Measuring First and Fourth year Medical Student Attitudes toward Patients with Alcohol and other Drug Use Disorders

By

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CERTIFICATE OF APPROVAL

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I. Acknowledgements

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II. Abstract

Background Screening and brief intervention (SBI) are well established in the medical literature as effective strategies to detect and intervene with patients who present with alcohol and other drug use (AOD) disorders. However, research on implementation of SBI has revealed that physicians are reluctant to employ this tool, citing several barriers. Among these barriers are negative attitudes toward patients with AOD disorders. These negative attitudes have also been found in medical students. The aim of this study was to assess the association between medical students' year in medical training, expected specialty and personal experience with substance use and attitudes towards patients with AOD disorders. **Methods** A composite questionnaire was created by combining the *Short Understanding of Substance Abuse Scale* and a modified version of the *Alcohol and Alcohol Problems Perception Questionnaire* to measure medical students' attitudes and their perception of role legitimacy, perception of addiction etiology, and personal motivation to work with substance abusing patients. The questionnaire was administered to first and fourth year medical students (MS1 and MS4) in the 2009/2010 academic year. Multiple linear regression models were used to investigate the association between medical students' year in medical training, expected medical practice and personal experience with substance use and their attitudes toward patients with AOD disorders. **Results** A total of 197 students participated in the survey. Medical students were found to have similar prevalence of alcohol and drug use behaviors as were reported in prior studies conducted with this population. Significant relationships were not found between student drug use behaviors, medical practice choice and attitudes. However, older students had significantly more positive attitudes toward patients with AOD disorders

than younger students. Further, binge drinkers had significantly more positive attitudes toward patients with AOD disorders than non-binge drinkers. Finally, female MS4s had significantly more negative attitudes toward patients with AOD disorders than their female MS1 counterparts. **Conclusions** The findings of this study suggest that medical students' own experience with alcohol use may affect their attitudes about patients with alcohol and other drug use disorders. Furthermore, the results indicate that attitudes toward patients with AOD disorders differ between MS1s and MS4s and that further research is needed to investigate the potential reasons for this relationship.

III. Introduction

A. Substance Abuse and Dependence: The Burden to Health and Economy

The leading cause of preventable death in the U.S. is tobacco use followed closely by alcohol and illicit drugs use (Mokdad, A. H., Marks, J. S., Stroup, D. F. et. al, 2004). The burden of substance abuse on the health of the U.S. population is evident not only by mortality, but also by morbidity. In 2005 it was estimated that 3.7% of all emergency department (ED) visits were due to drug-related events and 28.1% of injuries seen in the ED were directly caused by alcohol use (Cherpitel, C. J. & Ye, Y., 2008). The decline in health status caused by substance abuse also leads to increased healthcare costs. Individuals with a substance abuse disorder spend on average $1,244 more in health care costs, specifically in inpatient care, than people without this condition (Druss, B. G. & Rosenheck, R. A., 1999). The cost of substance abuse is not only present in healthcare, but overall it is estimated that nationally, substance abuse costs the United States $428.1 billion each year (Rice, D. P., 2003). The overall cost can be broken down into three abuse categories where alcohol abuse accounts for $175.9 billion, drug abuse accounts for $114.2 billion, and smoking accounts for $138 billion (Rice, D. P., 2003). Heroin use alone costs the United States $5.2 billion in criminal activities, $5.0 billion in medical care, and $0.1 billion in social welfare services (Mark, T. L., Woody, G. E., Juday, T. et al., 2001).

B. Social Stigma and Attitudes toward Substance Abuse

Stigma towards individuals with AOD disorders is widespread in American society. Research has suggested that the process by which stigma is generated may follow certain stages of development as described by Link & Phelan (2006). Four of these stages

are directly relevant to substance abuse. In the first stage of stigmatizing a group or individual, an influential subgroup of society identifies and labels a subjectively relevant difference between the socially accepted group and the disparate individual or population (Link, B. & Phelan, J., 2006). For substance abuse, this difference can be attributed to the action of abusing a substance which through many processes has become an undesirable behavior in American society.

Stereotyping the group or individual who is different represents the second developmental stage of stigma (Link, B. & Phelan, J., 2006). In this stage the group or individual stereotyped is identified by undesirable characteristics such as “impulsive,” “ignorant,” and “non-compliant”. These are common character labels used to describe drug abusers. In the third stage, the group who assigns the stereotype then separates themselves from the stigmatized group and uses labels such as “them” and “us” which leads to social discrimination, the fourth developmental stage of stigma (Link, B. & Phelan, J., 2006). Discrimination, most notably structural discrimination against individuals with AOD disorders is apparent, the locations of many substance abuse treatment facilities are in poor, isolated neighborhoods.

Social stigma may play a significant and important role in how individuals develop attitudes toward certain undesirable behaviors. Clinicians in the medical field in particular, have demonstrated negative attitudes towards patients with AOD disorders. Common stereotypes held by medical personnel include beliefs that addicts are untruthful about their condition, manipulative, and non-compliant, which make them difficult to care for (Johnson, T., Booth, A. & Johnson, P., 2005, O’Rourke, M., Richardson, L., Wilets, I et al., 2006). Some research has also suggested that physicians describe patients

with AOD disorders as uneducated, poor and not intelligent (Ballon, B. & Skinner, W., 2008). Harboring these stereotypes can lead to negative attitudes when treating AOD patients.

Attitudes toward patients who have AOD disorders are generally measured or inferred using several indicators including: 1) general attitude measures (Silins, E., Conigrave, K., Rakvin, C. et al., 2007, Anderson, P., Kaner, E., Wutzke, S. et al., 2004, Lindberg, M., Vergara, C., Wild-Wesley, R. et al., 2006, Landy, J., Hynes, J., Checinski, K. et al., 2005); 2) discomfort in working with this population (Silins, E., Conigrave, K., Rakvin, C. et al., 2007, Anderson, P., Kaner, E., Wutzke, S. et al., 2004); 3) belief in the effectiveness of interventions (O'Rourke, M., Richardson, L. D., Wilets, I et al., 2006, Landy, J., Hynes, J., Checinski, K. et al., 2005, Cape, G., Hannah, A. & Sellman, D., 2006); 4) perception of physician role legitimacy in treatment for AOD disorders (Silins, E., Conigrave, K., Rakvin, C. et al., 2007, Anderson, P., Kaner, E., Wutzke, S. et al., 2004, Lee, C. S., Abrantes, A. M., Colby, S. M. et al., 2008, O'Rourke, M., Richardson, L. D., Wilets, I et al., 2006); 5) belief in the etiology of addiction (Rosta, J., 2004); and, 6) physician/student perception of difficulty in working with patients presenting with an addiction (Lindberg, M., Vergara, C., Wild-Wesley, R. et al., 2006). All of these indicators act as surrogate measures of stigmatizing attitudes toward the drug abusing population. For example, discomfort in working with patients who have an AOD disorder can reflect an individual's belief that these patients are inherently difficult to work with because they are non-compliant with treatment recommendations. Furthermore, physician perception of addiction etiology (self-induced condition or a medical disease) may reflect

health care professionals' attitudes regarding a patient's impulsive tendencies and lack of self-control.

Unsurprisingly, negative physician attitudes toward patients with AOD disorders are common. O'Rourke and colleagues surveyed over 800 attending physicians and residents working in emergency departments throughout the United States on their beliefs and attitudes toward patients with AOD disorders. O'Rourke found that 42% of physician respondents indicated that patients with alcohol problems were difficult to work with and 70% responded "yes" to the question "I feel angry when dealing with patients with alcohol problems" (O'Rourke, M., Richardson, L. D., Wilets, I. et al., 2006). Furthermore, a significant proportion of the physicians and residents surveyed (80%) indicated that they believed existing treatments for alcohol abuse disorders were not effective (O'Rourke, M., Richardson, L. D., Wilets, I. et al., 2006). In another study of general practitioners in Germany and Denmark it was found that almost half of the total sample of physicians surveyed believed that alcoholism was a self-induced disease (Rosta, J., 2004).

Of particular concern is the presence of negative attitudes toward patients with AOD disorders among medical students. This indicates that apprehension to working with this patient population may be present during medical school. In a study done by Silins and colleagues (2007), general attitude, role legitimacy, motivation, and confidence were all measured in first- and fourth-year medical students regarding working with patients with AOD disorders. In Silins' work it was found that significant negative attitudes among students were present and increased with each year in medical training (Silins, E., Conigrave, K., Rakvin, C. et al., 2007). Dislike for specific groups of

substance abusers was also observed, with 32% of the first-year students reporting dislike for alcohol abusers, 29% indicating dislike for heroin users and 22% disliking smokers (Silins, E., Conigrave, K., Rakvin, C. et al., 2007). However, Landy et al. (2005) found that negative attitudes towards patients with AOD disorders among medical students improved as students progressed through their graduate medical education (Landy, J., Hynes, J., Checinski, K. et al., 2005). So while some studies suggest that medical students' attitudes toward patients with AOD disorders become more negative as the students move through medical school, at least one study has found that attitudes actually improve.

In another investigation of medical student attitudes, over-utilization of healthcare resources by patients with AOD disorders was perceived to be a significant problem (Lindberg, M., Vergara, C., Wild-Wesley, R. et al., 2006). In addition, medical students who participated in the Lindberg study also believed that caring for patients with alcohol and drug use disorders detracted from the care of non-abusing patients because they felt these patients were more demanding regarding the intensity of care they required (Lindberg, M., Vergara, C., Wild-Wesley, R. et al., 2006).

C. Why are Attitudes Important?

Despite the significant number of people with AOD disorders only a fraction receive treatment. It was estimated that of the 23.1 million people 12 years and older needing treatment in 2008 only 9.9% received substance abuse treatment (SAMHSA, 2009). This treatment gap in substance abuse services may be related to inadequate screening efforts by health care professionals and reflect biases and negative attitudes toward patients with AOD disorders.

One area of clinical care for patients with AOD disorders that may be affected by negative physician attitudes is the use of screening and brief intervention (SBI). Screening for substance abuse is the first step in intervening with the disease process. However, research shows that physicians have not fully adopted AOD screening into their practices. SBI has been found to be effective for intervening with problem drinkers and smokers (Roche, A. M. & Freeman, T., 2003, Lock, C. A., 2004). Furthermore, SBI is a cost-effective practice, especially in primary care settings (Kraemer, K. L., 2007, Mundt, M. P., 2006). A survey completed by family physicians and internists revealed that only 70% were screening most (80%) of their new patients for drug and alcohol abuse (Spandorfer, J. M., Israel, Y. & Turner, B. J., 1999). In addition, one-third of these respondents were screening less than half of their patients at annual visits (Spandorfer, J. M., Israel, Y. & Turner, B. J., 1999). In a similar study done by Friedmann and colleagues (2000), 88% of primary care physicians and psychiatrists asked new patients about alcohol use. However, only 13% in the sample used formal alcohol screening tools (Friedmann, P. D., McCullough, D., Chin, M. H. et al., 2000). Further, 82% of the physicians who were interviewed consistently offered interventions for patients whom they identified to be problem drinkers (Friedmann, P. D., McCullough, D., Chin, M. H. et al., 2000). Although the screening prevalence in these studies appears to be substantial it is still interesting to note that screening is not implemented 100% of the time.

