) (SAMHSA, 2005b). In 2005, smoking prevalence was highest among American Indian or Alaska Natives (32%), followed by whites (21.9%), African Americans (21.5%), Hispanics (16.2%), and Asians (13.3%) (CDC, 2006e). With Hawaiʻi’s diverse ethnic population, which is reflected in the study sample, these findings suggest that substance use could vary in the sample population based on ethnicity and could therefore add bias to study results unless controlled for. Data also shows that alcohol use varies among age groups. In 2003-2004, 28.7% of females aged 15-17 consumed alcohol while 58.7% of females aged 18-25 consumed alcohol and 54.3% of females aged 26-44 consumed alcohol (SAMHSA, 2005a). Therefore, age could be a potential confounding variable. Looking at employment status,
non-pregnant women who were employed are 1.5 times more likely to use any alcohol, 1.3 times more likely to binge drink, and 1.3 times more likely to frequently drink than those who are unemployed (CDC, 2002). Lastly, marital status was also identified as a potential confounding variable because it has been found that women aged 18-49 who were married had a lower rate of substance abuse or dependence than women of any other marital status, including divorced, separated, or never married women. In 2003, 10.7% of women who were divorced or separated had abused or were dependent on alcohol or an illicit drug along with 15.9% who had never married compared with only 4.1% of married women (SAMHSA, 2005b). Therefore, pregnancy status, ethnicity, age, employment status, and marital status were all determined to be potential confounding variables that could bias results.

2.3 Analysis

Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS, Version 14.0). Principal component analysis was conducted with the six observed substance use variables to determine if the variables could be reduced. Descriptive statistics appropriate to the level of measurement were generated for all study variables, which include education, income, eventful stressors, chronic stress, and substance use. One-way analysis of variance (ANOVA) was conducted on all potential confounding variables to determine which variables needed to be adjusted for.

Multiple linear regression analyses were used to test the five hypotheses. The significance level for all analyses was \( p < .05 \). Both unstandardized and standardized beta coefficients are presented. The unstandardized regression coefficient is the average
amount the dependent variable increases when the independent variable increases one unit. It is the slope of the regression line (Garson, 2007). The unstandardized regression coefficient associated with each variable is given in terms of the units of this variable. On the other hand, standardized regression coefficients (beta) use a standard unit that is the same for all variables in the equation (Abrams, 2006). Standardization is done by subtracting the mean from each data point and dividing the result by the standard deviation, which gives all variables a mean of zero and a standard deviation of one. The beta weight is therefore the average amount the dependent variable increases when the independent variable increases one standard deviation and the other independent variables are held constant. For example, if an independent variable has a beta weight of .5, the dependent variable will increase by half a standard deviation when the independent variable increases by one standard deviation. The beta weights help assess the unique importance of the independent variables relative to the given model embodied in the regression equation (Garson, 2007).
CHAPTER 3
RESULTS

3.1 Principal Components Analysis

Principal component analysis is appropriate when measures have been obtained on a number of observed variables, but a smaller number of artificial variables, (e.g. principal components) will account for most of the variance in the observed variables (Hatcher, 1994). The principal components can then be used as independent or dependent variables in subsequent analyses. Therefore, principal component analysis is a variable reduction procedure that is useful when there is believed to be a redundancy in variables, meaning some of the variables are correlated with one another and are therefore measuring the same construct. Table 2 shows the correlations existing between the 6 substance use variables.
## Table 2. Pearson Correlations Between the Original Six Substance Use Variables

<table>
<thead>
<tr>
<th>Substance</th>
<th>Alcohol</th>
<th>Tobacco</th>
<th>Marijuana</th>
<th>Cocaine</th>
<th>Meth</th>
<th>Heroin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tobacco</td>
<td>.195**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marijuana</td>
<td>.246**</td>
<td>.230**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cocaine</td>
<td>.039</td>
<td>.085**</td>
<td>.070*</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meth</td>
<td>.039</td>
<td>.133**</td>
<td>.047</td>
<td>.013</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Heroin</td>
<td>.161**</td>
<td>.062*</td>
<td>.083**</td>
<td>.028</td>
<td>.309**</td>
<td>1</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level  
** Correlation is significant at the 0.01 level
The correlations of the substance use variables show that five of the six items seem to hang together in two distinct groups. First, the alcohol, tobacco, and marijuana variables show small correlations (around .2) with one another. In the same way, the methamphetamine and heroin variables correlate with one another. Also, the alcohol, tobacco, and marijuana variables demonstrate weaker correlations with the methamphetamine and heroin variables than between themselves. The cocaine variable shows almost no relationship with the other five substance use variables. The correlation coefficient between cocaine and tobacco is significant at the .01 level and the cocaine and marijuana coefficient is significant at the .05 level. However, these correlations are below .2, which suggests almost no relationship exists (Cohen, 1988).

Responses to the 6 substance use questions were subjected to a principal component analysis. The principal axis method was used to extract the components, which was followed by a varimax (orthogonal) rotation. The Kaiser criterion was applied as one of two criteria for determining the number of components to retain and interpret. The Kaiser criterion states that only components with an eigenvalue greater than 1 are retained (Kaiser, 1960). The rationale for this criterion is that each observed variable contributes one unit of variance to the total variance in the data set. The sum of the eigenvalues is then equal to the number of observed variables. A component displaying an eigenvalue greater than 1 is accounting for a greater amount of variance contributed by one variable and is therefore accounting for a meaningful amount of variance. It is not effective to retain any component that accounts for less variance attributed by one variable since the purpose of principal component analysis is to reduce the number of...
observed variables into a smaller number of components (Hatcher, 1994). In the present study, only the first two components displayed eigenvalues greater than 1. The corresponding eigenvalues for component one and two equaled 1.62 and 1.17. The results of a scree test also suggested that only the first two components were meaningful (Figure 1).

With the scree test, the eigenvalues associated with each component are plotted. A “break” between the components with relatively large eigenvalues and those with small eigenvalues can be seen from the plot. The components appearing before this “break” are assumed to be meaningful and should be retained for rotations while those appearing after the “break” are assumed to be unimportant and are therefore not retained (Hatcher, 1994). Therefore, in accordance with the Kaiser criterion and the scree test, only the first two components were retained for rotation. Combined, components 1 and 2 accounted for 56.53% of the total variance.
Figure 1. Scree Plot of Eigenvalues from Principal Component Analysis for Substance Use
A varimax rotation was then performed on the factor solution for the purpose of reviewing of the correlations between the variables and the components to interpret the components more clearly. A varimax rotation is an orthogonal rotation, meaning it results in uncorrelated components. This rotation is done to maximize the uniqueness of each component (Hatcher, 1994). The substance use questionnaire items and corresponding factor loadings are presented in Table 3.
### Table 3. Rotated Component Matrix from Principal Component Analysis of Substance Use Variables

<table>
<thead>
<tr>
<th>Component 1</th>
<th>Component 2</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.650*</td>
<td>0.129</td>
<td>B3a. How often have you used alcohol in the past 12 months?</td>
</tr>
<tr>
<td>0.643*</td>
<td>0.124</td>
<td>B3c. How often have you used tobacco in the past 12 months?</td>
</tr>
<tr>
<td>0.722*</td>
<td>0.010</td>
<td>B3d. How often have you used marijuana in the past 12 months?</td>
</tr>
<tr>
<td>0.315</td>
<td>-0.060</td>
<td>B3e. How often have you used cocaine in the past 12 months?</td>
</tr>
<tr>
<td>-0.004</td>
<td>0.814*</td>
<td>B3f. How often have you used methamphetamine in the past 12 months?</td>
</tr>
<tr>
<td>0.086</td>
<td>0.794*</td>
<td>B3g. How often have you used heroin in the past 12 months?</td>
</tr>
</tbody>
</table>

* Factor loadings greater than .4
When interpreting the rotated factor pattern, an item was said to load on a given component if the factor loading was .40 or greater for that component and was less than .40 for the other (Hatcher, 1994). In an orthogonal analysis, factor loadings are equivalent to bivariate correlations between the observed variables and the components (Hatcher, 1994). Using these specified criteria, three items (e.g. alcohol, tobacco, and marijuana use) were found to load on the first component. Two items (e.g. methamphetamine and heroine use) loaded on the second component. Cocaine use did not load on either component.

Cocaine use demonstrated almost no correlation with the other five substance use variables and did not load on the two components extracted in the principal component analysis with a varimax rotation. To better determine if cocaine use could possibly be retained as a third component by itself, a third principal component analysis was run with the specification that three components be calculated. Results indicated that the third component had an eigenvalue of .979, and thus, explains less variance than is contained in one variable. It does not make sense to retain a factor that does not extract as much as the equivalent of one original variable. Cocaine use in the study population was also very low, with 24 respondents indicating use. With such a small frequency, this variable lacks power for prediction in regression analyses (Cohen, 1988). Therefore, the cocaine use variable was dropped from use in further analyses.

Frequency use of methamphetamine and heroine was also examined. Only 35 respondents indicated methamphetamine use and 4 indicated heroin use. These two variables, even when combined as one variable, which was suggested by the results of the
principal component analyses, also lack power for prediction in regression analyses (Cohen, 1988). The methamphetamine and heroin variables were therefore dropped from use in further analyses.

