AN ANALYSIS OF MEDICAL STUDENTS’ PERCEIVED SELF-EFFICACY TO COUNSEL AND SCREEN FOR ALCOHOL USE AMONG PREGNANT WOMEN

A dissertation submitted to the Kent State University College and Graduate School of Education, Health, and Human Services in partial fulfillment of the requirements for the degree of Doctor of Philosophy

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This study examined medical students’ perceived knowledge and self-efficacy in counseling about the health risks and resources for management of alcohol use and alcoholism and screening for alcohol use and alcoholism among pregnant women. Third year medical students ($n = 78$) from two Midwestern medical schools were compared on their perceived knowledge and counseling of the health risks related to consuming alcohol while pregnant, screening tools, self-help and group support and treatment programs as well as their perceived self-efficacy to screen for alcohol use among pregnant women using the T-ACE, CAGE, TWEAK, MAST and AUDIT. Their perceived knowledge, counseling and screening was also compared to various learning experiences during medical school. Medical students at a public university self-reported more knowledge about the health risks related to consuming alcohol while pregnant, self-help materials and group support and treatment programs. Medical students at a private university self-reported more knowledge about screening tools for alcohol use and alcoholism. Independently learning about the health risks was associated with medical students’ perceived knowledge, while receiving feedback on performance was associated
with screening self-efficacy and role modeling was associated with counseling self-efficacy.
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CHAPTER I
INTRODUCTION

Despite numerous prevention and intervention efforts over the past 30 years, alcohol use among pregnant women continues to be a public health threat. The Centers for Disease Control and Prevention (CDC, 2004a) estimated that 10% of pregnant women ages 18 – 44 report drinking alcohol at least once during their pregnancy. Although this rate of alcohol consumption during pregnancy represents a decrease from 16.5% of this risk behavior reported in 1995, the rate of binge drinking, 2% (consuming more than four drinks on one occasion at least one day in the past 30 days), and heavy drinking, 3.3% (consuming 5 or more drinks on one occasion 5 or more days in the past 30 days) remains elevated. In 1999, more than 130,000 women drank at these high-risk levels, thus increasing the chance that more babies would be born with alcohol-related birth defects (March of Dimes, 2003). The National Household Survey on Drug Abuse revealed that among women in their first trimester of pregnancy, 23.3% had used alcohol in the month preceding the survey, 8.8% “binge” drank in the month preceding the survey, and 1.8% drank heavily. Among respondents in their second trimester of pregnancy, 8.8% had used alcohol in the past month, 2.3% “binge” drank and 0.3% drank heavily. Consumption among third trimester respondents decreased to 6% in the past month and 0.6% “binged” (Substance Abuse and Mental Health Services Administration [SAMHSA], 2002).

Similarly, the CDC’s Behavior Risk Factor Surveillance System (2002) confirmed that more than half of female respondents who did not use birth control reported alcohol use
and 12.4% reported binge drinking. Thus, these women increased their chances of becoming pregnant and having a child born with Fetal Alcohol Spectrum Disorders (FASD). More recently, Tsai, Floyd, and Bertrand (2007) comparing 2001, 2002, and 2003 Behavioral Risk Factor Surveillance System (BRFSS) results, reported a statistically significant increase in the percentage of women of childbearing age who binge drank between 2001 and 2003: 11.9% – 13%.

According to the National Organization on Fetal Alcohol Syndrome (NOFAS, 2004), approximately 40,000 births each year are affected by prenatal alcohol use. This represents approximately 1 in every 100 live births (NOFAS), each with a lifetime cost of approximately $2 million per child in related medical costs (Lupton, Burd, & Harwood, 2004). These approximations of cost are reinforced by data collected by the Substance Abuse and Mental Health Services Administration (SAMHSA, 2002). Data from this agency confirmed the estimated lifetime cost of $2 million or more per child, $1.6 million in medical costs and $0.4 million for loss of productivity (SAMHSA, 2002). The CDC estimates that 0.2 – 1.5 per 1,000 live births in the U.S. are affected by Fetal Alcohol Syndrome (FAS) and approximately three times as many other live births are affected by Fetal Alcohol Spectrum Disorders (FASD; CDC, 2006a).

Evidence of Fetal Alcohol Syndrome dates back to the early 1700s in England during the gin epidemic. Parliament was warned that gin caused “weak, feeble and distempered children” (Abel, 1990, p. 4). In the mid 19th century, French physician, E. Lanceraux, described what is now known as FAS as follows:
As an infant, he dies of convulsions or other nervous disorders; if he lives, he becomes idiotic or imbecile, and in adult life bears the special characteristics: the head is small . . . his physiognomy vacant [peculiar facial features], a nervous susceptibility more or less accentuated, a state of nervousness bordering on hysteria, convulsions, epilepsy . . . are the sorrowful inheritance, . . . a great number of individuals given to drink bequeath their children. (Lanceraux, 1865; as cited in Abel, 1990)

FAS was first identified in the U.S. in 1973 and was characterized by a combination of mental, physical, and behavioral abnormalities such as altered growth, morphogenesis, cardiac abnormalities, cleft soft palates, microcephaly, developmental delays, fine motor problems, and joint difficulties (Jones & Smith, 1973).

In April 2004, national experts from the CDC, National Institutes of Health (NIH), SAMHSA, and Health Canada agreed on the phrase Fetal Alcohol Spectrum Disorders (FASD) as an “umbrella term to describe the range of effects that can occur in an individual whose mother drank alcohol during pregnancy. These effects include physical, mental, behavioral, and/or learning disabilities with possible implications” (Litle, 2004, p. 1).

Similarly, the Institute of Medicine (IOM) developed guidelines for diagnosing FAS in 1996. The IOM divides the criteria for the diagnosis of FAS into five categories ranging from what is known as full-blown FAS, with or without confirmation of maternal alcohol exposure to alcohol related neurodevelopmental disorders with confirmation of
maternal alcohol exposure (IOM, 1996). A detailed description of each category is located in Table 1.

Table 1

*The Institute of Medicine’s Diagnostic Criteria for Fetal Alcohol-Related Abnormalities*

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Category 1</strong></td>
<td>FAS with confirmed maternal alcohol exposure</td>
</tr>
<tr>
<td>Patients in this category have the classic triad of growth retardation, characteristic facial dysmorphology and neurodevelopmental abnormalities. Also known as full-blown FAS.</td>
<td></td>
</tr>
<tr>
<td><strong>Category 2</strong></td>
<td>FAS without confirmed maternal alcohol exposure</td>
</tr>
<tr>
<td>If triad described in category 1 is present, a diagnosis of FAS is possible without confirmation of maternal drinking.</td>
<td></td>
</tr>
<tr>
<td><strong>Category 3</strong></td>
<td>Partial FAS with confirmed maternal alcohol exposure</td>
</tr>
<tr>
<td>Patients may have only some of the characteristic facial abnormalities plus growth delays or central nervous system neurodevelopmental, behavioral/cognitive abnormalities.</td>
<td></td>
</tr>
<tr>
<td><strong>Category 4</strong></td>
<td>FAS with confirmed maternal alcohol exposure and alcohol related birth defects</td>
</tr>
<tr>
<td>Patients will have some congenital anomalies as a result of alcohol toxicity.</td>
<td></td>
</tr>
<tr>
<td><strong>Category 5</strong></td>
<td>FAS with confirmed maternal alcohol exposure and alcohol related neurodevelopmental disorders.</td>
</tr>
<tr>
<td>Patients will have evidence of central nervous system neurodevelopmental abnormalities or a complex pattern of behavioral/cognitive abnormalities, or both, but not necessarily any obvious physical changes.</td>
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*Note.* (IOM, 1996)

In July 2004, the National Center on Birth Defects and Developmental Disabilities, Centers for Disease Control, Department of Health and Human Services in conjunction with the National Task Force on Fetal Alcohol Syndrome and Fetal Alcohol Effect, the American Academy of Pediatrics, the American College of Obstetricians and Gynecologists, the March of Dimes, and the National Organization on Fetal Alcohol
Syndrome released – Fetal Alcohol Syndrome: Guidelines for Referral and Diagnosis.”

This document identified the following diagnostic criteria for fetal alcohol syndrome: facial dysmorphia (smooth philtrum, the groove between the nose and the upper lip; thin vermilion, and small palpebral fissures), growth problems, central nervous system abnormalities, including structural (small head circumference, brain abnormalities), neurological, and functional abnormalities. In addition, children may present cognitive or intellectual deficits or functional deficits that may include cognitive or developmental discrepancies, executive functioning deficits, motor functioning delays, attention or hyperactivity problems, social skills, and possible sensory, language and memory problems. Since maternal alcohol exposure may be confirmed or unknown, diagnostic criteria for a child with FAS must include documentation of all three of the facial abnormalities, growth deficits, and a central nervous system abnormality (CDC, 2004a).

Since 1973, the four main diagnostic criteria for FAS have remained the same: facial malformations, CNS abnormalities, growth retardation, and maternal alcohol consumption during pregnancy. Although these criteria have been established, there have been no specific and uniformly accepted diagnostic criteria available to clinicians. Diagnosis has been based on clinical examination of facial features, yet not all FAS children look the same. The original IOM document did not take into consideration the facial characteristics of different racial and ethnic minorities. In addition, there continues to be a lack of knowledge and misconceptions among primary care providers that FAS can only occur among children whose mothers are alcoholics as well as a lack of diagnostic criteria to distinguish FAS from other alcohol-related conditions. The CDC
developed these guidelines to assist health care providers in determining the impact of FAS on our society and to help in the delivery of appropriate services to these children (CDC, 2004a).

Statement of Problem

In November 2000, Healthy People 2010: Understanding and Improving Health for the year 2010 was released by then Secretary of Health and Human Services, Donna E. Shalala. This document contained 467 objectives in 28 focus areas (U.S. Department of Health and Human Services [USDHHS], 2000). The two overarching goals set forth by Healthy People 2010 are:

1. Increasing quality and years of healthy life
2. Eliminating health disparities

More recently, Healthy People 2010 released a midcourse review examining the status of the original objectives. Several objectives contained in Healthy People 2010 midcourse review have been developed to address alcohol use among women of childbearing age including the following:

Improve access to comprehensive, high-quality health care services.

- Objective 1-3. Increase the proportion of persons appropriately counseled about health behaviors.
  - Objective 1-3d. Risky drinking (adults aged 18 years and older).

Improve the health and well-being of women, infants, children, and families.

- Objective 16-17. Increase abstinence from alcohol, cigarettes, and illicit drugs among pregnant women.
Objective 16-17a. Increase in reported abstinence in past month from alcohol.

Objective 16-17b. Increase in reported abstinence in past month from binge drinking.

Objective 16-18. Reduce the occurrence of fetal alcohol syndrome (FAS).
Reduce substance abuse to protect the health, safety, and quality of life for all, especially children.

Objective 26-11. Reduce the proportion of persons engaging in binge drinking of alcoholic beverages.

Objective 26-11c. Reduce the proportion of adults 18 years and older engaging in binge drinking in the last month.


As one of the leading causes of preventable mental retardation and birth defects in the United States (USDHHS, 2007), FASDs are 100% preventable if a mother does not consume alcohol during pregnancy. Because no safe amount of alcohol or time during pregnancy has been identified, in February 2005, the 17th Surgeon General of the United States, Dr. Robert Carmona, reflecting on the 1981 Surgeon General's advisory, stated:

We do not know what, if any, amount of alcohol is safe. But we do know that the risk of a baby being born with any of the fetal alcohol spectrum disorders
increases with the amount of alcohol a pregnant woman drinks, as does the likely severity of the condition. And when a pregnant woman drinks alcohol, so does her baby. Therefore, it's in the child's best interest for a pregnant woman to simply not drink alcohol. (USDHHS, 2005a, p. 1)

Research has confirmed that:

- Alcohol consumed during pregnancy increases the risk of alcohol related birth defects.
- No amount of alcohol consumption can be considered safe during pregnancy.
- Alcohol can damage a fetus at any stage of pregnancy.
- Cognitive deficits and behavioral problems resulting from prenatal alcohol exposure are lifelong.
- Alcohol-related birth defects are completely preventable. (USDHHS, 2005a, p. 2)

Therefore:

1. A pregnant woman should not drink alcohol during pregnancy.
2. A pregnant woman who has already consumed alcohol during her pregnancy should stop in order to minimize further risk.
3. A woman who is considering becoming pregnant should abstain from alcohol.
4. Recognizing that nearly half of all births in the United States are unplanned, women of child-bearing age should consult their physician and take steps to reduce the possibility of prenatal alcohol exposure.
5. Health professionals should inquire routinely about alcohol consumption by women of childbearing age, inform them of the risks of alcohol consumption during pregnancy, and advise them not to drink alcoholic beverages during pregnancy. (USDHHS, 2005a, p. 2)

Numerous federal agencies and national organizations recommend that pregnant women and women who are planning on becoming pregnant abstain from alcohol consumption (CDC, 2004a; National Institute on Alcohol Abuse and Alcoholism/National Institutes of Health [NIAAA/NIH], 2004; NOFAS, 2004; SAMHSA, 2002). In addition, the U.S. Preventive Services Task Force (USPSTF, 2004) recommends screening and behavioral counseling interventions to reduce alcohol misuse by adults, including pregnant women, in primary care settings” (p. 1). According to the USPSTF (2004), additional research is needed to determine the effectiveness of counseling and screening for alcohol misuse among pregnant women in primary care settings.

Consistent with federal government recommendations, the American Medical Association (AMA), and the American College of Obstetrics and Gynecology (ACOG) recommended that physicians screen all women of childbearing age for alcohol use and continue to increase their own knowledge about substance use and abuse (AMA, 2007; ACOG, 2002). Unfortunately, only about half of physicians surveyed counsel or screen all women of childbearing age for alcohol use (Hennepin County Community Health Department, 2001; Diekman et al., 2000). Research supports that physician advice is the most important factor in determining whether or not a patient decreases his or her alcohol
intake (Frost-Pineda, VanSusteren, & Gold, 2004; Funkhouser & Denniston, 1985; Jones-Webb, McKiver, Pirie, & Miner, 1999; Lelong, Kaminski, Chwalow, Bean, & Subtil, 1995; Lussky, 1996; Minor & VanDort, 1982; Morse & Hutchins, 2000). To date, there are no mandates, only recommendations, on how physicians should be advising their patients regarding alcohol use during pregnancy (Blum, Nielson, & Riggs, 1998).

Current research examining physician counseling on alcohol use has relied heavily on physician self-report and patient recall to determine the rate at which physicians counsel or screen women of childbearing age about alcohol use during pregnancy (Arndt, Schultz, Turvey, & Petersen, 2002; Burns & Adams, 1997; Diekman et al., 2000; Flocke & Stange, 2004; Friedmann, McCullough, Chin, & Saitz, 2000; Gustafson, Ding, Kinney, Finch, & Hargreaves, 2001; Herbert & Bass, 1997; Little et al., 1983; Maheux, Haley, Rivard, & Gervais, 1999; Peterson, Connelly, Martin, & Kupper, 2001; Sarnoff, Adams, Shauffler, & Abrams, 2001). Additional studies have used standardized patients, individuals who are trained to portray a health/medical concern in order to evaluate medical education (Beaulieu et al., 2003; Ebbert & Connors, 2004), to determine the rate at which physicians counsel or screen for alcohol use (Kahan et al., 2004; Wenrich, Paauw, Carline, Curtis, & Ramsey, 1995; Wilson et al., 2002).

Purpose of Study

The purpose of this study was to analyze the relationship between perceived knowledge and perceived self-efficacy to counsel about health risks and resources for management of alcohol and alcoholism and to screen for alcohol use in pregnant women among medical students, enrolled in a 4-year private M.D. program, a 4-year public D.O.
program, or a 6-year B.S./M.D program. The demographics analyzed in this study included type of institution, type of learning experience, area of specialty interest, age, sex, and race of medical students. The theoretical framework reinforcing this study was self-efficacy from Bandura's social cognitive theory. Self-efficacy is —the belief in one’s capabilities to organize and execute the courses of action required to manage prospective situations” (Bandura, 1995, p. 2). According to Bandura (1994), individuals who believe they are capable of performing a particular task see it as a challenge to overcome, not something to be avoided. Individuals who believe they are less capable of performing a task see the challenge as a personal threat (Bandura, 1994).

Research Questions

1. Does age of medical student predict a higher level of knowledge about alcohol use among pregnant women?
2. Does age of medical student predict a higher level of self-efficacy to screen for alcohol use among pregnant women?
3. Does age of medical student predict a higher level of self-efficacy to counsel for alcohol use among pregnant women?
4. Does sex of medical student predict a higher level of knowledge about alcohol use among pregnant women?
5. Does sex of medical student predict a higher level of self-efficacy to screen for alcohol use among pregnant women?
6. Does sex of medical student predict a higher level of self-efficacy to counsel for alcohol use among pregnant women?
7. Does race of medical student predict a higher level of knowledge about alcohol use among pregnant women?

8. Does race of medical student predict a higher level of self-efficacy to screen for alcohol use among pregnant women?

9. Does race of medical student predict a higher level of self-efficacy to counsel for alcohol use among pregnant women?

10. Does type of institution attended predict a higher level of knowledge about alcohol use among pregnant women?

11. Does type of institution attended predict a higher level of self-efficacy to screen for alcohol use among pregnant women?

12. Does type of institution predict a higher level of self-efficacy to counsel for alcohol use among pregnant women?

13. Does specialty interest of medical student predict a higher level of knowledge about alcohol use among pregnant women?

14. Does specialty interest of medical student predict a higher level of self-efficacy to screen for alcohol use among pregnant women?

15. Does specialty interest of medical student predict a higher level of self-efficacy to counsel for alcohol use among pregnant women?

16. Does type of learning experience predict a higher level of knowledge about alcohol use among pregnant women?

17. Does type of learning experience predict a higher level of self-efficacy to screen for alcohol use among pregnant women?
18. Does type of learning experience predict a higher level of self-efficacy to counsel for alcohol use among pregnant women?

Definitions

*Fetal Alcohol Spectrum Disorders:* an *umbrella term to describe the range of effects that can occur in an individual whose mother drank alcohol during pregnancy. These effects include physical, mental, behavioral, and/or learning disabilities with possible implications*” (Litle, 2004, p. 1).

*Self-efficacy:* —*the belief in one’s capabilities to organize and execute the courses of action required to manage prospective situations*” (Bandura, 1995, p. 2).

*Medical specialty:* for the purpose of this study is defined as Family Medicine, Internal Medicine, Obstetrics and Gynecology, Pediatrics, Psychiatry & Surgery.

*Women of childbearing age:* refers to any woman between the ages of 15 and 44.

Assumptions

- Participants will respond to self-report questionnaire honestly.
- Participants will read and follow directions.
- Items on the instrument will accurately assess self-efficacy.
- Participants will understand the English language.
- Participants will check university email account on a regular basis.
CHAPTER II
LITERATURE REVIEW

The purpose of this study was to analyze the relationship between perceived knowledge and perceived self-efficacy to counsel about health risks and resources for management of alcohol and alcoholism and perceived self-efficacy to screen for alcohol use in pregnant women among third year medical students, enrolled in a 4-year private M.D. program, a 4-year public D.O. program, or a 6-year B.S./M.D program. The demographics analyzed in this study included type of institution, type of learning experience, area of specialty interest, age, sex, and race of medical students. The theoretical framework reinforcing this study was self-efficacy.

Alcohol Use in the United States

Excessive alcohol use is the third leading cause of preventable death in the U.S. (CDC, 2004a). Both Healthy People 2000 and 2010 have confirmed that the 10 leading causes of death among Americans for the past 10 years have been heart disease, cancer, cerebrovascular disease, accidents, chronic obstructive pulmonary disease, pneumonia and influenza, diabetes, suicide, chronic liver disease and cirrhosis, and HIV. McGinnis and Foege (1993), based on the reported deaths from the Healthy People publication, identified the “actual” causes of death to be tobacco, diet and exercise, alcohol, microbial agents, toxic agents, firearms, sexual behavior, motor vehicles, and illicit use of drugs. “Actual” causes of death include those that can be attributed to external factors. Similarly, in 2004, Mokdad, Marks, Stroup, and Gerberding reported that the “actual”
causes of death in 2000 were the same as in 1993; tobacco, poor diet and physical inactivity, and alcohol consumption. Alcohol consumption alone was responsible for 85,000 deaths in 2000. In 2001, the CDC reported approximately 75,766 deaths and 2.3 million years of potential life lost were attributable to excessive alcohol use among Americans (CDC, 2004b).

The Behavioral Risk Factor Surveillance System (BRFSS) in 2004 determined that 56.8% of adults had consumed at least one drink in the past 30 days, 4.8% reported heavy drinking, and 14.9% were identified as binge drinkers (National Center for Chronic Disease Prevention and Health Promotion, 2004). The Health Resources and Services Administration (HRSA) defined binge drinking as “five or more drinks on the same occasion on at least 1 day in the past 30 days, occasion meaning at the same time or within a few hours of each other” (USDHHS, 2003). Likewise, HRSA defined heavy drinking as “five or more drinks on the same occasion on each of 5 or more days in the past 30 days” (USDHHS, 2003). The National Survey on Drug Use and Health (Substance Abuse and Mental Health Services Administration, 2005) revealed similar findings to the BRFSS results, by confirming that 50.3% of Americans over the age of 12 were current drinkers. With that, 22.8% reported having engaged in binge drinking and 6.9% reported heavy drinking behaviors: “five or more drinks on the same occasion on at least 5 different days in the past 30 days.” Similarly, results from the National Health Interview Survey conducted between January and June 2005 revealed that 19.7% of adults surveyed had five or more drinks in one day over the past year (National Center for Health Statistics, 2005).
According to the CDC (2006b) excessive alcohol use can result in deaths, motor vehicle accidents, unintentional injuries, violence, sexually transmitted infections, hepatitis C, and prenatal complications. Similarly, alcohol abuse has been linked to chronic liver disease, liver cancer, oral-pharyngeal, esophagus, prostate, and breast cancers (American Cancer Society, 2002). In 2002, 41% of all traffic related deaths were attributed to alcohol use (National Transportation Highway Safety Board [NTHSB], 2006). In addition, 31% of those who die from non-traffic injuries, such as drowning, falls, hypothermia, burns, suicides or homicides (Smith, Branas, & Miller, 1999), and 40% of all crimes are alcohol related (Greenfield, 1998). According to the Bureau of Justice, when victims of violence were asked whether or not their offender was using alcohol or other drugs at the time of the offense, 70% reported that they believed their offender was under the influence of either alcohol or illicit drugs. In addition, 30% of rape/sexual assault offenders, 10% of robbery offenders, 21% of aggravated assault offenders, and 21% of simple assault offenders were perceived by their victims, to be under the influence of alcohol at the time of the offense.

Research has confirmed that individuals who abuse alcohol are more likely to engage in high risk sexual behaviors, including unprotected vaginal, oral, or anal intercourse, increasing their chances of contracting a sexually transmitted infection or HIV/AIDS (AGI, 1994). Finally, research has demonstrated that alcohol use during pregnancy may cause low birth weight, premature delivery, miscarriage, sudden infant death syndrome, and fetal alcohol spectrum disorders (CDC, 2006b).
Alcohol Use Among Women in the United States

It is estimated that, among all age groups, one-third of American women consume alcohol on a regular basis. In addition, approximately 2.3% of women are alcohol dependent (NIAAA, 2004). Redgrave, Swartz, and Romanoski (2003) have asserted that HRSA’s definitions for binge drinking and heavy drinking, resulting from research conducted on men, are misleading when applied to women. These researchers report that for women who are not pregnant, two or more drinks per day, or for pregnant women, one or more drinks per day, have been associated with —i effects” (p. 256).

In 2003, HRSA reported that 14.8% of women ages 18 and older were binge drinkers. Almost 32% of women aged 18 – 25 reported binge drinking, whereas 9% reported heavy drinking. Among women aged 26 and older, 12.6% reported binge drinking and 2.6% reported heavy drinking. In support of these findings, the 2004 National Survey on Drug Use and Health (Substance Abuse and Mental Health Services Administration, 2005) revealed that 44% of females over the age of 12 had used alcohol in the month preceding the survey. Further, results from the January – June 2005 National Health Interview Survey determined that 21% of females aged 18 – 24 and approximately 17% of females aged 25 – 44 had 5 or more drinks in 1 day in the 30 days preceding the survey.

According to the National Institute on Alcohol Abuse and Alcoholism (1999) women are at a greater risk for alcohol related problems than their male counterparts. Because women have less water in their bodies than men, they absorb and metabolize alcohol differently. As a result, women who consume alcohol will have higher
concentrations of ethanol in the blood compared to men of similar weight. Also, women who had consumed equal amounts are at an increased risk for developing liver damage, brain damage, heart disease, and breast cancer sooner than their male counterparts. In addition, as a result of alcohol consumption, women who consume alcohol are at an increased risk for violent victimization, traffic crashes, and prenatal complications (NIAAA, 1999).

