

**GENDER-DIFFERENCES IN REPORTS ABOUT ATTITUDES/BELIEFS ABOUT
AVOIDING ALCOHOL USE AND RECEIPT OF SCREENING BY A HEALTHCARE
TEAM MEMBER AMONG ADOLESCENTS WITH CHRONIC MEDICAL
CONDITIONS**

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Abstract

Adolescent risk-taking is well researched for youth without chronic medical conditions, but very little is known about its effects on youth with chronic medical conditions. Youth with chronic medical conditions who consume alcohol also expose themselves to behaviors and lifestyle factors that may worsen their health. In order to better inform prevention and intervention strategies, we must provide clinicians with a better understanding if gender differences exists in regard to attitudes/beliefs within a chronically ill population, particularly in regards to abstaining from substance use. Moreover, to identify whether there are gender differences in self-reporting of clinical screening. For the purposes of secondary analysis, the study used a census of 260 adolescents. Participants came from one of the following sites: Asthma, Endocrine, Gastroenterology, Rheumatology, or Pulmonary. Measures were used to assess adolescents with chronic illness's attitudes/beliefs about select reasons to abstain from drinking, and their self-report of receiving clinical guidance.

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Gender-Differences in Reports of Attitudes and Beliefs Concerning Avoiding Alcohol Use and Receipt of Screening by a Healthcare Team Member Among Adolescents with Chronic Medical Conditions

The developmental period of adolescence occurs between the ages of 12 and 18. During this time, youth typically experience biological, psychological, and social changes (Irwin & Millstein, 1986). For the purposes of this paper, the terms adolescent and youth are used interchangeably when referring to individuals between the ages of 12 and 18. It is well known that adolescents engage in risk-taking behaviors partly because of their felt sense of invulnerability to injury, harm, and danger (Elkind, 1967; Lapsley & Murphy, 1985). According to David Elkind's Theory of Adolescence, this is a period when adolescents experience a state of egocentrism. Adolescent egocentrism encourages an over-differentiation of feelings that contributes to the sense of uniqueness and "immortality" (Elkind, 1967). This sense of immortality, in turn, disposes adolescents to believe in a personal fable that harmful outcomes are more likely for others than for the self. For example, and as Elkind (1967) states, "many young girls become pregnant because, in part at least, their personal fable convinces them that pregnancy will happen to others but never to them" (Elkind, 1967).

Literature demonstrates that this period is particularly difficult for typically developing healthy adolescents. However, when healthy adolescents are compared to chronically ill peers, the observed developmental challenges are even more pronounced. These changes often produce disease-specific challenges related to disease management. When children enter adolescence, their parents are largely responsible for their disease management. By contrast, at the end of adolescence, the adolescent is largely responsible for his or her own health. Therefore, an additional challenge for chronically ill youth is the transfer of the responsibility for care from a

caretaker to the youth. Approximately 12% of the global population of adolescents are diagnosed with a chronic medical condition (Center for Disease Control, 2015). The figure for the United States alone is 25%.

Research provides evidence of gender-specific differences during adolescent development. These include differences in brain maturation, values and belief systems, and in the individuals that inhabit his or her social environment (Brook-Gunn, 1988; Schann et al., 1994). However, there is a knowledge gap concerning gender difference in chronically ill adolescents. The literature typically suggests that females biologically develop into maturity at a greater speed than males (Bolland et al., 2016). For example, a developing 16-year-old female has reached the final stages of puberty, whereas developing males at the same age have not. In addition, the maturation of a typical developing female's brain has been observed to occur at a faster rate than that of a typical developing male. Therefore, typical females have greater physical and cognitive maturity than typical males of the same age. Specifically, cognitive maturity contributes to an individual's development of moral reasoning—the source of an individual's morals and values—at an earlier stage in life. The literature has provided evidence that an adolescent's morals and values contribute to their engagement in or abstinence from risk-taking behaviors. A theoretical model to guide an understanding of adolescent risk-taking is “the biopsychosocial model of risk-taking” (Irwin & Millstein, 1986). This model of risk-taking provides a framework for posing questions about how adolescents take risks given the biological, psychological, and social-environmental factors specific to a given individual.

For the purposes of this secondary analysis, I focus on a list of experiences a chronically ill adolescent may endorse in order to abstain from drinking alcohol: losing control while drunk, disappointing parents, disappointing their doctor, causing their friends to think poorly of them,

and getting in trouble. Participants were asked if they would prefer to refrain from using alcohol based on the above statements. Participants' answers were based on a numeric value (i.e. whether they felt these reasons are very/somewhat important or not important enough to abstain from alcohol use). Research has shown that these values and beliefs are defined as moral reasoning and ultimately affect an individual's ability to make decisions, as well as generate potential long-term consequences. For example, both males and females lack the full ability to think abstractly about future outcomes, as this area of the brain does not fully mature until adulthood (Forbes & Dahl, 2010). Furthermore, social and environmental factors largely affect morals and values. Individuals within the social environment can include but are not limited to family members, friends, health care team members, teachers, coaches, and religious leaders (Irwin & Millstein, 1986).

Given that puberty and brain maturation (such as cognitive abilities) are primarily biologically determined, a large part of psychological and social development depends on social-environmental influences. Therefore, social-environmental factors ultimately affect how healthy adolescents and their chronically ill peers engage in decision-making. One of the most challenging aspects of adolescent decision-making is whether to engage in risk-taking behaviors (Furby & Beyth-Marom, 1992; Harden & Tucker-Drob, 2011; Rivara, Park, & Irwin, 2009). The literature provides evidence that during adolescence, most morbidity and mortality are the results of engaging in risk-taking behaviors such as smoking, substance use/abuse (including alcohol consumption), physical inactivity, risky sexual behavior, and driving. While co-occurrence of risk behaviors is common in adolescents, the most common risk-taking behavior is engaging in substance use, specifically alcohol (Forbes & Dahl, 2010). Adolescent alcohol use is associated with the top four leading causes of morbidity and mortality among teens.