The lack of physician involvement in screening and brief intervention for patients with drug and alcohol issues can be attributed to a substantial number of barriers. Several key challenges for physicians seeking to implement screening for drug and alcohol abuse have been identified in the literature. These barriers include time constraints, knowledge

of drug and alcohol problems, perception of treatment efficacy, and negative attitudes towards patients who abuse substances (Silins, E., Conigrave, K., Rakvin, C. et al., 2007, O'Rourke, M., Richardson, L. D., Wilets, I. et al., 2006, Roche, A. & Freeman, T., 2003).

A small but growing body of evidence is emerging which indicates how negative attitudes toward patients with AOD disorders are affecting physicians' motivation to screen and intervene with this patient group. Holland and colleagues interviewed a group of physicians as part of the Pennsylvania Screening, Brief Intervention, and Referral to Treatment (SBIRT) project to discern the major barriers experienced when screening for AOD use in their patients (2009). Focus groups revealed that some physicians severely stigmatized patients with AOD disorders and that these physicians felt it was not worth their time to intervene with patients who were intentionally harming themselves by abusing substances (Holland, C. L., Pringle, J. L. & Barbetti, V., 2009). Interestingly, physicians' own personal use of alcohol was also reported as being a significant barrier to screening for alcohol abuse. In the Holland study (2009) some physicians felt that their own alcohol use would be interpreted as abuse and were therefore hesitant to address AOD use with patients who also drank at the same level (Holland, C., Pringle, J. & Barbetti, V., 2009). In another study conducted by Marcell and colleagues it was found that the prevalence of screening for AOD disorders by physicians who worked with adolescents was significantly and positively associated with the physicians' perception of the effectiveness of screening and treatment (Marcell, A. V., Halpern-Felsher, B., Coriell, M. et al., 2002).

Negative attitudes towards specific patient populations and the potential effect on healthcare delivery is not an isolated phenomenon. The spectrum of patient populations

affected by medical community biases include the mentally ill, HIV infected, bi-sexual and indigent patients. In several of these patient groups, research has found a distressing relationship between healthcare providers' attitudes and clinical decision-making and willingness to care for these patients. For example, Pottick and colleagues investigated how certain clinician characteristics such as theoretical orientation to mental illness (biological/medical vs. behavioral/cognitive) affected clinical judgment of the presence of a mental disorder in vignette representations of mental health patients (2007). Pottick found that clinicians with a behavioral/cognitive orientation to mental illness were significantly less likely to indicate a diagnosis for the presence of a mental disorder (Pottick, K. J., Kirk, S. A., Hsieh, D. K. et al., 2007). In a different study, Mohr and colleagues found that clinicians' stereotypes of patients' sexual orientation affected the clinicians' assessment of the patients' mental health condition (Mohr, J. J., Weiner, J. L., Chopp, R. M. et al., 2009). Both Pottick and Mohr's studies indicate that clinicians' attitudes potentially affect their judgments of patient symptoms and condition.

Willingness to care for different patient groups is also affected by clinician attitudes. Tyer-Viola (2007) surveyed obstetric nurses about their attitudes toward pregnant women who were HIV positive. Overall, nurses were less willing to care for HIV positive pregnant women as opposed to pregnant women who were not HIV positive (Tyer-Viola, L. A., 2007). Specifically, nurses with more negative attitudes toward HIV positive pregnant women were less willing to care for these women than those who had more positive attitudes (Tyer-Viola, L. A., 2007).

D. Modeling the Effect of Physician Attitudes on Behavior

The Theory of Planned Behavior is useful for linking clinician attitudes about patient behaviors to clinicians' own behavior in caring for specific patient groups. In general, the Theory of Planned Behavior (TPB) attempts to connect health attitudes like those that clinicians may hold towards substance abusers directly with the behavior such as altered clinical decision-making or unwillingness to work with addicts.

According to this theory (TPB), health behavior is preceded by a behavioral intention which is made-up of three components: behavioral attitudes, subjective norms, and control beliefs (Ajzen, I., 1991). Behavioral attitudes consist of the belief about the outcome of the behavior and the evaluation of the perceived outcome. Subjective norms are also composed of two elements: normative beliefs and motivation to comply (Ajzen, I., 1991). Normative beliefs are an individual's beliefs that are influenced by family, friends, co-workers and society; whereas an individual's motivation to comply is his/her desire to uphold the normative beliefs. The final component of the TPB is perceived behavioral control which is the belief that the individual can accomplish or avoid the behavior (Ajzen, I., 1991). Figure 1 below displays a general representation of the Theory of Planned Behavior.

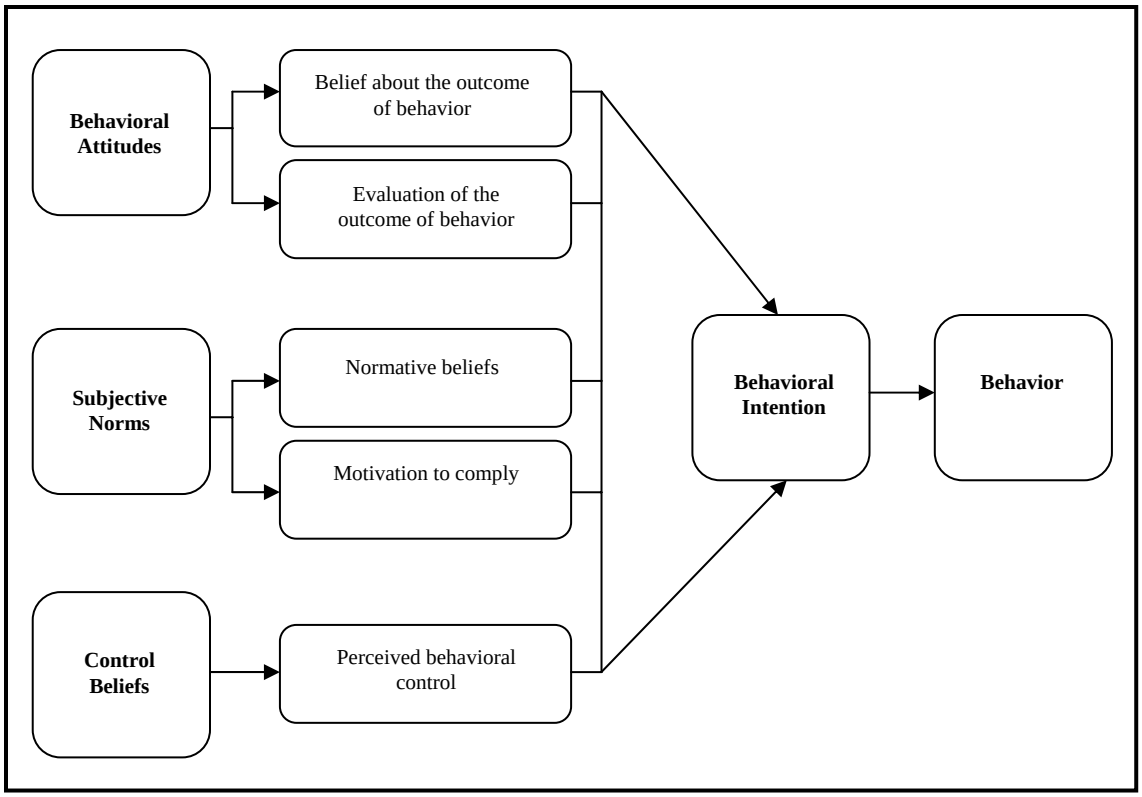

Figure 1 Basic model of the Theory of Planned Behavior. Model adapted from Ajzen (1991).

In applying the TPB to the phenomenon of how physician attitudes can affect clinical decision-making an interesting scenario emerges. Beginning with behavioral attitudes for example, physicians' attitudes toward substance abuse could be fueled by the belief that substance abuse (the behavior) will cause bad health (the outcome) in combination with the perception that bad health is undesirable. Furthermore, public stigma towards substance abuse may influence a clinician's personal beliefs about substance abuse (normative beliefs – a component of subjective norms) such that the clinician adopts negative beliefs about patients with substance abuse disorders. The clinician who adopts negative normative beliefs about substance abuse may do so because he/she feels that these beliefs are expected and fostered by the general public and

by the medical community (motivation to comply). The physician's perceived behavioral control could be interpreted as his/her confidence in being able to intervene with a patient presenting with substance abuse. Combining the attitudes, subjective norms, and perceived behavioral control regarding substance abuse theoretically leads to the behavioral intention and then subsequently to the behavior which would be the physician's decision to screen (or not to screen) for AOD disorders in his/her patients. Figure 2 displays the TPB as applied to physician screening for AOD disorders. Note that the example depicted by Figure 2 is fictitious and has not been tested.

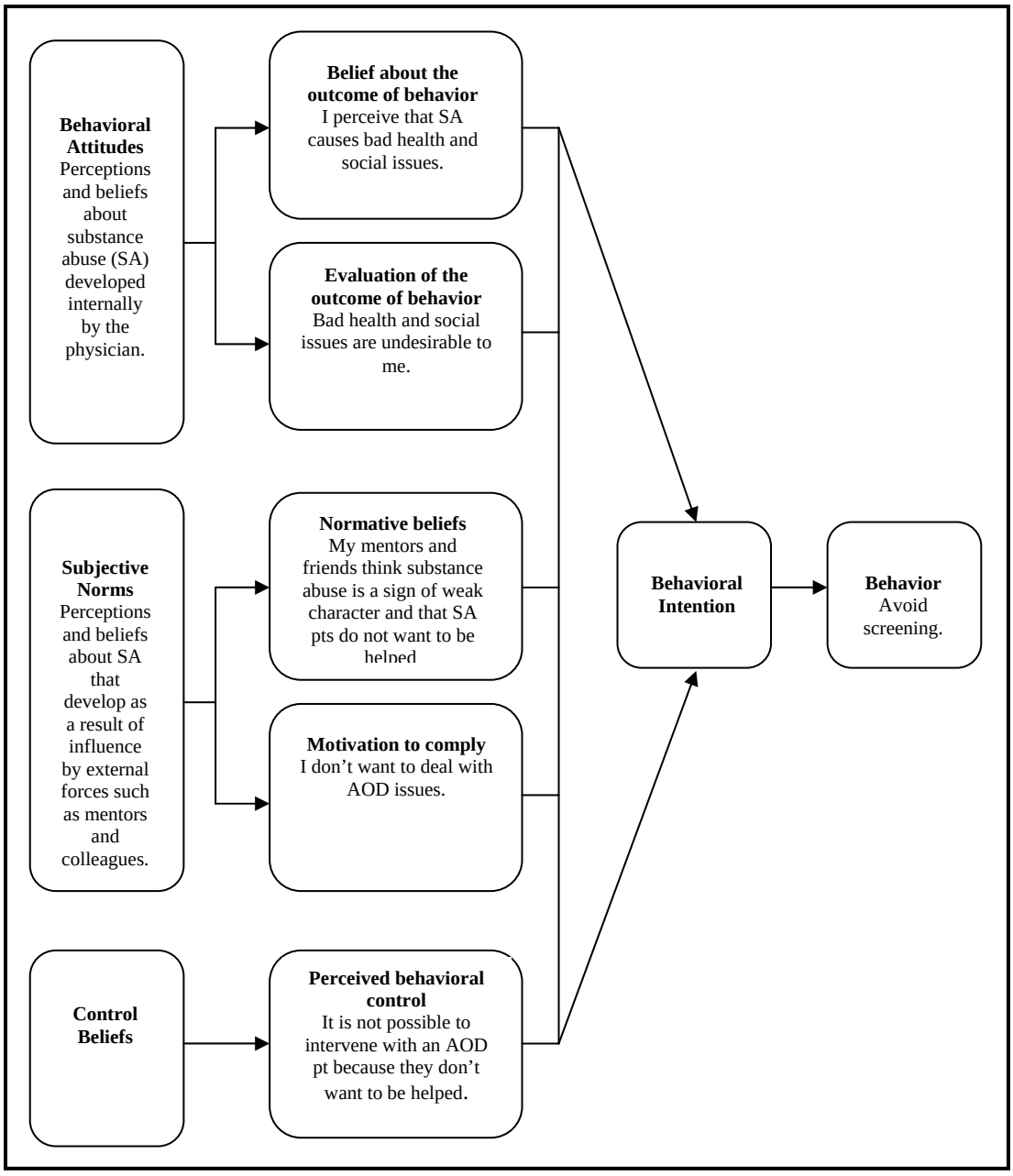

Figure 2 Hypothetical example using the Theory of Planned Behavior to describe physician screening and intervention for patient drug and alcohol disorders.