Redgrave et al. (2003) concurred with the NIAAA findings indicating that women appear to develop alcohol related problems earlier than men. According to their findings, women have a higher mortality rate despite a lower alcohol consumption rate compared to their male counterparts. They have an increased risk of cardiovascular disease and stroke, cancer, endocrine and gynecologic disorders, liver disease, reduction in bone mass, decrease in brain volumes, and decreased performance on cognitive tasks such as spatial memory, constructive thinking, and attention. Although women with alcohol use disorders are more likely to seek help for alcohol related problems than men, they are less likely to be identified or diagnosed with an alcohol use disorder by their physicians due to inadequate screening or a misdiagnosis with another psychological disorder (Brienza & Stein, 2002).

Alcohol Use Among Pregnant Women in the United States

The CDC (2004) estimated that 10% of pregnant women ages 18 – 44 reported drinking alcohol at least once during their pregnancy. Whereas this rate of alcohol consumption during pregnancy represents a decrease from 16.5% of such behavior
reported in 1995, the rate of binge drinking (2%) and heavy drinking (3.3%) remains higher than the objectives set forth in the Healthy People 2010 document (CDC, 2002).

In 1999, more than 130,000 women of childbearing age drank at high risk levels, thus increasing the chance that more babies would be born with alcohol-related birth defects (March of Dimes, 2003). The National Household Survey on Drug Abuse (SAMHSA, 2002) revealed that among women in their first trimester of pregnancy, 23.3% had used alcohol in the month preceding the survey, 8.8% “binge” drank in the month preceding the survey, and 1.8% drank heavily in the month preceding the survey. Among respondents in their second trimester of pregnancy, 8.8% had used alcohol in the month preceding the survey, 2.3% “binge” drank, and 0.3% “drank heavily” in the month preceding the survey. Further, among respondents in their third trimester of pregnancy, 6% had used alcohol in the month preceding the survey, and 0.6% “binge” drank. Due to a small sample size of women in their third trimester who reported that they were heavy drinkers, analyses were not conducted (SAMHSA). Similarly, the results of the CDC’s Behavior Risk Factor Surveillance System (CDC, 2004a) confirmed that more than half of the female respondents who did not use birth control reported alcohol use. In addition, 12.4% of such respondents reported binge drinking.

In a study conducted by Ebrahim, Diekman, Floyd, and Decoufle (1999) that compared binge drinking among pregnant and nonpregnant women, the results suggested that 13.7% of pregnant women and 52% of nonpregnant women consumed alcohol in the month preceding the survey. Almost 2% (1.9%) of pregnant women and 11.6% of nonpregnant women reported binge drinking. Similarly, in a study conducted by
O’Connor and Whaley (2003) among their 826 pregnant subjects, 197 reported drinking after having their pregnancies confirmed.

Women who engage in binge drinking increase their risks for having low birth weight babies, premature deliveries, miscarriages, stillbirth, sudden infant death syndrome, and fetal alcohol spectrum disorders (March of Dimes, 2002). Similarly, pregnant women who abuse alcohol are more at risk for serious health consequences such as cirrhosis, nutritional deficiencies, alcoholic hepatitis, difficulty with lactation, and pancreatitis compared to pregnant women who do not abuse alcohol (Fischer, Bitschnau, Peternell, Eder and Topitz, 1999; Mitchel, 1993).

Prenatal Alcohol Use Effects on Children

In a retrospective study conducted by Day et al. (1991), 519 three year olds, who were exposed to alcohol prenatally, tended to be smaller in length, weight, and head circumference at birth and were more likely to have more minor physical anomalies. Olsen, Bolumar, Bisanti, and the European Study Group on Infertility and Subfecundity (1997) reported that drinking even one drink a day while pregnant increased the risk of antisocial behavior, substance use, impulsivity, and disorganization among exposed children when they reached adolescence. In a longitudinal prospective study addressing alcohol and pregnancy, Streissguth and Connor (2001) followed a cohort of 500 children starting prenatally through 25 years of age. Subjects in the study were examined on days 1 and 2 after birth, at 8 and 18 months, and at ages 4, 7, 14, and 21 years. During the study, parents were interviewed and teacher response impressions were evaluated. Subjects were selected in utero based on the amount of alcohol their mothers reported
consuming in their fifth month of pregnancy. Two hundred and fifty infants from the heaviest drinkers and smokers and 250 infants from abstainers and infrequent drinkers were selected to participate in the study.

On day one after birth, infants exhibited poor habituation to superfluous stimuli, poor response intonation, weak reflexes, tremulousness, increased head turning to left, and decreased body activity (Landesman-Dwyer, Keller, & Streissguth, 1978; Streissguth, Bookstein, Sampson, & Barr, 1995). Day 2 after birth, infants exhibited sucking deficiencies (Martin, Martin, Streissguth, & Lund, 1979). At 8 months, infants displayed subtle mental and motor development deficiencies and increased feeding difficulties (Streissguth et al., 1995; Streissguth, Barr, Martin, & Herman, 1980), although their difficulties were no longer present at 18 months. At 4 years old, the children displayed lower IQs as well as poor fine and gross motor performance; and at 7 years old, they continued to display lower IQs (Barr, Streissguth, Darby, & Sampson, 1990; Sampson, Streissguth, Barr, & Bookstein, 1989; Streissguth, Barr, & Sampson, 1990; Streissguth, Barr, Sampson, Darby, & Martin, 1989; Streissguth et al., 1995).

Academic problems were present throughout school among children whose mothers drank during pregnancy. These children tended to have the most difficulty with math (Sampson, Streissguth, Barr, & Bookstein, 1989; Streissguth, Bookstein, Sampson, & Barr, 1993; Streissguth et al., 1994). Prenatal alcohol use was associated with increased likelihood of enrollment in special classes, as well as poor organization, attention, grammar, word recall, and tactfulness by the end of second grade (Streissguth et al., 1990; Streissguth, Bookstein, Sampson, & Barr, 1995). By the time the subjects
were 11 years old their scores on standardized tests in math and overall achievement were lower than those of their peers. Their teachers described these students as having difficulty with information processing and reasoning skills as well as being distractible, restless, and not very persistent (Carmichael Olson, Sampson, Barr, Streissguth, & Bookstein, 1992).

Fetal Alcohol Spectrum Disorders

Fetal Alcohol Spectrum Disorders (FASD) is an umbrella term used to describe the range of effects that can occur in an individual whose mother drank alcohol during pregnancy. These effects include physical, mental, behavioral, and/or learning disabilities with possible implications” (Litle, 2004, p. 1). FASD is one of the leading preventable causes of mental retardation in the western world and it is 100% preventable if the mother does not consume alcohol during pregnancy.

According to the National Organization on Fetal Alcohol Syndrome (NOFAS), approximately 40,000 births each year are affected by prenatal alcohol use in the United States. This represents approximately 1 in every 100 live births (NOFAS, 2004). Lupton (2003) identified two categories of costs associated with FASD. This financial burden includes both total annual costs to the Nation and lifetime costs of each child born with FASD. The costs of FASD include medical treatment for growth retardation and physical anomalies (heart defects, cleft palates, kidney and genital tract problems, vision difficulties, and skeletal and dental deformities) as well as services for the developmentally disabled, learning disabilities, and physical problems. In addition, there are costs associated with the criminal justice system, welfare payments, special
education, social and mental health services, institutional care until age 65, and the loss of productivity among caregivers and individuals with FASD (Lupton, 2003). The majority of the approximated lifetime costs of $2 million per child are medical costs (Lupton et al., 2004). These cost estimates are reinforced by data collected by the Substance Abuse and Mental Health Services Administration (SAMHSA, 2002), confirming that the estimated lifetime cost of $2 million or more per child of which $1.6 million dollars are associated with medical costs and $0.4 million for loss of productivity. Unfortunately, the difficulty in estimating the costs associated with FASD is influenced by the inability to correctly determine the incidence and prevalence rates, which services and health impacts to include, and the cost based on current dollar values and the dollar values of the future (Lupton, 2003).

Strategies to Prevent FASD

Over the past 30 years, many strategies have been used to limit the amount of alcohol consumed by pregnant women. In one of the earliest studies examining FASD prevention efforts, Waterson and Murray-Lyon (1990) reported that much of what was being done lacked a health promotion and health education theoretical and knowledge base and did not address appropriate risk factors and behaviors among high risk drinking target populations. In another attempt to examine FASD prevention efforts, Finkelstein (1993) suggested that all comprehensive programs for FASD should be family focused, community-based, comprehensive, multidisciplinary, and coordinated; should include competency building and empowerment training; should address many of the problems and needs of the mothers and families; should be individually tailored and long term; and
should encompass a range of treatment services. In addition, Hughes et al. (1995), Kaufman (1996), and Namyniuk, Brems, and Carson (1997) recommended that comprehensive FASD prevention programs include outreach programs for high-risk drinkers, family support and counseling, in addition to medical and psychiatric services.

FASD has captured the attention of community groups, public health communities, and health care providers nationwide. The federal government has developed specific strategies to prevent FASD. Healthy People 2010 focused on alcohol use in three areas related to this study.

Improve access to comprehensive, high-quality health care services.

- Objective 1-3. Increase the proportion of persons appropriately counseled about health behaviors.
  - Objective 1-3d. Risky drinking (adults aged 18 years and older).

Improve the health and well-being of women, infants, children, and families.

- Objective 16-17. Increase abstinence from alcohol, cigarettes, and illicit drugs among pregnant women.
  - Objective 16-17a. Increase in reported abstinence in past month from alcohol. Baseline data for 2002-2003 was 90%. The target for 2010 is 95%.
  - Objective 16-17b. Increase in reported abstinence in past month from binge drinking. Baseline data for 2002-2003 was 96%. The target for 2010 is 100%.
- Objective 16-18. Reduce the occurrence of fetal alcohol syndrome (FAS). Baseline data for 1995-1997 was 0.4 births per 1,000 live births. The target for 2010 is 0.1 per 1,000 live births.
Reduce substance abuse to protect the health, safety, and quality of life for all, especially children.
- Objective 26-11. Reduce the proportion of persons engaging in binge drinking of alcoholic beverages.
  - Objective 26-11c. Reduce the proportion of adults 18 years and older engaging in binge drinking in the last month. Baseline data for 1998 was 16.6%. The target for 2010 is 6%.

Using a public health approach, May (1995) categorized FASD prevention into three levels: primary, secondary, and tertiary prevention. In this context, primary prevention efforts are designed to stop alcohol use before it starts. According to May, this can be accomplished through public education, increasing taxes on alcoholic beverages, environmental change, promoting beverages with low or no alcohol content, positive initiatives, and socio-economic improvement. Secondary prevention efforts focus on early identification of problem drinking and treatment for pregnant women in order to
decrease the time the fetus is exposed to alcohol and severity of birth defects (May).

Tertiary prevention activities should focus on a woman who has already given birth to a child with FASD. In this situation the woman should be referred to treatment, educated about birth control options so as to not get pregnant again, and provided with case management for herself and the child (May).

In another study, Masis and May (1991) took a systems approach for FASD prevention. The prevention program consisted of community, family, and individual based techniques using primary, secondary, and tertiary prevention strategies. Primary prevention strategies included increasing knowledge and awareness of FAS in the community through presentations, posters, pamphlets, media and training of social service and child development workers, school personnel, WIC participants, alcohol counselors, and Indian Health Services providers. Secondary prevention strategies focused on screening patients in prenatal clinics and educating them on FAS and alcohol use. Tertiary prevention strategies included case management and social services, counseling, personal support, and medical services for referred clients. According to the authors, approximately 30,000 individuals were exposed to the media campaign, 147 school personnel and tribal agency employees were trained, and more than 2,000 community members were engaged in the presentations, health fairs, and local government meetings. Among all of the pregnant women screened for alcohol use, 48 were considered to be “at-risk” and were referred to the tertiary prevention program. After 18 months, only 32 of the women referred to the program were still living in the area. Of these 32 women, 18 were abstinent, 4 had reduced their drinking, and 10 were
still drinking at the same level (Masis & May). Masis and May believed the program was
effective because it was conducted by trusted community members and it was accepted
by the community and the women who were referred to the program. In the end, the
authors believed the whole community benefited from the information.

In 1996, the Institute of Medicine recommended that comprehensive programs for
FASD prevention include universal approaches, selective prevention interventions, and
indicated interventions.

*Universal Approaches*

Universal prevention attempts to promote the health and well-being of all
individuals in society or of a particular community. Universal prevention
interventions are those targeted to the general public to or an entire population
group. (Stratton, Howe, & Battaglia, 1996, p. 114)

Universal approaches to prevention of FASD include warning labels on all
alcoholic beverages, point of sale signage, public service announcements in the media,
and community wide educational programs. To this end, federal law required warning
labels to be put on all alcoholic beverages bottled on or after November 18, 1989 (Public
Law No 100-690, 1988). An example of such required warning labels states:

GOVERNMENT WARNING: (1) According to the Surgeon General, women
should not drink alcoholic beverages during pregnancy because of the risk of birth
According to Greenfield, Graves, and Kaskutas (1992), by the summer of 1991 only 27% of the U.S. population had seen the warning labels. Of those who had seen the warning labels, the majority of them (81%) recalled the labels mentioned pregnancy. Similarly, in 1991 approximately 31% of the U.S. population reported seeing point of sale signage at restaurants and bars and a little over half (56%) of them remembered the signs mentioning something about birth defects. In 1991, 73% of the U.S. population had seen some sort of public service announcement regarding alcohol use during pregnancy.

That same year, Kaskutas and Greenfield (1992) conducted a nationwide telephone survey examining the first effects of the warning labels. In a study of 2,006 adults, during June and July, six months prior to the placement of the warning labels on alcoholic beverages, and again in the summer of 1990, six months after the placement of the warning labels on alcoholic beverages, almost all (99%) of the women of childbearing age surveyed believed that drinking alcohol during pregnancy increased the risk for birth defects. Similarly, when respondents were asked whether they thought pregnant women should not drink, 98% of respondents who did not see the warning label believed that the statement was probably or definitely true and 98% of those who saw the label believed that the statement was probably or definitely true (Kaskutas & Greenfield). When Kaskutas and Greenfield examined the differences in behaviors between 1989 and 1990, they found no statistically significant behavior changes among women of childbearing age. Among women of childbearing age, 56% who did not see the label had a conversation about drinking and pregnancy, whereas 69% who saw the label had a conversation about drinking and pregnancy. The authors suggested that the warning
labels provide a reminder for existing knowledge about the consequences of drinking alcohol during pregnancy (Kaskutas & Greenfield).

In 1993, Hankin et al. conducted a similar study among inner city African American women. Between May 22, 1989, and May 31, 1992, 5,169 African American women seeking care at a prenatal clinic were interviewed about their alcohol consumption and whether or not there was a warning label on alcohol beverage containers. Prior to March 1990, a trend in awareness was not noted; however, between March 1990 and May 1992 there was a 48% increase in label awareness. This research suggested that there was a 4-month lag time before label awareness started to increase. As more alcohol beverage containers were labeled, more individuals were made aware of the consequences. In the beginning of the label enactment, wine and liquor bottles were not labeled as quickly as beer and wine coolers, suggesting the type of alcohol being consumed determined label awareness (Hankin et al.).

Further, Kaskutas and Graves (1994) conducted an observational study using telephone interviews to describe the relationship of exposure to health messages about the risks of using alcohol during pregnancy and the awareness and behavior of the respondents to this risk. Exposure to health messages included warning labels on alcoholic beverages, warning posters in bars and restaurants, or media advertisements. The findings of this research revealed 54% of the sample and 47% of the women of childbearing age reported seeing at least one message. Approximately 20% of the respondents and 25% of women of childbearing age saw two messages and only 6% of the respondents and 8% of the women of childbearing age saw three messages.
According to the authors, respondents exposed to two message types were one and a half times more likely to decrease the amount of alcohol consumed. Respondents who reported seeing three message types were two times more likely to decrease the amount of alcohol consumed because of health concerns (Kaskutas & Graves).

More recently, Kaskutas, Greenfield, Lee, and Cote (1998) conducted a similar study examining the reach and effects of health messages on alcohol use during pregnancy. In their study they used data collected on women of childbearing age in 1990, 1991, 1993, and 1994. According to their findings, in 1989, only 7% of pregnant women had seen the warning labels on alcohol beverage containers, 21% had seen signage or posters, 81% had seen advertisements, and 84% had had conversations about drinking during pregnancy. Among those, in 1989, who were likely to become pregnant, 11% had seen the warning labels on alcohol beverage containers, 26% had seen signage or posters, 69% had seen advertisements, and 77% had had conversations about drinking during pregnancy. In 1994, 42% of pregnant women had seen the warning labels on alcohol beverage containers, 17% had seen signage or posters, 58% had seen advertisements, and 58% had had conversations about drinking during pregnancy. Among those, in 1994, who were likely to become pregnant, 60% had seen the warning labels on alcohol beverage containers, 17% had seen signage or posters, 63% had seen advertisements, and 69% had had conversations about drinking during pregnancy (Kaskutas et al.). These findings suggest that more pregnant women were exposed to warning labels in 1994, than in 1989, but in 1994 fewer were being exposed to signage/posters, advertisements, and conversations about drinking during pregnancy. Similarly, among women who were
likely to become pregnant, there has been an increase in exposure to warning labels since 1989, but a decrease in exposure to signage/posters, advertisements, and conversations about drinking during pregnancy.

Selective Interventions

Selective interventions target persons and subgroups that are at excess risk of developing the problem, such as women of child-bearing age who drink alcohol. These interventions should be given by health care providers who are trained to question women about their drinking and contraceptive histories and to deliver interventions that are proportional to the woman’s level of risk. (Prenatal Exposure to Alcohol, 2000, p. 38)

Selected intervention strategies to prevent FASD include, but are not limited to, preconception counseling, training health care providers and teachers, and prenatal clinic programs. Preconception counseling involves educating women of childbearing age about the consequences of alcohol use during pregnancy before they become pregnant (Tough, 2005). The CDC has, as one of its activities for preventing FASD, education of families, professionals, and the public. With this strategy it is understood that most people are familiar with the term fetal alcohol syndrome, but teachers, parents, and health care providers do not have a basic understanding of FAS, nor an understanding of the needs these children have. It is the goal of the CDC to improve screening, identification, and treatment of those with FASD by educating students in the health field and practitioners that work with these children on a regular basis. It is also important to train parents, teachers, and other care givers about the syndrome, how it impacts the child, the best way
to work with an FASD child, and how to refer to local services for the child and family (CDC, 2006c).

In 1987, the National Institute on Alcohol Abuse and Alcoholism published “Program strategies for preventing fetal alcohol syndrome and alcohol related birth defects” summarizing the results of an educational program that was conducted between 1979 and 1981 in King County, Washington. In this study, physicians, social workers, teachers, nurses, alcohol counselors, and psychologists were educated about the consequences of alcohol use during pregnancy through lectures, publications, continuing education courses, and presentations. Upon completion of the study, participants reported an increase in knowledge about fetal alcohol syndrome and alcohol-related birth defects.

Rosett, Weiner, and Edelin (1981) surveyed more than 1,700 women who registered at a Boston City hospital for prenatal care on alcohol intake, drug use, smoking, diet, and demographics. Based on the information provided by the women, 10% identified as heavy drinkers, 40% identified as moderate drinkers, and 50% drank rarely or never. Among the women who reported being heavy drinkers, all were told of the risk involved to their child. At each prenatal visit subjects participated in a counseling session that reinforced the advice given by the obstetrics staff, coping strategies for managing challenging situations, and reinforcement about the advantages of reducing alcohol consumption (Rosett et al.). Thirty-one of the women participated in three or more counseling sessions. Among these women, 56% either stopped drinking or significantly decreased their drinking by their third trimester of pregnancy. This reduction in alcohol use by the third trimester appeared to be associated with a more normal growth among
the children compared to those born to heavy drinkers. In contrast, children born to heavy drinkers were two to three times more likely to have "congenital anomalies, growth retardation and jitteriness" (Rosett & Weiner, 1981, p. 150). According to the authors of the study, decreasing alcohol consumption during the third trimester has a positive effect on the child.

**Indicated Interventions**

Indicated interventions are targeted to women who are at high risk of giving birth to an alcohol-impaired child, because, for instance, they are drinking at a level that is likely to produce FAS-affected offspring or they have already delivered one child with FAS. These interventions should be offered in the form of brief interventions or more formal approaches as needed. (Prenatal Exposure to Alcohol, 2000, p. 38)

Most of the indicated interventions to prevent FASD include brief interventions or motivational interviewing. Brief interventions, according to the Center for Substance Abuse Treatment (CSAT, 1997), provide an opportunity for the health care provider to explain the results of the screening, provide information about safe consumption limits and advice about changing, assess the patient’s readiness to change, negotiate goals and strategies for change, and arrange for compliance monitoring” (p. 2). This is usually completed in one or more office visits. Brief interventions frequently include five steps:

1. A statement of medical concern from the counselor or health care provider about the client’s alcohol use.
2. Screening and assessment to determine the nature of the alcohol problem.
3. Feedback and advice on how to abstain from or reduce alcohol use.

4. A course of action that sets specific goals for abstaining from drinking or reducing alcohol consumption.

5. A summary of the discussion and the agreed-upon course of action and the scheduling of a follow-up appointment. (CSAT, 1997)

Several studies have evaluated the effectiveness of brief interventions. Kristenson, Ohlin, Hulten-Nosslin, Trell, and Hood (1983), Persson and Magnusson (1989), and Romelsjo et al. (1989) found brief interventions to be feasible and effective. The IOM (1990) reported that brief interventions were practical and cost effective for health care providers. Further, Orford, Oppenheimer, and Edwards (1976), Edwards et al. (1977), and Bien, Miller, and Tonigan (1993) reported a possible reduction or elimination of use when brief interventions are used with selected populations. Although there is evidence to suggest that brief interventions are effective, it is not known how long an intervention should last or how many interventions are needed to be effective in reducing or eliminating alcohol use (Babor & Grant, 1992; Chick, Ritson, Connaughton, Stewart, & Chick, 1988; Wallace, Cutler, and Haines, 1988).

Another indicated intervention involves motivational interviewing (MI). MI (Miller & Rollnick, 1991) is a strategy used to help people identify a problem or behavior and develop a plan to change the problem or behavior. The goal of MI is “to increase the client intrinsic motivation, so that change arises from within rather than being imposed on them from without” (p. 52). The five clinical principles of MI are (a) express empathy,
(b) develop discrepancy, (c) avoid argumentation, (d) roll with resistance, and (e) support self-efficacy.

Role of Physicians

The Institute of Medicine recommended that clinicians be trained to question women in an appropriate manner about their drinking and contraceptive histories and be prepared not just to question women about their alcohol abuse, but to discuss all aspects of alcohol use” (IOM, 1996, p. 123). Similarly, a number of studies investigating behavior change have found that physician advice is the most important factor in determining whether or not a patient abstains from alcohol (Frost-Pineda et al., 2004; Funkhouser & Denniston, 1985; Jones-Webb et al., 1999; Lelong et al., 1995; Minor & VanDort, 1982; Morse & Hutchins, 2000). According to ACOG (2000) it is the responsibility of the physician to screen, identify, and counsel women regarding substance use; conduct routine screening during history taking with all patients because many do not present with physical symptoms of substance abuse; be familiar with local community resources; and be able to refer out to these resources.

In his advisory in February 2005, the 17th Surgeon General of the United States, Dr. Robert Carmona, stated, “health professionals should inquire routinely about alcohol consumption by women of childbearing age, inform them of the risks of alcohol consumption during pregnancy, and advise them not to drink alcoholic beverages during pregnancy” (USDHHS, 2005a, p. 2). Several federal organizations support the Surgeon General’s advisory. In the National Institute on Alcohol Abuse and Alcoholism (NIAAA/NIH, 2005) publication –Helping Patients Who Drink Too Much: A Clinicians
Guide,” it is suggested that physicians consider incorporating routine screening into their practice for patients who are pregnant or trying to get pregnant and to advise abstinence from alcohol to those who are pregnant. The CDC and SAMHSA recommended that all women of child-bearing age, those who are pregnant or nursing, planning a pregnancy or are sexually active and not using contraceptives be routinely screened for alcohol use (CDC, 2004a; SAMHSA, 2002). NOFAS also recommended that physicians —see all women of reproductive age for alcohol problems and use appropriate strategies, such as treatment for alcohol problems, to eliminate drinking before conception” (NOFAS, 2005, p. 1).

In accordance with recommendations provided by federal agencies, professional medical organizations have developed recommendations for physicians concerning alcohol use during pregnancy. The American Medical Association (AMA) is the nation’s largest physicians group that connects physicians nationwide in order to promote professional and public health issues (AMA, 2005). The AMA strongly encouraged primary care physicians to establish a routine alcohol screening process for all patients. Also, they encouraged physicians to educate women of all ages about the dangers of alcohol and the effects alcohol has on the developing fetus (AMA, 2007). Likewise, the American College of Obstetrics and Gynecology (ACOG), the “nation’s leading group of physicians providing health care for women” (ACOG, 2006) in its 1994 Technical Bulletin recommended that “all pregnant women be questioned thoroughly about alcohol use” (ACOG, 1994).
Similarly, the American Academy of Pediatrics (AAP, 2006), "an organization of 60,000 pediatricians committed to the attainment of optimal physical, mental, and social health and well-being of infants, children, adolescents and young adults,” recommended that physicians who provide care for women and their newborns should increase their own awareness and that of their patients about fetal alcohol syndrome (FAS), alcohol-related neurodevelopmental disorder (ARND) and alcohol-related birth defects (ARBD) and how to prevent them” (AAP, 2000, p. 1).