A substance use variable was computed by combining the alcohol, tobacco, and marijuana use variables. Values range from 0 (no use) to 3 (every day use of all three substances). One respondent was deleted from the data set due to no use of alcohol, tobacco, or marijuana but monthly use of methamphetamine. All other respondents who had used cocaine, methamphetamine, or heroin also used one of the other substances, and therefore were included in analyses (n=1163).

3.2 Descriptive Findings

A summary of the descriptive results is provided in Table 4.

Table 4. Descriptive Statistics of Study Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Median</th>
<th>Standard Deviation</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>14.10</td>
<td>14.00</td>
<td>2.71</td>
<td>.79</td>
<td>.95</td>
</tr>
<tr>
<td>Income</td>
<td>4.06</td>
<td>3.00</td>
<td>2.68</td>
<td>.89</td>
<td>.15</td>
</tr>
<tr>
<td>Eventful Stress</td>
<td>1.41</td>
<td>1.00</td>
<td>1.48</td>
<td>1.16</td>
<td>1.02</td>
</tr>
<tr>
<td>Chronic Stress</td>
<td>2.81</td>
<td>3.00</td>
<td>1.16</td>
<td>.17</td>
<td>-.89</td>
</tr>
<tr>
<td>Substance Use</td>
<td>.37</td>
<td>.033</td>
<td>.55</td>
<td>1.53</td>
<td>1.88</td>
</tr>
</tbody>
</table>

On average, survey respondents had a high school education with some education beyond high school. More specifically, 25.0% of respondents graduated from high school with 35.0% going on for 1-3 more years of higher education and 26.8% having 16
or more years of education. Only 7.1% of respondents had 11 years or less of education. Table 1 shows the frequency distribution of the education level of respondents. For both skewness and kurtosis, values between -2 to 2 are considered to be normally distributed (Corder, 2004). Both skewness and kurtosis measures show a fairly normal distribution in respondents’ level of education (refer to Table 4).

The average annual household income was between $40,000 and $60,000. A closer look reveals that 26.0% of respondents’ annual household income ranged from $10,000 to less than $30,000, 18.7% of respondents income was between $30,000 to less than $50,000, and 13.9% of respondents income was between $50,000 to less than $80,000. Table 1 shows the frequency distribution of the annual household income of respondents. Both skewness and kurtosis measures show a fairly normal distribution in respondents’ income levels (refer to Table 4).

Looking at the number of eventful stressors experienced by respondents within the last year, 26.0% experienced one eventful stressor and 17.2% experienced two eventful stressors. No respondent experienced all eight eventful stressors within the last year. Both skewness and kurtosis measures show a fairly normal distribution in responses (refer to Table 4). Figure 2 shows the frequency distribution of the number of eventful stressors occurring to respondents within the last year.
Figure 2. Percentage of Respondents Experiencing Eventful Stressors
On average, chronic stress was moderate for respondents. 30.9% of respondents found their daily activities to be a little stressful while 24.6% felt their daily activities were moderately stressful. However, 22.7% of respondents were feeling quite a bit stressful about their daily activities at the time of the survey. Both skewness and kurtosis measures show a fairly normal distribution in responses (refer to Table 4). Figure 3 shows the frequency distribution of the chronic stress levels of respondents.
Figure 3. Percentage of Respondents by Chronic Stress Level

Chronic Stress Levels

Not at all Stressful  A Little Stressful  Moderately Stressful  Quite a Bit Stressful  Extremely Stressful

Percentage

0  5  10  15  20  25  30  35  40  45  50
Substance use, which included alcohol, tobacco, and marijuana use, occurred on average once a week to every few days. Both skewness and kurtosis measures show a fairly normal distribution in responses (refer to Table 4).

3.3 Correlation Measurement

Pearson product correlations were calculated between the six study variables and are presented in Table 5.

Table 5. Pearson Correlations Between Study Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Education</th>
<th>Income</th>
<th>Eventful Stress</th>
<th>Chronic Stress</th>
<th>Substance Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>.25**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eventful Stress</td>
<td>-.15**</td>
<td>-.29**</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chronic Stress</td>
<td>.05</td>
<td>-.04</td>
<td>.22**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Substance Use</td>
<td>-.22**</td>
<td>-.18**</td>
<td>.20**</td>
<td>.10**</td>
<td>1</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level
** Correlation is significant at the 0.01 level

It can be seen that education is related to income, eventful stress, and substance use. Income is related to education, eventful stress, and substance use. Education and income are negatively associated with eventful stress and substance use. However, this relationship is small. Eventful stress is positively associated with chronic stress and substance use. Chronic stress demonstrates no relationship with the other variables except for eventful stress and substance use.
3.4 Confounding Variables

Five variables were identified as being potential confounding variables in the study. These variables included pregnancy status, ethnicity, age, employment status, and marital status. One-way ANOVAs were run with each potential confounding variable and every one of the five variables in the study to determine if any of the potential confounding variables did actually have an effect on any of the variables under study. For those ANOVA tests that were significant, which implies that the groups composing the potential confounding variable are in fact different from one another depending on the outcome variable, the confounding variable was controlled for in all regression analyses used to test the hypotheses (Mertler & Vannatta, 2002). All five of the potential confounding variables (e.g., pregnancy status, ethnicity, age, employment status, and marital status) were found to have an effect on at least one of the five study variables and were therefore controlled for in each regression analysis to minimize bias in the study. The ANOVA results are presented in Table 6. Four of the five confounding variables, which included marital status, employment status, ethnicity, and pregnancy status, were dummy coded because they were categorical variables and could not be directly entered into the multiple linear regression analyses.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Education</th>
<th>Income</th>
<th>Eventful Stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnancy Status</td>
<td>F(1, 1066)=8.84*</td>
<td>F(1, 915)=.09</td>
<td>F(1, 1091)=1.44</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>F(12, 1011)=4.60*</td>
<td>F(12, 868)=5.51*</td>
<td>F(12, 1013)=2.48*</td>
</tr>
<tr>
<td>Age</td>
<td>F(29, 1032)=4.37*</td>
<td>F(29, 883)=3.55*</td>
<td>F(29, 1038)=2.13*</td>
</tr>
<tr>
<td>Employment Status</td>
<td>F(7, 1022)=2.23*</td>
<td>F(7, 876)=3.83*</td>
<td>F(7, 1026)=2.78*</td>
</tr>
<tr>
<td>Marital Status</td>
<td>F(4, 1078)=3.16*</td>
<td>F(4, 922)=18.08*</td>
<td>F(4, 1081)=23.52*</td>
</tr>
</tbody>
</table>

*Significant at the .05 level
Table 6. (Continued) ANOVA Results Between Confounding Variables and Study Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Chronic Stress</th>
<th>Substance Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pregnancy Status</td>
<td>F(1, 1127)=7.77*</td>
<td>F(1, 1091)=6.21*</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>F(12, 1050)=1.34</td>
<td>F(12, 1026)=2.29*</td>
</tr>
<tr>
<td>Age</td>
<td>F(29, 1069)=.97</td>
<td>F(29, 1040)=1.35</td>
</tr>
<tr>
<td>Employment Status</td>
<td>F(7, 1067)=1.69</td>
<td>F(7, 1039)=1.72</td>
</tr>
<tr>
<td>Marital Status</td>
<td>F(4, 1140)=1.89</td>
<td>F(4, 1100)=11.29*</td>
</tr>
</tbody>
</table>

*Significant at the .05 level
3.5 Analyses

3.5.1 Hypothesis 1

The first hypothesis was that women of higher SES will experience fewer eventful stressors than women of lower SES. Education and income were used as indicators of SES. Therefore, a negative relationship will exist between education and eventful stress as well as between income and eventful stress. Eventful stressors was regressed on education and income separately. The results of the multiple linear regression, which included not only the independent variable, education, but all five confounding variables, indicated that women with more education experience fewer eventful stressors (standardized beta (β) = -.11, p<.05). The unstandardized regression coefficient indicated that for every year of education, the occurrence of eventful stressors decreased by .06. Complete regression results can be found in Table 7.