Physicians play an important and significant role in caring for patients with AOD use disorders. Effective tools such as SBI have been developed to assist physicians in detecting and intervening with this patient group. Furthermore, a physician's efforts at screening for AOD disorders can increase the quality of primary care (Saitz, R., Horton, N. J., Cheng, D. M. et al., 2008). It is therefore important to discern the barriers to screening for AOD disorders experienced by physicians.

The growing body of evidence implicating negative attitudes as an especially salient barrier to physician involvement with patients who have AOD disorders necessitates research to examine the development of these attitudes. The presence of negative attitudes in medical student groups indicates that these attitudes may begin before or during medical training.

Does medical school foster or prevent the development of negative attitudes towards patients with AOD disorders? Negative attitudes towards patients with AOD disorders in medical students could be a reflection of the medical school experience itself. Difficult encounters with AOD using patients can play a role in students' attitudes toward this patient group. These encounters may be more prevalent in the fourth year of medical school as compared to the first year of school. Other medical school related experiences such as student abuse, ethical conflicts, and exposure to human suffering could have detrimental effects on medical students' attitudes both toward their role as a physician and toward difficult patient groups.

A student's personal experience with AOD disorders in a family member may contribute significantly to their attitudes toward AOD using patients. Medical student characteristics may also play a part in the development of negative attitudes, although this

area of research has not been adequately explored. Another example would be a student's own use of drugs or excessive alcohol consumption which may alter their perception of patients who display these same behaviors.

The purpose of this study was to investigate the relationship between medical students' intended area of medical practice, drug and alcohol use, year in medical training, and attitudes toward patients with substance abuse disorders (AOD disorders). A cross-sectional survey was done on first and fourth year medical students in the Oregon Health & Science University medical graduate program to test the following hypotheses:

1. Medical students who plan to become primary care physicians will have different attitudes toward AOD using patients when compared to medical students who plan to specialize in a non-primary care medical practice.

2. Medical students who have experience with substance use will have different attitudes towards AOD using patients than students with no experience.

3. First-year and fourth-year medical students will have different attitudes towards AOD using patients.

The recognition of attitudes towards patients with AOD disorders can help to develop educational programs which focus on developing medical students' professional attitudes and empathetic capacity toward this patient group. Educational interventions could also be targeted towards certain groups of medical students who are identified as harboring more negative attitudes toward patients with AOD disorders than other student

groups. The implications of these educational programs could result in reduced stigma toward AOD disorders in patients.

As demonstrated by the theoretical application of the TPB, attitudes may have an effect on clinical decision-making. With the implementation of educational programs and the projected improvement in attitudes it can be postulated that medical students may be more willing to get involved in the care of patients with AOD disorders if their attitudes improve. With increased involvement by physicians, rates of treatment engagement by patients with AOD disorders may increase. This could have profound effects for the general health of these patients which may have the long-term effect of reducing the burden of alcohol and drug abuse in the United States.

IV. Methods

This study employs a cross-sectional study design with first and fourth year medical students at the Oregon Health & Science University. Survey items capture student attitudes toward alcohol and other drug using/abusing patients as well as medical student characteristics and AOD use.

A. Instrument Development

Attitudes: A literature search was performed to identify studies using questionnaires measuring medical students' attitudes toward substance use and abuse – specifically those studies that 1) measured attitudes towards patients with alcohol and other drug use disorders (as opposed to attitudes towards substance abuse in general), and 2) had a psychosocial theoretical basis. Based on these criteria, questions were taken from the study conducted by Silins and colleagues (2007).

The questionnaire used by Silins and colleagues in their study of Australian medical students is an adaptation of the *Alcohol and Alcohol Problems Perception Questionnaire* (AAPPQ). The *AAPPQ* was originally developed through the Maudsley Alcohol Pilot Project by Cartwright and colleagues (1975) and is a popular tool to measure clinician attitudes towards patient alcohol abuse. It has also been applied in different populations of healthcare workers including nurses and addiction counselors (Anderson, P. & Clement, S., 1987, Hunot, V. & Rosenbach, a., 1998, Ford, R., Bammer, G. & Becker, N., 2008, Hughes, E., Wanigaratne, S., Gournay, K. et al., 2008). It is based on the premise that clinicians' individual characteristics affect their professional attitudes and behaviors (Cartwright, A. K., 1981).

The modified *AAPPQ* ($AAPPQ_m$) used by Silins and colleagues (2007) includes 21 item statements from the original *AAPPQ*. These questions make up four composite attitudinal constructs which measure 1) general attitude, 2) motivation to intervene with patients who have AOD disorders, 3) confidence in managing patients with AOD disorders, and 4) students' perceived role legitimacy in working as medical professionals with patients who have AOD disorders.

Silins added 18 additional questions to the $AAPPQ_m$. The additional items addressed the perceived importance of completing a drug and alcohol history with a patient, students' perceptions of the success of drug interventions such as methadone, and students' ratings of the adequacy of their medical graduate education in addressing AOD disorders (Silins, E., Conigrave, K., Rakvin, C. et al., 2007). Reliability measures such as a Cronbach's alpha were not given. For this study all questions from the $AAPPQ_m$ were included in Part I of the composite questionnaire.

The constructs in the $AAPPQ_m$ were projected to measure the important components of the Theory of Planned behavior. The general attitude construct represented the *behavioral attitudes* of medical students toward patients with AOD disorders (Example: "In general, I don't like heroin users") whereas the role legitimacy construct represented the students' *subjective norms* about patients with AOD disorders (Example: "It is the job of the physician to screen for alcohol abuse"). The motivation and confidence constructs represented the students' *control beliefs* about the effectiveness of treating AOD disorders (Ex: Methadone is just another drug given to drug addicts). Each construct within the $AAPPQ_m$ was made-up of item statements that measured an individual's agreement to each statement.

Addiction Etiology: A second questionnaire was chosen to address questions about the relationship between medical student attitudes and their perception of the etiology of addiction disorders. The *Short Understanding of Substance Abuse Scale* (SUSS) was chosen for its brevity and validated measures of addiction etiology. The *SUSS* is an adapted and shortened version of the original *Understanding of Alcoholism Scale* (UAS) developed by Moyers and Miller (1993) which assesses an individual's beliefs about the etiology of alcoholism. The purpose of the *SUSS* was to develop a similar measure to the *UAS* which included questions about addiction in general (Humphreys, K., Greenbaum, M. A. & Finney, J. W., 1996).

The original *UAS* contained questions pertaining to three popular models of addiction etiology, the disease-medical model, the psychosocial model and the eclectic orientation model. Each etiological model represented its own construct within the *UAS* with items measuring an individual's agreement to questions that reflected one of the three etiological models.

Humphreys and colleagues concluded that the *SUSS* demonstrated adequate internal consistency and construct validity when compared to its counterpart, the *UAS* (Humphreys, K., Greenbaum, M. A. & Finney, J. W., 1996). However, of the 3 original constructs presented in the *UAS*, Humphreys and colleagues determined that only questions pertaining to the disease model construct (Cronbach's alpha=0.88) and the psychosocial model construct (Cronbach's alpha=0.72) should be kept in the final *SUSS* instrument (Humphreys, K., Greenbaum, M. A. & Finney, J. W., 1996). They removed the eclectic orientation model construct because of its low alpha score (Cronbach's alpha=0.33) and poor factor loading.

For this study only questions included in the disease model construct and the psychosocial model construct were used in Part I of the composite questionnaire. Response scales for questions in the etiology construct were adapted from the Likert-like 5-point scale used in the *SUSS* to the 6-point Likert-like scale used in the $AAPPQ_m$ questionnaire developed by Silins. This was to ensure consistent interpretation and comparison of construct means.

Composite Questionnaire: The composite questionnaire developed for this study included two parts: the first part contained questions from the *SUSS* and $AAPPQ_m$ questionnaires. Appendix A lists the questions included in Part I. Part 2 of the composite questionnaire consisted of demographic and informational questions. These questions included items about the students' age, gender, race and ethnicity, international student status, medical practice choice, smoking, drinking, and drug behavior (Example: "What area of medical practice are you planning on going into?"). Smoking was measured as "light smoker" (1-5 cigarettes per day), "moderate smoker" (6-20 cigarettes per day), and "heavy smoker" (more than 20 cigarettes per day) (Roche, A. M., Parle, M. D., Stubbs, J. M., 1995). Questions pertaining to personal alcohol consumption were derived from the *Harvard School of Public Health College Alcohol Study questionnaire* (Wechsler, H., 2005). *The Harvard School of Public Health College Alcohol Study questionnaire* was used in multi-round surveys of students in four-year colleges to measure alcohol abuse behavior.

Permission to use the *SUSS* and the $AAPPQ_m$ was given by both questionnaire authors.

B. Thesis Framework

Only certain relationships were of particular interest for the current thesis project and only a fraction of the data collected by the composite questionnaire was needed to address the hypotheses. Figure 3 below is a pictorial representation of the relationships of interest. The solid arrows represent the specific relationships that were assessed by this thesis project and the dotted arrows represent additional relationships of interest for future research.