Physician Practices

Over the past 20 years, several studies have examined physicians’ practices when advising women on general health risks. In a study conducted by Maheux et al. (1999), 963 Canadian Obstetricians/Gynecologists and General Practitioners were surveyed to evaluate the proportion of physicians who assessed lifestyle health risks during general medical examinations. Their results indicated that General Practitioners routinely assessed adult patients for tobacco use (82.2%), alcohol use (67.2%), illicit drug use (34.2%), and family violence (3.2%). In comparison, Obstetricians/Gynecologists reported routinely assessing adult patients for tobacco use (56.6%), alcohol use (28.6%), illicit drug use (20.4%), and family violence (1.3%). According to the researchers, routine screening for such lifestyle health risks must become a standard of practice for physicians in order to develop the communication skills and conformability necessary for dealing with such sensitive issues (Maheux et al.).

In a similar study evaluating the percentage of patients who received preventive health counseling, Peterson et al. (2001) reported that 81% of the 24,620 Pregnancy Risk
Assessment Monitoring System (PRAMS) participants recalled receiving counseling on both cigarette and alcohol use from their health care provider, 73% received health counseling on illicit drug use whereas only 31% received health counseling on partner violence. PRAMS was set up by the CDC in 1985 to track selected maternal behaviors both during and after pregnancy in 22 states and New York City. The current study only compiled data from 14 of the 22 states to determine the percentage of PRAMS participants who were being counseled on selected behaviors. Likewise, in a study conducted by Sarnoff et al. (2001), data were collected from the California PRAMS on 1,423 women of Mexican descent. According to the authors, 89.1% of Mexican born women reported receiving advice on smoking, whereas 90.4% received advice on alcohol. In contrast, 78.1% of women born in the United States received advice on smoking whereas 79.7% received advice on alcohol use. This suggests that advice on smoking and alcohol use during pregnancy is not consistent for all women receiving prenatal care, and this inconsistency may be related to ethnicity.

In addition, Flocke and Stange (2004) used patient recall and direct observation to assess health behavior advice given by physicians. Among the 1,994 physicians who were observed, 11% discussed smoking, 9% discussed alcohol use, and only 2% discussed substance use with their patients. Of the 4,994 patients who participated in the study, 52% recalled being asked about smoking, 29% recalled being asked about their alcohol use, and 11% recalled being asked about substance use. Based on their findings, patients were more likely to recall health behavior advice if they were there for a wellness visit and not a sick visit. This suggests that physicians should take the
opportunity to give health behavior advice during wellness visits and not during sick visits because their patients may be more receptive to the information at that time (Flocke & Stange).

Additional studies specifically have examined physicians’ practices when advising women on alcohol use during pregnancy. In one of the earlier studies, Little et al. (1983) evaluated the impact of a professional educational program between 1979 and 1981 in King County, Washington, on the risk associated with alcohol use during pregnancy. Obstetricians’ advice to patients was measured before and after the educational program. Between 1979 (n = 368) and 1981 (n = 320) there was a 23% increase in the number of obstetricians advising women to limit their alcohol intake during pregnancy, 71% to 94%, respectively. In the end, these obstetricians were more than twice as likely to recommend abstinence, and fetal alcohol syndrome was more likely to be mentioned by name in 1981 than in 1979. Because this study was expensive, community-wide, and extremely visible, the authors recommended using caution when attempting to generalize the results to other communities (Little et al., 1983).

In a secondary analysis of the 1997 Behavioral Risk Factors Surveillance System interviews, Arndt et al. (2002) examined the demographic groups that were more or less likely to receive inquiries and education about alcohol use. Results indicated only 16.1% of the 23,349 possible respondents recalled being asked by their physician or health care provider about alcohol use. This suggests that women are less likely than men to be screened for alcohol use by their physician, yet they are experiencing more risks from lower levels of drinking than men (Arndt et al.).
Further, in a national study of 853 physicians, Friedmann et al. (2000) reported that 88% of the respondents —usually” or “always” — asked new patients about their alcohol use. Unfortunately, fewer than half of the physicians assessed maximum consumption and only 13% usually or always used a formal screening tool. Similarly, in a study conducted to examine the practices of Obstetricians/Gynecologists concerning patients’ alcohol use during pregnancy, 97% of the 604 respondents reported asking all their patients about use. Although 92% always asked about use during the initial visit, only 1% always asked about use during each prenatal visit. More than half of the respondents reported educating all their pregnant patients about the risks associated with drinking alcohol during pregnancy whereas others (36%) reported educating only those patients who were current or suspected drinkers. Only 23% of the respondents reported using a screening tool, thus indicating the need to provide physicians with effective screening tools for evaluating alcohol use during pregnancy (Diekman et al., 2000). In addition, Gustafson et al. (2001) conducted a study of the Hennepin County Community Health Department to understand the current practices being used to screen for prenatal alcohol use among health care providers. The Prenatal Alcohol Screening Survey (PASS) was mailed to 664 prenatal health care providers; 232 completed surveys were returned. According to their results, 54% of the respondents always asked pregnant women about their use, 68% asked about alcohol use in general, whereas 36% asked about specific types of alcohol. Fifty-three percent of the respondents reported that they never ask about use again if the patient initially reports no use and 48% will ask about use at every visit if the women report use or are suspected of using. Although 80% of the respondents
reported using a prenatal assessment form that asked about alcohol use, only 6% used an alcohol screening tool, such as the CAGE. The CAGE, described in detail in the following section, is a screening instrument used to assess alcohol use.

Screening Instruments

Physicians have available to them more than 20 self-report screening instruments that have been validated to detect substance use among their patients (Allen, Maisto, & Connors, 1995). The most commonly used instruments are the MAST, CAGE, T-ACE, TWEAK, and AUDIT.

The Michigan Alcohol Screening Test (MAST) is a 25-item questionnaire designed to be quickly self-administered or administered by a health care provider to detect alcohol-related problems or alcoholism (Selzer, 1971). Selzer (1966) conducted a study among 116 hospitalized alcoholics, 99 convicted drunk drivers, 110 individuals convicted of drunk and disorderly behavior, 98 individuals with 12 or more points on their license, and 103 individuals who were placed in a control group. All participants were administered the MAST. Participants who scored 3 points or less were considered nonalcoholic. A score of 4 points was indicative of alcoholism and 5 or more points indicated alcoholism. Individuals who scored positive for alcoholism in the control group were removed from the study. The results of the study revealed that 5% of the control group scored between 5 and 7, 55% of the drunk drivers and 59% of the drunk and disorderly scored 5 or more. The results suggest that the MAST identified more problem drinkers than any of the medical records that were searched. In addition, the MAST only takes about 15 minutes to administer (Selzer, 1971). According to Redgrave et al. (2003),
the MAST is not a valid screening instrument for women because it was only originally validated on White men. Similarly, Svikis and Reid-Quinones (2003) reported the MAST to be vulnerable to patient response sets and the scores vary because of other risk factors that are not related to individual drinking behavior, such as family history of alcoholism, which increases a MAST score.

Ewing and Rouse were the first to describe the CAGE at the International Congress on Alcohol and Drug Dependence in Australia in 1970. The CAGE questions are used to screen for alcohol use; they include: Have you ever tried to Cut down on your drinking? Have you ever been Annoyed by anybody criticizing your drinking? Have you ever felt Guilty about your drinking? Have you ever had an Eye-opener in the morning? (Ewing, 1984). Ewing originally studied the CAGE in 130 randomized medical and surgical patients. Fifty-eight of the 130 patients acknowledged alcoholism and 72 acknowledged heavy drinking. The CAGE correctly identified 95% of those who acknowledged alcoholism and 86% of those who acknowledged heavy drinking. Because of the CAGE’s ability to correctly detect alcoholism, the author hoped that the CAGE would be incorporated into the medical history of patients who consume alcoholic beverages (Ewing).

A 1995 study conducted by Wenrich et al. found only 17% of the physicians studied asked all four CAGE questions. These results suggest that many patients with possible alcohol problems are being overlooked by physicians. This study used 17 standardized patients, individuals who are trained to portray a health/medical concern in order to evaluate medical education (Beaulieu et al., 2003) to assess the extent to which
134 physicians screened for alcohol use and used the CAGE questions. In 13 of the 17 cases more than half of the physicians asked an initial question about alcohol use. Females were less likely to be asked about use if they presented with urinary tract infection symptoms, and males who presented with upper respiratory complaints were less likely to be asked about their use (Wenrich et al., 1995). Herbert and Bass (1997) found similar results when they surveyed 31 family physicians and 860 patients in Canada. Only 23% of the physicians in their study used the CAGE questions. Interestingly, the majority of physicians (97%) and patients (85%) surveyed believed that physicians should ask about drinking behavior, yet only 42% of the patients recalled being asked about their usage.

Two screening instruments were specifically designed to be used with women; the T-ACE and the TWEAK. The T-ACE was designed to screen for at risk drinking in an obstetric gynecological setting. The T-ACE questions include:

- **Tolerance**: How many drinks does it take to make you feel high?
- Have people ever **Annoyed** you by criticizing your drinking?
- Have you ever felt you ought to **Cut down** on your drinking?
- **Eye opener**: Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover?

A total score of 2 or more indicate pregnancy risk drinking (Sokol, Martier, & Ager, 1989). If an individual answers “more than two drinks” to the T question, it is considered a positive response and they score 2 points. An answer of yes to A, C, and E score 1 point.
each. A total score of 2 or more indicates possible risk drinking during pregnancy (Chang, 2001).

The TWEAK was designed specifically for use in a prenatal setting to detect alcohol use among women. The TWEAK questions include:

- How many drinks does it take for you to feel high (Tolerance)?
- Does your partner (or do your parents) ever Worry or complain about your drinking?
- Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover (Eye-opener)?
- Have you ever Awakened the morning after some drinking the night before and found that you could not remember part of the evening before?
- Have you ever felt that you ought to K/Cut down on your drinking? (Russell, 1994).

The TWEAK is scored on a 7-point scale. Two points are given if the woman reports being able to consume more than 5 drinks without falling asleep or passing out. Two points are also given if the woman reports family and friends worry about her drinking. For the remaining questions 1 point is given for each positive answer. A total score of 2 or more may indicate risk drinking (Chang, 2001).

Finally, the Alcohol Use Disorders Identification Test (AUDIT) was developed by the World Health Organization for early detection of harmful or hazardous alcohol consumption (Saunders, Aasland, Babor, de la Fuente, & Grant, 1993). According to Bohn, Babor, and Kranzler (1995) the AUDIT measures alcohol consumption, personal
and social harm associated with drinking and dependency symptoms. AUDIT scores can range anywhere from 0 – 40 with a cut point typically set at 8 for identifying possible alcohol problems. A cut point is — the scale value on the screening test informing a binary decision that a problem is present or not, as cut points decrease, sensitivity improves, as cut points increase, specificity improves” (Allen et al., 1995, p. 1728). Based on several studies summarized by Reinert and Allen (2002), the sensitivity of the AUDIT can range from 0.33 in male VA patients (Morton, Jones, & Manganaro, 1996) to 0.97 among drug-dependent inpatients (Skipsey, Burleson, & Kranzler, 1997) although the specificity can range from 0.69 among drug-dependent inpatients (Skipsey et al.) to 0.97 among African American primary care patients. In the 18 studies examined by Reinert and Allen (2002) the Cronbach’s alpha consistently fell in the 0.80s.

Since 1970 many studies have examined the sensitivity and specificity of the MAST, CAGE, T-ACE, TWEAK, and the AUDIT to detect alcoholism in different populations (Allen et al., 1995; Bradley, Boyd-Wickizer, Powell, & Burman, 1998; Chang, 2001; Mayfield & McLeod, 1974; Russell, 1996). Chang (2001) defined sensitivity as — the probability that a person who should test positive for alcoholism, actually tests positive” and specificity as the — the probability that a person who should test negative for alcoholism, actually does test negative” (p. 205). The results of the studies are listed in Table 1.

Despite the advantages of incorporating the aforementioned screening instruments into a clinical setting, they are not without their limitations. According to Allen et al. (1995) the MAST does not include any items on quantity and frequency; it only asks
about lifetime use and it focuses on late stage symptoms of alcoholism. The CAGE, likewise, does not include items on quantity and frequency and asks about lifetime use. The TWEAK is similar to the CAGE, but used with pregnant women. Svikis and Reid-Quinones (2003) reported similar findings. The CAGE focuses only on those who already have a problem with alcohol and neglects to identify heavy drinkers. It only assesses lifetime use which makes it less sensitive in detecting current drinkers. The MAST, according to Svikis and Reid-Quinones, may be open to patient response sets, answering the first few items the same way and assuming the rest of the questions are similar but not knowing additional items may be reverse scored, thus lowering the sensitivity. The AUDIT appears to be free of cultural bias and has outstanding psychometric properties; however, when used with women it is less sensitive and more specific than when used with men (Svikis & Reid-Quinones).

Barriers to Screening

Unfortunately, many studies report that despite recommendations from various credible sources, physicians do not screen all women of childbearing age for alcohol use for several reasons. According to the Hennepin County Community Health Department (2001) and Diekman (2000) only half of physicians surveyed counsel or screen all women of childbearing age for alcohol use. To date, there are no mandates, only recommendations, on what physicians should be doing with their patients regarding alcohol use during pregnancy (Blum et al., 1998).

Additional reasons why physicians do not screen all women of childbearing age for alcohol use include reported lack of sufficient training among physicians in working
with alcohol abusing patients, physicians feeling unable to help alcohol abusing pregnant women, and fear of offending their patients by asking questions about their alcohol use as barriers to screening (Wilkerson, 1997). Chasnoff, Landress, and Barrett (1990) reported a reluctance of physicians to ask about alcohol use among their patients for fear of an unfavorable reaction and possible loss of future referrals. According to Chasnoff et al., it is common for physicians to share the same social network as their patients making it difficult to ask about use. In a study conducted by Hoffman, Chang, and Lewis (2000), 20% of the 1,256 medical students surveyed reported receiving no training on addiction and 56% reported a limited amount of training. Likewise, Frost-Pineda et al. (2004) reported that only 56% of the 1,183 residency directors surveyed required substance abuse training in their curriculum.

In addition, Aira, Kauhanen, Larivaara and Rautio (2003) reported lack of time, inadequate training, and skepticism about the effectiveness of treatment as factors that complicate physicians‘ discussion of alcohol use with patients. In a study conducted by the Survey Research Laboratory at the University of Illinois at Chicago, “Missed Opportunity: National Survey of Primary Care Physicians and Patients on Substance Abuse,” it was reported that physicians are missing use among their patients because of inadequate training in medical school, skepticism about treatment effectiveness, patient resistance, discomfort with the topic of use, time constraints, fear of losing patients, or lack of insurance coverage (National Center on Addiction and Substance Abuse at Columbia University, 2000). Finally, in a study conducted by Brown, Anderson, and Szerlip (2003), it was reported that many physicians do not follow the recommended
practice guidelines because they are not familiar with them, they feel the patient loses their autonomy, or the physician disagrees with the guidelines.

Routinely screening all patients does not come without complications. Chang (2001) described four basic complications with screening pregnant women for alcohol use: the majority of screening instruments are not as effective in detecting alcohol use or abuse among women as they are among men; most women limit the amount of alcohol they consume once they learn they are pregnant and they are more likely to deny their use during pregnancy because they are embarrassed; the standard, quantity and frequency questions that are used to detect alcohol use do not seem to work as well with pregnant women; and patients are not consistently screened for alcohol use by their obstetricians. If obstetricians or other physicians would ask every patient at every visit it would reduce the stigma associated with alcohol use and allow the patient to feel more comfortable with their physician (Chang; Morse, Gehshan, & Hutchins, 1997).

Screening all patients for use places substance use as a critical health issue for pregnant women, provides an opportunity for education about the risks of substance use before and during pregnancy, and identifies at-risk pregnancies early enough for intervention and treatment (Morse et al., 1997). According to Morse et al. effective screening tools should be able to be administered in 5 – 10 minutes, be used routinely with every patient, be adapted to fit physician’s style, be administered multiple times, and offer a chance to provide information about substance use during pregnancy.
Self-Efficacy

Perceived self-efficacy is one’s belief that he or she is capable of performing a particular behavior or task. Perceived self-efficacy is regulated by four processes: cognitive, motivational, affective, and selection (Bandura, 1997). According to Bandura (1993), “human behavior is regulated by forethought which is embodied by cognized goals” (p. 118). The higher one’s perceived self-efficacy the more likely they are to think decisively, set high aspirations, construct difficult challenges, and commit themselves to meeting those challenges. These individuals envision positive outcomes and do not think about the things that could go wrong (Bandura, 1997). In the same way that these individuals have the forethought to accomplish their goals, they must also be motivated by the beliefs of what they are capable of doing. An individual’s self-efficacy is influenced by the goals he or she has set, the effort that must go into achieving these goals, how long it will take to achieve the goals, and how he or she responds to setbacks or failures (Bandura, 1997). When an individual is faced with a situation that could produce stress, depression, or anxiety, how he or she responds depends on how confident he or she is in his or her ability to cope with the situation at hand. Individuals who believe they can manage the situation are able to relax, stay calm, distract themselves, and get the support they need from others. Individuals with low self-efficacy tend to amplify the situation, thus increasing their stress, depression, or anxiety. Finally, “people are partly the product of their environment, by the choices we make, we cultivate different competencies, interests, and social networks that determine life courses” (Bandura, 1993, p. 135).
When it comes to taking a history of alcohol or other drugs use with their patients, few studies have examined physician or medical students’ self-efficacy to do so. Gopalan, Santora, Stokes, Moore, and Levine (1992) evaluated nine annual surveys conducted at Johns Hopkins University School of Medicine to assess students’ knowledge, attitudes, beliefs, and confidence in clinical skills, one of which was screening for alcohol and drug use. Confidence was measured on a 1 to 5 scale, 1 being no confidence and 5 being high confidence. Between 1987 and 1990 the sophomores and seniors were evaluated on their level of confidence in taking a history of alcohol or other drug use. Based on the results, in 1989, out of 99 sophomores, 43.4% reported a low confidence level, 46.6% reported a moderate confidence level, and only 10% reported a high confidence level in history taking of alcohol abuse. Among the seniors (n = 80) in 1989, 18.8% reported a low level of confidence, 52.5% reported a moderate level of confidence and 28.7% reported a high level of confidence. In 1990, 30.4% of the sophomores (n = 82) reported a low confidence level, 47.6% reported a moderate level of confidence, and 22.0% reported a high confidence level. Twenty-three percent of the seniors (n = 87) in 1990 reported a low level of confidence, 51.7% a moderate level, and 25.3% a high level of confidence in taking alcohol histories. The authors suggested that there was an increase in confidence level among the students, but it remained low at 25% among the seniors between 1987 and 1990, which is much lower than the institutional goal of 75% (Gopalan et al.).

In another study conducted by Duszynski, Nieto, and Valente (1995), 793 physicians were asked to rate their confidence in screening, counseling, and referring
patients for both alcohol and drug use. Based on their findings, most physicians neither agreed nor disagreed with the statements: “I know how to screen effectively for alcohol use and I know how to refer effectively for alcohol use.” A majority of the physicians disagreed with the statement: “I know how to counsel effectively for alcohol use.”

Further, only 10% agreed or strongly agreed that they felt confident in all three skills: screening, counseling, and referring. Overall the physicians in two cities were most confident in their ability to refer and least confident in their ability to counsel. According to Dusznyski et al., physicians lack the confidence to screen, counsel, and refer patients with alcohol problems because they feel ill-prepared to deal with the situation.

Friedmann et al. (2000) found similar results when physicians were asked if they felt very confident in their ability to take an alcohol history. Among family and internal medicine physicians and those practicing obstetrics/gynecology, the majority reported they neither agreed nor disagreed with their ability to take an alcohol history. Psychiatrists were more likely to agree that they were very confident in their ability to take an alcohol history. According to the authors of this study, one way to get more physicians involved in screening for alcohol use is for medical schools to adopt strategies that will increase students’ confidence in dealing with such issues (Friedmann et al.).

Medical Training

In the study conducted by Dusznyski et al. (1995), physicians were asked to report the number of substance abuse education hours they received in medical school and residency. They were also asked to report their continuing medical education hours in substance abuse and how many hours were recommended for license renewal. Based on
physicians' reports, those who graduated prior to 1959 received an average of 3.01 hours of substance abuse education in medical school and 0.34 hours in residency. The number of hours recommended in 1959 was 24.16 in medical school and 25.02 in residency. In comparison, between 1980 and 1988 physicians reported receiving 14.24 hours of substance abuse education in medical school and 20.31 in residency; however, this was still below the number of hours recommended, 31.36 for medical school and 33.73 for residency. As for continuing medical education, in 1959 the numbers are more positive. Physicians received an average of 3.89 and needed 4.20 for license renewal. Reports were similar between 1980 and 1988. Physicians received 3.24 hours each year in substance abuse education and only need 2.60 for license renewal (Duszynski et al.). Although the number of hours increased over the course of 30 years, many students are not being adequately trained in substance abuse education during medical school or residency.

Diekman et al. (2000) reported physicians' responses to whether they thought their medical training regarding alcohol use and pregnancy was adequate. Twenty-seven percent of the respondents reported their training was inadequate, 35% felt it was adequate, 28% reported it was good, and only 10% reported their training was outstanding. Similarly, Maheux et al. (1999) surveyed 963 Canadian Obstetricians/Gynecologists and General Practitioners and reported that 49% of the General Practitioners surveyed evaluated their medical training in alcohol use as adequate or excellent, whereas 43% of Obstetricians/Gynecologists surveyed reported their medical training in alcohol use as adequate or excellent. In addition, Hoffman et al. (2000) surveyed 1,256 medical students and 56% of the students reported receiving very little
training in chemical dependency whereas 20% reported receiving no training at all in chemical dependency. Further, Friedmann et al. (2000) reported that family medicine physicians receive an estimated 25 hours of substance abuse training during medical school, internal medicine physicians receive 20 hours, obstetricians/gynecologists receive 10 hours, and psychiatrists receive the most hours with 40.

In another study, Isaacson, Fleming, Kraus, Kahn and Mundt (2000) mailed surveys to the 1,831 residency directors of emergency, family, and internal medicine, psychiatry, ob/gyn, and osteopathic programs in the U.S. Of the 1,831 mailed surveys, 1,052 were returned. Among the respondents, 55.3% of the emergency medicine, 75% of the family medicine, 56.8% of internal medicine, 29.8% of ob/gyn, 31.4% of pediatric, 97.2% of psychiatric, and 45% of osteopathic residency programs had required curriculum for substance abuse. The authors believed that substance abuse training is inconsistent across disciplines and the programs are lacking in training primary care physicians in substance abuse.
CHAPTER III
METHODOLOGY

The purpose of this study was to analyze the relationship between knowledge about alcohol use and perceived self-efficacy to counsel and screen for alcohol use in pregnant women among medical students, enrolled in a 4-year private M.D. program, a 4-year public D.O. program, or a 6-year B.S./M.D program. The demographics analyzed in this study included type of institution, type of learning experience, area of specialty interest, age, sex, and race of medical students.

Description of Medical Schools

In 1972 the Ohio General Assembly approved a bill that provided $50,000 to —a consortium of state universities in northeastern Ohio for preparation of detailed plans for medical education based insofar as practicable upon facilities of existing universities in each area and upon community hospital facilities” (Northeastern Ohio Universities Colleges of Medicine and Pharmacy [NEOUCOM], 2009, History, p. 1). NEOUCOM was established in 1973 and now is a

Community-based, public institution that provides interdisciplinary training of health professionals offering an M.D. and a doctor of pharmacy. It is the oldest accelerated, combined B.S./M.D. program in the state of Ohio and one of only 17 accelerated programs in the nation. (NEOUCOM, History, p. 1)

The NEOUCOM consortium of universities includes Kent State University, The University of Akron, and Youngstown State University.
Students apply to NEOUCOM in their senior year of high school and, if accepted, are guaranteed a seat in the M.D. program upon completion of the requisite coursework at one of the consortium Universities. NEOUCOM admits approximately 105 students each year. The medical education at NEOUCOM is comprised of two phases of study. During Phase I, students complete required premedical courses at Kent State University, The University of Akron, or Youngstown State University. Completion of the premedical coursework takes the average student between two to three years. Upon successful completion of the pre-medical courses of study, the students begin Phase II in NEOUCOM’S 4-year program in medicine. The B.S./M.D. program takes the average student between six and seven years to complete (NEOUCOM, 2009).

Case Western Reserve University [CWRU], founded in 1843, is the largest private research university in Ohio. The medical school at CWRU initiated the most advanced medical curriculum in the country in 1952, integrating the basic and clinical sciences, focusing on organ systems and featuring an introduction to patients and clinical work in the first year” (CWRU, 2009). CWRU medical school includes a 4-year curriculum that emphasizes research and scholarship, clinical mastery, leadership, and civic professionalism through large and small group learning styles. CWRU medical school admits an estimated 130 students per academic year into the medical program. Upon completion of the requirements students earn an M.D (CWRU, 2009).