It is important to understand the effects of substance use on the brain and its development. For example, adolescents with an extensive history of alcohol and/or marijuana abuse have a smaller hippocampus, the area of the brain that converts information to memory. Thus, brain activity decreases when performing memory tasks (Jessor & Jessor, 1977). Furthermore, alcohol use in adolescence affects the sleep cycle, resulting in impaired learning and disrupting the release of the hormones required for growth and maturation. Moreover, it affects coordination, emotional control, decision-making, and speech (Ozer & Irwin, 2009).

Adolescent risk-taking is well researched for youth without chronic medical conditions, but little is known about its effects on youth with chronic medical conditions. There is a current gap in literature concerning two issues: 1) identify if gender differences exist in reports of select attitudes and beliefs about avoiding alcohol use, among youth with chronic medical conditions; and (2) examine gender differences in participants' self-reporting of being screened by their physician or other healthcare team member in the previous year. Studies that do exist reveal that youth with chronic medical conditions who use alcohol face the same potential harms as their healthy peers (Weitzman et al., 2015). Engaging in substance abuse can affect medication(s), laboratory test(s), treatment adherence, self-care, and other underlying disease statuses for youth with chronic medical conditions (Torpy, Campbell, & Glass, 2010). Youth with chronic medical conditions who consume alcohol also expose themselves to behaviors and lifestyle factors that may worsen their health, including sleep deprivation, dietary deviation, secondhand smoke, and unplanned/unprotected sex. Literature shows that youth who drink alcohol are also more likely to smoke marijuana, which can lead to poor diet, airway inflammation, treatment/medication non-adherence, and impaired sleep (Torpy, Campbell, & Glass, 2010; Wisk & Weitzman, 2016).

To best deliver prevention and intervention messages to adolescents concerning alcohol use, researchers have developed screening tools that allow clinicians to quantify their adolescent patients' substance abuse and determine their belief system concerning alcohol use. These tools pave the way for better communication between physicians and patients, particularly about substance use behaviors. Moreover, these tools positively impact a clinician's ability to deliver the best prevention and/or intervention to his or her patients based on their individualized morals and values (Harris et al., 2014). There is a critical need to investigate this particularly vulnerable population of chronically ill adolescents concerning substance use, as this area of research is severely underdeveloped. There is a gap in the literature concerning two issues: (1) whether gender differences exist in reports of select attitudes and beliefs about avoiding alcohol use, among youth with chronic medical conditions; and (2) whether gender differences in participants' self-reporting of being screened by their physician or other healthcare team member in the previous year. Adolescents engaging in substance use are more likely to report consumption of alcohol, marijuana, and tobacco (Omori & Ingersoll, 2005; Svensson, 2003). However, according to a recent study, more adolescents drink alcohol than smoke cigarettes or use marijuana (Johnston et al., 2016). In the month before the study was conducted, more than, more than 3 out of 10 high school seniors reported drinking some alcohol and one in six had engaged in "binge drinking" daily in the previous 2 weeks. Drinking endangers adolescents in many ways, including motor vehicle crashes, the leading cause of death for this age group (Johnston et al., 2016).

The Biopsychosocial Model of Risk-Taking

The biopsychosocial model was developed and first introduced by psychiatrist George L. Engel, who called for the "need for a new model" (Engel, 1977). Engel developed this model to

encompass the *biomedical model*, which only took into consideration the biological factors (genetic, biochemical, etc.) that affect an individual. He argued (Engel, 1977) that the biopsychosocial model is a framework used to explore the biological, psychological, and social factors that influence one's behavior. The biopsychosocial model was further developed into the biopsychosocial model of risk-taking (Irwin & Millstein, 1986; Jessor & Jessor, 1977; Udry, 1988). Specifically, researchers wanted to understand how risk-taking behaviors impacted the biological, psychological, and social/environmental of development (Irwin & Millstein, 1986; Jessor & Jessor, 1977; Udry, 1988).

Application of the biopsychosocial model of risk-taking is particularly relevant when exploring the biopsychosocial developmental period of adolescence. The following biological factors have been identified as predisposing adolescents to risk taking behaviors gender, genetic predispositions, and hormonal influences. The psychological factors are: sensation seeking, risk perception, depression, and low self-esteem. The social factors are: parenting styles, parental modeling of risk behaviors, peer behaviors, and peer initiation of risk taking behaviors (Irwin & Ryan, 1989; Irwin & Millstein, 1986; Lakon & Hipp, 2014; Salvy et al., 2014).

The literature has previously supported this model by focusing on biological risk factors such as gender, genetic predisposing, and hormonal and cognitive influences (Brook-Gunn, 1988; Schann et al., 1994). In addition, the literature has also explored the psychological factors such as sensation seeking, risk perception, and self-esteem (Jessor & Jessor, 1977; Omori & Ingersoll, 2005). Lastly, evidence states that there are social and environmental factors such as attachment, parenting style/monitoring, peer influences, and socioeconomic status (Hughes et al., 1991; Svensson, 2003).