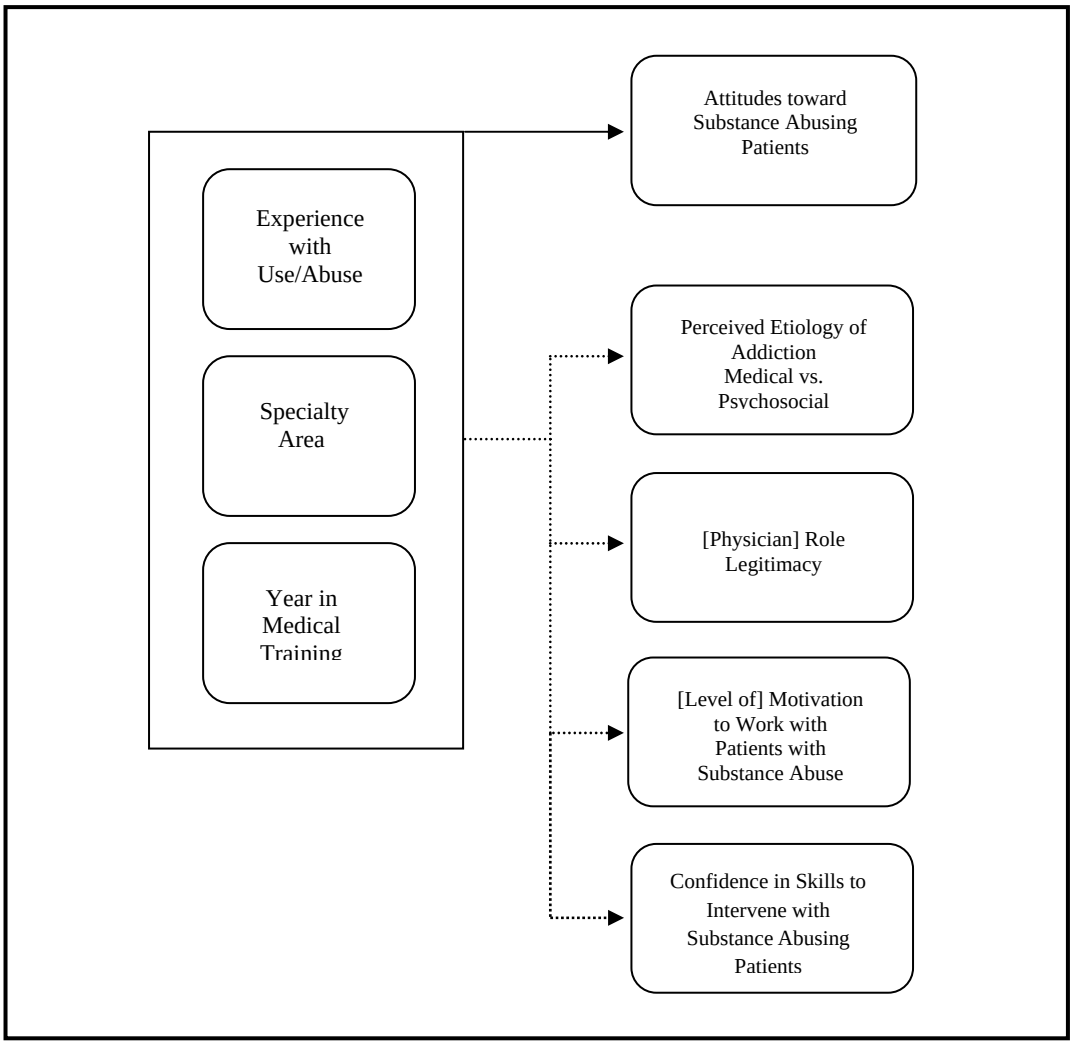

Figure 3 Framework representing scope of current thesis project.

C. Subject Selection

The target population for this study was Oregon Health & Science University (OHSU) first- and fourth-year medical students enrolled during the 2009/2010 academic year. A convenience sample from each of the target study groups was recruited. Participation in the survey was voluntary and anonymous. This study received approval from the Oregon Health & Science Internal Review Board and the Medical School Curriculum Committee.

D. Administration of Questionnaire

Medical school administrators allowed 10 minutes for survey administration to the students. Administration of the questionnaire was conducted in person by the author and additional research staff and faculty to speed the process. In-person administration to large groups of students was predicted from the literature to yield acceptable response rates (approximately 70%) (Silins, E., Conigrave, K., Rakvin, C. et al., 2007, Cape, G., Hannah, A. & Sellman, D., 2006). It also ensured that all surveys were administered in a consistent environment at the same time. Those who participated in the survey were entered into a raffle to win a $100 VISA gift card. For each class one student was randomly selected to receive the gift card.

Administration to First-year Medical Students: Administration of the survey to the first year medical students (MS1) was done in the fall of 2009 during a Principles of Clinical Medicine (PCM) seminar. This time and place was chosen by the School of Medicine's PCM Planning Committee as the most appropriate and least disruptive opportunity for survey administration.

Administration to Fourth-year Medical Students: Administration of the survey to the fourth year medical students (MS4) was done in the spring of 2010 during the students' Transition to Residency seminar. This time and place was chosen by the MS4 Educational Coordinator as the most appropriate and least disruptive opportunity for survey administration.

Human Subjects Protections: Due to the sensitive information collected by this research project, all surveys were anonymous. Out of concern for the identities of the MS4 students cross-tab analyses looking at specific drug or alcohol behaviors within medical practice choice areas were not run.

E. Variables

Predictor Variables: The main predictor variables of interest were students' intended/desired area of medical practice, students' personal experience with alcohol and illicit drugs (marijuana, heroin, ecstasy, cocaine, or PCP), and year in medical school. Area of intended medical practice was collapsed from the 14 options into 3 categories: primary care, specialty care, and undecided. Drug use was kept as a yes-no dichotomous variable. The primary alcohol variable of interest was binge drinking which was measured by the question "In the past 30 days on those occasions when you drank alcohol, how many drinks did you usually have?" This variable was dichotomized into binge drinking and non-binge drinking. Binge drinking was defined as the respondent indicating they drank 5 or more drinks in one sitting if male and 4 or more drinks in one sitting if female, otherwise they were classified as non-binge drinkers. Additional alcohol variables were investigated including the number of times a student experienced being

drunk within the 30 days prior to the survey, which was dichotomized into never having been drunk and having at least one event of being drunk. Students' year in medical school first year (MS1) and fourth year (MS4) was kept as a dichotomous variable.

Additional independent variables such as age and race were re-coded. Age was categorized into three groups, 20-24, 25-30, and older than 30 for descriptive purposes only. Age was kept as a continuous variable for regression analysis. Race was dichotomized into White and non-White due to very small group sizes within the non-white categories. Gender remained a dichotomous variable.

Outcome Variables: The primary outcome variable of interest was general attitudes toward patients with substance abuse disorders. This variable was measured by the mean response of each participant to questions included in the general attitude construct of the composite questionnaire. The response scales of negatively-worded items in the composite questionnaire were reversed so that a response of 1 would represent a strong agreement with the question and a response of 6 would represent a strong disagreement (see Appendix A, Table 12). A higher mean construct score is interpreted as the respondent having a more positive attitude regarding patients with AOD.

F. Statistical Analysis of Survey Data

Construct Validity Analysis: Cronbach's alpha was calculated for the 18 items within the general attitude construct. Cronbach's alphas were also calculated after removing each item individually from the total 18-item count of the Attitude construct. Corrected item-total correlations and squared multiple correlations were also calculated for each individual item in the general attitude construct.

Descriptive Statistics and Comparison of Attitude Mean Scores: Subject demographics were summarized using descriptive statistics. Construct mean, sum, and variance were calculated for the general attitude, confidence, motivation, and role legitimacy constructs.

The MS1 and MS4 groups were compared using a t-test with equal variances to determine if their mean responses to the general attitude construct were similar. The demographics of the two groups were also compared to assess whether combining the response data from both groups was appropriate. Total mean scores for the general attitude construct were calculated for each level of the predictor variables for the combined sample. Means were compared between levels using ANOVA with post-hoc Scheffe pairwise comparisons for predictor variables with more than two levels and two-sample t-tests for dichotomous variables.

Inverse variances for the construct means for each subject were calculated and used in weighting the regression models. Weighting was determined to be necessary in the models to place greater weight on individuals with consistent answers to construct questions.

Regression Analyses: Univariate regression models were run to determine the individual influence of each predictor variable on the main outcome. All regression models were weighted using the inverse variance of the general attitude construct score. Normal probability plots and residual curves were generated in conjunction with the univariate regression analyses to check for assumptions of normality and homogeneous variance of the data.

Multivariate model building procedures were undertaken to develop the most parsimonious linear models for the four associations of interest between the main predictor variables and the outcome. Predictor variables other than the four main predictors were considered for the multivariate models if they showed p-values of less than 0.25 in the univariate analysis or if they were indicated in past studies to have important influences on medical student attitudes. Gender, for example, has been shown in the literature to be an important predictor of physician and medical student attitudes and was therefore forced into the multivariate models. As with the univariate regression models, all multivariate regression models were weighted using the inverse variance of the general attitude construct score. Normal probability plots and residual curves were generated in all multivariate models to confirm normality and homogeneous variance of the data. A p-value of 0.05 was considered as significant in the final model. A separate model was built for students from each year as well as for the combined student sample. All analyses were performed using SAS® Software version 9.2 (SAS Institute Inc., Cary, NC, USA).

V. Results

A. Descriptive Statistics

The total reported class sizes for first-and fourth-year medical students were 120 and 125. The response rate for the first year class (MS1) was 82.5% (n=99) and 77.6% (n=97) in the fourth year class (MS4). Gender was approximately equally distributed in each class with 46.5% (n = 46) and 46.4% (n=45) male, respectively. Both groups were also similar in their racial makeup where 71.7% (n=71) of the first years and 75.8% (n=72) of the fourth years classified themselves as non-Hispanic white. For age, 45.5% (n=45) of first-year students were between 21 and 24 years old whereas 54.5% (n=54) were 25 years and older. Predictably, the majority of fourth-year students (72.9%, n=70) were between 25 and 30 years old (Table 1).

When asked about their choice of medical practice, the majority of MS1s (57.9%) indicated that they were planning on going into a primary care medical practice whereas the second largest group of students (31.8%) indicated that they would seek a specialty care practice. About 10.5% (n=10) of MS1s were undecided. As with the MS1s, the majority of MS4s (71.9%) chose a primary care practice and 28.1% chose a specialty care.

Table 1
Demographic characteristics of MS1 and MS4 groups.

	MS1 N = 99	MS4 N = 97
Gender:		
Male	46 (46.5%)	45 (46.4%)
Female	52 (52.5%)	52 (53.6%)
Primary Care:		
Family Practice	21 (22.1%)	20 (20.8%)
Internal Medicine	10 (10.5%)	17 (17.7%)
OB/GYN	5 (5.7%)	8 (8.3%)
General Practice	1 (1.1%)	0
Pediatrics	8 (9.1%)	11 (11.5%)
Emergency Medicine	10 (11.4%)	13 (13.5%)
Specialty Care:		
Pathology	0	4 (4.2%)
Neurology	3 (3.4%)	0
Psychiatry	2 (2.3%)	1 (1.0%)
Surgery	15 (17.1%)	4 (4.2%)
Oncology	3 (3.4%)	2 (2.1%)
Other	7 (8.0%)	16 (16.7%)
Undecided	10 (10.5%)	0
Age:		
20-24	45 (45.5%)	2 (2.1%)
25-30	44 (44.4%)	70 (72.9%)
>30	10 (10.1%)	24 (25.0%)
Race/Ethnicity:		
White non-Hispanic	71 (71.7%)	72 (75.8%)
Asian	16 (16.1%)	10 (10.5%)
Hispanic	1 (1.0%)	1 (1.1%)
Multiracial	7 (7.1%)	6 (6.3%)
Other	3 (3.0%)	6 (6.3%)

B. Smoking, Alcohol Use, and Drug Use Behaviors

The statistics regarding smoking, alcohol and drug use were not subdivided beyond year in school (MS1 vs. MS4) for the purpose of maintaining privacy of the students. Only one individual in the MS1 class reported smoking whereas no students in the MS4 class reported smoking. Therefore this variable was not considered for multivariate models. Having ever used illicit drugs (marijuana, cocaine, heroin, ecstasy,

PCP, etc.) was reported by 42.1% (n=40) of MS1s and 45.8% (n=44) of MS4s. Among the 40 MS1s who indicated that they had ever used illicit drugs, 71.1% indicated past use, compared to 78.1% of the 44 MS4s who had ever used drugs. Additionally, 29% of the MS1s and 22% of MS4s indicated current use (Table 2).

A small proportion of the MS1 and MS4 class (both at 6.3%) reported having *never* had a drink of alcohol. The majority of the students in both classes reported drinking on 3 to 5 occasions in the month prior to the survey (36.8% and 45.8% in the MS1 and MS4 classes). Both classes also reported similar prevalence of drinking in the week prior to the survey (65.7% MS1s and 74.2% MS4s).