When eventful stressors was regressed on income while controlling for the confounding variables, the results of this multiple linear regression indicated that women with more income also experience fewer eventful stressors (β = -.22, p<.05). The unstandardized regression coefficient indicated that for every $10,000 increase in income, the occurrence of eventful stressors decreased by .12. Complete regression results can be found in Table 8. Therefore, the null hypothesis was rejected, and it was concluded that women of higher SES do experience fewer eventful stressors than women of lower SES.
Table 7. Regression Results for Hypothesis 1a: Eventful Stressors Regressed on Education

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>95% Confidence Interval for B</th>
<th>Standardized Coefficients</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>Lower</td>
<td>Upper</td>
</tr>
<tr>
<td>Education</td>
<td>-0.06</td>
<td>0.02</td>
<td>-0.10</td>
<td>-0.02</td>
</tr>
<tr>
<td>Pregnancy Status (pregnant)</td>
<td>-0.12</td>
<td>0.10</td>
<td>-0.32</td>
<td>0.09</td>
</tr>
<tr>
<td>Pregnancy Status (unknown)</td>
<td>-0.28</td>
<td>0.18</td>
<td>-0.63</td>
<td>0.06</td>
</tr>
<tr>
<td>Marital Status (not married)</td>
<td>0.52</td>
<td>0.10</td>
<td>0.32</td>
<td>0.72</td>
</tr>
<tr>
<td>Employment Status (unemployed)</td>
<td>0.30</td>
<td>0.10</td>
<td>0.10</td>
<td>0.50</td>
</tr>
<tr>
<td>Ethnicity (non-white)</td>
<td>0.05</td>
<td>0.11</td>
<td>-0.17</td>
<td>0.26</td>
</tr>
<tr>
<td>Age</td>
<td>-0.02</td>
<td>0.01</td>
<td>-0.03</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Dependent Variable: Eventful Stressors
Table 8. Regression Results for Hypothesis 1b: Eventful Stressors Regressed on Income

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>95% Confidence Interval for B</th>
<th>Standardized Coefficients</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>Lower</td>
<td>Upper</td>
</tr>
<tr>
<td>Income</td>
<td>-0.12</td>
<td>0.02</td>
<td>-0.16</td>
<td>-0.08</td>
</tr>
<tr>
<td>Pregnancy Status (pregnant)</td>
<td>-0.07</td>
<td>0.11</td>
<td>-0.28</td>
<td>0.15</td>
</tr>
<tr>
<td>Pregnancy Status (unknown)</td>
<td>-0.14</td>
<td>0.19</td>
<td>-0.51</td>
<td>0.24</td>
</tr>
<tr>
<td>Marital Status (not married)</td>
<td>0.40</td>
<td>0.11</td>
<td>0.18</td>
<td>0.62</td>
</tr>
<tr>
<td>Employment Status (unemployed)</td>
<td>0.25</td>
<td>0.11</td>
<td>0.03</td>
<td>0.46</td>
</tr>
<tr>
<td>Ethnicity (non-white)</td>
<td>0.09</td>
<td>0.11</td>
<td>-0.12</td>
<td>0.31</td>
</tr>
<tr>
<td>Age</td>
<td>-0.02</td>
<td>0.01</td>
<td>-0.04</td>
<td>-0.01</td>
</tr>
</tbody>
</table>

Dependent Variable: Eventful Stressors
3.5.2 Hypothesis 2

The second hypothesis was that women of higher SES will experience less chronic stress than women of lower SES. Education and income were used as indicators of SES. Therefore, a negative relationship will exist between education and chronic stress as well as between income and chronic stress. Chronic stress was regressed on both education and income separately while controlling for confounding variables. The results of these multiple linear regressions indicate that a significant relationship does not exist between education and chronic stress ($\beta = .04$, $p>.05$) or between income and chronic stress ($\beta = -.03$, $p>.05$). Therefore, the null hypothesis was not rejected, and it was concluded that SES is not related to chronic stress. Complete regression results can be found in Tables 9 and 10.
Table 9. Regression Results for Hypothesis 2a: Chronic Stress Regressed on Education

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>95% Confidence Interval for B</th>
<th>Standardized Coefficients</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>Lower</td>
<td>Upper</td>
</tr>
<tr>
<td>Education</td>
<td>0.02</td>
<td>0.01</td>
<td>-0.01</td>
<td>0.05</td>
</tr>
<tr>
<td>Pregnancy Status (pregnant)</td>
<td>-0.24</td>
<td>0.08</td>
<td>-0.41</td>
<td>-0.08</td>
</tr>
<tr>
<td>Pregnancy Status (unknown)</td>
<td>-0.16</td>
<td>0.14</td>
<td>-0.43</td>
<td>0.11</td>
</tr>
<tr>
<td>Marital Status (not married)</td>
<td>0.15</td>
<td>0.08</td>
<td>-0.01</td>
<td>0.31</td>
</tr>
<tr>
<td>Employment Status (unemployed)</td>
<td>0.11</td>
<td>0.08</td>
<td>-0.05</td>
<td>0.27</td>
</tr>
<tr>
<td>Ethnicity (non-white)</td>
<td>-0.12</td>
<td>0.09</td>
<td>-0.29</td>
<td>0.05</td>
</tr>
<tr>
<td>Age</td>
<td>0.00</td>
<td>0.01</td>
<td>-0.01</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Dependent Variable: Chronic Stress
Table 10. Regression Results for Hypothesis 2b: Chronic Stress Regressed on Income

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>95% Confidence Interval for B</th>
<th>Standardized Coefficients</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>Lower</td>
<td>Upper</td>
</tr>
<tr>
<td>Income</td>
<td>-0.01</td>
<td>0.02</td>
<td>-0.05</td>
<td>0.02</td>
</tr>
<tr>
<td>Pregnancy Status (pregnant)</td>
<td>-0.25</td>
<td>0.09</td>
<td>-0.43</td>
<td>-0.08</td>
</tr>
<tr>
<td>Pregnancy Status (unknown)</td>
<td>-0.14</td>
<td>0.15</td>
<td>-0.44</td>
<td>0.16</td>
</tr>
<tr>
<td>Marital Status (not married)</td>
<td>0.08</td>
<td>0.09</td>
<td>-0.10</td>
<td>0.26</td>
</tr>
<tr>
<td>Employment Status (unemployed)</td>
<td>0.04</td>
<td>0.09</td>
<td>-0.13</td>
<td>0.22</td>
</tr>
<tr>
<td>Ethnicity (non-white)</td>
<td>-0.11</td>
<td>0.09</td>
<td>-0.28</td>
<td>0.07</td>
</tr>
<tr>
<td>Age</td>
<td>0.00</td>
<td>0.01</td>
<td>-0.01</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Dependent Variable: Chronic Stress
3.5.3 Hypothesis 3

The third hypothesis was that greater frequency of eventful stressors is associated with higher levels of substance use. A positive relationship between eventful stressors and substance use among women of childbearing age will exist. Substance use was regressed on eventful stressors while controlling for confounding variables. The multiple linear regression equation revealed that significant variance in substance use was explained by eventful stress ($\beta = .18, p<.05$). The unstandardized regression coefficient indicated that for every one eventful stressor experienced, the use of substances increased by .07. Therefore, the null hypothesis was rejected, and these results indicate that greater frequency of eventful stressors is associated with higher levels of substance use.

Complete regression results can be found in Table 11.
Table 11. Regression Results for Hypothesis 3: Substance Use Regressed on Eventful Stressors

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>95% Confidence Interval for B</th>
<th>Standardized Coefficients</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>Lower</td>
<td>Upper</td>
</tr>
<tr>
<td>Eventful Stressors</td>
<td>0.07</td>
<td>0.01</td>
<td>0.04</td>
<td>0.09</td>
</tr>
<tr>
<td>Pregnancy Status (pregnant)</td>
<td>0.00</td>
<td>0.04</td>
<td>-0.08</td>
<td>0.08</td>
</tr>
<tr>
<td>Pregnancy Status (unknown)</td>
<td>0.18</td>
<td>0.07</td>
<td>0.05</td>
<td>0.32</td>
</tr>
<tr>
<td>Marital Status (not married)</td>
<td>0.11</td>
<td>0.04</td>
<td>0.03</td>
<td>0.19</td>
</tr>
<tr>
<td>Employment Status (unemployed)</td>
<td>0.02</td>
<td>0.04</td>
<td>-0.05</td>
<td>0.10</td>
</tr>
<tr>
<td>Ethnicity (non-white)</td>
<td>-0.09</td>
<td>0.04</td>
<td>-0.17</td>
<td>-0.01</td>
</tr>
<tr>
<td>Age</td>
<td>0.00</td>
<td>0.00</td>
<td>-0.01</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Dependent Variable: Substance Use
3.5.4 Hypothesis 4

The fourth hypothesis was that greater frequency of chronic stress is associated with higher levels of substance use. A positive relationship will exist between chronic stress and substance use among women of childbearing age. Substance use was regressed on chronic stress while controlling for confounding variables. The multiple linear regression equation revealed that significant variance in substance use was explained by chronic stress ($\beta = .08, p<.05$). The unstandardized regression coefficient indicated that for every one increment increase in the scale of chronic stress, the use of substances increased by .04. Therefore, the null hypothesis was rejected, and these results indicate that greater frequency of chronic stress is associated with higher levels of substance use. Complete regression results can be found in Table 12.
Table 12. Regression Results for Hypothesis 4: Substance Use Regressed on Chronic Stress

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>95% Confidence Interval for B</th>
<th>Standardized Coefficients</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>Lower</td>
<td>Upper</td>
</tr>
<tr>
<td>Chronic Stress</td>
<td>0.04</td>
<td>0.02</td>
<td>0.01</td>
<td>0.07</td>
</tr>
<tr>
<td>Pregnancy Status (pregnant)</td>
<td>0.00</td>
<td>0.04</td>
<td>-0.08</td>
<td>0.07</td>
</tr>
<tr>
<td>Pregnancy Status (unknown)</td>
<td>0.17</td>
<td>0.07</td>
<td>0.04</td>
<td>0.30</td>
</tr>
<tr>
<td>Marital Status (not married)</td>
<td>0.13</td>
<td>0.04</td>
<td>0.05</td>
<td>0.20</td>
</tr>
<tr>
<td>Employment Status (unemployed)</td>
<td>0.05</td>
<td>0.04</td>
<td>-0.03</td>
<td>0.12</td>
</tr>
<tr>
<td>Ethnicity (non-white)</td>
<td>-0.08</td>
<td>0.04</td>
<td>-0.16</td>
<td>0.00</td>
</tr>
<tr>
<td>Age</td>
<td>-0.01</td>
<td>0.00</td>
<td>-0.01</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Dependent Variable: Substance Use
3.5.5 Hypothesis 5

The fifth hypothesis was that eventful stressors and chronic stress mediate the relationship between SES and substance use. A variable is considered to function as a mediator when it accounts for the relation between the predictor (e.g. independent) and criterion (e.g. dependent) variables. The mediator function of a third variable represents the generative mechanism through which the independent variable influences the dependent variable. Figure 4 is a path diagram depicting the causal chain involved in mediation. This model depicts a three-variable system where there are two causal paths leading to the dependent variable, which represent the direct impact of the independent variable (Path c) and the impact of the mediator (Path b). A path also exists from the independent variable to the mediator (Path a).