Ohio University College of Medicine [OUCOM], established in 1975, after a successful lobbying campaign that resulted in passage in the Ohio General Assembly of Amended House Bill 229, creating Ohio’s only osteopathic medical school as a
“constituent part” of Ohio University” (OUCOM, History, p. 1). At the completion of the 4-year curriculum, two years of study in the basic sciences and skill and knowledge acquisition of clinical training and two years of clinical preparation, students are awarded a D.O. On average, OUCOM admits 100 students per academic year to the program.

In the OUCOM program of study, upon successful completion of the basic science coursework, students begin clinical work. During the two years of clinical preparation, students participate in an 8-week family medicine clerkship, 42 weeks in hospital and specialty rotations, and 26 ambulatory, primary care clerkships. OUCOM’s D.O. program focuses on “wellness, unity of all body systems, the importance of preventive medicine, and the prominent role of the musculoskeletal system in restoring good health”. It operates under four basic principles: —1. The body is a single unit, 2. The body has intrinsic self-regulatory and healing mechanisms, 3. The body’s structure and function are interrelated; and 4. Disease is an effect, not a cause” (OUCOM, 2009).

Subjects

The subjects involved in this study were all male and female third year medical students at NEOUCOM, CWRU, and OUCOM who were enrolled as full time students as of September 2007. Third year medical students at the three participating institutions were chosen as subjects for this study because they have already completed training on alcohol assessment instruments as part of earlier program coursework. CWRU medical students receive training in their first year on the CAGE (personal communication, Kathy Cole-Kelly, February 3, 2006). As described in Chapter 2, the CAGE questions are used to screen for alcohol use. They include:
- Have you ever tried to **Cut** down on your drinking?
- Have you ever been **Annoyed** by anybody criticizing your drinking?
- Have you ever felt **Guilty** about your drinking?
- Have you ever had an **Eye-opener** in the morning? (Ewing, 1984).

NEOUCOM medical students receive training in three separate courses. In the first year of medical school the students learn about alcoholism cases and drug detoxification sessions in Molecules to Cells and drugs and dependency and alcohol and substance abuse in Brain, Mind, and Behavior. In their second year they receive four hours of substance abuse training in the Neurology module. Finally, in their third year they are taught the assessment tools listed in the *DSM-IV* and the CAGE in the Psychiatry module. OUCOM medical students receive training between their second and third year of coursework on the CAGE, the AUDIT, and additional “red flags” such as clinical presentation, collateral information, interviewing, criteria for diagnosis, readiness for change, severity of illness, and treatment matching criteria of addiction (Personal Communication, Dr. Steven Clay, September 28, 2006).

**Instrumentation**

In a study of primary care physicians, Gottlieb, Mullen, and McAlister (1987) examined the influence of perceived self-efficacy and outcome expectations on health counseling behaviors and practices among physicians for substance abuse behaviors. The original instrument asked respondents to rate the following on a four point scale; “How certain are you that you can convey to your patients appropriate information and useful skills for modifying the following?” (Gottlieb et al., p. 25). Twelve behaviors were then
listed with the foci of smoking, illicit drug abuse, OTC drug problems, and alcohol problems (Gottlieb et al.).

In addition, these authors examined the extent to which the subject physicians perceived they practiced the following behaviors: history taking, risk reduction advice, and referral. History taking was measured on a three point scale (routinely, occasionally when indicated, and rarely/never) — the extent to which you gather information on your patients in each of the areas listed” (Gottlieb et al., 1987, p. 25): smoking, illicit drug abuse, OTC drug problems, and alcohol problems. In addition, physicians were asked how they advised and treated patients with smoking, illicit drug abuse, OTC drug problems, and alcohol problems.

In Gottlieb et al.’s (1987) study, instruments were mailed to 500 randomly selected physicians (internal medicine, family practice, and general practice) chosen from the mailing list of the Texas Medical Association (responses = 442). The dependent variables in this analysis included history taking, advice, and referral. The independent variables were self-efficacy, outcome expectations, year of medical school graduation, specialty, and “size of practice location geographical area” (p. 25). Results revealed that subject physicians were most likely to take a history and counsel on smoking (73%), alcohol (50%), OTC drugs (40%), and illicit drugs (20%). Subject physicians reported being more likely to refer patients to counseling for illicit drugs (42%), alcohol (25%), OTC drugs (16%), and smoking (8%). Internal medicine physicians were more likely to collect information on all four risk behaviors, and family physicians were more likely to counsel patients. There were no differences found among specialty and outside referral
physicians. Subject physicians were more confident in their ability to handle smoking problems than those related to alcohol, OTC drugs, or illicit drugs. In three of the four risk behavior areas perceived self-efficacy was positively related to both history taking and counseling” (p. 27) whereas an opposite relationship was observed for outside referral for OTC and illicit drugs. According to the authors, physicians with high self-efficacy scores were less likely to refer a patient to outside resources?” (Gottlieb et al., 1987, p. 27).

In a similar study, Mullen and Holcomb (1990) examined the power of selected variables drawn from social learning theory in predicting self-reported levels of counseling” (p. 153) for 10 areas of health promotion and disease prevention among dental hygienists, registered dieticians, and certified nurse-midwives. The 10 areas of health promotion included high blood pressure, smoking, lack of exercise, overweight, high-fat diet, alcohol use, illicit drug use, stress, isolation and loneliness, and nonuse of safety belts. The authors used professional group membership in the State Board of Dental Examiners, the State Dietetics Association, or the American College of Nurse Midwives, as predictor variables. Additional predictor variables included self-efficacy, adherence expectation, and expectation of health impact. Counseling practice was measured on a five point scale from (5 = to a very great extent to 1 = to a very little extent) for each of the 10 areas of health promotion and disease prevention, “to what extent do you counsel patients about each of the following” (p. 154). History taking was measured on a three-point scale (3 = routinely, 2 = occasionally, when indicated, and 1 = never or rarely) and is used in this study to indicate concurrent validity (Mullen &
Holcomb, 1990). Self-efficacy was measured using a four point scale (4 = *very certain* to 1 = *very uncertain*), -how certain are you that you can convey to your patients appropriate information and useful skills for modifying” the 10 areas of health promotion and disease prevention. Outcome expectations were also assessed looking at adherence expectation and expectation of health impact. The authors reported test-retest reliability greater than 0.75 on instrument sections in counseling, history taking, self-efficacy, and outcome expectations among a sample of family practice physicians.

According to the authors (Mullen & Holcomb, 1990), respondents reported the highest level of counseling for high blood pressure and overweight, smoking, lack of exercise, and high-fat diet respectively. Subjects reported that they attended to alcohol abuse and stress some, isolation and loneliness less, and nonuse of seatbelts received the least in terms of the amount of counseling. Perceived self-efficacy mean scores were greatest for overweight, blood pressure, and smoking. The perceived self-efficacy scores were lowest among subjects for illicit drug use and isolation and loneliness.

In a related study, Tresolini and Stritter (1994) modified Mullen and Holcomb’s (1990) instrument discussed in the previous paragraph to assess medical students’ self-efficacy in educating patients regarding smoking cessation, nutrition, and exercise. In order to determine validity of the instrument, Tresolini and Stritter reviewed literature on the evaluation of medical students’ knowledge and skills in patient education for health promotion” (p. 249). In order to assess the instrument’s compatibility with self-efficacy theory and medical practice, the investigators had clinical medical faculty and educational psychologist review the instrument. In addition, the authors used multiple
data sources, made the data accessible to others, and asked selected subjects and colleagues to review the initial analyses to assist in ensuring reliability and validity.

In the study participants were asked to rate their level of confidence on a four point scale (1 = completely lacking in confidence, 2 = somewhat lacking in confidence, 3 = somewhat confident, and 4 = very confident) in their knowledge about the benefits of each behavior to teach or counsel patients, their confidence in being able to convey the information the patients need about the behavior, and their confidence that they have the skills to engage patients in an educational process for behavior change with regard to the behaviors” (p. 249). Overall, the students scored high on self-efficacy.

The instrument for the present study (Appendix A) was adapted from the Health Promotion/Disease Prevention Inventory (Tresolini & Stritter, 2002). This instrument is designed to evaluate the perceived self-efficacy among medical students to screen and counsel for alcohol use among pregnant women.

Reliability analyses were conducted on self-efficacy and learning experiences questions. Cronbach alpha scores were acceptable, using Robinson’s (1973) criteria of 0.60 - 0.70 as the lower level of acceptability.

<table>
<thead>
<tr>
<th></th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counseling Self-Efficacy</td>
<td>.799</td>
</tr>
<tr>
<td>Screening Self-Efficacy</td>
<td>.799</td>
</tr>
<tr>
<td>Learning Experience</td>
<td>.803</td>
</tr>
</tbody>
</table>

Self-Efficacy Inventory

For each item below, indicate how knowledgeable you are about:
1: Not knowledgeable at all  
2: Somewhat knowledgeable  
3: Knowledgeable  
4: Extremely knowledgeable

1. The health risks related to consuming alcohol while pregnant (beer, wine, liquor).
   1  2  3  4

2. Screening tools for alcohol use.
   1  2  3  4

3. Self-help materials and group support for alcoholism.
   1  2  3  4

4. Treatment programs for alcoholism.
   1  2  3  4

For each item below, indicate how confident you are in counseling pregnant women about alcohol use.

1: Not confident at all  
2: Somewhat confident  
3: Confident  
4: Extremely confident

5. The health risks related to consuming alcohol while pregnant (beer, wine, liquor).
   1  2  3  4

6. Screening tools for alcohol use.
   1  2  3  4

7. Self-help materials and group support for alcoholism.
   1  2  3  4

For each item below, indicate how confident you are in screening for alcohol use among pregnant women.

Confidence in screening for alcohol use using the

9. T-ACE (Tolerance, Annoyed, Cut down, Eye opener)  
10. CAGE (Cut down, Annoyed, Guilty, Eye opener)
11. TWEAK (Tolerance, Worry, Eye opener, Awakened, K/Cut down) 1 2 3 4

12. AUDIT (Alcohol Use Disorders Identification Test) 1 2 3 4

13. MAST (Michigan Alcohol Screening Test) 1 2 3 4

For the nine items below indicate the extent to which each type of learning experience contributed to your knowledge, counseling and/or screening skills related to alcohol use among pregnant women.

1: Did not contribute 3: Contributed extensively

2: Contributed slightly 4: Contributed greatly

14. Received factual information about alcohol use during pregnancy through independent study (e.g., reading, informal talks, extracurricular lectures or meetings). 1 2 3 4

15. Received factual information about alcohol use during pregnancy from classroom instruction about the risks of consuming alcohol during pregnancy. 1 2 3 4

16. Received explicit information about alcohol use during pregnancy from classroom instruction about alcohol counseling strategies. 1 2 3 4

17. Observed physician role models implementing alcohol counseling strategies with patients. 1 2 3 4

18. Practiced alcohol counseling strategies skills with patients. 1 2 3 4

19. Received explicit information from classroom instruction about alcohol screening tools. 1 2 3 4
20. Observed physician role models implementing alcohol screening tools with patients.  


22. Received feedback on performance after practice using alcohol screening tools or doing alcohol screenings with patients.  

Demographics  

23. Specialty Interests:  

____ Family Medicine  

____ Internal Medicine  

____ Obstetrics/Gynecology  

____ Pediatrics  

____ Surgery  

____ Other (please specify:________________________)  

____ Undecided  

24. Age:  

____ Under 26  

____ 26 – 30  

____ 31 – 35  

____ 36+  

25. Sex:  

____ Male  

____ Female  

26. Ethnicity  

____ White  

____ Black – not Hispanic
Operationalization of Variables

The following variables were operationalized and analyzed in order to answer the research questions:

Self-efficacy as it relates to age of medical student
Self-efficacy as it relates to sex of medical student
Self-efficacy as it relates to race of medical student (White, Black-not Hispanic, Hispanic or Latino, Asian or Pacific Islander, American Indian or Alaskan Native and other)
Self-efficacy as it relates to type of institution (4-yr. private, 4-yr. public, 6-yr. public)
Self-efficacy as it relates to specialty of medical student (Family Medicine, Internal Medicine, Obstetrics/Gynecology, Pediatrics, Surgery)

Research Hypotheses

1. There will be no statistically significant difference between younger and older medical students‘ perceived knowledge about the health risks and resources for management of alcohol use and alcoholism among pregnant women.
2. There will be no statistically significant difference between younger and older medical students in perceived self-efficacy to screen for alcohol use among pregnant women.

3. There will be no statistically significant difference between the self-efficacy scores of younger medical students and older medical students to counsel for alcohol use among pregnant women.

4. There will be no statistically significant difference between male medical students and female medical students perceived knowledge about alcohol use among pregnant women.

5. There will be no statistically significant difference between the self-efficacy scores of male medical students and female medical students to screen for alcohol use among pregnant women.

6. There will be no statistically significant difference between the self-efficacy scores of male medical students and female medical students to counsel for alcohol use among pregnant women.

7. There will be no statistically significant difference between medical students of color and White medical students in knowledge about alcohol use among pregnant women.

8. There will be no statistically significant difference between the self-efficacy scores of medical students of color and White medical students to screen for alcohol use among pregnant women.
9. There will be no statistically significant difference between the self-efficacy scores of medical students of color and White medical students to counsel for alcohol use among pregnant women.

10. There will be no statistically significant difference between medical students in the private university and medical students in public universities in knowledge about alcohol use among pregnant women.

11. There will be no statistically significant difference between the self-efficacy scores of medical students in the private university and medical students in public universities to screen for alcohol use among pregnant women.

12. There will be no statistically significant difference between the self-efficacy scores of medical students in the private university and medical students in public universities to counsel for alcohol use among pregnant women.

13. There will be no statistically significant difference between specialties in knowledge about alcohol use among pregnant women.

14. There will be no statistically significant difference in the self-efficacy scores between specialties to screen for alcohol use among pregnant women.

15. There will be no statistically significant difference in the self-efficacy scores between specialties to counsel for alcohol use among pregnant women.

16. There will be no statistically significant difference among OUCOM medical students and NEOUCOM medical students in knowledge about alcohol use among pregnant women.
17. There will be no statistically significant difference in the self-efficacy scores among OUCOM medical students and NEOUCOM medical students to screen for alcohol use among pregnant women.

18. There will be no statistically significant difference in the self-efficacy scores among OUCOM medical students and NEOUCOM medical students to counsel alcohol use among pregnant women.

19. There will be no statistically significant difference among OUCOM medical students and CWRU medical students in knowledge about alcohol use among pregnant women.

20. There will be no statistically significant difference in the self-efficacy scores among OUCOM medical students and CWRU medical students to screen for alcohol use among pregnant women.

21. There will be no statistically significant difference in the self-efficacy scores among OUCOM medical students and CWRU medical students to counsel about alcohol use among pregnant women.

22. There will be no statistically significant difference among NEOUCOM medical students and CWRU medical students in knowledge about alcohol use among pregnant women.

23. There will be no statistically significant difference in the self-efficacy scores among NEOUCOM medical students and CWRU medical students to screen for alcohol use among pregnant women.
24. There will be no statistically significant difference in the self-efficacy scores among NEOUCOM medical students and CWRU medical students to counsel about alcohol use among pregnant women.

25. There will be no statistically significant difference among learning experiences in knowledge about alcohol use among pregnant women.

26. There will be no statistically significant difference in the self-efficacy scores between learning experiences to screen for alcohol use among pregnant women.

27. There will be no statistically significant difference in the self-efficacy scores between learning experiences to counsel for alcohol use among pregnant women.

Statistical Analysis

The data were analyzed using the Statistical Package for Social Sciences (SPSS Version 16 for Macintosh). Cronbach’s alpha coefficients were used to assess reliability for self-efficacy and learning experiences questions. Frequencies of responses and means were calculated for each question to determine the strength of self-efficacy perceptions. Total mean scores were calculated for knowledge and counseling questions and differences in self-efficacy scores between sexes, age groups, specialty choice, and ethnicity were calculated. In addition, a one way Analysis of Variance was used to test the difference between learning experience and knowledge, learning experience and self-efficacy, and screening and learning experience and self-efficacy and counseling. Similarly, a one-way Analysis of Variance was used to test the difference between
specialty and knowledge, specialty and screening, and specialty and counseling. An independent sample \( t \)-test was used to test the differences between age and knowledge, age and screening, and age and counseling, sex and knowledge, sex and screening, and sex and counseling, ethnicity and knowledge, ethnicity and screening, and ethnicity and counseling, as well as institution and knowledge, institution and screening, and institution and counseling. Initial analyses were constructed by combining the four knowledge items into a scale ranging from 1 to 16, combining the four counseling items into a scale ranging from 1 to 16 and combining the five screening items into a scale ranging from 1 to 20. Finally, regression analyses were run to determine if there were statistically significant differences in perceived self-efficacy to counsel about health risks and resources for management of alcohol and alcoholism among pregnant women between learning experiences.

For research questions 1 – 3 the independent variable was age; that is, under 26 and 26 and over. For research questions 4 – 6 the independent variable was sex; that is, male or female. For research questions 7 – 9 the independent variable was race; that is, White, Black, not Hispanic, Hispanic or Latino, Asian or Pacific Islander, American Indian or Alaskan Native, and Other. For research questions 10 – 12 the independent variable was type of institution; that is, private or public. For questions 13 – 15 the independent variable was specialty interests; that is, family medicine, internal medicine, ob/gyn, pediatrics, surgery, other, or undecided.

*Research Question #1.* Does age of medical student predict a higher level of knowledge about alcohol use among pregnant women? The dependent variable was
knowledge. To determine if there was a difference between older and younger medical students and their knowledge about alcohol use among pregnant women, an independent \( t \)-test was conducted.

*Research Question #2.* Does age of medical student predict a higher level of self-efficacy to screen for alcohol use? The dependent variable was counseling self-efficacy. To determine if there was a difference between older and younger medical students and their self-efficacy to counsel about alcohol use among pregnant women, an independent \( t \)-test was conducted.

*Research Question #3.* Does age of medical student predict a higher level of self-efficacy to counsel for alcohol use among pregnant women? The dependent variable was screening self-efficacy. To determine if there was a difference between older and younger medical students and their self-efficacy to screen for alcohol use among pregnant women, an independent \( t \)-test was conducted.

*Research Questions #4.* Does sex of medical student predict a higher level of knowledge about alcohol use among pregnant women? The dependent variable was knowledge. To determine if there was a difference between male and female medical students and their knowledge about alcohol use among pregnant women, an independent \( t \)-test was conducted.

*Research Question #5.* Does sex of medical student predict a higher level of self-efficacy to screen for alcohol use among pregnant women? The dependent variable was screening self-efficacy. To determine if there was a difference between male and female
medical students and their self-efficacy to screen for alcohol use among pregnant women, an independent \( t \)-test was conducted.

**Research Question #6.** Does sex of medical student predict a higher level of self-efficacy to counsel for alcohol use among pregnant women? The dependent variable was counseling self-efficacy. To determine if there was a difference between male and female medical students and their self-efficacy to counsel for alcohol use among pregnant women, an independent \( t \)-test was conducted.

**Research Question #7.** Does race of medical student predict a higher level of knowledge about alcohol use among pregnant women? The dependent variable was knowledge. To determine if there was a difference between medical students of color and White medical students and their knowledge about alcohol use among pregnant women, an independent \( t \)-test was conducted.

**Research Question #8.** Does race of medical student predict a higher level of self-efficacy to screen for alcohol use among pregnant women? The dependent variable was screening self-efficacy. To determine if there was a difference between medical students of color and White medical students and their self-efficacy to screen for alcohol use among pregnant women, an independent \( t \)-test was conducted.

**Research Question #9.** Does race of medical student predict a higher level of self-efficacy to counsel for alcohol use among pregnant women? The dependent variable was counseling self-efficacy. To determine if there was a difference between medical students of color and White medical students and their self-efficacy to counsel for alcohol use among pregnant women, an independent \( t \)-test was conducted.
Research Question #10. Does type of institution attended predict a higher level of knowledge about alcohol use among pregnant women? The dependent variable was knowledge. To determine if there was a difference in knowledge between medical students at a private university and medical students at a public university, an independent t-test was conducted.

Research Question #11. Does type of institution attended predict a higher level of self-efficacy to screen for alcohol use among pregnant women? The dependent variable was screening self-efficacy. To determine if there was a difference between medical students at a private university and medical students at a public university and their self-efficacy to screen for alcohol use among pregnant women, an independent t-test was conducted.

Research Question #12. Does type of institution predict a higher level of self-efficacy to counsel for alcohol use among pregnant women? The dependent variable was counseling self-efficacy. To determine if there was a difference between medical students at a private university and medical students at a public university and their self-efficacy to counsel for alcohol use among pregnant women, an independent t-test was conducted.

Research Question #13. Does specialty interest of medical student predict a higher level of knowledge about alcohol use among pregnant women? The dependent variable was knowledge. To determine if there was a difference between medical students’ specialty interests and their knowledge about alcohol use among pregnant women, a one-way analysis of variance was conducted.
Research Question #14. Does specialty interest of medical student predict a higher level of self-efficacy to screen for alcohol use among pregnant women? The dependent variable was screening self-efficacy. To determine if there was a difference between medical students’ specialty interests and their self-efficacy to screen for alcohol use among pregnant women, a one-way analysis of variance was conducted.

Research Question #15. Does specialty interest of medical student predict a higher level of self-efficacy to counsel for alcohol use among pregnant women? The dependent variable was counseling self-efficacy. To determine if there was a difference between medical students’ specialty interests and their self-efficacy to counsel for alcohol use among pregnant women, a one-way analysis of variance was conducted.

Research Question #16. Does type of learning experience predict a higher level of knowledge about health risks and resources for management of alcohol and alcoholism among pregnant women? The dependent variable was knowledge. To determine if there was a difference in medical students’ learning experiences and their perceived knowledge, a regression analysis was conducted.

Research Question #17. Does type of learning experience predict a higher level of self-efficacy to screen for alcohol use among pregnant women? The dependent variable was screening self-efficacy. To determine if there was a difference in medical students’ learning experiences and their self-efficacy to screen for alcohol use among pregnant women, a regression analysis was conducted.

Research Question #18. Does type of learning experience predict a higher level of self-efficacy to counsel health risks and resources for management of alcohol and
alcoholism among pregnant women? The dependent variable was counseling self-efficacy. To determine if there was a difference in medical students’ learning experiences and their self-efficacy to counsel for alcohol use among pregnant women, a regression analysis was conducted.

Data Collection Protocol

The institutional review boards at Kent State University, NEOUCM, CWRU, and OUCOM granted human subjects’ approval (Appendices G through J). To the greatest extent possible, Dillman’s protocol for Internet survey research was followed. The lead investigator collaborated with the Administrative Associate at OU-COM CORE Research Office and the Program Assistant at NEOUCOM/COP to distribute the emails to all third year medical students at OUCOM and NEOUCOM. CWRU’s Director of the Center for the Advancement of Medical Learning provided the lead investigator with the emails of all third year medical students at CWRU.

A brief prenotice (Appendix B) email sent to the respondents was recommended and was sent to all third year medical students at NEOUCOM and OUCOM on January 16, 2008, and CWRU on February 13, 2008. A consent letter, instructions on how to complete the survey, and survey link (Appendix C) were sent to all third year medical students at NEOUCOM and OUCOM on January 18, 2008, and CWRU on February 15, 2008. After a month long series of weekly reminder/thank you notices (Appendices D, E, and F), NEOUCOM did not have a sufficient enough response rate to conduct meaningful analysis. A total of 34 OUCOM third year medical students and 45 CWRU third year medical students responded to the survey.
The completed instruments were stored in an Excel data sheet that was exported into SPSS by the lead investigator. No personal identifying factors were used on the instruments. Submitting the completed instrument implied participant consent to participate in the study. Subjects were able to choose not to participate in the study by refusing to complete the instrument.

All researchers and key personnel have completed their institutional Human Subjects protections training prior to administering the instrument via email. Certificates of Completion for each researcher and key personnel will be kept on file in 316 White Hall, Kent State University, Kent, OH 44242.

Ethical Considerations

Institutional Review Board – Human Subjects Research approval was obtained prior to the start of the data collection. Subjects were made fully aware of the procedures that were set up to protect their anonymity and any potential risks that could exist should a security violation occur while providing information online. Subjects were also made aware that submission of a completed survey implied consent to participate in the research study.

Delimitations

The medical curriculum at each institution addresses substance abuse screening and counseling in the first two years. For this reason, this study was limited to third year medical students at OUCOM, NEOUCOM, and CWRU medical school.

Assumptions

This study assumed that all:
• Participants will respond to self-report questionnaire honestly.
• Participants will read and follow directions.
• Items on the instrument will accurately assess self-efficacy.
• Participants will understand the English language.
• Participants will check university email account on a regular basis.
CHAPTER IV

RESULTS

The purpose of this study was to analyze the relationship between knowledge about alcohol use and perceived self-efficacy to counsel and screen for alcohol use in pregnant women among medical students enrolled in a 4-year private M.D. program, a 4-year public D.O. program, or a 6-year B.S./M.D. program. The demographics analyzed in this study included type of institution, type of learning experience, area of specialty interest, age, sex, and race of medical student.