The majority of the MS1s (86.1%) reported drinking 1 to 4 drinks per occasion with a mean of 2 drinks on each occasion. An even larger proportion of MS4s (96.3%) had reported drinking 1 to 4 drinks per occasion with an average of 1.9 drinks on each occasion. A large difference in the proportion of binge drinkers was observed between the two groups where only 4.1% (n=4) of MS4s reported binge drinking at least 4 or more alcoholic drinks per occasion for females (n=3) and 5 or more for males (n=1) and 12.2% (n=12) of MS1s reporting binge drinking of at least 4 or more drinks per occasion for females (n=3) and 5 or more drinks for males (n=9) (Table 2).

Frequency of drinking leading to inebriation (drunkenness) was also measured. The majority of both MS1s and MS4s indicated no events of drunkenness in the 30 days prior to the survey (57.9% and 64.9%). However, 35.8% of MS1s and 24.5% of MS4s reported being drunk on 1-2 occasions in the month prior to the survey (Table 2). Predictably, the majority of students who were classified as binge drinkers also reported

being drunk at least once in the month prior to the survey (13 of the 16 binge drinkers reported being drunk at least once in the 30 days prior to the survey).

Table 2
Alcohol and drug use behaviors.

Questionnaire Item	MS1 N=99	MS4 N=97
Have you ever used drugs?		
Yes	40 (40.4%)	45 (46.4%)
No	55 (55.6%)	52 (53.6%)
How often do you use drugs?		
Daily	2 (5.3%)	2 (4.8%)
Weekly	3 (7.9%)	0
Monthly	1 (2.6%)	2 (4.8%)
Yearly	5 (13.2%)	5 (12.2%)
I used to	27(71.1%)	32 (78.1%)
How often in the last 30 days did you drink enough to get drunk?		
Never	55 (57.9%)	61 (64.2%)
1-2 occasions	34 (35.8%)	24 (25.3%)
3-5 occasions	3 (3.2%)	5 (5.3%)
6-9 occasions	2 (2.1%)	5 (5.3%)
40 or more occasions	1 (1.1%)	0
In the last 30 days on the occasions when you drank, how many drinks did you have per sitting?		
1 drink	23 (24.2%)	33 (35.1%)
2 drinks	28 (29.5%)	30 (31.9%)
3 drinks	11 (11.6%)	11 (11.7%)
4 drinks	6 (6.3%)	5 (5.3%)
5 drinks	3 (3.2%)	2 (2.1%)
6 drinks	2 (2.1%)	1 (1.1%)
7 drinks	3 (3.2%)	0
8 drinks	1 (1.1%)	0
9 drinks or more	2 (2.1%)	0

Construct validity: A Cronbach's alpha of 0.85 was found for the items in the general attitude construct indicating excellent internal consistency and reliability of this construct. The largest improvement in the Cronbach's alpha would have been accomplished if item 5, "In general, it is rewarding to work with patients who are

problem drinkers." were removed from the general attitude construct. However, item 5 was not removed due to lack of theoretical justification and due to its small magnitude of increase in the alpha value if removed. Refer to Table 12 in Appendix A for the item analysis results.

C. General Attitude toward Patients with Substance Use Disorders

The general attitude mean score was 4.4 (SD 0.6) across the entire student sample. Univariately, mean general attitude scores did not differ significantly between levels of year in school (MS1 vs. MS4), race (White vs. non-White), drug use (yes/no), frequency of drug use (more than yearly use of drugs, yearly use, and past use), age (20-24, 25-30, > 30), and binge drinking (yes/no) (see Table 3). However, students who indicated that they would like to go into specialty care practice had significantly more negative attitudes (lower attitude mean score) than those who were not sure of their practice decision. There was no significant difference in general attitude between primary care practice and specialty care practice (Table 4).

Table 3

General attitude mean scores for binomial predictor variables.

	General Attitude Mean Score (SD)	*p*Value
Group Means:		
MS1	4.5 (0.6)	0.3
MS4	4.4 (0.6)	
Drug Use:		
Yes	4.4 (0.6)	0.7
No	4.4 (0.7)	
Binge Drinking:		
Yes	4.5 (0.6)	0.5
No	4.4 (0.7)	
Race		
non-White	4.4 (0.7)	0.99
White	4.4 (0.6)	
Gender		
Male	4.1 (0.6)	0.7
Female	4.4 (0.6)	

*Scale of agreement: 1=Strongly disagree to 6=Strongly agree.

Table 4

General attitude mean scores for multilevel predictor variables.

	General Attitude Mean Score (SD)	*p*Value
Frequency of Drug Use:		
Daily, Weekly, Monthly	4.3 (0.7)	0.3
Yearly	4.7 (0.6)	
Past use	4.4 (0.6)	
Practice:		
Primary Care	4.4 (0.6)	0.04
Specialty Care	4.3 (0.6)	
Not sure	4.9 (0.4)	

*Scale of agreement: 1=Strongly disagree to 6=Strongly agree with construct item statement.

MS1 Regression Analysis: Overall, univariate regression models revealed no significant predictive value for practice choice, drug use and binge drinking. The potentially confounding variables race, age, and gender were also not found to be significant in the univariate models. Mean differences for univariate analyses are presented in Table 5.

In multivariate analysis, binge drinking was only marginally significant (Table 6). After adjustment for the other variables in the model, binge drinkers tended to have more positive attitudes towards patients with AOD disorders with a mean score 0.42 points (95% CI: -0.002, 0.85) higher than that of non-binge drinkers. This finding is consistent with the study's second hypothesis that medical students who have experience with substance use have different attitudes toward patients with AOD disorders than students without this experience. The remaining two predictor variables, practice choice and drug use were not significant in the multivariate model. Age was removed from the multivariate model because it was not found to be significant and did not influence the parameter estimates of the main predictor variables by more than 10%. However, gender was forced into the multivariate model because it has been established in previous research that males and females differ in their attitudes toward patients with AOD disorders. Adjusted mean differences from multivariate analyses are presented in Table 6.

Table 5

Mean differences for univariate models in MS1 and MS4 regression as well as combined data models.

Predictor Variable	Attitude Mean Difference		
	MS1 β (95% CI) *p*Value	MS4 β (95% CI) *p*Value	Combined β (95% CI) *p*Value
Practice Choice			
Specialty vs. Primary	-0.15 (-0.43, 0.13) 0.29	-0.19 (-0.52, 0.14) 0.26	-0.17 (-0.38, 0.04) 0.12
Undecided vs. Primary	0.30 (-0.07, 0.67) 0.11	NA	0.32 (-0.06, 0.71) 0.10
Binge Drinking			
Yes vs. No	0.28 (-0.11, 0.66) 0.15	0.16 (-0.52, 0.85) 0.64	0.26 (-0.09, 0.60) 0.14
Drug Use			
Yes vs. No	-0.09 (-0.35, 0.18) 0.51	-0.15 (-0.45, 0.14) 0.31	-0.11 (-0.30, 0.09) 0.29
Race			
non-White vs. White	0.19 (-0.08, 0.45) 0.17	-0.25 (-0.62, 0.11) 0.17	0.02 (-0.20, 0.23) 0.88
Gender			
Female vs. Male	0.14 (-0.12, 0.40) 0.29	-0.27 (-0.55, 0.02) 0.07	-0.07 (-0.27, 0.12) 0.45
Age	0.01 (-0.02, 0.03)* 0.56	0.07 (0.04, 0.10)* <0.001	0.02 (0.004, 0.04)* 0.02
Year			
MS4 vs. MS1	NA	NA	-0.09 (-0.28, 0.10) 0.36

*For every one year increase in age.

Table 6

Mean differences for multivariate model in MS1 group.

Predictor Variable	Attitude Mean Difference	
	β (95% CI)	P-value
Practice Choice		
Specialty vs. Primary	-0.14 (-0.47, 0.19)	0.40
Undecided vs. Primary	0.22 (-0.17, 0.62)	0.26
Binge Drinking		
Yes vs. No	0.42 (-0.002, 0.85)	0.05
Drug Use		
Yes vs. No	-0.10 (-0.38, 0.17)	0.45
Gender		
Female vs. Male	0.14 (-0.16, 0.43)	0.36

MS4 Regression Analysis: None of the three main predictor variables (practice choice, binge drinking and drug use) were significantly associated with mean attitude scores in the univariate analysis, but there was a significant association between age and mean attitude score where older students had slightly more positive attitudes toward patients with AOD disorders than younger students. For example, with a 5-year increase in age, mean attitude scores increase by 0.35. Gender was marginally significant in univariate models where female MS4s were found to have more negative attitudes compared to male MS4s. The mean attitude differences for all predictor variables including covariates are displayed in Table 5.

As with the univariate analyses, there were no significant associations found between the three main predictors and mean attitude score within the MS4 multivariate model. However, gender and age remained significant in the MS4 model. For example, with a 5-year increase in age, mean attitude scores increase by 0.33 points. Females had significantly more negative attitudes towards patients with AOD disorders with a mean score 0.30 points (95% CI: -0.57, -0.03) lower than that of male MS4s. The adjusted

mean attitude differences for the three main predictor variables and the model covariates are displayed in Table 7.

Table 7
Mean differences for multivariate models in MS4 regression.

Predictor Variable	Attitude Mean Difference	
	β (95% CI)	P-value
Practice Choice		
Specialty vs. Primary	-0.12 (-0.43, 0.19)	0.44
Binge Drinking		
Yes vs. No	0.25 (-0.38, 0.89)	0.43
Drug Use		
Yes vs. No	-0.11 (-0.39, 0.16)	0.42
Gender		
Female vs. Male	-0.30 (-0.57, -0.03)	0.03
Age	0.07 (0.03, 0.10)*	0.0002

*For every one year increase in age.

Combined Regression Analysis: Year was considered a main predictor variable in this stage of the analysis so that the third hypothesis, that MS1 and MS4 students would have different attitudes could be tested. In univariate analyses none of the four main predictor variables (practice choice, binge drinking, drug use and year in school) were significantly associated with mean attitude score (Table 5). However, univariate analyses found that age was significantly and positively associated with the mean attitude score and was considered for the multivariate analysis. The remaining covariates were not significantly associated.

In multivariate analysis, binge drinking and age were significant predictors of mean attitude scores. Binge drinkers as well as older students had significantly more positive attitudes toward patients with AOD disorders. Binge drinkers had mean scores of 0.41 points (95% CI: 0.06, 0.76) higher than non-binge drinkers. Regarding older

students, for every five year increase in age students' mean score increased by 0.20 points (95% CI: 0.05, 0.30). Interestingly, there was also a significant negative interaction between year and gender. Female MS4s had significantly more negative attitudes toward patients with AOD disorders with a mean score 0.37 points (95% CI: -0.63, -0.11) lower than that of female MS1s (Table 9). There was no significant difference in attitudes between male MS1s and MS4s (mean score difference of 0.08 points; 95% CI: -0.22, 0.39). Table 8 displays the multivariate adjusted mean differences for attitude score. Figure 4 gives a visual representation of the adjusted attitude mean scores between MS1s and MS4s for each gender.

Given the small sample size of participants classified as binge drinking, a sensitivity analysis was conducted using the variable measuring students' frequency of drunkenness in the month prior to the survey in the model. This variable was considered a close measure to binge drinking because binge drinking would theoretically lead to drunkenness and the variable levels of drunkenness were more evenly distributed. It was found that 13 of the 16 binge drinkers also reported being drunk at least once in the month prior to the survey. Drunkenness was not found to be significantly associated with attitudes (Table 9).