Figure 4. Mediation Model
According to Baron and Kenny's (1986) method used to test mediation, a variable is a mediator when it meets the following conditions: (a) variation in the independent variable significantly accounts for variation in the presumed mediator (i.e., they must be significantly related, Path a), (b) variation in the independent variable significantly accounts for variation in the dependent variable (i.e., they must be significantly related, Path c), (c) variations in the mediator significantly account for variation in the dependent variable (i.e., they must be significantly related, Path b), and (d) when you statistically control for the potential mediator, the relationship that once existed between the independent variable and the dependent variable ceases to exist or is significantly reduced (Baron & Kenney, 1986; Paxton, Estabrooks, & Dzewaltowski, 2004). A significant reduction signifies that a given mediator is indeed potent, but not both a sufficient and necessary condition for an effect to occur. Social phenomena usually have multiple causes, so it is realistic to study mediators that significantly reduce Path c between the independent and dependent variables rather than eliminating the relationship entirely (Baron & Kenney, 1986).

To test for mediation, a series of regression models need to be estimated. They include the three following regression equations: first, regressing the mediator on the independent variable; second, regressing the dependent variable on the independent variable; and third, regressing the dependent variable on the mediating variable. These regression equations test the linkages of the mediation model. All three regression equations must demonstrate that a significant relationship exists between the variables in the mediation model. Without all three causal paths, mediation cannot occur. If all
regression equations hold in the predicted direction, then a fourth regression equation should be run to determine mediation, which is said to occur when the effect of the independent variable on the dependent variable lessens once the mediating variable is added to the regression model (Baron & Kenney, 1986; Paxton, Estabrooks, & Dzewaltowski, 2004).

Hypothesis 5a stated that eventful stressors mediate the relationship between education and substance use. Using Baron and Kenney’s (1986) method to test for mediation, the first step is regression of the mediator on the independent variable. This step was completed while testing Hypothesis 1 and revealed that significant variance in eventful stressors was explained by education ($\beta = -.11, p<.05$) (Table 7). The second step of regressing the dependent variable on the independent variable, while controlling for confounding variables, showed that significant variance in substance use was explained by education ($\beta = -.20, p<.05$) (Table 13). Complete regression results for step 2 of this mediation model can be found in Table 13. In step 3 of the mediation method, substance use (e.g., dependent variable) was regressed on eventful stress (e.g., mediating variable), which was done while testing Hypothesis 3. Significant variance in substance use was explained by eventful stress ($\beta = .18, p<.05$). The final regression equations, Figure 5, revealed that when the equation controlled for eventful stressors the relationship between education and substance use was reduced ($\beta = -.19, p<.05$). The beta decreased by 5%. Complete regression results for step 4 of this mediation model can be found in Table 14. Partial mediation did occur because the effect of the independent variable
(e.g., education) on the dependent variable (e.g., substance use) lessened once the mediating variable (e.g., eventful stressors) was added to the regression model.

Figure 5. Mediation Model for Education, Eventful Stressors, and Substance Use
<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>95% Confidence Interval for B</th>
<th>Standardized Coefficients</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>-0.04</td>
<td>0.01</td>
<td>-0.05 -0.03</td>
<td>-0.20</td>
</tr>
<tr>
<td>Pregnancy Status (pregnant)</td>
<td>-0.02</td>
<td>0.04</td>
<td>-0.10 0.05</td>
<td>-0.02</td>
</tr>
<tr>
<td>Pregnancy Status (unknown)</td>
<td>0.16</td>
<td>0.07</td>
<td>0.03 0.29</td>
<td>0.08</td>
</tr>
<tr>
<td>Marital Status (not married)</td>
<td>0.13</td>
<td>0.04</td>
<td>0.05 0.20</td>
<td>0.11</td>
</tr>
<tr>
<td>Employment Status (unemployed)</td>
<td>0.04</td>
<td>0.04</td>
<td>-0.04 0.11</td>
<td>0.03</td>
</tr>
<tr>
<td>Ethnicity (non-white)</td>
<td>-0.08</td>
<td>0.04</td>
<td>-0.16 0.00</td>
<td>-0.07</td>
</tr>
<tr>
<td>Age</td>
<td>0.00</td>
<td>0.00</td>
<td>-0.01 0.00</td>
<td>-0.02</td>
</tr>
</tbody>
</table>

Dependent Variable: Substance Use
Table 14. Regression Results for Step 4 of Mediation Model Testing Hypothesis 5a:
Substance Use Regressed on Education while controlling for Eventful Stressors

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>95% Confidence Interval for B</th>
<th>Standardized Coefficients</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>Lower</td>
<td>Upper</td>
</tr>
<tr>
<td>Education</td>
<td>-0.04</td>
<td>0.01</td>
<td>-0.05</td>
<td>-0.03</td>
</tr>
<tr>
<td>Eventful Stressors</td>
<td>0.06</td>
<td>0.01</td>
<td>0.03</td>
<td>0.08</td>
</tr>
<tr>
<td>Pregnancy Status (pregnant)</td>
<td>-0.01</td>
<td>0.04</td>
<td>-0.09</td>
<td>0.06</td>
</tr>
<tr>
<td>Pregnancy Status (unknown)</td>
<td>0.18</td>
<td>0.07</td>
<td>0.05</td>
<td>0.32</td>
</tr>
<tr>
<td>Marital Status (not married)</td>
<td>0.11</td>
<td>0.04</td>
<td>0.03</td>
<td>0.19</td>
</tr>
<tr>
<td>Employment Status (unemployed)</td>
<td>0.01</td>
<td>0.04</td>
<td>-0.06</td>
<td>0.09</td>
</tr>
<tr>
<td>Ethnicity (non-white)</td>
<td>-0.09</td>
<td>0.04</td>
<td>-0.17</td>
<td>-0.01</td>
</tr>
<tr>
<td>Age</td>
<td>0.00</td>
<td>0.00</td>
<td>-0.01</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Dependent Variable: Substance Use
Hypothesis 5b stated that eventful stressors mediate the relationship between income and substance use. Using Baron and Kenney’s (1986) method to test for mediation, the first step is regression of the mediator on the independent variable. This step was completed while testing Hypothesis 1 and revealed that significant variance in eventful stressors was explained by income ($\beta = -.22, p<.05$) (Table 8). The second step of regressing the dependent variable on the independent variable, while controlling for all confounding variables, showed that significant variance in substance use was explained by income ($\beta = .15, p<.05$) (Table 15). Complete regression results for step 2 of this mediation model can be found in Table 15. In step 3 of the mediation method, substance use (e.g., dependent variable) was regressed on eventful stress (e.g., mediating variable), which was done while testing Hypothesis 3. Significant variance in substance use was explained by eventful stress ($\beta = .18, p<.05$). The final regression equations, Figure 6, revealed that when the equation controlled for eventful stressors the relationship between income and substance use was reduced ($\beta = -.12, p<.05$). The beta actually decreased by 20%. Complete regression results for step 4 of this mediation model can be found in Table 16. Partial mediation did occur because the effect of the independent variable (e.g., income) on the dependent variable (e.g., substance use) lessened once the mediating variable (e.g., eventful stressors) was added to the regression model.
Figure 6. Mediation Model for Income, Eventful Stressors, and Substance Use

Mediating Variable: Eventful Stressors
\[ R^2 = 0.12 \]

Independent Variable: Income
\[ \beta = -0.22 \]

Dependent Variable: Substance Use
\[ R^2 = 0.08 \]

\[ \beta = -0.12 \]

\[ \beta = 0.18 \]
Table 15. Regression Results for Step 2 of Mediation Model Testing Hypothesis 5b: Substance Use Regressed on Income