Data Collection and Response Rate

Prior to conducting the study, Human Subjects Research approval was sought from each participating institution's Institutional Review Board. In an initial step, approval was granted by Kent State University (researcher's institutional affiliation), on January 17, 2007. Subsequently, the NEOUCOM Institutional Review Board, Protection of Human Subjects in Research, Office of Research and Sponsored Programs granted approval on September 4, 2007. The Office for Human Research Protections at OUCOM granted IRB approval on December 28, 2007, and CWRU Social/ Behavioral Science IRB (Case IRB) granted approval for their students to serve as subjects in the study in a two stage process (on August 29, 2007, and February 7, 2008).

As discussed in Chapter 3, Dillman’s (2007) tailored design method was used to collect study data. Dillman recommended that researchers send four contact emails following an electronic pre-notice of the study. The purpose of the pre-notice is to inform
participants that they will be receiving a request to participate in an upcoming study. The second contact, according to Dillman, should contain a cover letter and the link to the instrument. The third, fourth, and final contacts with subjects include a thank you and/or a reminder emails concerning their participation in the study. In this study a designee at each institution assumed responsibility for sending out the pre-notice, cover letter, link to instrument, and all follow-up correspondence.

Per institutional stipulation, Perseus software was used to collect the data at NEOUCOM. The Program Assistant who was the primary contact person with subjects at NEOUCOM/COP was sent the pre-notice, consent letter, link to instrument, and the three reminder/thank you notices in an email from the lead investigator. On January 16, 2008, the Program Assistant sent pre-notices, explaining the study to the 120 third year medical students at NEOUCOM. On January 18, 2008, these subjects were sent the consent form and the link (Appendix C) to the instrument. The subjects were instructed to complete and submit the instrument via Perseus. The Program Assistant forwarded each completed instrument to the lead researcher for data entry and analysis. After a month long series of weekly reminder/thank you notices (Appendices D, E, and F), only 16 third year medical students from NEOUCOM provided responses to the instrument.

Due to an insufficient response rate as reported in Table 2 (13%) from NEOUCOM, meaningful analyses were not able to be conducted. Although there is no standard response rate for online data collection processes or studies, 30% is considered average (Instructional Assessment Resources, 2009). Similarly, in a study conducted by
Table 2

*Data Collection and Response Rates*

<table>
<thead>
<tr>
<th></th>
<th>Start Date</th>
<th>End Date</th>
<th>Total Sample Size</th>
<th>Response Rate (N)</th>
<th>Response Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEOUCOM</td>
<td>1/18/2008</td>
<td>2/15/2008</td>
<td>120</td>
<td>16</td>
<td>13%</td>
</tr>
<tr>
<td>OUCOM</td>
<td>1/18/2008</td>
<td>2/15/2008</td>
<td>113</td>
<td>34</td>
<td>30%</td>
</tr>
<tr>
<td>CWRU</td>
<td>2/15/2008</td>
<td>3/14/2008</td>
<td>146</td>
<td>44</td>
<td>30%</td>
</tr>
</tbody>
</table>

Sheehan (2001), comparing email survey response rates, the average response rate was 36.83%.

The Administrative Associate at OU-COM CORE Research Office who served as the primary contact person with subjects was sent the pre-notice, consent letter, link to instrument, and the three reminder/thank you notices in an email from the lead investigator. On January 16, 2008, the Administrative Associate sent pre-notices explaining the study to the 113 third year medical students at OUCOM. On January 18, 2008, these subjects were sent the consent form and the link (Appendix C) to the instrument. The subjects were instructed to complete and submit the instrument via SurveyMonkey, an online data collection program. After a month long series of weekly reminder/thank you notices (Appendices D, E, and F), a total of 34 third year medical students from OUCOM responded to the instrument (30%) as described in Table 2.

Although the appropriate body at CWRU granted initial IRB approval, the medical school required an expanded deliberation process. The Research in Medical Education (RIME) committee in the school of medicine must approve all research
involving medical students at CWRU. After the lead researcher contacted the Director of
the Center for the Advancement of Medical Learning, the RIME committee deliberated
about the research proposal on December 6, 2007, and January 3, 2008, and approval to
proceed with the study at CWRU was granted on February 7, 2008. Once approval was
obtained from the committee to conduct the research, the Director of the Center for the
Advancement of Medical Learning provided the lead investigator with 147 e-mail
addresses of the third year medical students at CWRU.

One hundred and forty seven CWRU medical students in their third year of study
were sent pre-notices on February 13, 2008. There was a delivery failure for one email
making the total emails sent 146. On February 15, 2008, these subjects were sent the
consent form and link to the instrument. Again, there was a delivery failure for one email.
Consistent with the work of Dillman (2007), the subjects at CWRU received a month
long series of weekly reminder/thank you notices. As noted in Table 1, a total of 45
CWRU third year medical students provided responses to the instrument (30%).

Demographic Characteristics Among Study Respondents

As noted in Table 3, the majority of respondents from CWRU were undecided in
their specialty interest (33.3%). Fifteen percent of respondents reported a specialty
interest of “other,” indicating they were not interested in family medicine, internal
medicine, pediatrics, ob/gyn, or surgery. The remaining respondents reported specialty
interests in family medicine (4.4%), internal medicine and pediatrics (11.1%), ob/gyn
(8.9%), and surgery (13.3%).
Table 3

**Demographic Characteristics of Study Respondents: Specialty Interest**

<table>
<thead>
<tr>
<th>Specialty Interest</th>
<th>CWRU N</th>
<th>CWRU %</th>
<th>OUCOM N</th>
<th>OUCOM %</th>
<th>Combined N</th>
<th>Combined %</th>
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<tbody>
<tr>
<td>Family Medicine</td>
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<td>4.4</td>
<td>3</td>
<td>8.8</td>
<td>5</td>
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<tr>
<td>Internal Medicine</td>
<td>5</td>
<td>11.1</td>
<td>3</td>
<td>8.8</td>
<td>8</td>
<td>10.1</td>
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<tr>
<td>Obstetrics/Gynecology</td>
<td>4</td>
<td>8.9</td>
<td>1</td>
<td>2.9</td>
<td>5</td>
<td>6.3</td>
</tr>
<tr>
<td>Pediatrics</td>
<td>5</td>
<td>11.1</td>
<td>2</td>
<td>5.9</td>
<td>7</td>
<td>8.9</td>
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<td>5</td>
<td>14.7</td>
<td>12</td>
<td>15.2</td>
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<tr>
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<td>15</td>
<td>33.3</td>
<td>18</td>
<td>52.9</td>
<td>33</td>
<td>41.8</td>
</tr>
</tbody>
</table>

Similarly, the majority of OUCOM third year medical students were undecided (52.9%) in their specialty interests. Approximately 15% of respondents reported a specialty interest of "other," indicating they were not interested in family medicine, internal medicine, pediatrics, ob/gyn, or surgery. The remaining respondents reported specialty interests in family and internal medicine (8.8%), ob/gyn (2.9%), pediatrics and surgery (5.9%).

The age group represented by the subjects can be seen in Table 4. Age at CWRU and OUCOM was divided into four ranges; under 25, 26-30, 31-35, and 36 and over. The majority of subjects at both CWRU and OUCOM were under the age of 26 (54.5%). Twenty-nine percent were between the ages of 26 and 30, 8.9% were between 31 and 35, and only one respondent reported being 36 or older. Due to a limited number of
respondents who reported being in the over 31 age group, this age category was collapsed into two ranges; under 26 years of age and 26 years old and over, as a way to conduct meaningful analysis.

Table 5 reflects the sex of the respondents. OUCOM respondents were nearly equally likely to be male (48.8) or female (51.2%). In contrast, the majority of subjects from CWRU were female (60.6%) compared to 36.4% male.

Table 5

**Demographic Characteristics of Study Respondents: Sex**

<table>
<thead>
<tr>
<th>Sex</th>
<th>CWRU</th>
<th>OUCOM</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>12</td>
<td>21</td>
<td>35</td>
</tr>
<tr>
<td>Female</td>
<td>20</td>
<td>22</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>60.6</td>
<td>51.2</td>
<td>53.2</td>
</tr>
</tbody>
</table>
Ethnicity was divided into six categories as noted in Table 6: White, Black – not Hispanic, Hispanic or Latino, Asian or Pacific Islander, American Indian or Alaskan Native, and other. The majority of respondents at OUCOM were White (68.8%), followed by African American (15.6%), Other (9.4%), and Asian Pacific Islander and Hispanic (3.1%). The majority of respondents at CWRU were White (69.8%) followed by Asian Pacific Islander (14%), Other (11.6%), and African American (4.7%). Due to a limited number of respondents who reported being Black – not Hispanic, Hispanic or Latino, Asian or Pacific Islander, American Indian or Alaskan native or other, ethnicity was collapsed into two categories: White and medical students of color, in order to conduct meaningful analysis.

Table 6

*Demographic Characteristics of Study Respondents: Ethnicity*

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>CWRU</th>
<th>OUCOM</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>22</td>
<td>66.7</td>
<td>30</td>
</tr>
<tr>
<td>Black – not Hispanic</td>
<td>5</td>
<td>15.2</td>
<td>2</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>1</td>
<td>3.0</td>
<td>0</td>
</tr>
<tr>
<td>Asian or Pacific Islander</td>
<td>1</td>
<td>3.0</td>
<td>6</td>
</tr>
<tr>
<td>American Indian or Alaskan Native</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>9.1</td>
<td>5</td>
</tr>
</tbody>
</table>
Self-reported knowledge responses of the health risks related to consuming alcohol while pregnant from OUCOM and CWRU combined can be seen in Table 7. Both older and younger medical students reported being most knowledgeable about the health risks related to consuming alcohol while pregnant.

Self-reported knowledge scores about the resources for management of alcohol use and alcoholism from OUCOM and CWRU combined can be seen in Table 7. Older medical students (26 years of age and over) reported being least knowledgeable about the treatment programs for alcohol use and alcoholism. Younger medical students (under 26 years of age) reported being least knowledgeable about self-help materials and group support for alcohol use and alcoholism.

Table 7

*Descriptive Statistics: Age x Knowledge*

<table>
<thead>
<tr>
<th></th>
<th>Knowledge (Q1 – Q4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Under 26 X (SD)</td>
</tr>
<tr>
<td>Health Risks</td>
<td>3.07 (0.60)</td>
</tr>
<tr>
<td>Screening Tools</td>
<td>2.90 (0.66)</td>
</tr>
<tr>
<td>Self-help materials and group support</td>
<td>2.14 (0.68)</td>
</tr>
<tr>
<td>Treatment</td>
<td>2.19 (0.71)</td>
</tr>
</tbody>
</table>

Counseling self-efficacy scores about the health risks related to consuming alcohol while pregnant from OUCOM and CWRU combined can be seen in Table 8.
Table 8

*Descriptive Statistics: Age x Counseling*

<table>
<thead>
<tr>
<th>Counseling (Q5 – Q8)</th>
<th>Under 26 X (SD)</th>
<th>26 and over X (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Risks</td>
<td>2.79 (0.72)</td>
<td>2.71 (0.87)</td>
</tr>
<tr>
<td>Screening Tools</td>
<td>2.67 (0.65)</td>
<td>2.21 (0.73)</td>
</tr>
<tr>
<td>Self-help materials and group support</td>
<td>2.24 (0.73)</td>
<td>2.12 (0.88)</td>
</tr>
<tr>
<td>Treatment</td>
<td>2.17 (0.79)</td>
<td>2.03 (0.91)</td>
</tr>
</tbody>
</table>

Both younger and older medical students reported being most self-efficacious in their ability to counsel about the health risks related to consuming alcohol while pregnant.

Counseling self-efficacy scores about the resources for management of alcohol use and alcoholism from OUCOM and CWRU combined can be seen in Table 9. Both younger medical students (under 26 years of age) and older medical students (26 years of age and over) reported being least self-efficacious in their ability to counsel about the treatment programs for alcohol use and alcoholism.

Screening self-efficacy responses for the T-ACE, CAGE, TWEAK, AUDIT, and MAST from OUCOM and CWRU were combined and are depicted in Table 9. Both younger and older medical students (under 26 years of age) reported being most self-efficacious in their ability to screen for alcohol use and alcoholism using the CAGE. Younger medical students (under 26 years of age) reported being least self-efficacious in their ability to screen for alcohol use and alcoholism using the MAST. Older medical
### Table 9

**Descriptive Statistics: Age x Screening**

<table>
<thead>
<tr>
<th>Screening (Q9 – Q13)</th>
<th>Under 26 X (SD)</th>
<th>26 and over X (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-ACE</td>
<td>1.95 (0.96)</td>
<td>1.94 (0.97)</td>
</tr>
<tr>
<td>CAGE</td>
<td>3.57 (0.59)</td>
<td>3.18 (0.76)</td>
</tr>
<tr>
<td>TWEAK</td>
<td>1.60 (0.73)</td>
<td>1.66 (0.90)</td>
</tr>
<tr>
<td>AUDIT</td>
<td>1.43 (0.80)</td>
<td>1.42 (0.83)</td>
</tr>
<tr>
<td>MAST</td>
<td>1.40 (0.77)</td>
<td>1.50 (0.88)</td>
</tr>
</tbody>
</table>

Students (26 years of age and over) reported being least self-efficacious in their ability to screen for alcohol use and alcoholism using the AUDIT.

Self-reported knowledge responses of the health risks related to consuming alcohol while pregnant among male and female medical students from OUCOM and CWRU combined can be seen in Table 10. Both male and female medical students reported being most knowledgeable about the health risks related to consuming alcohol while pregnant.

Self-reported knowledge responses about the resources for management of alcohol use and alcoholism among male and female medical students from OUCOM and CWRU combined can be seen in Table 10. Among female medical students subjects reported being least knowledgeable about the treatment programs for alcohol use and alcoholism. Among male medical students subjects reported being least knowledgeable about the
Table 10

*Descriptive Statistics: Sex x Knowledge*

<table>
<thead>
<tr>
<th>Knowledge (Q1 – Q4)</th>
<th>Male X (SD)</th>
<th>Female X (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Risks</td>
<td>3.26 (0.67)</td>
<td>2.90 (0.62)</td>
</tr>
<tr>
<td>Screening Tools</td>
<td>2.94 (0.65)</td>
<td>2.74 (0.70)</td>
</tr>
<tr>
<td>Self-help materials and group support</td>
<td>2.26 (0.83)</td>
<td>2.17 (0.67)</td>
</tr>
<tr>
<td>Treatment</td>
<td>2.29 (0.84)</td>
<td>2.12 (0.67)</td>
</tr>
</tbody>
</table>

self-help materials and group support as well as the treatment programs for alcohol use and alcoholism.

Counseling self-efficacy scores of the health risks related to consuming alcohol while pregnant among male and female medical students from OUCOM and CWRU combined can be seen in Table 11. Both male and female medical students reported being most self-efficacious in their ability to counsel about the health risks related to consuming alcohol while pregnant.

Counseling self-efficacy scores about the resources for management of alcohol use and alcoholism among male and female medical students from OUCOM and CWRU combined can be seen in Table 11. Both male and female medical students reported being least self-efficacious about the treatment programs for alcohol use and alcoholism.
Table 11

Descriptive Statistics: Sex x Counseling

<table>
<thead>
<tr>
<th>Counseling (Q5 – Q8)</th>
<th>Male X (SD)</th>
<th>Female X (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Risks</td>
<td>2.79 (0.81)</td>
<td>2.71 (0.78)</td>
</tr>
<tr>
<td>Screening Tools</td>
<td>2.56 (0.71)</td>
<td>2.38 (0.73)</td>
</tr>
<tr>
<td>Self-help materials and group support</td>
<td>2.26 (0.90)</td>
<td>2.12 (0.71)</td>
</tr>
<tr>
<td>Treatment</td>
<td>2.29 (0.84)</td>
<td>1.95 (0.83)</td>
</tr>
</tbody>
</table>

Screening self-efficacy responses of the T-ACE, CAGE, TWEAK, AUDIT, and MAST among male and female medical students from OUCOM and CWRU were combined and are depicted in Table 12. Both male and female medical students reported being most self-efficacious in their ability to screen for alcohol use and alcoholism using the CAGE. Female medical students reported being least self-efficacious in their ability to screen for alcohol use and alcoholism using the AUDIT. Male medical students reported being least self-efficacious in their ability to screen for alcohol use and alcoholism using the MAST.

Self-reported knowledge responses about the health risks related to consuming alcohol while pregnant among White medical students and medical students of color from OUCOM and CWRU combined can be seen in Table 13. Both White medical students and medical students of color reported being most knowledgeable about the health risks related to consuming alcohol while pregnant.
Table 12

*Descriptive Statistics: Sex x Screening*

<table>
<thead>
<tr>
<th>Screening (Q9 – Q13)</th>
<th>Male X (SD)</th>
<th>Female X (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-ACE</td>
<td>2.00 (1.03)</td>
<td>1.90 (0.91)</td>
</tr>
<tr>
<td>CAGE</td>
<td>3.50 (0.62)</td>
<td>3.31 (0.75)</td>
</tr>
<tr>
<td>TWEAK</td>
<td>1.81 (0.97)</td>
<td>1.48 (0.63)</td>
</tr>
<tr>
<td>AUDIT</td>
<td>1.61 (1.00)</td>
<td>1.29 (0.60)</td>
</tr>
<tr>
<td>MAST</td>
<td>1.56 (1.01)</td>
<td>1.36 (0.62)</td>
</tr>
</tbody>
</table>

Table 13

*Descriptive Statistics: Ethnicity x Knowledge*

<table>
<thead>
<tr>
<th>Knowledge (Q1 – Q4)</th>
<th>White X (SD)</th>
<th>Nonwhite X (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Risks</td>
<td>3.09 (0.69)</td>
<td>3.00 (0.60)</td>
</tr>
<tr>
<td>Screening Tools</td>
<td>2.85 (0.66)</td>
<td>2.78 (0.74)</td>
</tr>
<tr>
<td>Self-help materials and group support</td>
<td>2.25 (0.76)</td>
<td>2.13 (0.69)</td>
</tr>
<tr>
<td>Treatment</td>
<td>2.26 (0.79)</td>
<td>2.04 (0.64)</td>
</tr>
</tbody>
</table>

Self-reported knowledge responses about the resources for management of alcohol use and alcoholism among White medical students and medical students of color from OUCOM and CWRU combined can be seen in Table 13. White medical students
reported being least knowledgeable about self-help materials and group support for alcohol use and alcoholism. Medical students of color reported being least knowledgeable about the treatment programs for alcohol use and alcoholism.

Counseling self-efficacy responses of the health risks related to consuming alcohol while pregnant among White medical students and medical students of color from OUCOM and CWRU combined can be seen in Table 14. Both White medical students and medical students of color reported being most self-efficacious in their ability to counsel about the health risks related to consuming alcohol while pregnant.

Table 14

*Descriptive Statistics: Ethnicity x Counseling*

<table>
<thead>
<tr>
<th>Counseling</th>
<th>White X (SD)</th>
<th>Of Color X (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Risks</td>
<td>2.81 (0.79)</td>
<td>2.61 (0.78)</td>
</tr>
<tr>
<td>Screening Tools</td>
<td>2.55 (0.64)</td>
<td>2.26 (0.86)</td>
</tr>
<tr>
<td>Self-help materials and group support</td>
<td>2.23 (0.82)</td>
<td>2.09 (0.73)</td>
</tr>
<tr>
<td>Treatment</td>
<td>2.15 (0.84)</td>
<td>2.00 (0.84)</td>
</tr>
</tbody>
</table>

Counseling self-efficacy responses about the resources for management of alcohol use and alcoholism for White medical students and medical students of color from OUCOM and CWRU combined can be seen in Table 14. Both White medical students and medical students of color reported being least self-efficacious in their ability to counsel about the treatment programs for alcohol use and alcoholism.
Screening self-efficacy responses of the T-ACE, CAGE, TWEAK, AUDIT, and MAST among White medical students and medical students of color from OUCOM and CWRU were combined and are depicted in Table 15. Both White medical students and medical students of color reported being most self-efficacious in their ability to screen for alcohol use and alcoholism using the CAGE. Both White medical students and medical students of color reported being least self-efficacious in their ability to screen for alcohol use and alcoholism using the AUDIT.

Table 15

*Descriptive Statistics: Ethnicity x Screening*

<table>
<thead>
<tr>
<th>Screening (Q9 – Q13)</th>
<th>White X (SD)</th>
<th>Nonwhite X (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-ACE</td>
<td>1.94 (0.98)</td>
<td>1.96 (0.93)</td>
</tr>
<tr>
<td>CAGE</td>
<td>3.51 (0.64)</td>
<td>3.13 (0.76)</td>
</tr>
<tr>
<td>TWEAK</td>
<td>1.65 (0.84)</td>
<td>1.57 (0.73)</td>
</tr>
<tr>
<td>AUDIT</td>
<td>1.50 (0.90)</td>
<td>1.26 (0.54)</td>
</tr>
<tr>
<td>MAST</td>
<td>1.51 (0.93)</td>
<td>1.30 (0.47)</td>
</tr>
</tbody>
</table>

Self-reported knowledge responses of the health risks related to consuming alcohol while pregnant from OUCOM and CWRU combined can be seen in Table 16. Medical students at OUCOM reported being most knowledgeable about the health risks related to consuming alcohol while pregnant.
Self-reported knowledge responses about the resources for management of alcohol use and alcoholism from OUCOM and CWRU combined can be seen in Table 16. Medical students from CWRU reported being most knowledgeable about the screening tools for alcohol use and alcoholism and least knowledgeable about treatment programs for alcohol use and alcoholism. Medical students at OUCOM reported being least knowledgeable about self-help materials and group support for alcohol use and alcoholism.

Table 16

*Descriptive Statistics: Institution x Knowledge*

<table>
<thead>
<tr>
<th>Knowledge (Q1 – Q4)</th>
<th>CWRU X (SD)</th>
<th>OUCOM X (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Risks</td>
<td>2.91 (0.64)</td>
<td>3.32 (0.64)</td>
</tr>
<tr>
<td>Screening Tools</td>
<td>2.98 (0.73)</td>
<td>2.62 (0.55)</td>
</tr>
<tr>
<td>Self-help materials and group support</td>
<td>2.05 (0.71)</td>
<td>2.44 (0.79)</td>
</tr>
<tr>
<td>Treatment</td>
<td>1.98 (0.79)</td>
<td>2.50 (0.66)</td>
</tr>
</tbody>
</table>

Self-reported counseling responses of the health risks related to consuming alcohol while pregnant from OUCOM and CWRU combined can be seen in Table 17. Both medical students at OUCOM and CWRU reported being most self-efficacious in their ability to counsel about the health risks related to consuming alcohol while pregnant.
Self-reported counseling responses about the resources for management of alcohol use and alcoholism from OUCOM and CWRU combined can be seen in Table 17. Medical students at CWRU reported being least self-efficacious in their ability to counsel about the treatment programs for alcohol use and alcoholism. Medical students at OUCOM reported being least self-efficacious in their ability to counsel about self-help materials and group support for alcohol use and alcoholism.

Table 17

*Descriptive Statistics: Institution x Counseling*

<table>
<thead>
<tr>
<th>Counseling (Q5 – Q8)</th>
<th>CWRU X (SD)</th>
<th>OUCOM X (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Risks</td>
<td>2.66 (0.71)</td>
<td>2.94 (0.89)</td>
</tr>
<tr>
<td>Screening Tools</td>
<td>2.43 (0.79)</td>
<td>2.50 (0.62)</td>
</tr>
<tr>
<td>Self-help materials and group support</td>
<td>2.11 (0.78)</td>
<td>2.29 (0.87)</td>
</tr>
<tr>
<td>Treatment</td>
<td>1.89 (0.78)</td>
<td>2.41 (0.89)</td>
</tr>
</tbody>
</table>

Screening self-efficacy scores of the T-ACE, CAGE, TWEAK, AUDIT, and MAST among OUCOM and CWRU combined can be seen in Table 18. Medical students from OUCOM and CWRU reported being most self-efficacious in their ability to screen for alcohol use and alcoholism using the CAGE. Medical students at CWRU reported being equally least self-efficacious in their ability to screen for alcohol use and alcoholism using the AUDIT and MAST. Medical students at OUCOM subjects reported being least self-efficacious in their ability to screen for alcohol use using the AUDIT.
Table 18

Descriptive Statistics: Institution x Screening

<table>
<thead>
<tr>
<th>Screening (Q9 – Q13)</th>
<th>CWRU X (SD)</th>
<th>OUCOM X (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-ACE</td>
<td>1.83 (0.99)</td>
<td>2.06 (0.92)</td>
</tr>
<tr>
<td>CAGE</td>
<td>3.53 (0.59)</td>
<td>3.24 (0.78)</td>
</tr>
<tr>
<td>TWEAK</td>
<td>1.55 (0.77)</td>
<td>1.79 (0.93)</td>
</tr>
<tr>
<td>AUDIT</td>
<td>1.24 (0.69)</td>
<td>1.65 (0.88)</td>
</tr>
<tr>
<td>MAST</td>
<td>1.24 (0.69)</td>
<td>1.70 (0.88)</td>
</tr>
</tbody>
</table>

Results of Tests of Hypotheses

Hypothesis #1: There will be no statistically significant difference between younger and older medical students’ perceived knowledge about the health risks and resources for management of alcohol use and alcoholism among pregnant women.