Table 8
Mean differences for multivariate models in combined regression.

Predictor Variable	Attitude Mean Difference	
	β (95% CI)	P-value
Practice Choice		0.17
Specialty vs. Primary	-0.10 (-0.32, 0.13)	0.40
Undecided vs. Primary	0.30 (-0.10, 0.70)	0.14
Binge Drinking		
Yes vs. No	0.41 (0.06, 0.76)	0.02
Drug Use		
Yes vs. No	-0.14 (-0.33, 0.05)	0.15
Gender		
Female vs. Male	0.12 (-0.16, 0.41)	0.40
Age	0.04 (0.01, 0.06)*	0.002
Year*Gender	-0.45 (-0.84, -0.06)	0.02
Female: MS4 vs. MS1	-0.37 (-0.63, -0.11)	0.01
Male: MS4 vs. MS1	0.08 (-0.23, 0.39)	0.59

*For every one year increase in age.

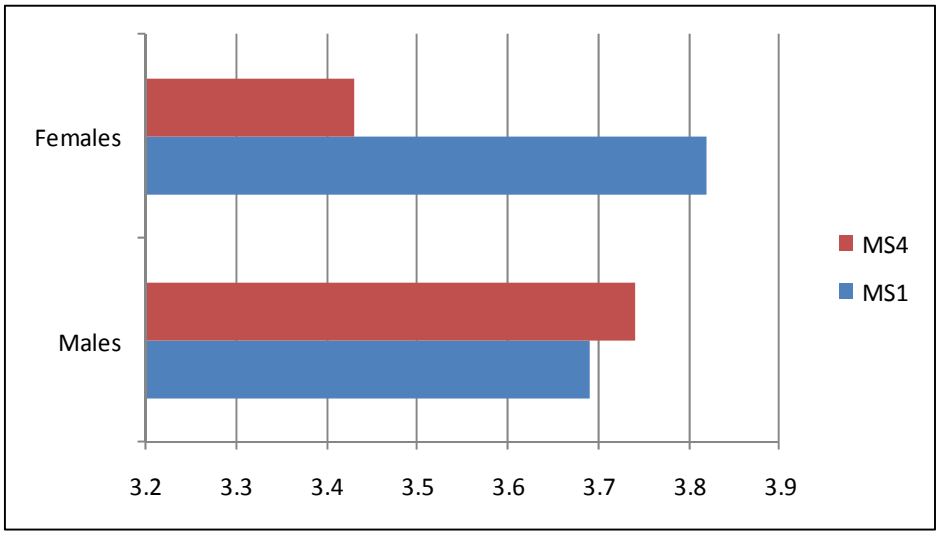

Figure 4 *Bar graph of adjusted mean attitude scores compared between MS1s and MS4s by gender.*

Table 9
Mean differences for multivariate models in combined regression using drunk variable.

Predictor Variable	**Attitude Mean Difference**	
	β (95% CI)	P-value
Practice Choice		0.17
Specialty vs. Primary	-0.10 (-0.32, 0.13)	0.25
Undecided vs. Primary	0.31 (-0.09, 0.71)	0.13
Drunk in past month		
Yes vs. No	0.16 (-0.05, 0.37)	0.13
Drug Use		
Yes vs. No	-0.15 (-0.35, 0.05)	0.15
Year		
MS4 vs. MS1	-0.01 (-0.31, 0.30)	0.96
Gender		
Female vs. Male	0.05 (-0.24, 0.33)	0.74
Age	0.04 (0.02, 0.06)*	0.001
Year*Gender	-0.34 (-0.73, 0.04)	0.08

*For every one year increase in age.

Summary of significant findings: Binge drinkers had significantly more positive attitudes than non-binge drinkers. It was also found that older medical students had significantly more positive attitudes than younger medical students. Finally, there was a significant interaction between year and gender. Female MS4s had significantly more negative attitudes toward AOD patients than female MS1s whereas male MS4s' attitudes did not differ significantly from male MS1s' attitudes.

VI. Discussion

This study is one of the first to investigate the association between medical students' drinking and other drug use behaviors and their choice of medical practice and attitudes toward patients with alcohol and other drug use (AOD) disorders.

A. Study Sample Prevalence of Alcohol and Drug Use

This study found the prevalence of alcohol use within the year of the survey to be 89.5% in the MS1 class and 88.5% in the MS4 class. These estimates are lower than those found in prior research where Croen and colleagues found the prevalence to be 97.8% of first year students and 95.0% of third year students (Croen, L. G., Woesner, M., Herman, M. et al., 1997) though estimates in the MS4 students in this sample may not be directly comparable to the third year students in Croen's study due to possible differences in medical school curriculum and other individual characteristics. Furthermore, the trends in alcohol use among American medical students may be different now as compared to a decade ago when Croen's study was conducted. However, recent research is lacking regarding medical students' alcohol consumption patterns. Compared to American college students the drinking prevalence in this sample of medical students is similar (Wechsler, H., Lee, J., Kuo, M. et al., 2002).

The prevalence of binge drinking behavior (defined as drinking 5 or more drinks in a single sitting for males and 4 or more drinks for females) was found to be 12.2% in the MS1 class and 4.1% in the MS4 class. For comparison, a study conducted on British medical students by Newbury-Birch and colleagues found that 15% of 2nd-year students and 18% of fourth year students met the criteria for binge drinking behavior (Newbury-Birch, D., Walshaw, D. & Kamali, F., 2001). Although informative, these estimates are

not directly comparable considering the differences in measurements of binge drinking and student nationality. However, when compared to trends in American undergraduate college students, this sample of medical students had a much lower prevalence of binge behavior (approx. 40% in college students) (Wechsler, H., Lee, J., Kuo, M. et al., 2002).

A possible interpretation of the large difference between binge drinking prevalence in this study's MS1 and MS4 groups would be that the MS1 cohort is much closer in average age to undergraduate college students where binge drinking is a common behavior (>40% of college students) (Wechsler, H., Lee, J., Kuo, M. et al., 2002). It may be that MS1s are continuing to exhibit undergraduate student behaviors. MS1s may also have less obligations in that they are not responsible for participating in hospital rotations where shifts can be long which would leave less time for social events where binge drinking could occur. Underreporting of binge drinking behavior in both student groups may also explain the differences between the groups and the differences when these results are compared to other studies.

Experience with drug use (i.e. marijuana, cocaine, heroin, ecstasy, PCP) in both MS1 and MS4 groups was consistent with Croen's findings (Croen, L. G., Woesner, M., Herman, M. et al., 1997) where the current study found that 40.4% of MS1s and 46.4% of MS4s reported ever using illicit drugs. Interestingly, the prevalence of ever using illicit drugs for the medical students in this sample is higher than the estimated prevalence in undergraduate American college students (35%) (Johnston, L. D., O'Malley, P. M., Bachman, J. G. et al., 2009).

It is unclear whether the current estimates of drinking and drug use behavior found in this study truly reflect the prevalence of these behaviors in American medical

students due to the lack of specific and current research on this subject in the United States. This study was also limited to one medical school where students could potentially differ from the general population of American medical students. However, it was interesting to find that a sizeable proportion of the medical students in this sample reported alcohol and drug use behaviors. Furthermore, some of the reported behaviors were classified at abnormal levels of consumption. For example, approximately 29% of MS1s and 22% of MS4s who responded to the question "How often do you use drugs?" (n=38 and n=41) reported current use of illicit substances (at least once a year). Drinking levels were also found to be high in approximately 14% of MS1s and 4% of MS4s who met the criteria for binge drinking. The potential implications of these results are serious. Students' over use of alcohol and illicit drugs could affect their academic performance and their clinical competency. It is unclear however, from the results of this study when the students were engaging in these activities and if their use was during academic or clinical hours.

It is also interesting to note that medical students are generally considered to be the most successful students of their undergraduate college classes. The students identified in this study as binge drinkers or current users of illicit drugs may have been able to maintain their drinking and drug use while remaining academically successful both in college and in medical school. However, academic performance was not measured in this study and conclusions cannot be drawn from the results regarding students' performance in medical school.

B. Attitudes and Drinking and Drug Use Behaviors

An interesting finding of this study was that students who were classified as binge drinkers had comparatively more positive attitudes toward patients with AOD disorders than those who were not classified as binge drinkers. This association was consistent with the study's second hypothesis which was that medical students with substance use (alcohol) experience would have different attitudes than students without this experience. However, the sample size of binge drinkers was small (n=16) and the estimated difference may not be robust. Sensitivity analyses using frequency of drunkenness did not reveal any significant association.

Drug use was also not found to be a significant predictor of attitudes in this sample of medical students. These results negate this study's second hypothesis that students who have experience with drugs and alcohol would have different attitudes toward patients with AOD disorders when compared to students who do not have these experiences. A possible reason for not finding a difference in attitudes toward patients with AOD disorders between students with drug use experience and those without may be that drug use as a personal characteristic does not contribute to the prediction of attitudes. Another possible explanation may be that medical students who use drugs have similar perception of patients with AOD disorders as students who do not use drugs.

C. Comparing Attitudes between MS1s and MS4s

In this study it was found that female MS4s had significantly lower mean attitude scores than female MS1s indicating that female MS4s had more negative attitudes toward patients with AOD disorders while there were no significant differences between the two male students groups. This finding is consistent with the third hypothesis of this study

where it was predicted that MS1 and MS4 attitudes would differ regarding patients with AOD disorders.

There are numerous potential explanations for the observed attitude difference between female MS4s and MS1s. One possible explanation may be that medical student distress, particularly in females, is a contributing factor to the negative attitudes found in this study. Distress includes stress, depression, and burnout (Dyrbye, L.N., Thomas, M.R. & Shanafelt, T.D., 2005). Interestingly, higher prevalence of distress has been identified among female medical students (Dyrbye, L.N., Thomas, M.R. & Shanafelt, T.D., 2006). However, the effect of distress on medical student attitudes towards patients is severely under-studied, though some research exists regarding how *specific components* of distress may contribute to negative attitudes. In a study conducted by Griffith and Wilson (2003) it was found that the attitudes of internists towards certain patient groups became significantly more negative in parallel to their significantly decreased scores of idealism (a sign of burnout which is a component of distress) as they progressed through their internship (Griffith, C. & Wilson, J., 2003). For example, Griffith reported that in the second year of their internships, internists believed that a significantly larger proportion of patients with chronic pain were drug seekers as compared to the proportion they reported in their first year of internship (Griffith, C. & Wilson, J., 2003). It is suggested from Griffith's study that certain components of distress such as burnout may contribute to the increasingly more negative attitudes of medical professionals. The relationship found by Griffith, however, was for both genders and not specified for female professionals. Therefore further investigation of burnout and attitudes toward patients is needed.

Another possible contributor to the female MS4's more negative attitudes could be that they had more frequent and more negative experiences with patients with AOD disorders in their clinical training years. Yet another potential contributor to female MS4's more negative attitudes could be that female students may be overly idealistic when first entering medical school regarding their ability as a physician to make positive changes in patients' lives. In this study this may be reflected in the more positive attitudes of MS1 females toward patients with AOD disorders when compared to the attitudes of their male counterparts (mean attitude score of 4.52 for female MS1s and 4.43 for male MS1s), though this difference was not significant (t= -0.68, p-value=0.50). After their experiences in clinical rotations where they encounter death and suffering and significant challenges with patient care they may become discouraged which could contribute to their significantly more negative attitudes toward patients with AOD disorders.