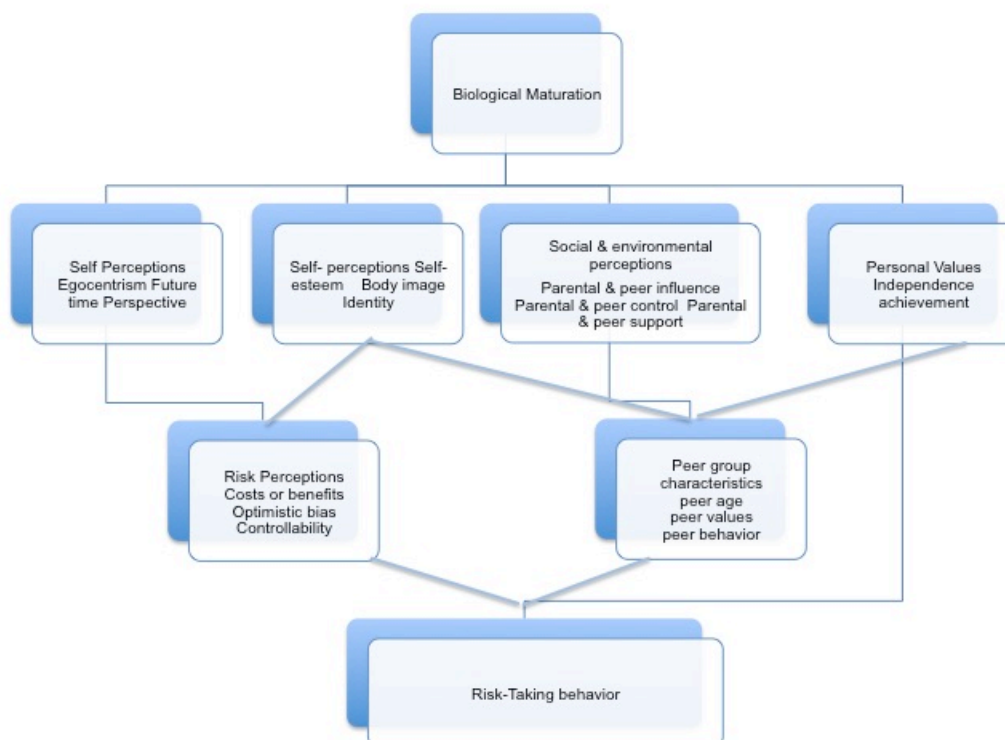


Figure 1. Biopsychosocial Model of Risk-taking behavior (Irwin & Millstein, 1986)

Biological Maturation in Adolescence

Adolescent development can be divided into three phases: early adolescence, middle adolescence, and late adolescence. Brain maturation in these periods affects how adolescents think and feel, and ultimately plays a role in risk-taking behaviors. For example, adolescents are less likely to perceive long-term consequences of their risks, and therefore engage in behaviors that can be fatal. During early adolescence, which occurs between the ages of 10 and 14 years, puberty heightens the desire for emotional reusability, sensation seeking, and reward orientation. Middle adolescence, which occurs between the ages of 15 and 19 years, is a period of heightened vulnerability to risk-taking and problems with managing risk-taking behaviors. Finally, late adolescence, which occurs between the ages of 20 and 24 years, is the period in which brain maturation facilitates regulatory competence (Ernst et al. 2004; Spear, 2000).

Brain development during adolescence primarily occurs in the frontal lobe, which is largely responsible for executive functions, planning, reasoning, and impulse control. This area of the brain is thought to support higher cognitive abilities, such as the bridging of temporal delays in memory (Diamond, 1991). In addition, adolescent development affects the hippocampus and hypothalamus (Forbes & Dahl, 2010). These brain regions are stressor-sensitive areas that form part of the neural circuitry modulating the motivational value of alcohol and other reinforcing stimuli (Spear, 2002). Another key factor is the limbic area of the brain, the site of its “reward system.” Drugs activate this system by inducing powerful feelings of pleasure that enhance the desire to use them (Ernst et al. 2004). For example, adolescents report feeling “high” when engaging in drug use. This often results in feelings of increased happiness, pleasure, and overall mood status.

Interestingly, MRI studies have shown correlations between activity in the socio-emotional reward system and preference for immediate over delayed rewards (McClure et al. 2004) and risky decision-making (Ernst et al. 2004). Furthermore, evidence from an experimental study using transcranial magnetic stimulation demonstrated increased risk-taking following disruption of activity in the right DLPFC, a region consistently implicated in studies of cognitive control (Forbes & Dahl, 2010). Investigations into the neural underpinnings of reward-related behavior in the brain shed light on the increased risk for problems related to reward processing. These reward-related brain regions are found in the dorsal and ventral striatum. In some cases, the effect of substance use on these regions of the brain can result in the following conditions: affective disorders, substance use disorders, and a broad range of physical and mental health problems.

A study by Erika et al. (2010) demonstrated gender differences based on testosterone levels. For example, testosterone was positively correlated with striatal reactivity in boys during reward anticipation, and negatively correlated with striatal reactivity in girls and boys during reward outcome. Therefore, the developmental effects during reward outcome suggest that pubertal development may be linked in particular to changes in the consumption or “liking” aspects of reward processing which suggest pleasure and are considered to have different neural underpinnings from the “wanting” aspects of reward processing (Berridge & Robinson, 2003; Berridge, Robinson, & Aldridge, 2009; Castro & Berridge, 2014; Flagel et al., 2011).

Biological changes, whether through neuroendocrine levels in brain maturation or other hormonal influences, greatly impact pubertal events taking place. In effect, biological maturation activates the psychological and social changes that occur in adolescence. Therefore, an understanding of psychological sensation-seeking behaviors, and the social environment

adolescents are surrounded by, likely sheds light on their ability to engage or not in risk-taking behaviors.

Within the biopsychosocial model of risk-taking, the biological component is particularly important for understanding biological differences in gender. Literature has shown that environmental factors also affect pubertal timing in females, including presence or absence of the father during childhood (Belsky, 2011; Deardorff et al., 2011). Interestingly, early pubertal maturation in males and females has been seen to correlate with adolescents engaging with older peers because of their advanced pubertal appearance and wish to engage in “adult” behaviors, such as smoking, drinking, and sexual intercourse (Brooks-Gunn, 1988). Research indicates that early maturing females are more likely to initiate sexual intercourse at younger ages (Phinney, Jensen, Olsen, & Cundick, 1990).

Risk-taking and Sensation-Seeking Behaviors for Adolescents

The biological components of risk-taking are not enough to understanding how adolescents take risks. Therefore, it is imperative to include psychological and social-environmental factors that impact the overall risk-taking model. Many psychological factors impact how adolescents engage in risk-taking/sensation-seeking behaviors. For example, the personality system houses adolescents’ values, expectations, beliefs, attitudes, and orientations toward self and society; these often affect how adolescents engage in risk-taking.