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>95% Confidence Interval for B</th>
<th>Standardized Coefficients</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>Lower</td>
<td>Upper</td>
</tr>
<tr>
<td>Income</td>
<td>-0.03</td>
<td>0.01</td>
<td>-0.05</td>
<td>-0.02</td>
</tr>
<tr>
<td>Pregnancy Status (pregnant)</td>
<td>0.01</td>
<td>0.04</td>
<td>-0.08</td>
<td>0.09</td>
</tr>
<tr>
<td>Pregnancy Status (unknown)</td>
<td>0.14</td>
<td>0.08</td>
<td>-0.01</td>
<td>0.29</td>
</tr>
<tr>
<td>Marital Status (not married)</td>
<td>0.12</td>
<td>0.04</td>
<td>0.04</td>
<td>0.21</td>
</tr>
<tr>
<td>Employment Status (unemployed)</td>
<td>0.03</td>
<td>0.04</td>
<td>-0.06</td>
<td>0.11</td>
</tr>
<tr>
<td>Ethnicity (non-white)</td>
<td>-0.09</td>
<td>0.04</td>
<td>-0.17</td>
<td>0.00</td>
</tr>
<tr>
<td>Age</td>
<td>0.00</td>
<td>0.00</td>
<td>-0.01</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Dependent Variable: Substance Use
Table 16. Regression Results for Step 4 of Mediation Model Testing Hypothesis 5b: Substance Use Regressed on Income while controlling for Eventful Stressors

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>95% Confidence Interval for B</th>
<th>Standardized Coefficients</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td>-0.03 0.01</td>
<td>-0.04 0.01</td>
<td>-0.12 0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Eventful Stressors</td>
<td>0.05 0.01</td>
<td>0.03 0.08</td>
<td>0.14 0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Pregnancy Status (pregnant)</td>
<td>0.01 0.04</td>
<td>-0.07 0.10</td>
<td>0.01 0.76</td>
<td>0.78</td>
</tr>
<tr>
<td>Pregnancy Status (unknown)</td>
<td>0.17 0.08</td>
<td>0.02 0.32</td>
<td>0.08 0.03</td>
<td>0.03</td>
</tr>
<tr>
<td>Marital Status (not married)</td>
<td>0.11 0.04</td>
<td>0.03 0.20</td>
<td>0.10 0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Employment Status (unemployed)</td>
<td>0.01 0.04</td>
<td>-0.07 0.10</td>
<td>0.01 0.78</td>
<td>0.78</td>
</tr>
<tr>
<td>Ethnicity (non-white)</td>
<td>-0.09 0.04</td>
<td>-0.18 -0.01</td>
<td>-0.08 0.04</td>
<td>0.04</td>
</tr>
<tr>
<td>Age</td>
<td>0.00 0.00</td>
<td>-0.01 0.01</td>
<td>0.00 0.95</td>
<td></td>
</tr>
</tbody>
</table>

Dependent Variable: Substance Use
Hypothesis 5c stated that chronic stress mediates the relationship between education and substance use. Using Baron and Kenney's (1986) method to test for mediation, the first step is regression of the mediator on the independent variable. When chronic stress (e.g., mediator) was regressed on education (e.g., independent variable), which was completed while testing Hypothesis 2, the analysis revealed that a significant relationship does not exist between education and chronic stress ($\beta = .04$, $p > .05$). There was no reason to continue testing if chronic stress mediates the relationship between education and substance use because variation in the independent variable was not accounted for in the presumed mediator.

Hypothesis 5d stated that chronic stress mediates the relationship between income and substance use. Using Baron and Kenney's (1986) method to test for mediation, the first step is regression of the mediator on the independent variable. When chronic stress (e.g., mediator) was regressed on income (e.g., independent variable), which was completed while testing Hypothesis 2, the analysis revealed that a significant relationship does not exist between income and chronic stress ($\beta = -.03$, $p > .05$). There was no reason to continue testing if chronic stress mediates the relationship between income and substance use because variation in the independent variable was not accounted for in the presumed mediator.

Overall, two mediation models were identified. The first model was that eventful stress partially mediated the relationship between education and substance use. The second model was that eventful stress partially mediated the relationship between income and substance use. However, chronic stress did not demonstrate mediation between
either of the SES indicators and substance use. Therefore, the overall hypothesis that eventful stressors and chronic stress mediate the relationship between SES and substance use was rejected.

It was noted that a correlation existed between the two indicators of SES, education and income. Therefore, exploratory analyses were conducted using these two variables simultaneously in multiple regression analyses. When eventful stressors was regressed on education and income (controlling for confounding variables), education was no longer significant ($\beta = -.05$, $p > .05$) unlike when eventful stressors was regressed on education independently of income. However, significant variance in eventful stressors was still explained by income ($\beta = -.21$, $p < .05$). On the other hand, when substance use was regressed on education and income, significant variance in substance use was still explained by education ($\beta = -.18$, $p < .05$) and income ($\beta = -.11$, $p < .05$). However, there were no a priori hypotheses predicting this relationship. This observation also applies to the case of eventful stressors and chronic stress, which were correlated, but were not included together in a priori hypotheses.
The purpose of this study was to estimate the associations between socioeconomic status, stressors (particularly eventful stressors and chronic stressors), and substance use among women of childbearing age. The results of this research supported the hypothesis that women of higher SES do experience fewer eventful stressors than women of lower SES. However, no association was found to exist between SES and chronic stress. Hypotheses between stressors and substance use were supported with the findings that greater frequency of eventful stressors and chronic stress are independently associated with higher levels of substance use. Finally, eventful stress was found to partially mediate the relationship between education and substance use as well as between income and substance use. However, chronic stress did not demonstrate mediation between either of the SES indicators and substance use.

4.1 Examination of Hypotheses

4.1.1 Hypothesis 1

It was concluded that women of higher SES do experience fewer eventful stressors than women of lower SES. This finding was significant, but these results must be cautiously interpreted. The unstandardized beta weights indicated that for every $10,000 increase in income, the occurrence of eventful stressors decreased by .12. Essentially, to reduce the occurrence of one eventful stressor, an individual’s income would have to increase by approximately $77,000. This calculation does demonstrate that those respondents whose household income is $0-9,000, which represents 14.8% of the study population, experience one more eventful stressor per year than those 7.0% of
respondents whose household income is $80,000 or more. In respect to the prediction of eventful stress by education level, the unstandardized beta weights revealed that for every year of education, the occurrence of eventful stressors decreased by .06. To reduce the occurrence of one eventful stressor, an individual must complete 17 years of education. When using the values applied in this study, this finding indicates that those respondents with 22 years or more of education will experience one less eventful stressor than respondents who have 5 years of education. It must be kept in mind that these relationships can only be applied to the sample population and cannot be applied to the general population because these are unstandardized measures.

It was found that as education increases, occurrence of eventful stressors decreases among women of childbearing age. This same association was also found to exist between income and occurrence of eventful stressors. These findings are congruent with those of McLeod and Kessler (1990). McLeod and Kessler (1990) found that for all types of life events, except network events, those persons of low SES were more likely to experience the event than those of high SES. Network events, which are those negative events that happened to members of the respondent’s social network such as a death of a friend’s spouse, child’s divorce, or spouse’s job loss, were positively related to SES. It has been found that social network ties increase with SES, so it would be logical that as SES increased, network events would increase as well.

Instead of summing all eventful stressors for a total number of life events experienced within the last 12 months, McLeod and Kessler (1990) separated the life events into six distinct categories to determine if different types of life events occur more
or less frequently between SES statuses. The six categories included: income loss, ill
health, marital separation and divorce, other love loss, death of a loved one, and network
events. Combining diverse life events into a single unweighted sum masks variability
among crises. By using six event categories, a more detailed understanding of the
process that determines SES differences in vulnerability to life events can be reached
(McLeod & Kessler, 1990). Limiting stress measurement to a checklist of recent events
also significantly underestimates total stress exposure among persons of lower
socioeconomic status relative to those of higher status (Turner & Avison, 2003).

In the future, differentiation between types of life events along with inclusion of a
comprehensive set of events relevant to the population under study would broaden the
conceptualization of eventful stressors. By conducting a focus group with a
representative sample of the study population, eventful stressors pertinent to the group in
question could be brought to light. It could be that the events listed in the general
checklists used, such as Holmes and Rahe’s (1967) Social Readjustment Rating Scale, are
not incorporating the relevant stressful events different groups and individuals are
experiencing. Without a better understanding of what types of eventful stressors as well
as the extent to which differing populations are experiencing eventful stressors, the
effects of these stressors cannot be assessed. Lack of assessment then leads to lack of
appropriate and successful interventions.

McLeod and Kessler (1990) examined three components of socioeconomic status,
which included education, income, and occupation, and their relationship to the exposure
of life event stress. Of the three components of SES, income was the one to be associated
most consistently with exposure to eventful stressors with education following second and occupational status last. The results of the present study did find that when considered separately both education and income were significant predictors of eventful stress. However, when eventful stress was regressed on education and income in the same equation, education was no longer significant. Therefore, this finding is consistent with that of McLeod and Kessler (1990) in that income is a better predictor of eventful stress than education.