The Theory of Planned Behavior can be used as a framework to understand the effect of female MS4s' negative attitudes on their future clinical decision-making such as their use of screening and brief intervention with patients with AOD disorders. The negative change in attitudes toward patients with AOD disorders may contribute to the existing *behavioral attitudes* that a female student has which further propagates the *subjective norms* that the student is exposed to through her peers and mentors. The female students' possible experiences with AOD abusing patients may also contribute to their waning *perceived behavioral control* in intervening or helping with this patient group. The sum of these occurrences could lead to the students' disinterest and hesitance in screening or intervening with patients presenting with an AOD disorder. It should be stressed that negative attitudes may not necessarily predict behavior and that the TPB is

only a theoretical concept that helps to model the *potential* effect of female MS4 attitudes on clinical decision-making.

The results of this current study must be cautiously interpreted. However, the changes in female medical students' orientation to patients with AOD disorders (and potentially other difficult patient groups) should be examined further to determine if educational interventions to both support students and to develop their empathetic capacity throughout their medical school experience are required.

D. Strengths and Limitations

Although this study posits interesting relationships regarding medical student attitudes towards patients with AOD disorders and their own personal use of alcohol and drugs and their specialty choice there are significant limitations. A fundamental limitation to this study was the use and application of Silin and colleagues' adapted AAPPQ questionnaire for medical students. Although the AAPPQ had been used previously on various groups of medical professionals, to the author's knowledge the modified AAPPQ's application to medical students was only done in Australia. Australia as a country may have a different emphasis or approach to substance abuse in medical student training than the United States, therefore Australian medical students could have different attitudes toward patients with AOD disorders. However, regardless of the potential cultural differences in attitudes of Australian medical students the Cronbach's alpha for construct validity was exceptional for the modified AAPPQ used in this study with American medical students indicating that the questions in the general attitude construct of the $AAPPQ_m$ held together well and were measuring the same concept.

A second limitation to this study is that the modified AAPPQ was not a validated survey tool to measure medical students' attitudes toward patients with substance abuse disorders. The original AAPPQ had been validated by the author with use in a population of alcohol counselors (Cartwright, A. K., 1979). Furthermore, the modified AAPPQ contained additional questions that were not part of the original and validated measure.

A third limitation to this study was the classification of binge drinking. Binge drinking is defined by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) as "consuming 5 or more drinks (male), or 4 or more drinks (female), in about 2 hours" (NIAAA, 2004). In using the Harvard School of Public Health College Alcohol Study questionnaire by Wechsler (2004), accurate classification of binge drinking based on the NIAAA definition was not possible due to the wording of the questions; questions used in this study asked only about the number of drinks consumed in "one sitting" without specification of how one sitting was defined. Therefore due to the ambiguity of the question "one sitting" could have measured a 5-hour period and not a 2-hour period in which a student drank 4 or more or 5 or more drinks. This is a case of non-differential misclassification in that the chance of classifying an individual as a binge drinker who was truly not a binge drinker is random as is the chance of classifying an individual who is truly a binge drinker as a non-binge drinker. In theory, this non-differential misclassification would bias the results of the study toward the null hypothesis which would depress the magnitude of the association between binge drinking and attitudes. Therefore, it is possible that the true affect of binge drinking on attitudes toward patients with AOD disorders is larger than what was found in this analysis.

Misclassification of medical practice type is also a potential limitation. The division of primary and specialty care practices may not be accurate. Some research categorizes emergency care as a specialty practice (Hojat, M. & Zuckerman, M., 2008) whereas in this study emergency care was considered a primary care medical practice. In the combined sample 11.7% (n=23) students indicated emergency medicine as their expected medical practice. However, grouping emergency medicine into the specialty practice group yielded similar results in the models.

Reporting bias (social desirability bias) is also a potential limitation of this study. Fear of disclosure of such personal and potentially damaging information may have led students to be apprehensive about their reporting of drug use and consumption of alcohol. Specific study design features were implemented to reduce the magnitude of reporting bias. One such design feature was making the survey anonymous. Another action taken to reduce reporting bias was the author administering the survey as opposed to medical school administrators.

The generalizeability of this study's results is also limited. The data obtained for this study included students from a single medical school. The results of the study could therefore represent a cohort effect where the relationships observed may be unique to the MS1 and MS4 groups in this sample. The difference found between female MS1s and MS4s may also be the result of a cohort effect. It is also possible that there is a geographic difference between medical schools. For example, approximately 70% of OHSU's current MS1 class are Oregon residents, and may differ from students in other states. The attitudes of Oregonians toward individuals with AOD disorders, given the

large number of social programs that Oregon provides may be different when compared to other medical student groups from different states.

Finally, the results of this study do not represent a causal relationship due to the cross-sectional design where temporality was not accounted for in the single time point measurement of medical students' attitudes.

E. Future Research

The results of this research have brought to the surface additional questions which require further investigation. First and foremost would be to investigate the potential contributors to female medical student attitudes using a longitudinal study design.

Future analyses using data collected by this thesis project should also be considered. For example, within the scope of this thesis the general attitude construct was the only outcome considered while the remaining 5 constructs (role legitimacy, motivation, confidence, medical etiology, and psychosocial etiology) were not investigated. In other studies using the AAPPQ, attitude was measured by considering all of the constructs available in this questionnaire (general attitude, role legitimacy, motivation, and confidence). It would be interesting to calculate a total mean score across all constructs and observe how the predictor variables used in this project (medical practice type, year in medical school, and drug/alcohol use) influence attitudes toward substance abusing patients. An expansion of the current study would also involve an investigation into the perception of addiction etiology and how attitudes affect this perception.

Further expansion on the ideas investigated in this thesis would be to administer the questionnaire to a larger, more diverse population of medical students attending

different medical schools throughout the U.S. Conducting a larger scale study such as this would enable more precise measurement of attitudes not only because the sample size would be larger but also because differences between medical schools could be measured. For example, teaching philosophies and age distribution of students could be measured and found to be different across medical schools. These differences may influence the attitudes of medical students and elucidating this would allow for more targeted educational intervention into improving students' attitudes toward patients who abuse substances.

An equally interesting question to investigate in the future would be the relationship between attitudes toward substance abusing patients, and the empathetic capacity of medical students. A study such as this could combine the questionnaire used by the current study with a tool that measures medical student and physician empathy. The impact of attitudes on physician clinical decision-making such as their screening for alcohol and drug abuse should also be studied further as well as environmental variables such as students' experience with substance abuse within their family or social circle.

VII. Summary and Conclusions

The results of this study revealed that a small number of medical students currently engage in potentially harmful drinking and illicit drug use behaviors. This finding is potentially concerning given that medical students will gain significant responsibilities as physicians regarding the care of their patients. It is important that the physician is both mentally and physically healthy if he/she is expected to care for sick individuals.

This study failed to produce supporting evidence for the first hypothesis that medical student attitudes toward patients with AOD disorders would differ between students choosing primary care practices and those choosing specialty care practices. However, this study did find that binge drinking behavior was significantly associated with more positive attitudes toward patients with AOD disorders. This finding supports the second hypothesis of the study where it was predicted that students with alcohol or drug use experience would have different attitudes toward patients with AOD disorders than students without experience with alcohol or drug use.

This study also found that female MS4s had significantly more negative attitudes toward AOD patients than their MS1 counterparts which supports the third hypothesis that medical student attitudes would differ between the first- and fourth-year classes. This difference in attitudes between female MS4s and MS1s indicates that further research is needed to discern what experiences or personal characteristics of female medical students may contribute to MS4s having more negative attitudes.

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IX. Appendix A

I. Sample Questionnaire

Oregon Health & Science University
IRB Study #5612

ID # 0000

This survey is anonymous and the information you provide will not be linked to your name or any other identifying information. If you have any questions or concerns about this survey, please contact MPH student, Allison Buti by campus phone at 503.418.8046 or by email at butia@ohsu.edu.

Thank you very much for participating in this survey!!!

Part I. Please circle your response to the following statements with 1 being strongly disagree and 6 being strongly agree:

	Strongly Disagree	**Disagree**	**Somewhat Disagree**	**Somewhat Agree**	**Agree**	**Strongly Agree**
1. I feel I am able to appropriately advise my patients about drinking and its effects.	1	2	3	4	5	6
2. Pessimism is the most realistic attitude to take towards problem drinkers.	1	2	3	4	5	6
3. I feel I have the right to ask patients questions about their drinking.	1	2	3	4	5	6
4. I feel that my patients believe I have the right to ask them questions about their drinking.	1	2	3	4	5	6
5. In general, it is rewarding to work with patients who are problem drinkers.	1	2	3	4	5	6
6. The medical practitioner has a responsibility to offer advice in the case of patients with alcohol problems.	1	2	3	4	5	6
7. In general, I don't like problem drinkers.	1	2	3	4	5	6

8. I am interested in the nature of alcohol related problems and the responses that doctors can make to them.	1	2	3	4	5	6
9. My graduate medical education to date has prepared me to recognize my limitations in the diagnosis of alcohol problems.	1	2	3	4	5	6
10. I can't understand why problem drinkers keep drinking.	1	2	3	4	5	6
11. I feel that the best I can personally offer problem drinkers is referral to someone else.	1	2	3	4	5	6

	Strongly Disagree	**Disagree**	**Somewhat Disagree**	**Somewhat Agree**	**Agree**	**Strongly Agree**
12. I believe I would often feel uncomfortable when working with problem drinkers.	1	2	3	4	5	6
13. I would be likely to refer a drinker to a self-help group, such as Alcoholics Anonymous.	1	2	3	4	5	6
14. The only viable treatment goal for problem drinkers is abstinence.	1	2	3	4	5	6
15. Advice on drinking is only likely to work with well-educated people.	1	2	3	4	5	6
16. Intervention for a person with an alcohol problem is rarely successful.	1	2	3	4	5	6
17. I feel that methadone treatment is merely supplying drugs to drug addicts.	1	2	3	4	5	6
18. A drug use history is unlikely to be useful, as patients will generally try to hide their drug use.	1	2	3	4	5	6
19. I feel I am able to	1	2	3	4	5	6

appropriately advise patients about heroin and its effects.						
20. In general, I don't like heroin addicts.	1	2	3	4	5	6
21. I am interested in the nature of opiate related problems and the responses that can be made to them.	1	2	3	4	5	6
22. I can't understand why heroin addicts continue to use heroin.	1	2	3	4	5	6
23. I believe I would often feel uncomfortable when working with heroin addicts.	1	2	3	4	5	6
24. Intervention for a person with a heroin problem is rarely successful.	1	2	3	4	5	6
25. The medical practitioner has the responsibility to offer advice in the case of patients with heroin problems.	1	2	3	4	5	6
26. Advising a person to cease smoking is inappropriate, as the community is sufficiently aware of the risks of smoking.	1	2	3	4	5	6
27. In general, I don't like smokers.	1	2	3	4	5	6
28. I am interested in the nature of tobacco related problems and the responses that doctors can make to them.	1	2	3	4	5	6
29. I can't understand why smokers don't quit.	1	2	3	4	5	6