Regarding the personality system, we can now better understand adolescent attitudes and beliefs concerning abstaining or engaging in alcohol use. A gendered perspective of the ways the personality system is satisfied is important to understanding why males and females may take risks or seek sensation behaviors differently.

Few studies have examined adolescents' attitudes and beliefs regarding abstention from alcohol, although some research studies have examined alcohol consumptions as related to gender. For example, Pedersen and Krondal (1998) looked at predictors of alcohol consumption and found that parental norms strongly influenced females, but not males. In contrast, peer norms strongly influenced males, but not females. It is often seen in the literature that risk-taking is correlated with adolescents' desires for sensation seeking. These sensation-seeking behaviors often exacerbate an adolescent's ability to abstain from or engage in these risk-taking behaviors. Adolescent risk-taking can be seen largely as a sensation seeking behavior, as has been explored thoroughly by researchers. The literature has found six principal categories that impact how an individual approaches risk-taking behaviors: cognitive scope, perception of both self and social environment, personal values, risk perception, and characteristics of peer groups (Testa & Simonson, 1996; Loonen et al., 2002).

To understand these six categories, it is important to examine them more thoroughly. The cognitive scope of an adolescent lies in egocentrism—an individual's inability to differentiate between one's self and others. Adolescence appears to be a time for egocentrism (Rivara, Park, & Irwin, 2009). Moreover, an adolescent's ability to perceive the future is not yet fully developed, and this may affect his or her ability to make decisions regarding future events. Another category, self-perception, continues to grow and develop throughout an individual's lifetime. However, during adolescence, self-perception revolves around self-esteem, body image, self-reliance, tolerance, and identity, all of which are particularly good indicators of whether an adolescent engages in high- or low-risk behaviors. For example, youth with high self-esteem and a developed identity may be more likely to avoid risk-taking behaviors. Moreover, the perception of the social environment is important, and can be divided into parental and peer influence,

controls, and support (Furby & Beyth-Marom, 1992; Harden & Tucker-Drob, 2011; Rivara, Park, & Irwin, 2009).

Given what is known about adolescent development, it should be unsurprising that risk behaviors during adolescence are linked to high sensation-seeking and reward-seeking behaviors (Zuckerman, 2007). It is important to understand the role of sensation-seeking and engagement in risk activities on adolescent development, as this is a period that bears a heightened potential for risky behaviors (Steinberg, 2005). The developmental period of adolescence is transitional, during which refinements in cognitive, emotional, and social skills that facilitate exploration, novelty, and sensation-seeking behaviors are formed (Griffiths & Buller, 2000; Engstrom, 1992). Typically, a developing adolescent's transition to independence comes with many costs, often related to excessive risk-taking behaviors, such as substance use. This is because adolescence is a principal time for experimentation with risk-taking, drugs, and alcohol (Burke et al., 1989). Interestingly, the onset of substance abuse in adolescence is related to enhanced reward-seeking in combination with a relatively delayed maturation of cognitive control (Griffiths & Buller, 2000; Engstrom, 1992; Testa & Simonson, 1996; Loonen et al., 2002).

Risk-taking behavior can be defined through the evaluation of benefits and risks. Therefore, risk preference is a trade-off between perceived benefits and perceived risks (Weber & Hsee, 1998; Weber & Milliman, 1997). From a neurodevelopmental perspective, limbic-based bottom-up systems are distinguished by heightened reactivity to motivational stimuli, this system rewards rapidly from early adolescence. On the other hand, the prefrontal lobe functions as a top-down system, which enables more effective cognitive control. Due to the developmental period of adolescence—and where this judgment center is housed—adolescents clearly mature at a much slower rate than adults, thus impacting their judgment (Casey & Jones, 2010). This creates

a developmental mismatch, which is a key contributor to adolescents engaging in risk-taking behaviors.

Studies have provided evidence that there is a positive correlation between risk-taking behavior and expected benefit; while a negative correlation has been found between risk-taking and risk perception (Cohn, Macfarlane, Yanez, & Imai, 1995; Gerrard et al., 1996; Lavery, Siegel, Cousins, & Rubovits, 1993).

The Social Environment of Adolescent Risk-taking

A large body of literature has examined environmental risk factors for the early initiation of substance use, focusing primarily on the role of the proximal influence of parents and peers (Beal et al., 2001; Best et al., 2005; Johnson et al., 2002; O'Donnell et al., 2008). Research has shown that the positive influence of both peers and parents are vital to minimizing risk-taking throughout adolescence. The influence of parents and peers on adolescence engagement in risk-taking, and specifically alcohol consumption, is pivotal. The family environment and positive parenting practices further enforce the direct and indirect reduction of alcohol use. A positive family environment, such as having good parental monitoring and positive parent-child communication, reduces the potentially negative impact of peers on adolescents' drinking behavior. Specifically, a positive family environment is associated with a reduced number of peer friends who drink alcohol, and adolescents report less perceived approval from friends to drink alcohol. In addition, it improves adolescents' self-reporting of self-efficacy for refusing alcohol and decreases stress. Interestingly, it has been found that mothers and fathers contribute equally to a positive family environment. Moreover, findings show that the importance of family and peer relationships may also differ by gender. Peer relationships may be more important than

parental influence for females (Fang, Schinke, & Cole, 2009; Gunn & Smith, 2010) or for males (Piquero, Gover, McDonald, & Piquero, 2005).