4.1.2 Hypothesis 2

It was hypothesized that women of higher socioeconomic status would experience less chronic stress than women of lower socioeconomic status. However, socioeconomic status was not found to be related to chronic stress. This finding is inconsistent with past research findings. Turner, Wheaton, and Lloyd (1995) found that chronic stress was significantly related to SES. However, Turner et al. (1995) chose to operationalize SES in relation to occupational prestige level, which could explain why SES was found to be predictive of chronic stress, considering that in the present study, education and income were used as indicators of SES. Chronic stress was found to be inversely related to occupational prestige. Turner et al. (1995) suggests using occupational prestige level over educational level as an index because average levels of education and the meaning of any given level of education with respect to conditions of life tend to vary with the age of respondents, which can distort or obscure estimates of social status and mobility. However, in the present study, age was controlled for primarily due to the differences in educational level relative to age. On the other hand, Turner et al. (1995) presents a good
argument for using occupational prestige level over personal or family income to estimate SES due to increased missing data that occurs with income. Respondents are more willing to describe their occupations than to provide their income. Considering that 13.9% of respondents in the present study responded "don’t know" when asked what their household income level was, missing data was substantial for the income variable with a total of 19.6% after the "don’t know" responses were recoded as missing. Even though education and income were predictive of eventful stress, these two indicators were not predictive of chronic stress. In the future, using occupational prestige level instead of education and income to operationalize SES might be more predictive of chronic stress.

The chronic stress measure used in the current study could also have not been extensive enough. First of all, there was only one question assessing a respondent’s level of chronic stress with five response options. Secondly, the question asked how stressful the last two weeks had been for the respondent. Two weeks is a relatively short amount of time. Chronic stress may either surface repeatedly or remain over a considerable amount of time (Pearlin, 2002). If a respondent was experiencing episodic chronic stress and it did not surface in the two weeks preceding the survey, the respondent would be less likely to report a higher level of chronic stress. Turner et al. (1995) measured chronic stress with a 51-item inventory that covered nine areas including general problems, financial issues, work, marriage and relationship, family, parental, social life, health, and residence. A more extensive measure of chronic stress allows for better detection of its underlying variability.
It could be possible that socioeconomic status is just not predictive of chronic stress. Chronic stress might be influenced by personal characteristics. Turner and Turner (2005) found that emotional reliance and prior depression are significant predictors of chronic stress. Emotional reliance, which is also known as interpersonal dependency, refers to a combination of thoughts, feelings, and behaviors that revolve around the need to associate and interact with as well as rely upon significant others. Excessive dependency can strain relationships and contribute to perceptions of dissatisfaction. This dissatisfaction in turn affects an individual's well-being resulting in interpersonal stress. Therefore, ongoing interpersonal stressors may be self-generated through individual attributes and behaviors (Turner & Turner, 2005). Another possible determinant of stress exposure in adulthood could be the level of stress experienced earlier in life. Parental emotional problems have been found to be significant of a child's exposure to stress. For example, children of mothers with a history of depression experience higher stress exposure to chronic and episodic stress than do children of mothers without depression (Adrian & Hammen, 1993). Low parental support and dysfunctional parenting often accompanies parental depression and is likely to reduce a child's coping skills and other personal resources necessary for avoiding or managing stress later on in life (Cummings & Davies, 1994; Downey & Coyne, 1990).

4.1.3 Hypothesis 3

Results indicate that greater frequency of eventful stressors is associated with higher levels of substance use. The unstandardized regression coefficient indicated that for every one eventful stressor experienced, the use of substances increased by .07. A
response value of .07 indicates substance use once every two weeks. Therefore, this finding indicates that a respondent who experiences one eventful stressor could increase use of one substance (e.g., alcohol, tobacco, or marijuana) from no use to once every two weeks or a respondent could go from using a substance once every two weeks to once a week. Another possibility that exists is when an eventful stressor occurs, the use of one substance every day could be accompanied by use of another substance once every two weeks.

On average, respondents used one substance once a week to every few days and experienced one to two eventful stressors a year. For someone to go from using a substance once a week to every day, twelve eventful stressors would have to occur within one year for that individual to start using the substance every day. Therefore, caution should be taken when interpreting these results, even though they are significant. It must also be remembered that these relationships can only be applied to the sample population and cannot be applied to the general population because these are unstandardized measures.

Past research on eventful stress and its relationship to substance use has focused on individual substances and not in conjunction with one another. However, the results of the current study are still similar to previous findings. For example, it has been found that as eventful stress increases, drinking increases (Abbey, Smith, & Scott, 1993; Cole, Tucker, & Friedman, 1990). Evidence shows that life-events affect alcohol use, particularly when these events are operationalized separately or categorized (Veenstra, Lemmens, Friesema, Garretsen, Knottnerus, & Zwietering, 2006). Smoking rates have
also been found to covary with negative life events, which means the more reported stress, the more cigarettes are smoked (Conway, Vickers, Ward, & Rahe, 1981; Hellerstedt & Jeffrey, 1997; Kassel, Stroud, Paronis, 2003; Odgen & Mitandabari, 1997; Steptoe, Wardle, Pollard, Canaan, & Davies, 1996).

4.1.4 Hypothesis 4

Results indicate that greater frequency of chronic stress is also associated with higher levels of substance use. The unstandardized regression coefficient indicated that for every one increment increase in the scale of chronic stress, the use of substances increased by .04. This value indicates substance use about once a month. Therefore, if chronic stress levels increased, for example, from “a little bit stressful” to “moderately stressful,” a respondent’s substance use would increase from no use to once a month use or from once a month use to every two weeks use. A respondent’s substance use could rise from once every two weeks to once a week if her chronic stress increased by levels, such as from “not at all stressful” to “moderately stressful.” However, if a respondent went from “not at all stressful” to “extremely stressful,” her substance use could rise from no substance use to once a week use. Use of one or two substances every day to once a week use of one other substance could also occur depending on level of substance use to begin with.

Lack of research related to chronic stress in general but particularly in relation to substance use does not allow comparison of these results to other research findings. For this very reason, more research needs to be conducted in this area. Without more knowledge about the effects of chronic stress, those who are vulnerable to experiencing
chronic stress, such as those in the lower occupational prestige levels (Turner et al., 1995), will suffer from the lack of appropriate interventions to combat its effects.

4.1.5 Hypothesis 5

The overall hypothesis that eventful stressors and chronic stress mediate the relationship between SES and substance use was rejected. Chronic stress did not demonstrate mediation between either of the SES indicators and substance use. Mediation by chronic stress was not demonstratively possible since SES was not predictive of chronic stress. However, eventful stress partially mediated the relationship between education and substance use as well as the relationship between income and substance use. As a mediator, eventful stress was able to reduce the standardized beta coefficient between education and substance use by .01 (5%) while eventful stress was able to reduce the beta coefficient between income and substance use by .03 (20%), respectively. The relationship between SES and substance use did not cease to exit when eventful stress was controlled for, which means that eventful stress was not both a sufficient and necessary condition for substance use to occur. However, social phenomena usually have multiple causes, so it is realistic that eventful stress is not the only risk factor for substance use.

4.2 Limitations and Strengths

There are a few limitations of this study that must be considered. First of all, a cross-sectional study design was employed, which does not allow causal inferences to be made. In regard to the questionnaire, respondents were asked to remember their substance use and the occurrence of eventful stressors for the past 12 months, which
could have introduced a recall bias. A response bias could also have been introduced due to the substance use question and the lack of social desirability to admit substance use, especially illegal drug use. However, the questionnaire was self-administered and respondents were anonymous, which would reduce the likelihood of response bias. A systematic bias to consider is the inclusion of respondents aged 14-24. For this age group particularly, education and income levels are highly dependent upon age. Therefore, excluding respondents aged 14-24 from analyses was considered, but due to the high numbers of respondents in this age group (n=516), age was controlled for instead.

Another limitation was the measurement scales used for the two stress variables. There was a lack of references and psychometric properties (e.g. reliability and validity) for these two scales, but these measures were developed by professionals in the field of stress research. As previously mentioned, the chronic stress measure that was used might not have been comprehensive enough. Instead of summing all eventful stressors for a total number of life events, differentiation between types of life events along with inclusion of a comprehensive set of events relevant to the population under study would broaden the conceptualization of eventful stressors.

The strengths of this study must also be mentioned. One strength of the study is the large sample size (n=1, 163). The eleven sites from which data was gathered were selected from a representative group of both private and public clinics from all 4 counties in the state of Hawai‘i, which is good for generalizibility of the data to women of childbearing age across the state. This study also furthers research in the area of social stress. Eventful stress has been studied more so than chronic stress, however, the
outcome measure of eventful stress has been mainly focused in mental health problem areas such as depression. When eventful stress research has looked at substance use problems, it has not studied the use of substances in conjunction with one another, which this study does. In relation to chronic stress, this study sheds light on an area that has been altogether lacking in social stress research. Not only does this study advance research in the area of stress and substance use, it also is the first of its kind to look at stress as a mediator of the relationship between socioeconomic status and substance use.