In order to test hypothesis #1, four concepts were collapsed in the construction of the variable “knowledge:” health risks related to consuming alcohol while pregnant, screening tools, self-help materials and group support, and treatment programs. An independent t test was conducted to determine if there were any statistically significant differences in perceived knowledge of the effects of alcohol use among pregnant women between older and younger medical students. The results of the analysis, as noted in Table 19, revealed that there was no statistically significant difference between older and younger medical students in their perceived knowledge about health risks related to
Table 19

*Independent Sample Test – Age x Knowledge*

<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Levene’s Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig</td>
<td>t</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>6.345</td>
<td>.014</td>
<td>-0.010</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>-0.010</td>
<td>55.866</td>
<td>.992</td>
</tr>
</tbody>
</table>
consuming alcohol while pregnant and the resources for management of alcohol use and alcoholism among pregnant women. As such, the null hypothesis was not rejected. These findings suggest that among subjects in this study, older (26 and over) medical students and younger (under 26) medical students have similar perceived knowledge of the health risks related to consuming alcohol while pregnant, screening tools, self-help materials and group support, and treatment programs with regard to alcohol use among pregnant women.

Hypothesis #2: There will be no statistically significant difference between younger and older medical students' perceived self-efficacy to screen for alcohol use and alcoholism among pregnant women.

In order to test hypothesis #2, five concepts were collapsed in the construction of the variable “screening”: T-ACE, CAGE, TWEAK, AUDIT, and MAST. An independent t test was conducted to determine if there were any statistically significant differences in perceived self-efficacy to screen for alcohol use among pregnant women between older and younger medical students. The results of the analysis, as noted in Table 20, revealed there was no statistically significant difference between older and younger medical students in their perceived self-efficacy to screen for alcohol use among pregnant women. As such, the null hypothesis was not rejected. These findings suggest that among subjects in this study, older (26 and over) medical students and younger (under 26) medical students have similar levels of perceived self-efficacy in their ability to screen for alcohol use among pregnant women using the T-ACE, CAGE, TWEAK, AUDIT, and MAST.
Table 20

*Independent Sample Test – Age x Screening*

<table>
<thead>
<tr>
<th>Levene's Test for Equality of Variances</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean Difference</td>
</tr>
<tr>
<td></td>
<td>Sig (2-tailed)</td>
</tr>
<tr>
<td><strong>t-test for Equality of Means</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Sig</td>
</tr>
<tr>
<td>----------------</td>
<td>------</td>
</tr>
<tr>
<td>Screening</td>
<td>Equal variances assumed</td>
</tr>
<tr>
<td></td>
<td>Equal variances not assumed</td>
</tr>
</tbody>
</table>
Hypothesis #3: There will be no statistically significant difference between younger and older medical students’ perceived self-efficacy to counsel about the health risks and resources for management of alcohol use and alcoholism among pregnant women.

In order to test hypothesis #3, four concepts were collapsed in the construction of the variable “counseling”: health risks related to consuming alcohol while pregnant, screening tools, self-help materials/group support, and treatment programs. An independent t test was conducted to determine if there were any statistically significant differences in perceived self-efficacy to counsel about health risks related to consuming alcohol while pregnant and resources for management of alcohol use and alcoholism among pregnant women between older and younger medical students. The results of the analysis, as noted in Table 21, revealed that there was no statistically significant difference between older and younger medical students in their perceived self-efficacy to counsel about health risks related to consuming alcohol while pregnant and resources for management of alcohol use and alcoholism among pregnant women. As such, the null hypothesis was not rejected. These findings suggest that among subjects in this study, older (26 and over) medical students and younger (under 26) medical students have similar levels of perceived self-efficacy in their ability to counsel about health risks related to consuming alcohol while pregnant, screening tools, self-help materials and group support and treatment programs with regard to alcohol use among pregnant women.
Table 21

*Independent Sample Test – Age x Counseling*

<table>
<thead>
<tr>
<th>Levene’s Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig</td>
</tr>
<tr>
<td>Counseling Equal variances assumed</td>
<td>4.543</td>
<td>0.036</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>1.214</td>
<td>56.985</td>
</tr>
</tbody>
</table>
Hypothesis #4: There will be no statistically significant difference between male and female medical students’ perceived knowledge about the health risks and resources for management of alcohol use and alcoholism among pregnant women.

In order to test hypothesis #4, four concepts were collapsed in the construction of the variable “knowledge” of the health risks related to consuming alcohol while pregnant, screening tools, self-help materials and group support, and treatment programs. An independent t test was conducted to determine if there were any statistically significant differences in perceived knowledge about the health risks related to consuming alcohol while pregnant and resources for management of alcohol use and alcoholism among pregnant women between male and female medical students. The results of the analysis, as noted in Table 22, revealed that there was no statistically significant difference between male and female medical students in perceived knowledge of alcohol use and alcoholism among pregnant women. As such, the null hypothesis was not rejected. These findings suggest that among subjects in this study, male and female medical students have similar levels of perceived knowledge of the health risks related to consuming alcohol while pregnant, screening tools, self-help materials and group support and treatment programs with regard to alcohol use among pregnant women.
<table>
<thead>
<tr>
<th>Knowledge</th>
<th>Levene's Test for Equality of Variances</th>
<th>$t$-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig</td>
<td>t</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>1.527</td>
<td>0.220</td>
<td>1.851</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>1.813</td>
<td>64.523</td>
<td>0.074</td>
</tr>
</tbody>
</table>

Table 22

**Independent Sample Test – Sex x Knowledge**

Levene's Test for Equality of Variances

$t$-test for Equality of Means

95% Confidence Interval of the Difference
Hypothesis #5: There will be no statistically significant difference between male and female medical students’ perceived self-efficacy to screen for alcohol use and alcoholism among pregnant women.

In order to test hypothesis #5, five concepts were collapsed in the construction of the variable “screening”: T-ACE, CAGE, TWEAK, AUDIT, and MAST. An independent t test was conducted to determine if there were any statistically significant differences in perceived self-efficacy to screen for alcohol use among pregnant women between male and female medical students. The results of the analysis, as noted in Table 23, revealed that there was no statistically significant difference between male and female medical students’ perceived self-efficacy to screen for alcohol use among pregnant women. As such, the null hypothesis was not rejected. These findings suggest that among subjects in this study, male and female medical students have similar levels of perceived self-efficacy in their ability to screen for alcohol use among pregnant women using the T-ACE, CAGE, TWEAK, AUDIT, and MAST.
Table 23

*Independent Sample Test – Sex x Screening*

<table>
<thead>
<tr>
<th>Screening</th>
<th>Levene’s Test for Equality of Variances</th>
<th>$t$-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig</td>
<td>t</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>3.799</td>
<td>0.055</td>
<td>1.620</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>1.542</td>
<td>52.271</td>
<td>0.129</td>
</tr>
</tbody>
</table>
Hypothesis #6: There will be no statistically significant difference between male and female medical students’ perceived self-efficacy to counsel about the health risks and resources for management of alcohol use and alcoholism among pregnant women.

In order to answer hypothesis #6, four concepts were collapsed in the construction of the variable “counseling”: health risks related to consuming alcohol while pregnant, screening tools, self-help materials and group support and treatment programs. An independent t test was conducted to determine if there were any statistically significant differences in perceived self-efficacy to counsel for alcohol use and alcoholism among pregnant women between male and female medical students. The results of the analysis, as seen in Table 24, revealed that there was no statistically significant difference between male and female medical students’ perceived self-efficacy to counsel about the health risks related to consuming alcohol while pregnant and resources for management of alcohol use and alcoholism among pregnant women. As such, the null hypothesis was not rejected. These findings suggest that among subjects in this study male and female medical students have similar levels of perceived self-efficacy in their ability to counsel about the health risks related to consuming alcohol while pregnant, screening tools, self-help materials and group support and treatment programs with regard to alcohol use among pregnant women.
Table 24

*Independent Sample Test – Sex x Counseling*

<table>
<thead>
<tr>
<th>Levene’s Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig</td>
</tr>
<tr>
<td>Counseling Equal variances assumed</td>
<td>0.517</td>
<td>0.474</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>1.399</td>
<td>66.447</td>
</tr>
</tbody>
</table>
Hypothesis #7: There will be no statistically significant difference between White medical students and medical students of color perceived knowledge about the health risks and resources for management of alcohol use and alcoholism among pregnant women.

In order to test hypothesis #7, four concepts were collapsed in the construction of the variable “knowledge:” health risks related to consuming alcohol while pregnant, screening tools, self-help materials and group support and treatment programs. An independent t test was conducted to determine if there were any statistically significant differences in perceived knowledge about the health risks related to consuming alcohol while pregnant and resources for management of alcohol use and alcoholism among pregnant women between White medical students and medical students of color. The results of the analysis, seen in Table 25, revealed that there was no statistically significant difference between White medical students and medical students of color with regard to perceived knowledge about health risks related to consuming alcohol while pregnant and resources for management of alcohol use and alcoholism among pregnant women. As such, the null hypothesis is not rejected. These findings suggest that among subjects in this study, White medical students and medical students of color have similar levels of perceived knowledge about the health risks related to consuming alcohol while pregnant, screening tools, self-help materials and group support and treatment programs about alcohol use among pregnant women.
Table 25

*Independent Sample Test – Ethnicity x Knowledge*

<table>
<thead>
<tr>
<th>Levene’s Test for Equality of Variances</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
</tr>
<tr>
<td>Knowledge Equal variances assumed</td>
<td>0.051</td>
</tr>
<tr>
<td>Knowledge Equal variances not assumed</td>
<td>0.944</td>
</tr>
</tbody>
</table>
Hypothesis #8: There will be no statistically significant difference between White medical students and medical students of color perceived self-efficacy to screen for alcohol use among pregnant women.

In order to test hypothesis #8, five concepts were collapsed in the construction of the variable “screening:” T-ACE, CAGE, TWEAK, AUDIT, and MAST. An independent t test was conducted to determine if there were any statistically significant differences in perceived self-efficacy to screen for alcohol use among pregnant women between White medical students and medical students of color. The results of the analysis, as seen in Table 26, revealed that there was no statistically significant difference between White medical students and medical students of color in perceived self-efficacy to screen for alcohol use among pregnant women. As such, the null hypothesis was not rejected. These findings suggest that among subjects in this study, White medical students and medical students of color have similar levels of perceived self-efficacy in their ability to screen for alcohol use among pregnant women using the T-ACE, CAGE, TWEAK, AUDIT, and MAST.
<table>
<thead>
<tr>
<th></th>
<th>Levene's Test for Equality of Variances</th>
<th>$t$-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig</td>
<td>t</td>
</tr>
<tr>
<td>Screening</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>2.529</td>
<td>0.116</td>
<td>1.055</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>1.206</td>
<td>63.197</td>
<td>0.232</td>
</tr>
</tbody>
</table>

Table 26

*Independent Sample Test – Ethnicity x Screening*
Hypothesis #9: There will be no statistically significant difference between White medical students and medical students of color perceived self-efficacy to counsel about the health risks and resources for management of alcohol use and alcoholism among pregnant women.

In order to test hypothesis #9, four concepts were collapsed in the construction of the variable ‘counseling’—health risks related to consuming alcohol while pregnant, screening tools, self-help materials and group support, and treatment programs. An independent t test was conducted to determine if there were statistically significant differences in perceived self-efficacy to counsel for alcohol use and alcoholism among pregnant women between White medical students and medical students of color. The results of the analysis, as seen in Table 27, revealed that there was no statistically significant difference between White medical students and medical students of color in perceived self-efficacy to counsel about health risks related to consuming alcohol while pregnant and resources for management of alcohol use and alcoholism among pregnant women. As such, the null hypothesis was not rejected. These findings suggest that among subjects in this study, White medical students and medical students of color have similar levels of perceived self-efficacy in their ability to counsel about the health risks related to consuming alcohol while pregnant, screening tools, self-help materials and group support and treatment programs with regard to alcohol use among pregnant women.
Table 27

*Independent Sample Test – Ethnicity x Counseling*

<table>
<thead>
<tr>
<th>Counseling</th>
<th>Levene’s Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig</td>
<td>t</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>0.000</td>
<td>0.998</td>
<td>1.066</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>1.051</td>
<td>43.027</td>
<td>0.299</td>
</tr>
</tbody>
</table>
Hypothesis #10: There will be no statistically significant difference between medical students in a private university and medical students in public universities perceived knowledge about the health risks and resources for management of alcohol use and alcoholism among pregnant women.

In order to test hypothesis #10, four concepts were collapsed in the construction of the variable “knowledge:” health risks related to consuming alcohol while pregnant, screening tools, self-help materials and group support and treatment programs. An independent t test was conducted to determine if there were statistically significant differences in perceived knowledge about the health risks related to consuming alcohol while pregnant and resources for management of alcohol use and alcoholism among pregnant women between medical students at a private university and medical students at a public university. The results of the analysis, seen in Table 28, revealed that there was a statistically significant difference ($p < .05$ and $p < .01$) in perceived knowledge about the health risks related to consuming alcohol while pregnant and resources for management of alcohol use and alcoholism among pregnant women between medical students at a private university and medical students at a public university. As such, the null hypothesis was rejected. These findings suggest that among the subjects in this study, there is a difference in perceived knowledge of health risks related to consuming alcohol while pregnant, screening tools, self-help materials and group support and treatment programs between medical students at a private university and medical students at a public university with regard to alcohol use among pregnant women.
Table 28

*Independent Sample Test – Institution x Knowledge*

<table>
<thead>
<tr>
<th>Levene’s Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig</td>
</tr>
<tr>
<td>Knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>0.394</td>
<td>0.532</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>-2.055</td>
<td>72.084</td>
</tr>
</tbody>
</table>
In order to determine the source of the specific differences in perceived knowledge, additional independent t tests were run between OUCOM and CWRU on perceived knowledge of the health risks related to consuming alcohol while pregnant, screening tools, self-help materials and group support, and treatment programs. Table 29 reveals a significant difference ($p < .05, p < .01$) between CWRU and OUCOM medical students in all knowledge questions. These analyses revealed that OUCOM medical students reported being more knowledgeable than CWRU medical students about the health risks related to consuming alcohol while pregnant, self-help materials and group support and treatment programs related to alcohol use among pregnant women. In addition, CWRU medical students perceived themselves as being more knowledgeable about the screening tools for alcohol use and alcoholism than OUCOM medical students.
Table 29

*Group Statistics: Institution x Knowledge*

<table>
<thead>
<tr>
<th></th>
<th>Institution</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>CWRU</td>
<td>44</td>
<td>2.91</td>
<td>0.640</td>
<td>0.097</td>
</tr>
<tr>
<td></td>
<td>OUCOM</td>
<td>34</td>
<td>3.32</td>
<td>0.638</td>
<td>0.109</td>
</tr>
<tr>
<td>Q2</td>
<td>CWRU</td>
<td>44</td>
<td>2.98</td>
<td>0.731</td>
<td>0.110</td>
</tr>
<tr>
<td></td>
<td>OUCOM</td>
<td>34</td>
<td>2.62</td>
<td>0.551</td>
<td>0.095</td>
</tr>
<tr>
<td>Q3</td>
<td>CWRU</td>
<td>44</td>
<td>2.05</td>
<td>0.714</td>
<td>0.108</td>
</tr>
<tr>
<td></td>
<td>OUCOM</td>
<td>34</td>
<td>2.44</td>
<td>0.786</td>
<td>0.135</td>
</tr>
<tr>
<td>Q4</td>
<td>CWRU</td>
<td>44</td>
<td>1.98</td>
<td>0.792</td>
<td>0.119</td>
</tr>
<tr>
<td></td>
<td>OUCOM</td>
<td>34</td>
<td>2.50</td>
<td>0.663</td>
<td>0.114</td>
</tr>
</tbody>
</table>
# Table 30

**Independent Sample Test – Institution x Knowledge**

<table>
<thead>
<tr>
<th>Q1</th>
<th>Equal variances assumed</th>
<th>Levene’s Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig</td>
<td>t</td>
<td>df</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>1.341</td>
<td>.251</td>
<td>-2.838</td>
<td>76</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>-2.840</td>
<td>71.236</td>
<td>.006**</td>
<td>-414</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q2</th>
<th>Equal variances assumed</th>
<th>Levene’s Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig</td>
<td>t</td>
<td>df</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>.074</td>
<td>.786</td>
<td>2.390</td>
<td>76</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>2.477</td>
<td>75.986</td>
<td>.015*</td>
<td>.360</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q3</th>
<th>Equal variances assumed</th>
<th>Levene’s Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig</td>
<td>t</td>
<td>df</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>4.531</td>
<td>.037</td>
<td>-2.323</td>
<td>76</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>-2.294</td>
<td>67.448</td>
<td>.025*</td>
<td>-.396</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q4</th>
<th>Equal variances assumed</th>
<th>Levene’s Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig</td>
<td>t</td>
<td>df</td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>.258</td>
<td>.613</td>
<td>-3.099</td>
<td>76</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>-3.171</td>
<td>75.478</td>
<td>.002**</td>
<td>-.523</td>
</tr>
</tbody>
</table>

* *p < .05
** *p < .01
Hypothesis #11: There will be no statistically significant difference between medical students in a private university and medical students in public universities perceived self-efficacy to screen for alcohol use and alcoholism among pregnant women.

In order to test hypothesis #11, five concepts were collapsed in the construction of the variable "screening": T-ACE, CAGE, TWEAK, AUDIT, and MAST. An independent t test was conducted to determine if there were statistically significant differences in perceived self-efficacy to screen for alcohol use among pregnant women between medical students at a private university and medical students at a public university. The results of the analysis, as noted in Table 31, revealed that there was no statistically significant difference in perceived self-efficacy to screen for alcohol use among pregnant women between medical students at a private university and medical students at a public university. As such, the null hypothesis was not rejected. These findings suggest that among subjects in this study, medical students at a private university and medical students at a public university have similar levels of perceived self-efficacy to screen for alcohol use among pregnant women using the T-ACE, CAGE, TWEAK, AUDIT, and MAST.
Table 31

*Independent Sample Test – Institution x Screening*

<table>
<thead>
<tr>
<th></th>
<th>Levene’s Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig</td>
<td>t</td>
</tr>
<tr>
<td>Screening</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>3.046</td>
<td>0.051</td>
<td>-1.347</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>-1.317</td>
<td>62.471</td>
<td>0.193</td>
</tr>
</tbody>
</table>
Hypothesis #12: There will be no statistically significant difference between medical students in a private university and medical students in public universities perceived self-efficacy to counsel about the health risks and resources for management of alcohol use and alcoholism among pregnant women.

In order to test hypothesis #12, four concepts were collapsed in the construction of the variable “counseling:” health risks related to consuming alcohol while pregnant, screening tools, self-help materials and group support, and treatment programs. An independent t test was conducted to determine if there were statistically significant differences in perceived self-efficacy to counsel about the health risks related to consuming alcohol while pregnant and resources for management of alcohol and alcoholism among pregnant women between medical students at a private university and medical students at a public university. The results of the analysis, as noted in Table 32, revealed that there was no statistically significant difference in perceived self-efficacy to counsel about health risks related to consuming alcohol while pregnant and resources for management of alcohol and alcoholism between medical students at a private university and medical students at a public university. As such, the null hypothesis was not rejected. These findings suggest that among subjects in this study, medical students at a private university and medical students at a public university have similar levels of perceived self-efficacy in their ability to counsel about the health risks related to consuming alcohol while pregnant, screening tools, self-help materials and group support and treatment programs with regard to alcohol use among pregnant women.
Table 32

*Independent Sample Test – Institution x Counseling*

<table>
<thead>
<tr>
<th></th>
<th>Levene’s Test for Equality of Variances</th>
<th>t-test for Equality of Means</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>Sig</td>
<td>t</td>
</tr>
<tr>
<td>Counseling</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>2.194</td>
<td>0.143</td>
<td>-1.740</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-1.701</td>
<td>64.519</td>
<td>0.094</td>
</tr>
</tbody>
</table>
Hypothesis #13: There will be no statistically significant difference between medical specialty interests perceived knowledge about the health risks and resources for management of alcohol use and alcoholism among pregnant women.

In order to test hypothesis #13, four concepts were collapsed in the construction of the variable –knowledge:” health risks related to consuming alcohol while pregnant, screening tools, self-help/group support, and treatment programs. A one way analysis of variance (ANOVA) test was conducted to determine if there were statistically significant differences between specialty interests in perceived knowledge about health risks related to consuming alcohol while pregnant and resources for management of alcohol and alcoholism among pregnant women. The results of the analysis, as noted in Table 33, revealed that there was no statistically significant difference between specialty interests and perceived knowledge about health risks related to consuming alcohol while pregnant and resources for management of alcohol and alcoholism among pregnant women. As such, the null hypothesis was not rejected. These findings suggest that among subjects in this study, regardless of specialty interests, medical students have similar levels of perceived knowledge in health risks related to consuming alcohol while pregnant, screening tools, self-help materials and group support and treatment programs with regard to alcohol use among pregnant women.
Hypothesis #14: There will be no statistically significant difference between medical specialty interests perceived self-efficacy to screen for alcohol use and alcoholism among pregnant women.

In order to test hypothesis #14, five concepts were collapsed in the construction of the variable “screening:” T-ACE, CAGE, TWEAK, AUDIT, and MAST. A one way analysis of variance (ANOVA) test was conducted to determine if there were statistically significant differences in perceived self-efficacy to screen for alcohol use among pregnant women between specialty interests. The results of the analysis, as noted in Table 34, revealed that there was no statistically significant difference between specialty interests and perceived self-efficacy to screen for alcohol use among pregnant women. As such, the null hypothesis was not rejected. These findings suggest that among subjects in this study, regardless of specialty interest, medical students have similar levels of

Table 33

Knowledge x Specialty Interests

<table>
<thead>
<tr>
<th>ANOVA</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>10.871</td>
<td>6</td>
<td>1.812</td>
<td>0.400</td>
<td>0.876</td>
</tr>
<tr>
<td>Within Groups</td>
<td>321.247</td>
<td>71</td>
<td>4.526</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>332.218</td>
<td>77</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Table 34

*Screening x Specialty Interests*

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Screening</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>43.877</td>
<td>6</td>
<td>7.313</td>
<td>0.760</td>
<td>0.603</td>
</tr>
<tr>
<td>Within Groups</td>
<td>663.531</td>
<td>69</td>
<td>9.616</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>707.408</td>
<td>75</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

perceived self-efficacy to screen for alcohol use among pregnant women using the T-ACE, CAGE, TWEAK, AUDIT, and MAST.

Hypothesis #15: There will be no statistically significant difference between specialty interests perceived self-efficacy to counsel about the health risks and resources for management of alcohol use and alcoholism among pregnant women.

In order to test hypothesis #15, four concepts were collapsed in the construction of the variable –counseling:” health risks related to consuming alcohol while pregnant, screening tools, self-help/group support, and treatment programs. A one way ANOVA test was conducted to determine if there was a difference between medical specialty interests in perceived self-efficacy to counsel about the health risks related to consuming alcohol while pregnant and resources for management of alcohol and alcoholism among pregnant women. The results of the analysis, as noted in Table 35, revealed that there was no statistically significant difference between medical specialty interests and perceived
self-efficacy to counsel about the health risks related to consuming alcohol while pregnant and resources for management of alcohol and alcoholism. As such, the null hypothesis was not rejected. These findings suggest that in this study, regardless of specialty interests, medical students have similar levels of perceived self-efficacy to counsel about the health risks related to consuming alcohol while pregnant, screening tools, self-help/support groups and treatment programs with regard to alcohol use among pregnant women.

As described in Table 1, the response rate from NEOUCOM did not provide sufficient data to analyze hypotheses 16, 17, 18, 22, 23, and 24. Analyses were conducted on OUCOM and CWRU only.