When considering parental influence, it is also necessary to consider the impact of peer influence. Developmentally, adolescents may engage in problem behaviors with peers as learning processes occur primarily through social interactions (Bandura, 1997). Research on adolescent peer influence has shown that adolescents with alcohol-using peers are more likely to use alcohol than adolescents without friends who drink (Bahr, Hawks, and Wang, 1993; Donovan and Jessor, 1983; Fisher and Bauman 1988; Marcos, Bahr, and Johnson, 1986). Adolescents tend to overestimate the prevalence, acceptability of use, and availability of drugs within their peer groups. Teenagers understand descriptive norms by understanding the prevalence of alcohol consumption, whereas injunctive norms help adolescents understand perceptions of acceptability and approval (Fischhoff, 2008)

The peer influence process shows that same-sex friendship creates a pattern of mutual influence concerning abstaining from or engaging in substance use (Loewenstein et al., 2001). However, in mixed-sex friendships, gender plays an important process for peer influence and substance use. Research findings show that males are more likely to strongly influence females concerning drinking than females are to influence males in a mixed-sex friendship. An adolescent's personal view, such as interdependence, closely correlates with risk-taking behavior. Research shows that an adolescent's views of his or her personal value in terms of affection and achievement correlate with and serve as protective factors in minimizing risk-taking. Conversely, an adolescent who has diminished personal values is more prone to risk-taking behaviors (Rivara, Park, & Irwin, 2009).

Gender-Based Patterns of Substance Use Consumption for Healthy Adolescents

During the developmental period of adolescence, the earlier the initiation of substance use and the heavier the use of alcohol and drugs, there is a greater chance of lifetime substance use and alcohol problems (Zucker, 2006). The large body of research on adolescent substance consumption suggests that there are likely gender-specific reasons for the initiation of substance use. However, few studies have examined this, and therefore more research is needed to explore differences between drinking behaviors and outcomes among male and female adolescents (Chen & Jacobsen, 2012). Studies also suggest that patterns of adolescent alcohol use may differ by race/ethnicity and socioeconomic class (Chen, Yi, Williams, & Fade, 2009; Dauber, Houge, Paulson, & Leiferman, 2009).

Interestingly, one study showed that while both adolescent males and females believed that alcohol lowered inhibitions and caused relaxation, only adolescent females believed that alcohol increased confidence by removing inhibitions and providing an escape from problems (Globetti et al., 2000). A recent study found males and females who began drinking earlier than their peers drank more at age 12 than their counterparts who began to drink at a later age (Bolland et al., 2016). However, females who began drinking earlier than their peers drank more at age 12 than early initiating males. Although male adolescents tend to drink more than female adolescents, females who began to drink earlier tend to drink more than all male adolescents, from early adolescence beginning at age 12 through middle adolescence at age 17 (Bolland et al., 2016).

Male initiation of alcohol use aims to increase social bonding with other substance-using males (Newcomb et al., 1988), enhance a sense of self (Liu and Kaplan, 1996), and for sensation seeking and boredom relief (Wilson and Herrnstein, 1985). In contrast, female initiation of

alcohol use is seen to address emotional problems, including relationship difficulties, loss, tension, and depression. Such factors are more likely to stimulate substance use among females than external acceptance and personal assertion motivations prevalent among males (Liu and Kaplan, 1996; Robbins, 1989). Therefore, early initiation should not be viewed as experimentation, a term that suggests transient or random behavior, but rather as behavior that presages continued problematic drinking (Bolland et al., 2016). Adolescent males have been found to use alcohol to demonstrate their stamina, self-control, nonconformity, and willingness to take risks, thereby embodying masculinity through risky drinking behaviors (Peralta, 2007). Patterns of such masculinity in adolescent substance use and risk-taking have been observed among adolescents in the United States (Locke & Mahalik, 2005; Wilson, Pritchard, & Schaffer, 2004; Young, Morales, McCabe, Boyd, & D'Arcy, 2005). Therefore, one may hypothesize that males are less likely to hold attitudes and beliefs that will lead them to abstain from alcohol use.

Females, however, are often thought of as avoiding risky behaviors, often considered in the United States as focused on relationships and connections with others (Gilligan, 1982), as well as containing qualities of gentleness, affection, passivity, and dependence (Bem, 1974; Broverman, Broverman, Clarkson, Rosenkrantz, & Vogel, 1970; Naffin, 1985). Adolescent female college binge drinkers have been described as “doing” a form of masculinity (Young et al., 2005). Therefore, females may be more likely than males to abstain from drinking, for example, not engaging in binge drinking or playing drinking games, due to attitudes and beliefs that conform with the social constructs of femininity.

The literature indicates a gender gap in self-reported health. This gap may be due to different health attitudes across genders. Findings show that when females are compared to males, the largest gaps occur in the self-reporting of seeking care for milder morbidities, and

those involving more discretion in defining illness and/or the need for care (Hibbard and Pope, 1986). Therefore, the ways in which males and females perceive themselves as being ill or being at risk for developing an illness appear to be different.

Researchers have taken a close look at gender and practitioners' counseling styles to measure a patient's likelihood of receiving clinical guidance. Female primary care doctors have been reported to engage in a more active partnership with their patients, speak more positively, and are more likely to engage in motivational interviewing methods to encourage patient-centered communication (Hall et al., 1994; Miller, 1996; Roter et al., 2002). It is important to note that the counseling styles of female and male physicians are comparatively similar and do not significantly differ in their general influence on the patient-doctor relationship (Roter et al., 2002). Another study has found that adult male patients were less likely to be advised to stop drinking altogether than adult female patients, especially when primary care providers were male (Geirsson et al., 2004). In addition, patients who were male and excessive drinkers were more likely to be told to cut down drinking, whereas female patients who were excessively drinkers were more frequently told to stop drinking excessively or to abstain altogether. Not surprisingly, women were more likely to receive referrals for treatment than males (Geirsson et al., 2004). Many other studies have provided complementary findings that indicate clinicians may give little advice to male patients since male drinking is more acceptable to social norms (Gassman & Weisner, 2005; Hensing & Spak, 2009; Samuelsson & Wallander, 2014; Freimuth, 2010). Furthermore, studies have shown that adult males are one-third to one-half less likely than females to have spoken to a healthcare professional about mental health within the previous year (Burns et al. 2000; Proudfoot & Teesson, 2001; Rhodes et al. 2002; Wang et al. 2005; Levinson & Ifrah, 2010; Reavley et al., 2011; Cox et al., 2014; Fleury et al., 2014).