4.3 Conclusion

To reach the Healthy People 2010 goal of reducing substance abuse, interventions can be aimed at various junctures of the stress process. Socioeconomic status, eventful stress, and chronic stress were all found to be related to substance use. The results of this study demonstrated that eventful stress partially mediates the relationship between socioeconomic status and substance use. Within the conceptual framework of the stress process, socioeconomic status influences both eventful stress and substance use, so preventive efforts would theoretically be the most effective if they were to alter the conditions of those status groups, particularly the less educated and lower income groups, who experience more eventful stress and have higher substance use levels. One way to go about changing social inequality and disparity is through shifting public policy. However, preventive strategies of this kind, which involve changing structural arrangements and economic stratification, are long-term undertakings. There is resistance to changing the distribution of power, prestige, and privilege within status hierarchies. Even if equity among statuses was achieved, the results from such an
endeavor would most likely take time to emerge (Pearlin, 2002). Effective interventions to help reduce the impact of stress on outcomes such as substance use are more realistic for achieving short-term results.

When attempting to minimize the negative outcomes of stressors, there are key resources people can use. In the Stress Process Model, these resources are collectively referred to as moderating resources and include the following: coping repertoires, social support, and mastery (Pearlin, 2002). The first moderating resource, coping, refers to the things people do in response to situations that put their adaptive capacities to test (Lazarus & Folkman, 1984). There are four functions that coping serves: prevention of the stressful situation, alteration of the stressful situation, changing the meaning of the situation, and management of the symptoms of stress (Pearlin & Aneshensel, 1996). In regards to coping and the prevention of a stressful situation, life-event stressors that are scheduled events are essentially built into the life cycle and can therefore be forecasted in advance. These scheduled events include life transitions such as marriage, the birth of children, and retirement. Due to their predictably, these stressors allow for preparatory coping, resulting in freedom from lasting negative health consequences (Pearlin, 2002; Pearlin & Aneshensel, 1996). Secondly, in more of a general relation to stressors, successful confrontation of a problem reduces stress in the short run while also providing a potential protective barrier against future reemergence of problems in that role area (Pearlin & Aneshensel, 1996).

The second function coping serves is alteration of the stressful situation. By modifying the situation in which the stressor is embodied or by changing one’s behavior
within it can eliminate or reduce stress. Coping also serves the function of changing the meaning of the stressful situation by modifying the perceptions, knowledge, and beliefs of the situation to reduce its harmful or threatening qualities. An example of this type of coping is the trivialization of a problematic situation, which in turn minimizes the threat the situation poses. The last coping function is controlling the symptoms of stress so they do not overwhelm an individual. Stress management can be done effectively through meditation or exercise, for example (Pearlin & Aneshensel, 1996).

Social support, another key moderating resource, also provides the same functions of coping: prevention of the stressful situation, alteration of the stressful situation, changing the meaning of the situation, and management of the symptoms of stress (Pearlin & Aneshensel, 1996). Social support actually might be more important than coping in the prevention of stressors, particularly those that can have negative health-related effects. Those individuals that make up our social support network define what is undesirable and should be avoided as well as what is acceptable and should be sought after. However, avoidance of a stressful situation depends on the social support's conceptualization of desirability. Social support can alter a problematic situation through provision of instrumental support, which includes material help, information, or assistance. Thirdly, perceptual management of stress is largely influenced by social support. Individual's normative values, aspirations, and ideologies are shaped through interaction in groups. The norms that are formed therefore legitimize and reinforce the perception of the situation. Lastly, social support validates the management techniques used to control stress symptoms (Pearlin & Aneshensel, 1996).
Mastery is the third and final moderating resource of stress. It is concerned with control over forces affecting one's life regardless of their source. Mastery functions as a powerful moderator. One explanation for this is that the possession of a sense of control in and of itself tends to reduce feelings of vulnerability in otherwise threatening conditions. Another explanation is that mastery acts as a self-fulfilling prophecy in which when we feel we possess control over the forces of our lives, we act accordingly. Therefore, the three key moderating resources (e.g., mastery, coping, and social support) are all unique, but each one acts as mutual reinforcement to the others (Pearlin, 2002). Interventions designed to teach coping skills, increase social support networks, and improve an individual's aptitude at mastery have the possibility to reduce substance use as a means of dealing with stress. By equipping people with these resources, it is possible that the outcomes of stress could be ameliorated.
APPENDIX

Section A: The following questions concern your health. Please CIRCLE the number that corresponds to your answer.

1. During the past 12 months has your physical health been:
   - Poor
   - Fair
   - Good
   - Very good
   - Excellent

2. During the past 12 months has your emotional or psychological health been:
   - Poor
   - Fair
   - Good
   - Very good
   - Excellent

3. During the past 12 months, have you been admitted to hospital for a condition other than having a baby?
   - No
   - Yes 
     IF YES, What was the reason?

4. In the past month, how often were you distressed by:
   - Feeling no interest in things
   - Feeling hopeless about the future
   - Feeling sad or depressed
   - Feelings of worthlessness
   - Thoughts of death and dying
   - Thoughts of ending your life

5. Are you pregnant?
   - No
   - Yes
   - Don't know
     IF YES:
     a. Did you wish/want to get pregnant?
     - No
     - Yes
     b. Have you received prenatal care?
     - No
     - Yes
     c. Have you attended prenatal classes?
     - No
     - Yes

6. Within the past 12 months have you:
   a. Had a pap smear?
   - No
   - Yes
   b. Had a mammogram?
   - No
   - Yes
   c. Conducted a breast self-examination?
   - No
   - Yes
   d. Had your blood pressure taken?
   - No
   - Yes
   e. Seen a dentist for a routine check?
   - No
   - Yes

7. What is your current marital status:
   - Married
   - Living in a manager-ital relationship
   - Separated
   - Never married

8a. How many different sex partners have you had in the past TWO years? (CIRCLE)
   - 1
   - 2
   - 3
   - 4
   - 5
   - 6
   - 7
   - 8
   - Or more

8b. How often do you and your partner use a condom?
   - Never
   - Rarely
   - Sometimes
   - Often
   - Always

8c. How many times have you EVER been found positive for a sexually transmitted disease (STD) such as chlamydia, herpes, gonorrhea etc.?

8d. How worried are you about getting HIV (AIDS)?
   - Not at all
   - A little
   - Moderately
   - Quite a bit
   - Extremely

9. During the past two weeks, how stressful have your daily activities been for you?
   - Not at all
   - A little
   - Moderately
   - Quite a bit
   - Extremely

10. Do you suffer from a chronic illness or a disability that causes you significant discomfort or limits your daily activities?
     - No
     - Yes 
       IF YES, What is the illness or disability?

11. How many times a week do you exercise/work-out for at least 20 minutes?
    - 1
    - 2
    - 3
    - 4
    - 5
    - 6
    - 7 or more
Section B: The following questions concern substance use.

1. For each of the substances listed below, please CIRCLE "yes" if you have EVER used the substance. Please indicate how old you were when you first used it, and if you have EVER been hooked on (addicted to) this substance.

<table>
<thead>
<tr>
<th>Substance</th>
<th>Have you ever used this substance?</th>
<th>What age were you when you first used it?</th>
<th>Have you ever been hooked or addicted to this substance?</th>
<th>Are you hooked on or addicted to this substance now?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol (beer, wine, liquor)</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Tobacco (snuff, cigarettes, chew)</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Marijuana, Hashish</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Cocaine, Crack</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Metamphetamine (ice, speed, crank)</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Heroin, methadone, other opiates</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Sedatives (downers, tranquilizers, roids)</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Synthetic endorphins (Eddie, Luteke)</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Tranquilizers (Valium)</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Inhalants (Glu, paint, gas etc.)</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Hallucinogens (LSD, PCP, Ecstasy)</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

2. Have you ever taken any of these drugs with a needle? (CIRCLE) No Yes

3. In the PAST 12 MONTHS how often have you used each of the following substances? Please indicate your response by CIRCLING the number that corresponds to your answer.

<table>
<thead>
<tr>
<th>Substance</th>
<th>Every Day</th>
<th>Every Few Days</th>
<th>About Once a Week</th>
<th>Every Few Weeks</th>
<th>About Once a Month</th>
<th>Every Few Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol (beer, wine, liquor)</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>How often do you have FIVE or more drinks in a sitting?</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Tobacco (snuff, cigarettes, chew)</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Marijuana, Hashish</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Cocaine, Crack</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Metamphetamine (ice, speed, crank)</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Heroin, methadone, other opiates</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>How often do you take any of these drugs with a needle?</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
4. About how many PACKS OF CIGARETTES do YOU smoke per day? (PLEASE CIRCLE)

<table>
<thead>
<tr>
<th>Packs of Cigarettes per Day</th>
<th>2 or more packs</th>
<th>1½ packs to less than 2 packs</th>
<th>1 pack to less than 1½ pack</th>
<th>½ pack to less than 1 pack</th>
<th>Less than ½ pack</th>
<th>None</th>
</tr>
</thead>
</table>

5. Have you EVER received treatment for the use of any of these substances? (PLEASE CIRCLE ALL THAT APPLY)

<table>
<thead>
<tr>
<th>Substance</th>
<th>Ever received treatment?</th>
<th>Currently in treatment for</th>
<th>Treatment in the past year for</th>
<th>Ever attended a 12-step program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol (beer, wine, liquor)</td>
<td>No 1 Yes ᵃ</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Tobacco (snuff, cigarettes, chew)</td>
<td>No 1 Yes ᵃ</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Marijuana, Hashish</td>
<td>No 1 Yes ᵃ</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Cocaine, Crack</td>
<td>No 1 Yes ᵃ</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Methamphetamine (ice, speed, crank)</td>
<td>No 1 Yes ᵃ</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Heroin, methadone, other opioids</td>
<td>No 1 Yes ᵃ</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

6. If you are NOT currently receiving treatment, do you feel you could now use treatment? (PLEASE CIRCLE)

No
Yes

7. Please indicate how strongly you agree with the following statements:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Somewhat disagree</th>
<th>Somewhat agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>There are enough treatment services available for all people with drug or alcohol problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment services are affordable for all people with drug or alcohol problems</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6. **CIRCLE the answer that applies to you for each of the substances listed.**

During the PAST 12 MONTHS have you ever...