Hypothesis #25: There will be no statistically significant difference between learning experiences and perceived knowledge about the health risk and resources for management of alcohol use and alcoholism among pregnant women.
In order to test hypothesis #25, four concepts were collapsed in the construction of the variable “knowledge:” health risks related to consuming alcohol while pregnant, screening tools, self-help materials and group support and treatment programs. A regression analysis was conducted to determine is there were any significant differences between learning experiences in perceived knowledge about the health risks related to consuming alcohol while pregnant and resources for management of alcohol use and alcoholism among pregnant women. A significant relationship was revealed through the regression analysis ($p < .05$, $p < .01$, $p < .001$). As noted in Table 36, there was a statistically significant difference between learning experiences and perceived knowledge about health risks related to consuming alcohol while pregnant and resources for management of alcohol use and alcoholism among pregnant women. As such, the null hypothesis was rejected. These findings suggest that for medical students in this study, there is a difference between learning experiences and perceived knowledge about health risks and resources for management of alcohol use and alcoholism among pregnant women. According to the findings, independent study was the only variable that accounted for a statistically significant amount of variability in perceived knowledge.
Table 36

*Coefficients*

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>7.571</td>
<td>0.581</td>
<td>13.032</td>
</tr>
<tr>
<td></td>
<td>Q14</td>
<td>1.229</td>
<td>0.239</td>
<td>0.510</td>
</tr>
<tr>
<td>2</td>
<td>(Constant)</td>
<td>4.941</td>
<td>0.915</td>
<td>5.401</td>
</tr>
<tr>
<td></td>
<td>Q14</td>
<td>1.311</td>
<td>0.224</td>
<td>0.545</td>
</tr>
<tr>
<td></td>
<td>Q15</td>
<td>.896</td>
<td>0.251</td>
<td>0.331</td>
</tr>
</tbody>
</table>

*a Dependent Variable: Knowledge

*p < .05; **p < .01; ***p < .001

Hypothesis #26: There will be no statistically significant difference between learning experiences and perceived self-efficacy to screen for alcohol use and alcoholism among pregnant women.

In order to test hypothesis #26, five concepts were collapsed in the construction of the variable screening for alcohol use and alcoholism among pregnant women: T-ACE, CAGE, TWEAK, AUDIT, and MAST. A regression analysis was conducted to determine if there were differences between learning experiences in perceived self-efficacy to screen for alcohol use among pregnant women. A significant relationship was revealed through the regression analysis ($p \leq .05, p \leq .01, p \leq .001$). As noted in Table 37, there was a statistically significant difference between learning experiences and perceived self-
efficacy to screen for alcohol use among pregnant women. As such, the null hypothesis was rejected. These findings suggest that among the subjects in this study, there is a difference between learning experiences and perceived self-efficacy to screen for alcohol use among pregnant women. According to the findings, receiving feedback on performance after practice using alcohol screening tools or doing alcohol screenings with patients was the only variable that accounted for a statistically significant amount of variability in perceived screening self-efficacy.

Table 37

*Coefficients*

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
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<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
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<td></td>
<td>Q22</td>
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<td>(Constant)</td>
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<td></td>
<td>Q22</td>
<td>1.562</td>
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<td>Q20</td>
<td>.820</td>
<td>0.398</td>
<td>0.227</td>
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</table>

*aDependent Variable: Screening

*p < .05; **p < .01; ***p < .001
Hypothesis #27: There will be no statistically significant difference between learning experiences and perceived self-efficacy to counsel about the health risks and resources for management of alcohol use and alcoholism among pregnant women.

In order to test hypothesis #27, four concepts were collapsed in the construction of the variable “counseling”: health risks related to consuming alcohol while pregnant, screening tools, self-help materials and group support and treatment programs. A regression analysis was conducted to determine if there were statistically significant differences between learning experiences in perceived self-efficacy to counsel about health risks and resources for management of alcohol and alcoholism among pregnant women. A significant relationship was revealed through the regression analysis ($p \leq .05$, $p \leq .01$, $p \leq .001$), as noted in Table 38, there was a statistically significant difference between learning experiences and perceived self-efficacy to counsel about the health risks related to consuming alcohol while pregnant and resources for management of alcohol and alcoholism among pregnant women. As such, the null hypothesis was rejected. These findings suggest that among the subjects in this study, there is a difference between learning experiences and perceived self-efficacy to counsel about health risks related to consuming alcohol while pregnant and resources for management of alcohol and alcoholism among pregnant women. According to the findings, observing physician role models implementing alcohol counseling strategies with patients was the only variable that accounted for a statistically significant amount of variability in perceived counseling self-efficacy.
Table 38

Coefficients$^a$

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
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</tr>
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<td></td>
<td>Q17</td>
<td>1.425</td>
<td>0.258</td>
<td>0.537</td>
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</tbody>
</table>

$^a$Dependent Variable: Counseling

*p < .05; **p < .01; ***p < .001

Summary

With regard to hypothesis #10 the following significant relationship was found. Medical students at a private university and medical students at a public university have a difference in perceived knowledge of health risks related to consuming alcohol while pregnant, screening tools, self-help materials and group support, and treatment programs with regard to alcohol use among pregnant women. Medical students at a private university and medical students at a public university have a difference in the level of perceived self-efficacy about health risks related to consuming alcohol while pregnant and resources for management of alcohol and alcoholism among pregnant women. Medical students at a private university and medical students at a public university have similar levels of perceived self-efficacy in their ability to counsel about the health risks related to consuming alcohol while pregnant, screening tools, self-help materials and
group support, and treatment programs with regard to alcohol use among pregnant women.

Analyses revealed that the only variable that accounted for the variation among perceived knowledge of the health risks related to consuming alcohol while pregnant, screening tools, self-help materials and group support, and treatment programs was receiving factual information about alcohol use during pregnancy through independent study. Medical students at both institutions reported that receiving factual information about alcohol use during pregnancy through independent study (e.g., reading, informal talks, extracurricular lectures, or meetings) contributed the most to their knowledge, related to alcohol use among pregnant women.

Analyses revealed that the only variable that accounted for the variation among perceived screening for alcohol use and alcoholism is receiving feedback on performance after practice using alcohol screening tools or doing alcohol screening with patients. Medical students at both institutions reported that receiving feedback on performance after practice using alcohol screening tools or doing alcohol screening with patients contributed the most to their counseling skills related to alcohol use among pregnant women.

Analyses revealed that the only variable that accounted for the variation among perceived counseling about the health risks related to consuming alcohol while pregnant, screening tools, self-help materials, and group support and treatment programs is observing physician role models implementing alcohol counseling strategies with patients. Medical students at both institutions reported that observing physician role
models implementing alcohol counseling strategies with patients contributed most to their screening skills related to alcohol use among pregnant women.
CHAPTER V
DISCUSSION AND CONCLUSIONS

The purpose of this study was to analyze the relationship between perceived knowledge about health risks related to consuming alcohol while pregnant, resources for management of alcohol and alcoholism, and perceived self-efficacy to counsel and screen for alcohol use in pregnant women among third year medical students enrolled in a 4-year private M.D. program, a 4-year public D.O. program, and a 6-year B.S./M.D program. The demographics analyzed in this study included type of institution, type of learning experience, area of specialty interest, age, sex, and race of medical student.

Alcohol use among pregnant women continues to be a public health threat in the U.S. As such, there have been significant efforts to develop counseling and screening protocols for use by physicians to decrease the number of women consuming alcohol during pregnancy. To date, the AMA, AAP, ACOG, IOM, NIAAA, CDC, SAMHSA, NOFAS, and the 17th Surgeon General of the U.S. recommended physicians counsel and screen all women of childbearing age for alcohol use on a regular basis (ACOG, 1994, 2000; AAP, 2006; AMA, 1997, 1999, 2005; CDC, 2004a; IOM, 1996; NIAAA, 2005; NOFAS, 2005; SAMHSA, 2002; USDHHS, 2005a). The increase in recommendations from both federal agencies and professional medical organizations prompted this investigator to conduct the current study to examine third year medical students’ perceived knowledge about health risks related to consuming alcohol while pregnant, perceived self-efficacy to counsel and screen pregnant women about the health risks
related to consuming alcohol while pregnant, and the resources for management of alcohol use and alcoholism. Perceived self-efficacy is one’s belief that they are capable of performing a particular behavior or task. Perceived self-efficacy is regulated by four processes: cognitive, motivational, affective, and selection (Bandura, 1997).

Discussion of Descriptive Statistics

Previous research has examined the knowledge, counseling, and screening strategies of practicing physicians, but there is little baseline data on medical students’ perceived knowledge and perceived self-efficacy to counsel and screen pregnant women about the health risks related to consuming alcohol while pregnant and the resources for management of alcohol and alcoholism. This chapter examines the findings of the current study in relation to the existing literature.

In this study, all male and female third year medical students at Northeastern Ohio Colleges of Medicine (NEOUCOM), Case Western Reserve University (CWRU), and Ohio University College of Medicine (OUCOM) who were enrolled as full time students as of September 2007 were asked to participate in the study. There were 34 respondents from OUCOM, 45 respondents from CWRU and 16 respondents from NEOUCOM. A variety of demographic data (age, sex race, institution, specialty interest, and learning experiences) were collected to determine if there were any differences between respondent demographics and perceived knowledge of the health risks related to consuming alcohol while pregnant, screening tools, self-help materials and group support, and treatment programs. Demographic data were also collected to determine if there were any differences between perceived self-efficacy to counsel about the health
risks related to consuming alcohol while pregnant, screening tools, self-help materials and group support, and treatment programs. Lastly, demographic data were collected to determine if there were any differences between perceived self-efficacy to screen for alcohol use and alcoholism among pregnant women. With respect to demographic variables, the majority of respondents were under the age of 26 (55.8%), female (53.2%), White (67.1%), and undecided in their specialty interest (43%).

Findings from this study revealed that medical students under the age of 26 had higher mean self-efficacy scores to counsel about health risks related to consuming alcohol while pregnant (2.79), screening tools (2.67), self-help materials and group support (2.24), and treatment programs (2.17) than their counterparts who were 26 and over. Similarly, medical students under the age of 26 had higher mean self-efficacy scores to screen for alcohol use and alcoholism using the T-ACE (1.95), CAGE (3.57), and the AUDIT (1.43), whereas medical students 26 years and older had higher mean self-efficacy scores to screen for alcohol use and alcoholism among pregnant women using the TWEAK (1.66) and the MAST (1.50). This may be due to younger medical students having more updated and recent training regarding alcohol use and alcoholism among pregnant women and the importance of screening.

Male medical students had higher mean self-efficacy scores to counsel for health risks related to consuming alcohol while pregnant (2.79), screening tools (2.56), self-help materials and group support (2.26), and treatment programs (2.29) than female medical students. Male medical students also had higher mean self-efficacy scores to screen for alcohol use and alcoholism among pregnant women using the T-ACE (2.00), CAGE
(3.50), TWEAK (1.81), AUDIT (1.61), and the MAST (1.56) than female medical students. This is possibly due to older, male medical students having more self-efficacy than younger, female students overall.

White medical students had higher mean self-efficacy scores to counsel for health risks related to consuming alcohol while pregnant (2.81), screening tools (2.55), self-help materials and group support (2.23), and treatment programs (2.15) than medical students of color. White medical students had higher mean self-efficacy scores to screen for alcohol use and alcoholism among pregnant women using the CAGE (3.51), TWEAK (1.65), AUDIT (1.50), and the MAST (1.51), but medical students of color had a higher mean self-efficacy score to screen for alcohol use and alcoholism among pregnant women using the T-ACE (1.96). It is unclear why medical students of color would have a higher mean self-efficacy score to screen for alcohol use and alcoholism using the T-ACE.

Medical students at OUCOM had higher mean self-efficacy scores to counsel for health risks related to consuming alcohol while pregnant (2.94), screening tools (2.50), self-help materials and group support (2.29), and treatment programs (2.41) than medical students at CWRU. Medical students at OUCOM also had higher mean self-efficacy scores to screen for alcohol use and alcoholism among pregnant women using the T-ACE (2.06), TWEAK (1.79), AUDIT (1.65), and the MAST (1.70), but medical students at CWRU had a higher mean self-efficacy score to screen for alcohol use using the CAGE (3.53). These differences may be related to the difference in the curriculum taught at OUCOM and CWRU.
The statistical findings for 19 of the 27 hypotheses are examined below in relation to the existing literature reviewed in Chapter 2. Analyses of differences between public and private institutions were completed with OUCOM and CWRU only. Hypotheses 16, 17, 18, 22, 23, and 24 were not addressed due to low return rates.

Tests of Hypotheses

Knowledge and Perceived Self-Efficacy of Medical Students

*Age differences.* Hypothesis #1 looked at the differences between younger and older medical students’ perceived knowledge about the health risks and resources for management of alcohol use and alcoholism among pregnant women. Past studies have shown this knowledge may be influenced by the time period of date students attended medical school. For example, a study conducted by Diekman et al. (2000), revealed respondents who graduated from medical school prior to 1990 were more likely to report inadequate training in medical school with regard to maternal prenatal alcohol use and a need for additional training in alcohol assessment and counseling when compared to their counterparts who graduated after 1989.

Similarly, based on physician reports, Duszynski et al. (1995) found that those who graduated prior to 1959 received fewer hours of substance abuse education in medical school (3 hours) and in residency (0.34 hours) than those who graduated between 1980 and 1988, 14.34 and 20.31 respectively. The number of hours recommended in 1959 was 24.16 in medical school and 25.02 in residency as compared to 31.36 for medical school and 33.73 for residency between 1980 and 1988. Despite the increase in the number of hours physicians are receiving in medical school and residency Duszynski
et al. did not think physicians were being adequately trained in substance abuse education in medical school or in residency. By contrast, data from this study suggest that there was no difference between older and younger medical students in perceived knowledge of health risks related to consuming alcohol while pregnant, screening tools used to assess alcohol use and alcoholism, self-help materials and group support for alcohol use and alcoholism, and treatment programs for alcohol use and alcoholism among pregnant women. Although mean scores were higher for younger medical students, no significant differences were found between older and younger medical students.

Hypothesis #2 dealt with the differences between younger and older medical students’ perceived self-efficacy to screen for alcohol use and alcoholism among pregnant women. For example, in a study of 604 obstetricians and gynecologists, Diekman et al. (2000) found that respondents who graduated from medical school before 1990 were significantly less likely to use an alcohol screening instrument compared to their counterparts who graduated after 1989. In addition, a study conducted by Gopalan et al. (1992) evaluated sophomores and seniors at Johns Hopkins University School of Medicine between 1987 and 1990 on their level of confidence in taking a history of alcohol or other drug use. Their results, similar to Diekman et al. (2000), found older medical students (seniors) were more confident at all levels than younger medical students (sophomores) in taking histories of alcohol abuse. In contrast, data from this study suggest that there was no difference in older medical students and younger medical students’ level of perceived self-efficacy to screen for alcohol use and alcoholism among pregnant women using the T-ACE, CAGE, TWEAK, AUDIT, and MAST.
Hypothesis #3 examined the differences between younger and older medical students’ perceived self-efficacy to counsel about the health risks and resources for management of alcohol use and alcoholism among pregnant women. Previous research has addressed this question. In a study conducted by Diekman et al. (2000), respondents who graduated medical school prior to 1973 were less likely to advise abstinence or reduction in the amount of alcohol used during pregnancy with women who reported moderate drinking compared to respondents who graduated more recently. In contrast, the current data suggest that there was no difference in older medical students and younger medical students’ level of perceived self-efficacy to counsel about health risks, screening tools, self-help/group support, and treatment programs with regard to alcohol use among pregnant women. This result may be confounded by the fact that although there was a range of ages, all respondents were third year medical students.

Sex differences. Hypothesis #4 looked at the differences between male and female medical students’ perceived knowledge about the health risks and resources for management of alcohol use and alcoholism among pregnant women. In the previously mentioned study by Diekman et al. (2000), few results were significant when comparing males and females. Male respondents were less likely to indicate that having referral sources for their patients would improve their alcohol use assessment and management practices” compared to their female counterparts (p. 759). Similarly, data from the current study suggest that there was no difference between male and female medical students in perceived knowledge of health risks related to consuming alcohol while pregnant, screening tools used to assess alcohol use and alcoholism, self-help materials
and group support for alcohol use and alcoholism, and treatment programs for alcohol use and alcoholism among pregnant women. This may be due to the fact that they have received the same education over the course of their schooling.

Hypothesis #5 examined the differences between male and female medical students’ perceived self-efficacy to screen for alcohol use and alcoholism among pregnant women. In the context of this particular finding, little previous research has been conducted to compare male and female medical students’ perceived self-efficacy to screen for alcohol use among pregnant women. The only study assessing for gender variation found no statistically significant results between males and females after adjusting for age (Diekman et al., 2000). The current study also suggests that there was no difference in male and female medical students’ level of perceived self-efficacy to screen for alcohol use among pregnant women using the T-ACE, CAGE, TWEAK, AUDIT, and MAST. Once again, this finding may be the result of the same education received during their schooling.

Hypothesis #6 looked at the differences between male and female medical students’ perceived self-efficacy to counsel about the health risks and resources for management of alcohol use and alcoholism among pregnant women. Although Diekman et al. (2000) found few statistically significant results related to gender, female respondents were more likely than their male counterparts to advise abstinence when a patient reported moderate alcohol use. The data from the current study suggest that there was no difference in male and female medical students’ level of perceived self-efficacy to counsel about the health risks related to consuming alcohol while pregnant, and alcohol
screening tools, self-help materials and group support, and treatment programs among pregnant women.

**Racial Differences**

Hypotheses #7, 8, and 9 looked at the differences between White medical students and medical students of color perceived knowledge and perceived self-efficacy to counsel about the health risks and resources for management of alcohol use and alcoholism among pregnant women and the perceived self-efficacy to screen for alcohol use and alcoholism among pregnant women. In the context of these particular findings, little previous research has been conducted around race and perceived knowledge and perceived self-efficacy to counsel about the health risks and resources for management of alcohol use and alcoholism among pregnant women and the perceived self-efficacy to screen for alcohol use and alcoholism among pregnant women. In the current study the data suggest that there was no difference between White medical students and medical students of color in perceived knowledge about health risks related to consuming alcohol while pregnant, screening tools used to assess alcohol use and alcoholism, self-help materials and group support for alcohol use and alcoholism, and treatment programs for alcohol use and alcoholism among pregnant women.

**Type of institution.** Hypothesis #10 dealt with the differences between medical students in a private university and medical students in public universities perceived knowledge about the health risks and resources for management of alcohol use and alcoholism among pregnant women. Few previous studies have been conducted that compare medical students from different types of institutions and their perceived
knowledge of the health risks and resources for management of alcohol use and alcoholism among pregnant women. Data from the current study suggests that there was a difference between medical students in a private university and medical students in a public university in perceived knowledge of health risks related to consuming alcohol while pregnant, screening tools used to assess alcohol use and alcoholism, self-help materials and group support for alcohol use and alcoholism, and treatment programs for alcohol use and alcoholism among pregnant women.

OUCOM medical students self-reported that they were more knowledgeable than CWRU medical students with regard to the health risks related to consuming alcohol while pregnant, self-help materials and group support and treatment programs. CWRU medical students self-reported that they were more knowledgeable about the screening tools for alcohol use and alcoholism than OUCOM medical students.

Hypothesis #11 examined the differences between medical students in a private university and medical students in public universities perceived self-efficacy to screen for alcohol use and alcoholism among pregnant women. Few previous studies have been conducted comparing type of institution and students’ perceived self-efficacy to screen for alcohol use among pregnant women. Current data from this study suggest that there was no difference between medical students at a private university and medical students at a public university in their perceived self-efficacy to screen for alcohol use among pregnant women using the T-ACE, CAGE, TWEAK, AUDIT, and MAST.

Hypothesis #12 looked at the differences between medical students in a private university and medical students in public universities perceived self-efficacy to counsel
about the health risks and resources for management of alcohol use and alcoholism among pregnant women. There is a dearth of previous research on medical students’ perceived self-efficacy to screen for alcohol use among pregnant women and the type of institution they attend. The data from this study suggest that there was no difference between medical students at a private university and medical students at a public university in their perceived self-efficacy to counsel about the health risks related to consuming alcohol while pregnant, alcohol screening tools, self-help materials and group support, and treatment programs among pregnant women.

**Medical Specialty Interests**

Hypothesis #13 dealt with the differences between medical specialty interests and perceived knowledge about the health risks and resources for management of alcohol use and alcoholism among pregnant women. According to Friedmann et al. (2000), family medicine physicians receive an estimated 25 hours of substance abuse training during medical school, internal medicine physicians receive 20 hours, obstetricians/gynecologists receive 10 hours, and psychiatrists receive the most hours with 40. In the Diekman et al. (2000) study, 27% of the Obstetric/Gynecology respondents reported their medical training regarding alcohol use and pregnancy was inadequate, 35% reported it was adequate, 28% reported it was good, and only 10% reported their training was outstanding.

Based on a study conducted by Mengel, Searight, and Cook (2006), the majority (92.3%) of family physicians surveyed knew that prenatal alcohol exposure was a risk factor for irreversible CNS damage. Diekman et al. (2000) also found that 50% of
Obstetricians/Gynecologists surveyed reported advising and educating all patients about the consequences of drinking during pregnancy. Thirty-six percent advised only current drinkers or suspected drinkers and 13% advised only those with a risk factor of heavy alcohol use. Of the ob/gyns in Diekman et al.’s study, 85% always discussed adverse effects of alcohol use during pregnancy with women who reported moderate alcohol use (3 – 13 drinks per week). In the same study 65% of the respondents saw a need for additional training to enhance ascertainment skills.

In contrast, data from this study suggest that there was no difference between specialty interest and level of perceived knowledge in the health risks related to consuming alcohol while pregnant, alcohol screening tools, self-help materials and group support, and treatment programs among pregnant women.

Hypothesis #14 examined the differences between medical specialty interests‘ and perceived self-efficacy to screen for alcohol use and alcoholism among pregnant women. In a study to understand the current practices being used by health care providers to screen for prenatal alcohol use, Gustafson et al. (2001) mailed 664 prenatal health care providers The Prenatal Alcohol Screening Survey (PASS). Of the 664 mailed surveys, 232 were completed and returned. Results of this study revealed 54% of the health care provider respondents always asked pregnant women about their use, 68% asked about alcohol use in general, and 36% asked about specific types of alcohol. Fifty-three percent of the respondents reported that they never asked about use again if the patient initially reported no use and 48% would ask about use at every visit if the women reported use or were suspected of using. Although 80% of the respondents reported using a prenatal
assessment form that asks about alcohol use, only 6% used an alcohol screening tool, such as the CAGE.

Similarly, a 1995 study conducted by Wenrich et al. found only 17% of the physicians studied asked all four CAGE questions. In addition, Herbert and Bass (1997) found similar results when they surveyed 31 family physicians and 860 patients in Canada. Only 23% of the physicians in their study used the CAGE questions.

In studies conducted by Hennepin County Community Health Department (2001) and Diekman et al. (2000) only half of physicians surveyed counseled or screened all women of childbearing age for alcohol use. Maheux et al. (1999) surveyed 963 Canadian Obstetricians/Gynecologists and General Practitioners to evaluate the proportion of physicians who assessed lifestyle health risks during general medical examinations. Their results indicated that the majority of General Practitioners routinely assessed adult patients for alcohol use (67.2%), but only 28.6% of Obstetricians/Gynecologists reported routinely assessing adult patients for alcohol use. Friedmann et al. (2000) surveyed 853 physicians, and reported that 88% of the respondents ―usually” or “always” asked new patients about their alcohol use. Unfortunately, fewer than half of the physicians assessed maximum consumption and only 13% usually or always used a formal screening tool.

In a study conducted by Diekman et al. (2000), only 23% of the Obstetricians/Gynecologists surveyed reported using a screening tool, thus indicating the need to provide physicians with effective screening tools for evaluating alcohol use during pregnancy. In another study, Duszynski et al. (1995) asked 793 physicians to rate their confidence in screening, counseling, and referring patients for both alcohol and drug use.
Based on their findings, most physicians neither agreed nor disagreed with the statement: “I know how to screen effectively for alcohol use and I know how to refer effectively for alcohol use.” According to Morse et al. (1997) effective screening tools should be able to be administered in 5 – 10 minutes, used routinely with every patient, adapted to fit physician‘s style, administered multiple times, and offered a chance to provide information about substance use during pregnancy. In contrast, data from the current study suggests that regardless of specialty interest, there was no statistically significant difference between medical students‘ level of perceived self-efficacy to screen for alcohol use among pregnant women using the T-ACE, CAGE, TWEAK, AUDIT, and MAST.

Hypothesis #15 looked at the differences between specialty interests‘ and perceived self-efficacy to counsel about the health risks and resources for management of alcohol use and alcoholism among pregnant women. Data from the current study suggest that regardless of specialty interests, there was no difference between specialty interests and level of perceived self-efficacy to counsel about the health risks related to consuming alcohol while pregnant, alcohol screening tools, self-help materials and support group, and treatment programs among pregnant women.

In contrast to the current study, Friedmann et al. (2000) found that among family and internal medicine physicians and those practicing obstetrics/gynecology, the majority reported they neither agreed nor disagreed that they were very confident with their ability to take an alcohol history. Psychiatrists were more likely to agree that they were very confident in their ability to take an alcohol history. Similarly, Maheux et al. (1999)
surveyed 963 Canadian Obstetricians/Gynecologists and General Practitioners to evaluate the proportion of physicians who assessed lifestyle health risks during general medical examinations. Their results indicated that General Practitioners routinely assessed the majority of adult patients for alcohol use (67.2%) and Obstetricians/Gynecologists reported routinely assessing some of their adult patients for alcohol use (28.6%).