Gender-Based Patterns of Substance Use for Youth with Chronic Medical Conditions

Youth with chronic medical conditions who are in the transitional period of adolescence experience short- and long-term health risks. This transitional period of adolescence can be defined as the period between late childhood and the beginning of adulthood (Lerner & Steinberg, 2004). It is a time when adolescents assert more autonomy over their decisions, emotions, and actions (Steinberg, 2005). A recent study conducted by Wisk and Weitzman (2016) compared youth with chronic medical conditions to healthy peers. The findings indicated that youth with chronic medical conditions were more likely to engage in and experience heavier substance use (Wisk & Weitzman, 2016).

Weitzman et al. (2015) found similar results, showing that youth with chronic medical conditions engaged in substance use within a population sample of youth ages 9–18-years old. The findings show that within this sample, nearly one-third reported engaging in alcohol use which was also associated with older age. Drinking patterns did not vary by gender, race/ethnicity, condition, or mental health status. In addition, the median age of the participant's first drink was 15 years old, and on average, females initiated alcohol use at older ages than males (Weitzman et al., 2015).

In this study, all participants showed a steady increase in alcohol consumption after pre-adolescence (age ≤ 14 years) which peaked in early adulthood (age 21–23 years), with 68.8% of youth without chronic illness reporting having tried alcohol during the study, compared to 71.7% of youth with chronic medical conditions. Among youth who used alcohol, youth with chronic medical conditions had higher rates of binge drinking during pre-adolescence. This study highlights an important gap in knowledge and the necessity of implementing a screening process for youth with chronic medical conditions given the alcohol use among this population.

Background of Previous Study

Alcohol and Marijuana Use and Treatment Nonadherence Among Medically Vulnerable Youth Main Study Design (Weitzman, 2015)

Data for the secondary investigation was collected by Weitzman and colleagues who recruited 403 youth between the ages of 9 and 18 in care for a chronic medical condition. This study had a quantitative design and consisted of structured assessment(s) made during a routine subspecialty care visit. The goal of this assessment was to quantify the onset, frequency, and intensity of alcohol and marijuana use among youth receiving care for a chronic medical condition.

Previous Study Sample (Weitzman et al., 2015)

Participants in the sample were recruited if they had Type 1 diabetes, juvenile idiopathic arthritis, moderate persistent asthma or cystic fibrosis, or Inflammatory Bowel Disease (IBD). Additionally, participants had to have been diagnosed at least 1 year prior to the study. Participants were excluded from the sample if they were emotionally unstable on the day of participation. A convenience sample of 403 English-speaking patients ages 9 to 18 were recruited. The researchers apportioned the sample equally across conditions as follows: (n=20) youth ages 9 to 11, (n=40) youth ages 12 to 13, (n=100) youth ages 14 to 15, and (n=240) youth ages 16 to 18. To ensure ample sample size by age group, youth were oversampled in mid and late adolescence.

Previous Study Recruitment and Consent (Weitzman et al., 2015)

Participants in this study were recruited from outpatient subspecialty clinics affiliated with large pediatric teaching hospitals in the Northeast United States. The four main clinics recruited patients with the following conditions: Type 1 diabetes, arthritis, asthma/Cystic Fibrosis, and IBD (ulcerative colitis or Crohn's disease). The criteria for inclusion were that participants be

between the ages of 9 and 18, and that the diagnosis of their chronic medical condition had been made at least 1 year prior. Criteria for exclusion were medical or emotional instability on the day of their appointment. Participants were recruited onsite at the time of their appointment at their subspecialty clinics. Youth and their parents (or guardians) who showed interest in participating in the study were then required to consent. Adolescent participants assented with a waiver of parental consent and with the approval of the Boston Children's Hospital Institutional Review Board. Participants were informed upon assent/consent that their answers would be confidential unless a possible risk of acute harm was detected when answering questions with safety flags. The forms were stored in a safe and locked facility. Further, the researchers obtained a certificate of confidentiality for this study.

Previous Study Methods (Weitzman et al., 2015)

Those recruited in the study were instructed to complete a self-administered questionnaire on a tablet computer. Privacy of the participant was ensured as the tablet had a polarizing screen to obscure view. Participants were also given the option to listen to an audio recording of the assessment and response options. No data was saved locally on tablets.

Previous Study Measures (Weitzman et al., 2015)

The measures given in this study were used to assess alcohol use knowledge, behaviors, health care interactions, and marijuana use. The length of questions ranged from 57-281, depending on responses to programmed skip logic. The following measures were used: Demographic/SES, Diagnostic Interview- Alcohol and Marijuana Use Scale, Mental Health Inventory of the Short Form-36, Knowledge of Medication and Laboratory Test Interactions, and the Morisky Medication Adherence Scale.

Present Study

Previous literature (Weitzman et al., 2015) reveals that youth with chronic medical conditions who consume alcohol are also vulnerable to behaviors and lifestyle factors that may worsen their health. Youth with chronic medical conditions are just as likely as their peers to engage in substance use as their healthy peers (Wisk & Weitzman, 2016). Therefore, further investigation within the population of youth with chronic medical conditions is needed. Given that adolescence is a period in which risk-taking behavior is heightened, it is important to specifically address the needs of this sensitive population which is currently understudied. Theories related to adolescent risk-taking can be conceptualized within a model (see Figure 1) that encompasses the biological, psychological, and social factors that impact risk-taking. The biopsychosocial model of risk-taking suggests that adolescent do not solely engage in risk-taking behaviors due to one factor, but rather due to many factors. That is, adolescents are not only affected by their biological maturation, but psychological factors, such as self-perception and personal values. However, both biological maturation and social factors are both positively and negatively affected by an adolescent's social environment. Therefore, an adolescent's reasons for engaging in or abstaining from risk-taking behaviors are affected by the interaction of the biological, psychological, and social-environmental components of his or her individual experiences. Given that adolescence is a period intricately connected to identity formation, the current study focuses on gender differences. This secondary analysis proposes to: (1) examine gender differences in reports of select attitudes and beliefs about avoiding alcohol use among youth with chronic medical conditions; and (2) examine gender differences in participants' self-reporting of being screened by their physician or other healthcare team member in the previous year.