<table>
<thead>
<tr>
<th>Substance</th>
<th>Alcohol</th>
<th>Marijuana</th>
<th>Cocaine / Crack</th>
<th>Crystal Meth (Ice, baitu)</th>
<th>Heroin, Opiates</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Had to use more of this substance to get high?</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>b. Felt sick because you cut down or stopped using?</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>c. Used this substance in order to get over a hangover or keep from getting sick</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

7. In the past 12 months, please indicate how often you think your HUSBAND / PARTNER has used each of the following substances. Please CIRCLE the number that corresponds to your answer.

<table>
<thead>
<tr>
<th>Substance</th>
<th>Every Day</th>
<th>Alcohol daily (1-6 times a week)</th>
<th>1-3 times a MONTH</th>
<th>Every Few Months</th>
<th>None in the past 12 months</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Alcohol (beer, wine, liquor)</td>
<td>6</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>b. How often does he have 5 or more drinks in one sitting?</td>
<td>6</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>c. Tobacco (snuff, cigarettes, chew)</td>
<td>6</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>d. Marijuana, Hashish</td>
<td>6</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>e. Cocaine, Crack</td>
<td>6</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>f. Methamphetamine (Ice, speed, crank)</td>
<td>6</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>g. Heroin, methadone, other opiates</td>
<td>6</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>h. How often has he taken any of these drugs with a needle?</td>
<td>6</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

10. **About how many PACKS OF CIGARETTES does your HUSBAND/PARTNER smoke per day? (PLEASE CIRCLE)**

<table>
<thead>
<tr>
<th>Number of Packs</th>
<th>None</th>
<th>Less than 1/4 pack</th>
<th>1/4 pack to less than 1 pack</th>
<th>1 pack to less than 2 packs</th>
<th>2 or more packs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1/4</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>1/4 pack to less</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>than 1 pack</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 pack to less</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>than 2 packs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 or more packs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11. **How many other people in your home (not counting you and your partner) regularly smoke cigarettes?**

<table>
<thead>
<tr>
<th>Number of People</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6 or more</th>
</tr>
</thead>
</table>
Section C: The following questions concern your background

1. What is your date of birth? _____ / _____ / _____

2a. How many children do you have? (CIRCLE)
   - 0
   - 2
   - 3
   - 4
   - 5 or more

2b. How many are under five years old?
   - 0
   - 2
   - 3
   - 4
   - 5 or more

3. Please indicate which of the following events has happened to you in the LAST YEAR.
   - Serious accident or illness
   - Trouble with the law
   - Serious problems with relationships
   - You moved, or someone moved in or out of the household
   - Major financial problems or crisis
   - Someone in your family was robbed or attacked
   - Unwanted pregnancy, abortion or miscarriage
   - Someone in your family lost a job or had major problems at work

4. Which of the following best describes your employment situation? (CIRCLE)
   - 1. Employed full time
   - 2. Employed on maternity leave or leave for some other reason
   - 3. Employed part time
   - 4. A full-time homemaker
   - 5. Retired
   - 6. Disabled
   - 7. Self-employed
   - 8. Or social security survivor’s benefits
   - 9. Unemployed, looking for work

5. What is your ZIP Code?

6. CIRCLE the highest grade in school you completed
   - 1
   - 2
   - 3
   - 4
   - 5
   - 6
   - 7
   - 8
   - 9
   - 10
   - 11
   - 12

7. How many years of education BEYOND high school have you completed? (CIRCLE)
   - 0
   - 2
   - 3
   - 4
   - 5

8. Are you attending school? (CIRCLE)
   - Full time
   - Part time
   - Not at all

9. Do you have a telephone in your home? (CIRCLE)
   - Yes
   - No

10. Was there any time during the past two years when you did not have a permanent address?
    - No
    - If yes, how long was it for?
    - ______ days

11. How long have you lived in Hawaii?
    - ______ years

12. Approximately what is your annual FAMILY or HOUSEHOLD Income? (CIRCLE)
    - $0 to less than $10,000
    - $10,000 to less than $20,000
    - $20,000 to less than $30,000
    - $30,000 to less than $40,000
    - $40,000 to less than $50,000
    - $50,000 to less than $60,000
    - $60,000 to less than $70,000
    - $70,000 to less than $80,000
    - $80,000 to less than $100,000
    - $100,000 to less than $120,000
    - $120,000 to less than $140,000
    - $140,000 or more
    - Don’t know
13. What type of medical insurance do you have? (CIRCLE ONE)

<table>
<thead>
<tr>
<th>Option</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>0</td>
</tr>
<tr>
<td>HMASA regular</td>
<td>1</td>
</tr>
<tr>
<td>HMASA QUEST</td>
<td>2</td>
</tr>
<tr>
<td>Kaiser Permanente regular</td>
<td>3</td>
</tr>
<tr>
<td>Kaiser Permanente QUEST</td>
<td>4</td>
</tr>
<tr>
<td>Medicare</td>
<td>5</td>
</tr>
<tr>
<td>Medicaid</td>
<td>6</td>
</tr>
<tr>
<td>Straub regular</td>
<td>7</td>
</tr>
<tr>
<td>Straub QUEST</td>
<td>8</td>
</tr>
<tr>
<td>Queen's Hawaii Care</td>
<td>9</td>
</tr>
<tr>
<td>Queen's QUEST</td>
<td>10</td>
</tr>
<tr>
<td>HDS Medical</td>
<td>11</td>
</tr>
<tr>
<td>Aetna</td>
<td>12</td>
</tr>
<tr>
<td>Prudential</td>
<td>13</td>
</tr>
<tr>
<td>PGWA</td>
<td>14</td>
</tr>
<tr>
<td>AlphaCare</td>
<td>15</td>
</tr>
<tr>
<td>Island Care</td>
<td>16</td>
</tr>
<tr>
<td>Kepelani Health Hawaii</td>
<td>17</td>
</tr>
<tr>
<td>Military</td>
<td>18</td>
</tr>
<tr>
<td>Medline</td>
<td>19</td>
</tr>
<tr>
<td>Campus / VA</td>
<td>20</td>
</tr>
<tr>
<td>Other (specify)</td>
<td>21</td>
</tr>
<tr>
<td>Don't know/Not sure</td>
<td>22</td>
</tr>
</tbody>
</table>

14. How often do you wear a seatbelt when you drive/sit in a car?

- Never
- Sometimes
- Always

15. Not counting minor traffic violations, have you ever been arrested and booked (taken into police custody)?

- No
- Yes

  If Yes, How often? (CIRCLE)
  - Never
  - 2 or more times

16. Have you ever operated a motor vehicle after having more than one or two drinks?

- No
- Yes

  If Yes, How many times in the last 24 months?
  - Never
  - 2 or more times

17. Have you ever been arrested for driving under the influence?

- No
- Yes

  If Yes, how often?
  - Never
  - 2 or more times

18. What do you consider YOUR ethnic background to be? (CIRCLE ALL THAT APPLY)

- White/Caucasian
- Native Hawaiian/Part Hawaiian
- Chinese
- Filipino
- Japanese
- Puerto Rican
- Korean
- Samoan
- Portuguese
- Black or African-American
- Vietnamese
- Hispanic/Latino
- American Indian or Alaskan Native
- Other (PLEASE WRITE IN)

19. With which ethnic group do you identify the MOST? (CIRCLE ONE OR MORE)

- White/Caucasian
- Native Hawaiian/Part Hawaiian
- Chinese
- Filipino
- Japanese
- Puerto Rican
- Korean
- Samoan
- Portuguese
- Black or African-American
- Vietnamese
- Hispanic/Latino
- American Indian or Alaskan Native
- Other (PLEASE WRITE IN)

---

Thank you for your time and cooperation. Your responses will be kept strictly confidential.

PLEASE PLACE YOUR SURVEY IN THE ENVELOPE AND RETURN TO THE RECEPTIONIST

DO NOT PUT YOUR NAME ON THIS SURVEY

MAHALO
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Sept. 24, 2006, from
http://www.cdc.gov/tobacco/sgr/sgr_forwomen/ataglance.htm#top.

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