	Strongly Disagree	**Disagree**	**Somewhat Disagree**	**Somewhat Agree**	**Agree**	**Strongly Agree**
30. I believe I would often feel uncomfortable when working with smokers.	1	2	3	4	5	6
31. Intervention for a person with a tobacco problem is	1	2	3	4	5	6

rarely successful.						
32. The medical practitioner has a responsibility to offer advice in the case of patients with tobacco problems.	1	2	3	4	5	6
33. A patient who is dependent on opiates and sustains an injury should be given more than the normal quantity of pain relief.	1	2	3	4	5	6
34. A person who seeks opiates to support an addiction should be refused treatment.	1	2	3	4	5	6
35. I couldn't imagine working with patients with drug and alcohol problems as a career.	1	2	3	4	5	6
36. A drug and alcohol history should be one of a doctor's regular diagnostic tools.	1	2	3	4	5	6
37. It is part of my job to help people who cannot cope.	1	2	3	4	5	6
38. Every alcoholic and addict must accept that he or she is powerless over alcohol and drugs, and can never drink or use drugs again.	1	2	3	4	5	6
39. Every alcoholic or addict is one drink or one hit away from total relapse.	1	2	3	4	5	6
40. The society or culture in which one grows up has a significant influence on whether or not one becomes an alcoholic or an addict.	1	2	3	4	5	6
41. People can be born alcoholics or drug addicts.	1	2	3	4	5	6
42. A person's environment plays an important role in determining whether he or she develops alcoholism or drug addiction.	1	2	3	4	5	6
43. Once a person is an alcoholic or an addict, he or she will always be an alcoholic or an addict.	1	2	3	4	5	6

44. Alcoholism and drug addiction are caused, in part, by growing up in a dysfunctional family.	1	2	3	4	5	6
45. If an alcoholic or addict is sober or straight for five years, then starts drinking or using drugs again, he or she is right back where he or she left off in the development of the disease.	1	2	3	4	5	6

	Strongly Disagree	**Disagree**	**Somewhat Disagree**	**Somewhat Agree**	**Agree**	**Strongly Agree**
46. Alcoholism and drug addiction are caused, in part, by what one learns about alcohol and drugs and the drinking/drug use patterns of one's family and peers.	1	2	3	4	5	6
47. A person can develop alcoholism or drug addiction because of underlying psychological problems.	1	2	3	4	5	6
48. There are only two possibilities for an alcoholic or drug addict – permanent abstinence or death.	1	2	3	4	5	6
49. If an alcoholic has a drink, or if an addict takes a hit, they lose control and are unable to stop from getting drunk or high.	1	2	3	4	5	6

Part II. Please answer the following questions about yourself:

1. What is your age? _____

2. What is your gender? O Male O Female

3. What ethnicity do you identify with most?

O Hispanic O Black

O American Indian/ Alaska Native O Asian

O White non-Hispanic O Pacific Islander

O Multiracial/ethnic O Other (please specify): _____

4. Are you an international medical student? O Yes O No

5. What year in school are you? O First-year O Fourth-year

6. What area of medical practice are you planning on going into? Please select your top choice.

O Family Practice O Internal Medicine

O OB/GYN O General Practice

O Pathology O Pediatrics

O Neurology O Emergency Medicine

O Psychiatry O Pulmonology

O Surgery O Oncology

O Other (please specify): _____

O Aren't sure…

7. Do you smoke? O Yes O No

If "yes", how much? O 1-5 cigarettes/day O 6-20 cigarettes/day O more than 20 cigarettes/day

8. When did you last have a drink (that is more than just a few sips)? (Exclude use in religious ceremonies)

O I have never had a drink

O not in the past year

O more than 30 days ago, but less than a year ago

O more than a week ago, but less than 30 days ago

O within the last week

9. On how many occasions have you had a drink of alcohol in the past 30 days?

O Zero

O 1-2 occasions O 10-19 occasions

O 3-5 occasions O 20-39 occasions

O 6-9 occasions O 40 or more occasions

10. In the past 30 days on those occasions when you drank alcohol, how many drinks did you usually have? **(Please consider 1 drink as one 12 ounce can or bottle of beer, one 5 ounce glass of wine, one 12 ounce bottle of wine cooler or 1 ½ ounce liquor straight or in a mixed drink)**

O 1 drink O 6 drinks

O 2 drinks O 7 drinks

O 3 drinks O 8 drinks

O 4 drinks O 9 or more drinks

O 5 drinks O Not applicable

11. In the past 30 days, how often did you drink enough to get drunk? (By drunk we mean unsteady, dizzy or sick to your stomach.)

O Never

O 1-2 occasions O 10-19 occasions

O 3-5 occasions O 20-39 occasions

O 6-9 occasions O 40 or more occasions

12. Have you ever used a recreational drug such as marijuana, cocaine, heroin, ecstasy, PCP, etc.?

O Yes O No

If "yes", how often? O daily O weekly O monthly O yearly O I used to…

THANK YOU FOR PARTICIPATING IN THIS SURVEY!!!

KEEP YOUR EYES ON YOUR E-MAIL BECAUSE YOU MAY BE THE WINNER OF THE $100 VISA GIFT CARD RAFFLE.

II. Methods Tables

Table 10

Construct items.

Construct	Item Statement
General Attitude	Pessimism is the most realistic attitude to take towards problem drinkers.
	In general, it is rewarding to work with patients who are problem drinkers.
	In general, I don't like problem drinkers.
	I can't understand why problem drinkers keep drinking.
	I believe I would often feel uncomfortable when working with problem drinkers.
	The only viable treatment goal for problem drinkers is abstinence.
	Advice on drinking is only likely to work with well-educated people.
	Intervention for a person with an alcohol problem is rarely successful.
	I feel that methadone treatment is merely supplying drugs to drug addicts.
	In general, I don't like heroin addicts.
	I can't understand why heroin addicts continue to use heroin.
	I believe I would often feel uncomfortable when working with heroin addicts.
	Intervention for a person with a heroin problem is rarely successful.
	In general, I don't like smokers.
	I can't understand why smokers don't quit.
	I believe I would often feel uncomfortable when working with smokers.
	Intervention for a person with a tobacco problem is rarely successful.
	A person who seeks opiates to support an addiction should be refused treatment.

Construct	Item Statement
Confidence	I feel I am able to appropriately advise my patients about drinking and its effects.
	I feel I have the right to ask patients questions about their drinking.
	I feel that my patients believe I have the right to ask them questions about their drinking.
	My graduate medical education to date has prepared me to recognize my limitations in the diagnosis of alcohol problems.
	I feel that the best I can personally offer problem drinkers is referral to someone else.
	I would be likely to refer a drinker to a self-help group, such as Alcoholics Anonymous.
	I feel I am able to appropriately advise patients about heroin and its effects.
Motivation	I am interested in the nature of alcohol related problems and the responses that doctors can make to them.
	A drug use history is unlikely to be useful, as patients will generally try to hide their drug use.
	I am interested in the nature of opiate related problems and the responses that can be made to them.
	Advising a person to cease smoking is inappropriate, as the community is sufficiently aware of the risks of smoking.
	I am interested in the nature of tobacco related problems and the responses that doctors can make to them.
	I couldn't imagine working with patients with drug and alcohol problems as a career.
Role Legitimacy	The medical practitioner has a responsibility to offer advice in the case of patients with alcohol problems.
	The medical practitioner has the responsibility to offer advice in the case of patients with heroin problems.
	The medical practitioner has a responsibility to offer advice in the case of patients with tobacco problems.
	A drug and alcohol history should be one of a doctor's regular diagnostic tools.
	It is part of my job to help people who cannot cope.

Construct	Item Statement
Medical Model Etiology	Every alcoholic and addict must accept that he or she is powerless over alcohol and drugs, and can never drink or use drugs again.
	Every alcoholic or addict is one drink or one hit away from total relapse.
	People can be born alcoholics or drug addicts.
	Once a person is an alcoholic or an addict, he or she will always be an alcoholic or an addict.
	If an alcoholic or addict is sober or straight for five years, then starts drinking or using drugs again, he or she is right back where he or she left off in the development of the disease.
	There are only two possibilities for an alcoholic or drug addict – permanent abstinence or death.
	If an alcoholic has a drink, or if an addict takes a hit, they lose control and are unable to stop from getting drunk or high.
Psychosocial Model Etiology	The society or culture in which one grows up has a significant influence on whether or not one becomes an alcoholic or an addict.
	A person's environment plays an important role in determining whether he or she develops alcoholism or drug addiction.
	Alcoholism and drug addiction are caused, in part, by growing up in a dysfunctional family.
	Alcoholism and drug addiction are caused, in part, by what one learns about alcohol and drugs and the drinking/drug use patterns of one's family and peers.
	A person can develop alcoholism or drug addiction because of underlying psychological problems.

*The general attitude construct was the primary focus of the current thesis project.

Table 11

Construct items with reversed scales.

	Item Number	Item Statement
Attitude	2	Pessimism is the most realistic attitude to take towards problem drinkers.
Attitude	7	In general, I don't like problem drinkers.
Attitude	10	I can't understand why problem drinkers keep drinking.
Attitude	12	I believe I would often feel uncomfortable when working with problem drinkers.
Attitude	14	The only viable treatment goal for problem drinkers is abstinence.
Attitude	15	Advice on drinking is only likely to work with well-educated people.
Attitude	16	Intervention for a person with an alcohol problem is rarely successful.
Attitude	17	I feel that methadone treatment is merely supplying drugs to drug addicts.
Motivation	18	A drug use history is unlikely to be useful, as patients will generally try to hide their drug use.
Attitude	20	In general, I don't like heroin addicts.
Attitude	22	I can't understand why heroin addicts continue to use heroin.
Attitude	23	I believe I would often feel uncomfortable when working with heroin addicts.
Attitude	24	Intervention for a person with a heroin problem is rarely successful.
Motivation	26	Advising a person to cease smoking is inappropriate, as the community is sufficiently aware of the risks of smoking.
Attitude	27	In general, I don't like smokers.
Attitude	29	I can't understand why smokers don't quit.
Attitude	30	I believe I would often feel uncomfortable when working with smokers.
Attitude	31	Intervention for a person with a tobacco problem is rarely successful.
Attitude	34	A person who seeks opiates to support an addiction should be refused treatment.
Motivation	35	I couldn't imagine working with patients with drug and alcohol problems as a career.

*Reversed scale: 1=Strongly agree, 2=Agree, 3=Somewhat agree, 4=Somewhat disagree, 5=Disagree, 6=Strongly disagree.

III. Results Tables

Table 12

Item analysis results: General attitude construct.

Item # and Description	α if Item Deleted
***Attitude* (α = 0.85)**	
(2) Pessimism is the most realistic attitude to take towards problem drinkers.	0.84
(5) In general, it is rewarding to work with patients who are problem drinkers.	0.88
(7) In general, I don't like problem drinkers.	0.84
(10) I can't understand why problem drinkers keep drinking.	0.84
(12) I believe I would often feel uncomfortable when working with problem drinkers.	0.84
(14) The only viable treatment goal for problem drinkers is abstinence.	0.86
(15) Advice on drinking is only likely to work with well-educated people.	0.84
(16) Intervention for a person with an alcohol problem is rarely successful.	0.84
(17) I feel that methadone treatment is merely supplying drugs to drug addicts.	0.84
(20) In general, I don't like heroin addicts.	0.84
(22) I can't understand why heroin addicts continue to use heroin.	0.84
(23) I believe I would often feel uncomfortable when working with heroin addicts.	0.84
(24) Intervention for a person with a heroin problem is rarely successful.	0.84
(27) In general, I don't like smokers.	0.84
(29) I can't understand why smokers don't quit.	0.84
(30) I believe I would often feel uncomfortable when working with smokers.	0.84
(31) Intervention for a person with a tobacco problem is rarely successful.	0.84
(34) A person who seeks opiates to support an addiction should be refused treatment.	0.85