Hypotheses

Hypothesis I: Females are more likely than males to endorse specific reasons for abstaining from alcohol use.

Hypothesis II: Females are more likely than males to self-report screening by a doctor or healthcare team member over the past year.

Method

A data set that was previously collected was stored on an encrypted and firewall-protected laptop. All identifiers were removed from the data set. Youth had previously assented with a waiver of parental consent under the approval of the Boston Children's Hospital Institutional Review Board. A certificate of confidentiality was obtained for this study at Boston Children's Hospital.

Participants: For the purposes of secondary analysis, the study used a census of 260 adolescents (46.69% males and 53.31% females). Of these, 13–14-year-olds made up the smallest percent of the sample (11.92%), where as the 15–16-year-olds made up (37.30%). The 17-18-year-olds made up about half the sample (50.56%).

Recruitment: Previous recruitment came from a subspecialty clinic affiliated with a large pediatric teaching hospital in the Northeast United States. Participants came from one of the following sites: Asthma, Endocrine, Gastroenterology, Rheumatology, or Pulmonary.

Measurement Variables

Dependent Variables

Data was collected based on responses to the following statements and question.

Reason to Abstain I: Mark the level of importance (very important, somewhat important, not important) to abstain from drinking for the following statement: "I don't want to lose control

while drunk.”

Reason to Abstain 2: Mark the level of importance (very important, somewhat important, not important) to abstain from drinking for the following statement: “I don’t want to disappoint my parents.”

Reason to Abstain 3: Mark the level of importance (very important, somewhat important, not important) to abstain from drinking for the following statement: “I don’t want to disappoint my doctor.”

Reason to Abstain 4: Mark the level of importance (very important, somewhat important, not important) to abstain from drinking for the following statement: “I don’t want my friends to think badly of me.”

Reason to Abstain 5: Mark the level of importance (very important, somewhat important, not important) to abstain from drinking for the following statement “I don’t want to get in trouble while drunk.”

Screened for Drinking: The variable measuring self-report of participants being *screened* for drinking is based on the question: “Other than today, in the past year, did your doctor or a member of your health care team ask you if you drink alcohol?” (yes, no).

Independent Variable

Gender: The measure of *gender* is based on the following question: “What is your gender?” (male=0; female=1).

Control Variables

Age: The measure of age is based on the following question: “What is your age?” (14–15 years old= group 1; 16–17 years old=group 2; 18 years old=group 3).

Race: The measure of race is based on the following question: “What is your race?” (American Indian=1; Asian=2; Black=3; Hawaii/Pacific Islander=4; White=5).

Parent Education Level: The measure of parent education level is based on the following question: “What is your parents’ highest level of education?” (8th grade or less=1; 8th grade or more but not high school graduate=2; High school or GED=3; Business, trade, or vocational school after high school=4; Some college, but did not graduate=5; Graduated college or university=6; Professional degree beyond 4-year college=7; Unknown=8).

Past Year Alcohol Consumption: The measure of past year alcohol consumption is based on the following question: “Have you had a drink in the last year?” (yes, no).

Data Analysis

An analysis was employed to identify the frequencies of the social and demographic characteristics of participants by clinic site. In addition, a bivariate logistic regression was employed to Hypothesis 1 in order to identify gender differences in reports of select attitudes and beliefs about avoiding alcohol use. The first equation identified the odds ratios of reasons to abstain by demographic characteristics such as age and parent education. Race was not included in this model as this would not bring any significance due to majority of the sample identifying as white (76.85%). The second equation identified the odds ratios of reasons to abstain by demographics characteristics with the addition of gender in order to identify if gender differences existed within the select reason to abstain from alcohol use. The third equation identified the odds ratios of reasons to abstain by demographics characteristics with the addition of gender and past year alcohol use in order to identify if past year alcohol use was significant to the select reason to abstain from alcohol use in this model. The three equations are as follows:

$$\text{Reason to Abstain} = a + b_1\text{age} + b_2\text{parent education} \quad (1)$$

$$\begin{aligned} \text{Reason to Abstain} = & a + b_1 \text{age} + b_2 \text{parent education} \\ & + b_4 \text{gender} \end{aligned} \quad (2)$$

$$\begin{aligned} \text{Reason to Abstain} = & a + b_1 \text{age} + b_2 \text{parent education} \\ & + b_4 \text{gender} + b_5 \text{past year alcohol use} \end{aligned} \quad (3)$$

A bivariate logistic regression similar to Hypotehsis 1 three equations were also employed to address Hypothesis 2 to identify if gender differences existed in participants' self-reporting of being screened by their physican or other healthcare team member in the past year. The fourth equation identified the odds ratios of reasons to abstain by demographic characteristics such as age and parent education. Similarly, race was not included in this model as this would not bring any significance due to majority of the sample identifying as white (76.85%). The fifth equation identified the odds rations of reasons to abstain by demographics characteristics with the addition of gender in order to identify if gender differences existed within participants' self-reporting of being screened by their physican or other healthcare team member in the past year. The sixth equation identified the odds rations of reasons to abstain by demographics characteristics with the addition of gender and past year alcohol use in order to identify if past year alcohol use was significant to participants' self-reporting of being screened by their physican or other healthcare team member in the past year. The three equations are as follows:

$$\text{Doctor Asked Drinking Status} = a + b_1 \text{age} + b_2 \text{parent education} \quad (4)$$

$$\begin{aligned} \text{Doctor Asked Drinking Status} = & a + b_1 \text{age} + b_2 \text{parent education} \\ & + b_3 \text{gender} \end{aligned} \quad (5)$$

$$\begin{aligned} \text{Doctor Asked Drinking Status} = & a + b_1 \text{age} + b_2 \text{parent education} \\ & + b_3 \text{gender} + b_4 \text{past year alcohol use} \end{aligned} \quad (6)$$

Results

In this secondary analysis, 260 participants were included in the sample. As presented in Table 1, we can see that the sample is comprised of females (53.31%) and males (46.69%), all between the ages of 13 and 18 years. The sample was divided by age into three groups –ages 13 to 14 (10.84%), ages 15 to 16 (39.16%), and ages 17 to 18 (50%). Race was categorized as white (76.85%), non-white (23.15%). About three-fourths of the sample reported having a parent with a college degree (72.76%).