*Learning experiences.* Hypothesis #25 dealt with the differences between learning experiences and perceived knowledge about the health risk and resources for management of alcohol use and alcoholism among pregnant women. In the present study, 17.7% of respondents reported being somewhat knowledgeable, 54.4% reported being knowledgeable, and 27.8% reported being extremely knowledgeable about the health risks associated with alcohol use during pregnancy. Thirty-three percent of respondents reported being somewhat knowledgeable, 51.9% reported being knowledgeable, and 15.2% reported being extremely knowledgeable about the screening tools for alcohol use. Fifteen percent of respondents reported being not knowledgeable at all, 53.2% reported being somewhat knowledgeable, 26.6% reported being knowledgeable, and 5.1% reported being extremely knowledgeable about the self-help materials and group support for alcoholism. Eighteen percent reported being not knowledgeable at all, 48.1% reported being somewhat knowledgeable, 30.4% reported being knowledgeable, and 3.8% reported being extremely knowledgeable about the treatment programs for alcoholism. As such, data from this study suggest that there was a difference between learning experiences (independent study, factual and explicit information from classroom instruction, observing physician role models, practicing counseling and screening with
patients, receiving feedback on performance) and perceived knowledge about health risks and resources for management of alcohol and alcoholism among pregnant women. Independent study was the only variable that accounted for a statistically significant amount of variability in perceived knowledge.

Hypothesis #26 looked at the differences between learning experiences and perceived self-efficacy to screen for alcohol use and alcoholism among pregnant women. In the present study, 41.8% of respondents reported being not confident at all, 24.1% reported being somewhat confident, 26.6% reported being confident, and 5.1% reported being extremely confident in screening for alcohol use using the T-ACE. One percent of respondents reported being not confident at all, 7.6% reported being somewhat confident, 40.5% reported being confident, and 49.4% reported being extremely confident in screening for alcohol use using the CAGE. Fifty-two percent of respondents reported being not confident at all, 27.8% reported being somewhat confident, 12.7% reported being confident, and 3.8% reported being extremely confident in screening for alcohol use using the TWEAK. Seventy-two percent of respondents reported being not confident at all, 13.9% reported being somewhat confident, 7.6% reported being confident, and 3.8% reported being extremely confident in screening for alcohol use using the AUDIT. Seventy percent of respondents reported being not confident at all, 15.2% reported being somewhat confident, 7.6% reported being confident, and 3.8% reported being extremely confident in screening for alcohol use using the MAST. As such, data from this study suggest that there was a difference between learning experiences and perceived self-efficacy to screen for alcohol use among pregnant women using the T-ACE, CAGE,
TWEAK, AUDIT, and MAST. Receiving feedback on performance after practice using alcohol screening tools or doing alcohol screenings with patients was the only variable that accounted for a statistically significant amount of variability in perceived screening self-efficacy.

Hypothesis #27 examined the differences between learning experiences and perceived self-efficacy to counsel about the health risks and resources for management of alcohol use and alcoholism among pregnant women. In the present study, 3.8% of respondents reported being not confident at all, 32.9% reported being somewhat confident, 44.3% reported being confident, and 19% reported being extremely confident in their ability to counsel about the health risks associated with alcohol use during pregnancy. Six percent of respondents reported being not confident at all, 46.8% reported being somewhat confident, 40.5% reported being confident, and 6.3% reported being extremely confident in their ability to counsel about the screening tools for alcohol use. Nineteen percent of respondents reported being not confident at all, 48.1% reported being somewhat confident, 26.6% reported being confident, and 6.3% reported being extremely confident in their ability to counsel about the self-help materials and group support for alcoholism. Twenty-five percent reported being not knowledgeable at all, 43% reported being somewhat knowledgeable, 25.3% reported being knowledgeable, and 6.3% reported being extremely confident in their ability to counsel about the treatment programs for alcoholism. Thus, the data in this study suggest that there was a difference between learning experiences and perceived self-efficacy to counsel about health risks and resources for management of alcohol and alcoholism among pregnant women.
According to the findings, observing physician role models implementing alcohol counseling strategies with patients was the only variable that accounted for a statistically significant amount of variability in perceived counseling self-efficacy.

Due to insufficient response rates from NEOUCOM, meaningful analyses for hypotheses 16-24 could not be conducted.

Limitations

This study relied on self-report data and was subject to certain limitations such as honesty of participants’ responses to the questionnaire. In addition, the small size of the sample limits generalizability to the sample only, and not to third year medical students at the institutions involved in the study or to medical students in the United States. Participation in this study was voluntary. Volunteers may give different responses than those who are not likely to volunteer.

Recommendations for Future Research

Based on the findings of this study, a number of recommendations are offered for future research about medical students’ perceived knowledge, perceived self-efficacy to counsel about health risks and resources for management of alcohol and alcoholism, and perceived self-efficacy to screen for alcohol use using the T-ACE, CAGE, TWEAK, AUDIT, and the MAST. Recommendations include the following:

- Conduct future studies using methodology other than electronic mail surveys. Response rates using this method were very low. Administering surveys to intact groups of medical students in their junior year classes at a variety of institutions may be a more effective method for increasing response rates.
• Conduct additional studies to ascertain differences between male and female medical students’ perceived knowledge and perceived self-efficacy to counsel about health risks and resources for management of alcohol and alcoholism and perceived self-efficacy to screen for alcohol use among pregnant women.

• Conduct additional research to examine differences in race and ethnicity of medical students and their perceived knowledge and self-efficacy to counsel about health risks and resources for management of alcohol and alcoholism and perceived self-efficacy to screen for alcohol use among pregnant women.

• Conduct additional research to examine the effect of the type of medical institution (public or private) and perceived knowledge and self-efficacy of medical students to counsel about health risks and resources for management of alcohol and alcoholism and perceived self-efficacy to screen for alcohol use among pregnant women.

• Conduct additional research to examine the inconsistency between the current study and previous studies regarding medical student specialty interests and perceived knowledge and self-efficacy to counsel about health risks and resources for management of alcohol and alcoholism and perceived self-efficacy to screen for alcohol use among pregnant women.

• Conduct additional research to determine the relationship between learning experiences of medical students and perceived knowledge and self-efficacy to counsel about health risks and resources for management of alcohol and alcoholism and perceived self-efficacy to screen for alcohol use among pregnant women.
alcoholism and perceived self-efficacy to screen for alcohol use among pregnant women.

- Replicate the study with other health professionals (e.g., nurses, physician assistants, midwives) with modifications as needed to measure their perceived knowledge and self-efficacy to counsel about health risks and resources for management of alcohol and alcoholism and perceived self-efficacy to screen for alcohol use among pregnant women.
APPENDICES
APPENDIX A

SELF-EFFICACY INVENTORY
Self-Efficacy Inventory

For each item below, indicate how **knowledgeable** you are about:

1: Not knowledgeable at all  
2: Somewhat knowledgeable  
3: Knowledgeable  
4: Extremely knowledgeable

1. The health risks related to consuming alcohol while pregnant (beer, wine, liquor).
2. Screening tools for alcohol use.
3. Self-help materials and group support for alcoholism.
4. Treatment programs for alcoholism.

For each item below, indicate how confident you are in **counseling** pregnant women about alcohol use:

1: Not confident at all  
2: Somewhat confident  
3: Confident  
4: Extremely confident

5. The health risks related to consuming alcohol while pregnant (beer, wine, liquor).
6. Screening tools for alcohol use.
7. Self-help materials and group support for alcoholism
8. Treatment programs for alcoholism.

For each item below, indicate how confident you are in **screening** for alcohol use among pregnant women.
Confidence in screening for alcohol use using the

9. T-ACE (Tolerance, Annoyed, Cut down, Eye opener) 1 2 3 4

10. CAGE (Cut down, Annoyed, Guilty, Eye opener) 1 2 3 4

11. TWEAK (Tolerance, Worry, Eye opener, Awakened, K/Cut down) 1 2 3 4

12. AUDIT (Alcohol Use Disorders Identification Test) 1 2 3 4

13. MAST (Michigan Alcohol Screening Test) 1 2 3 4

For the nine items below indicate the extent to which each type of learning experience contributed to your knowledge, counseling and/or screening skills related to alcohol use among pregnant women.

1: Did not contribute 3: Contributed extensively
2: Contributed slightly 4: Contributed greatly

17. Received factual information about alcohol use during pregnancy through independent study (e.g. reading, informal talks, extracurricular lectures or meetings). 1 2 3 4

18. Received factual information about alcohol use during pregnancy from classroom instruction about the risks of consuming alcohol during pregnancy. 1 2 3 4

19. Received explicit information about alcohol use during pregnancy from classroom instruction about alcohol counseling strategies. 1 2 3 4

17. Observed physician role models implementing alcohol counseling strategies with patients. 1 2 3 4
18. Practiced alcohol counseling strategies skills with patients. 1  2  3  4
19. Received explicit information from classroom instruction about alcohol screening tools. 1  2  3  4
20. Observed physician role models implementing alcohol screening tools with patients. 1  2  3  4
21. Practiced using alcohol screening tools with patients. 1  2  3  4
22. Received feedback on performance after practice using alcohol screening tools or doing alcohol screenings with patients. 1  2  3  4

Demographics

23. Specialty Interests:  _____ Family Medicine
   _____ Internal Medicine
   _____ Obstetrics/Gynecology
   _____ Pediatrics
   _____ Surgery
   _____ Other (please specify:________________________)
   _____ Undecided

24. Age:  _____ Under 26
   _____ 26 – 30
   _____ 31 – 35
   _____ 36+
25. Sex:  
   _____ Male
   _____ Female

26. Ethnicity  
   _____ White
   _____ Black – not Hispanic
   _____ Hispanic or Latino
   _____ Asian or Pacific Islander
   _____ American Indian or Alaskan Native
   _____ Other
APPENDIX B

SURVEY PRENOTICE EMAIL
Dear Class of 2009,

In the next couple days you will receive an email requesting your participation in an Internet questionnaire for a research project being conducted by Katherine Ott Walter, Ph.D. candidate at Kent State University. This study is partial fulfillment for a Ph.D. degree from Kent State University.

IRB approval number: 07E274

I am writing in advance because many people like to know ahead of time that they will be contacted to participate in a study. The study is an important one that will attempt to determine medical students’ self-efficacy to counsel and screen for alcohol use among pregnant women.

Thank you for your time and consideration. It’s only with the help of professionals like you that research can be successful.

Sincerely,

Katherine Ott Walter
Ph.D. candidate, Kent State University
Dear Class of 2009,

My name is Katherine Ott Walter, and I am a Ph.D. candidate at Kent State University majoring in Health Education and Promotion. As a requirement for completion of my degree, I am working on a dissertation entitled “An analysis of medical students’ perceived self-efficacy to counsel and screen for alcohol use among pregnant women.” The study will require input from a group of medical students from three medical schools in the state of Ohio through a web-based survey. I would be very grateful if you would take a few minutes to respond to the web-based questionnaire.

IRB approval number: 07E274

INFORMED CONSENT DOCUMENT

You are being asked to participate in a research study about medical students’ perceived self-efficacy to screen for alcohol use among pregnant women. You were selected as a possible participant because you are enrolled as a third year medical student at Ohio University College of Medicine. Please read this form carefully before agreeing to participate in the study.

Researchers at Ohio University College of Medicine are conducting this study.

**Background Information**
The purpose of this research is to analyze the perceived self-efficacy of medical students enrolled in a 4-year private M.D. program, a 4-year public D.O program and a 6-year B.S./M.D. program to screen for alcohol use among pregnant women. The demographic variables to be analyzed in this study will be type of institution, age of medical student, sex of medical student and area of specialty.

**Procedures**
If you agree to be a participant in this research, we would ask you to do the following things:

a) Read the consent form thoroughly and determine whether or not you would like to participate in the study.

b) If you agree to participate in the study click on the link embedded in the email to be directed to the survey.

c) You may stop at any point during the survey should you not want to continue for any reason.

d) Complete the survey and click on the submit button to forward your results to an Excel spreadsheet.
**Risks and Benefits to Being in the Study**

This research has no known risks associated with participation.

By participating in this study your responses will help influence medical school in the development of their curriculum around alcohol screening for pregnant women. It is expected that participants will gain knowledge of additional screening tools available to them for assessing alcohol use among pregnant women.

**Compensation**

You will receive no compensation for agreeing to participate in this study.

**Confidentiality**

The records of this research will be kept private. In any sort of report we might publish, we will not include any information that will make it possible to identify a participant. Research records will be kept in a locked file, and access will be limited to the researchers, the University review board responsible for protecting human participants, and regulatory agencies.

Please accept my sincere thank you in advance for you cooperation in this study.

Your expediency in returning the web-based questionnaire will be greatly appreciated. If you are interested in receiving a summary of the results of this study, please contact Katherine Ott Walter. The study should be completed by May 2008. By clicking on the link provided below and logging into the secure website, you are agreeing to participate in this research study.

Here is the link to the survey:


Your password is: se200708

If you have any questions about this study, I would be happy to talk with you. My contact information is below.

Thank you again for your time and valuable input.

Katherine Ott Walter
Email: mkott@kent.edu
Phone: 330-388-7869
APPENDIX D

FIRST THANK YOU / REMINDER NOTICE
Dear Class of 2009,

My name is Katherine Ott Walter, and I am a Ph.D. candidate at Kent State University majoring in Health Education and Promotion. As a requirement for completion of my degree, I am working on a dissertation entitled “An analysis of medical students‘ perceived self-efficacy to counsel and screen for alcohol use among pregnant women”. The study will require input from a group of medical students from three medical schools in the state of Ohio through a web-based survey. I would be very grateful if you would take a few minutes to respond to the web-based questionnaire.

IRB approval number: 07E274

Last week a web-based questionnaire seeking your opinions about medical students‘ perceived self-efficacy to counsel and screen for alcohol use among pregnant women was emailed to you. If you have already completed and submitted the questionnaire, please accept my sincere thanks. If not, I encourage you to respond and will be especially grateful for your help. It is only by asking students like you to share their opinions and experiences that we can fully understand and improve educational practices to benefit the future physicians of our society.

I am providing the web-based questionnaire link again in this email with the password for logging in to the questionnaire. If you have already responded, again, thank you for your time. If for any reason you do not want to participate in this study, please let me know by responding to this email.

By clicking on the link provided below and logging into the secure website, you are agreeing to participate in this research study.

Here is the link to the survey:


Your password is: se200708

If you have any questions about this study, I would be happy to talk with you. My contact information is below.

Thank you again for your time and valuable input.

Katherine Ott Walter
Email: mkott@kent.edu
Phone: 330-388-7869
APPENDIX E

SECOND THANK YOU / REMINDER NOTICE
Dear Class of 2009,

My name is Katherine Ott Walter, and I am a Ph.D. candidate at Kent State University majoring in Health Education and Promotion. As a requirement for completion of my degree, I am working on a dissertation entitled “An analysis of medical students’ perceived self-efficacy to counsel and screen for alcohol use among pregnant women.” The study will require input from a group of medical students from three medical schools in the state of Ohio through a web-based survey. I would be very grateful if you would take a few minutes to respond to the web-based questionnaire.

IRB approval number: 07E274

Two weeks ago I sent you a web-based questionnaire asking for your opinions about medical students’ perceived self-efficacy to counsel and screen for alcohol use among pregnant women. If you have already completed and submitted the questionnaire, please accept my sincere thanks.

I am writing again because of the importance that your questionnaire has for helping to get accurate results. It’s only by hearing from everyone involved in the study that we can be sure the results are representative. If you have not completed the questionnaire in encourage you to do so.

The questionnaire will be confidential and your name will not be connected to the results in any way. Protecting confidentiality of research participants is very important to me, as well as to the University.

By clicking on the link provided below and logging into the secure website, you are agreeing to participate in this research study.

Here is the link to the survey:


Your password is: se200708

If you have any questions about this study, I would be happy to talk with you. My contact information is below.

Thank you again for your time and valuable input.

Katherine Ott Walter
Email: mkott@kent.edu
Phone: 330-388-7869
APPENDIX F

FINAL CONTACT / THANK YOU
Dear Class of 2009,

My name is Katherine Ott Walter, and I am a Ph.D. candidate at Kent State University majoring in Health Education and Promotion. As a requirement for completion of my degree, I am working on a dissertation entitled “An analysis of medical students‘ perceived self-efficacy to counsel and screen for alcohol use among pregnant women”. The study will require input from a group of medical students from three medical schools in the state of Ohio through a web-based survey. I would be very grateful if you would take a few minutes to respond to the web-based questionnaire.

IRB approval number: 07E274

Over the past few weeks I have been collecting data on an important research study I am conducting for completion of my dissertation. The purpose of the study is to examine medical students‘ perceived self-efficacy to counsel and screen for alcohol use among pregnant women. The study in drawing to a close, and this is the last contact you will receive. The questionnaire will close February 29, 2008.

I am sending this final contact because of our concern that some medical students who have not responded may have had different experiences than those who have responded to the questionnaire. Keep in mind that your participation is voluntary and if you prefer not to participate that’s okay.

I sincerely appreciate your willingness to consider the request as I conclude this effort to better understand medical students‘ perceived self-efficacy to counsel and screen for alcohol use among pregnant women.

By clicking on the link provided below and logging into the secure website, you are agreeing to participate in this research study.

Here is the link to the survey:


Your password is: se200708

If you have any questions about this study, I would be happy to talk with you. My contact information is below.

Thank you again for your time and valuable input.

Katherine Ott Walter
Email: mkott@kent.edu
Phone: 330-388-7869
APPENDIX G

KENT STATE UNIVERSITY IRB APPROVAL
APPENDIX H

OHIO UNIVERSITY COLLEGE OF MEDICINE IRB APPROVAL
A determination has been made that the following research study is exempt from IRB review because it involves:

Category 2 - research involving the use of educational tests, survey procedures, interview procedures or observation of public behavior

Project Title: An Analysis of Medical Student's Perceived Self-Efficacy to Screen for Alcohol Use among Pregnant Women

Project Director: Grace Brannan Katherine Ott

Department: COM Core Research

Advisor: Robin Stack, C.I.P., Human Subjects Research Coordinator

Office of Research Compliance

The approval remains in effect provided the study is conducted exactly as described in your application for review. Any additions or modifications to the project must be approved by the IRB (as an amendment) prior to implementation.
APPENDIX I

NORTHEASTERN OHIO UNIVERSITIES COLLEGE OF MEDICINE

IRB APPROVAL
Northeastern Ohio Universities College of Medicine  
NEOUCOM  
Institutional Review Board

DATE: September 4, 2007

TO: Paul Hartung, Ph.D.  
Principal Investigator  
c/o Katherine Ott Walter, MS, CHES  
KSU Ph.D. Candidate

FROM: Jon Walro, Ph.D.  
NEOUCOM/COP Chair, IRB

SUBJECT: “An Analysis of Medical Students’ Perceived Self-Efficacy to Screen for Alcohol Use Among Pregnant Women”

PROTOCOL #: 07-017

The NEOUCOM Institutional Review Board approved the above-mentioned protocol on September 4, 2007 by the expedited review process. This approval is current from 09/04/07 until 09/03/08. Your annual progress report will be due on 08/21/08.

Attached please find the approved information sheet for this study, stamped in red. Please distribute this document as it appears in the attachment.

Please remember it is your responsibility as the Principal Investigator of this project to inform the IRB of any of the following occurrences or changes:

1. Any addition or removal of investigators (additions requires Human Subject Safety training).
2. Any engagement in scientific misconduct by personnel conducting this study must be reported to the IRB Chair immediately.
3. Change of procedures.
4. Any addition or removal of collaborating institutions.
5. Any development regarding a conflict of interest issues.
6. Any addition or removal of funding sources or awards.
7. Any amendments and/or addendums.
8. Any change in the number of visits or the length required to complete the study.
9. Any addition or removal of patients.
10. Any change in the classification of subjects enrolled for the study.
11. Any change in the inclusion/exclusion factors of the study.
12. Any changes or additions to the recruitment materials.
13. Any changes in the sources of subjects.
14. Any change in the risk to the subjects.
15. Any change in the benefit related to the subjects.
16. Any change in the objectives of the approved study.
17. Any change in the methods of the study.
18. Any change in the research plan of the study.
19. Any Adverse Events (AE) that occur with local subjects.
20. Any Serious Adverse Events (SAE) that occur with any subject in the study.

If you have any questions or concerns please contact Denese Shipp, Human Protections Administrator, at 325-6499 or e-mail dshipp@neoecom.edu.
Information Sheet

An analysis of medical students' perceived self-efficacy to screen for alcohol use among pregnant women

You are being asked to participate in a research study about medical students' perceived ability to screen for alcohol use among pregnant women. You were selected as a possible participant because you are enrolled as a third year medical student at Northeastern Ohio Universities College of Medicine (NEOUCOM). Please read this form carefully before agreeing to participate in the study.

Researchers at NEOUCOM are conducting this study.

Background Information
The purpose of this research is to analyze the perceived self-efficacy of medical students enrolled in a four year private M.D. program, a four year public D.O program and a six year B.S./M.D. program to screen for alcohol use among pregnant women. The demographic variables to be analyzed in this study will be type of institution, age of medical student, ethnicity of medical student, sex of medical student and area of specialty (Ob/Gyn, Pediatrics, Surgery, etc).

Procedures
If you agree to be a participant in this research, we would ask you to do the following things:
   a) Read the consent form thoroughly and determine whether or not you would like to participate in the study.
   b) If you agree to participate in the study click on the link embedded in the email to be directed to the survey.
   c) You may stop at any point during the survey should you not want to continue for any reason.
   d) Complete the survey and click on the submit button to forward your results to an Excel spreadsheet.

Risks and Benefits to Being in the Study
This research has no known risks associated with participation.

By participating in this study your responses may help medical schools improve their curriculum for alcohol screening among pregnant women. It is expected that you will gain knowledge of additional screening tools available for assessing alcohol use among pregnant women.

Compensation
You will receive no compensation for agreeing to participate in this study.

Confidentiality
The records of this research will be kept private. In any sort of report we might publish, we will not include any information that will make it possible to identify a participant.

NEOUCOM IRB APPROVAL
From 07/04/07 to 09/03/08
IRB Chair. J. M. Wilber Date 09/04/07
Research records will be kept in a locked file, and access will be limited to the researchers, the University Review Board responsible for protecting human participants, and regulatory agencies.

**Voluntary Nature of the Study**
Your participation is voluntary. Participating or declining in this study will in no way affect your academic standing. If you choose not to participate, it will not affect your current or future relations with the University or other cooperating institutions (Case Western University School of Medicine and Ohio University College of Medicine). There is no penalty or loss of benefits for not participating or for discontinuing your participation.

You will be provided with any significant new findings that develop via an email from Paul Hartung, Ph.D.

**Contacts and Questions**
The researchers conducting this study are Dr. Paul Hartung and Katherine Ott. If you have any questions, concerns or complaints about the study, you may contact Katherine Ott at (330) 388-7869 or write: Katherine Ott; 333 N. Portage Path #29, Akron, OH 44303.

If the researchers cannot be reached, or if you would like to talk to someone other than the researcher(s) about: (1) questions, concerns or complaints regarding this study, (2) research participant rights, (3) research-related injuries, or (4) other human subjects issues, please contact the NEOUCOM Institutional Review Board write Denise Shipp, M.S., Human Protections Administrator, (330) 325-6498, IRB Office, NEOUCOM Rootstown Campus, Rootstown, OH 44272

Please print a copy of this form for your records.

**Statement of Consent**
I have read the above information. I consent to participate in this research. I am at least 18 years of age.

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**NEOUCOM IRB APPROVAL**
From 09/04/07 to 09/03/08
IRB Chair: [Signature] Date: 09/03/07
Case Western Reserve University
Institutional Review Board

NOTICE OF EXEMPTION

Responsible Investigator: Cynthia Bearer
Department: Dental Orthodontics
IRB Protocol Number: 20070625
Title: The Analysis of Perceived Self-Efficacy of Medical Students to Screen for Alcohol use among Pregnant Women
Co-Investigator: Katherine Ott

Exemption Date: July 2, 2007

The Institutional Review Board (IRB) has deemed the above protocol EXEMPT under 45 Code of Federal Regulations (CFR) part 46.101b. The IRB will not conduct subsequent reviews of this protocol.

Any changes to the protocol that put it under the purview of the IRB would require a formal application to, and approval of, the IRB prior to implementation of the change.

IRB applications are available at the CWRU IRB Pages, or from the Office of Research Compliance (ORC) at Adelbert Hall, room 4.

Questions? Please visit our website: http://ora.ra.cwru.edu/orc_humansubjects_CWRU_IRB.asp
OR
contact our administrative office
Isabel Sanchez, IRB Director
216.368.6993
Maureen Dore-Arshenovitz, IRB Assistant
216.368.6925
Fax: 216.368.3737
CASE Institutional Review Board
Office of Research Compliance
Sears Building 657
Cleveland, OH 44106-7230
APPENDIX K

CASE WESTERN UNIVERSITY SCHOOL OF MEDICINE

EMAIL PERMISSION FROM COMMITTEE TO CONDUCT STUDY
Hi Katherine,
Attached are the Class of 2009 e-mail addresses. Each one is ___@case.edu.
Please let me know if you need something more and let me know how it goes.

Best,
Klara
REFERENCES
REFERENCES


age: the necessity of a preconceptional approach. *Journal of Women’s Health & Gender-Based Medicine*, 8(6), 733-736.