The first objective of this study was to examine gender differences in reports of select attitudes and beliefs about avoiding alcohol use controlling for a given level of consumption amongst youth with chronic medical conditions. Amongst the five select reasons to abstain, only the select reason of not wanting to lose control while drunk was seen in the model as statistically significant for gender. Therefore, for the purposes of this paper only the results from this logistic regression will be presented. As seen in Table 2, in Equation 1, the correlation between the demographic characteristics and wanting to abstain from alcohol use due not wanting to get in trouble is not significant in the model. In Equation 2, when gender (ref=male) is added to the model gender becomes statistically significant ($OR = 0.200$ $p < .001$). In Equation 3, gender (ref=male) continues to be significant ($OR = 0.200$ $p < .001$) when past year alcohol use is added to the model (ref= no past year alcohol use). Therefore, we reject the null hypothesis for these select reasons. This evidence provides support for hypothesis 1 that females are more likely than males to endorse wanting to abstain from alcohol use due to not wanting to loose control while drunk.

The second objective of this study was to examine gender differences among youth with chronic medical conditions regarding a participant's self-report of receiving clinical guidance. To

address the second aim of the study, a bivariate logistic regression was employed. Table 3 presents the logistic regression model for participants' self-report of being screened by a doctor or healthcare team member. In equation 4, age (ref= group 1 vs. 3) is statistically significant. Providing evidence that (group 1), 13 to 14-year-olds are about two times as likely as (group 3), 17 to 18-year-olds ($OR=2.544$ $p < .05$). In equation 5, when gender (ref= male) is added into the equation age (ref= group 3) continues to be significant. Providing evidence that (group 1), 13 to 14-year-olds are about two times as likely as (group 3), 17 to 18-year-olds ($OR=2.531$ $p < .05$). As well as, that (group 2) 15 to 16-year-olds are about two times as likely as (group 3), 17 to 18-year-olds ($OR=2.078$ $p < .05$). No statistically significant gender differences are observed. In equation 6, when age (ref= group 3) and gender (ref= male) are in the model and past year alcohol, use (ref=no past year alcohol use) is added into the equation, age continues to be significant. Providing evidence that (group 1), 13 to 14-year-olds are about three times as likely as (group 3), 17 to 18-year-olds ($OR=3.430$ $p < .01$). As well as, that (group 2) 15 to 16-year-olds are about two times as likely as (group 3), 17 to 18-year-olds ($OR=2.334$ $p < .001$). No statistically significant gender differences are observed. However, past year alcohol use (ref= no past year alcohol use) is statistically significant in the model ($OR=1.945$ $p < .05$). Supporting the notion that participants with past year alcohol use are almost two times as likely to report being screened by a doctor or health care team member than their non-past year alcohol user peers. Therefore we accept the null hypothesis that no gender differences were found in participants self report of being screened by a doctor or healthcare team member.

Discussion

The purpose of the study was to fill the gap in literature concerning two issues: (1) whether gender differences exist in reports of select attitudes and beliefs about avoiding alcohol use,

among youth with chronic medical conditions; and (2) whether gender differences in participants' self-reporting of being screened by their physician or other healthcare team member in the previous year. Adolescence is a period of heightened onset and higher frequency of substance use behavior. In turn, this poses an increased risk for short and long term health risks. Although substance abuse behaviors encompass many health risks even for healthy youth, their chronically ill peers face even greater health risks given their unique health status and disease management needs. The literature has shown that youth with chronic medical conditions who also engage in alcohol use are nearly twice as likely to be at risk for medication non-adherence compared to those who do not engage in alcohol use (Weitzman, Ziemnik, Huang and, Levy, 2015). In addition, substance abuse may negatively impact an individual's ability to get quality sleep, manage a healthy diet, and engage in protected sex. The consequences of a lack of quality sleep, eating unhealthy foods, and engaging in unprotected sex on health are particularly devastating for youth taking immune-suppressing or teratogenic medications (Torpy, Campbell, & Glass, 2010). Therefore, adolescents with chronic illness may face grave consequences, especially compared to their healthy peers. Evidence from research has proven that many providers rarely screen typically developing healthy young patients for substance abuse, and may not even use validated screening tools (McPherson & Hersch, 2002; Harris et al., 2012). It is important to note that youth with chronic illnesses may have providers who assume their patients know about the potential complications and exacerbations resulting from substance abuse, and may believe that screening is unnecessary (Wisk & Weitzman, 2016).

Are there gender differences in chronically ill adolescents' reasons for abstaining from alcohol use?

Amongst the select reasons to abstain from alcohol use gender differences are only

observed in one of the five select reasons to abstain from alcohol use: not wanting to lose control while drunk. Therefore, one can conclude from this investigation that there are no significant gender differences in reasons to abstain from alcohol use. However, further investigation into this question is warranted as there was one statistically significant finding, and therefore there may be other select morals or values for wanting to abstain from engaging in alcohol use not explored in this analysis.

To guide one's understanding into the statistically significant finding, it is useful to understand the risk-taking behaviors through the theoretical framework of the biopsychosocial model of risk-taking (Irwin & Millstein, 1986). It is important to remember that typical healthy developing adolescents of either gender are biologically incapable of thinking abstractly about future outcomes, as this area of the brain does not fully mature until adulthood (Forbes & Dahl, 2010). Further, adolescents hold many morals and values, and social environmental factors that significantly affect them. Reasons to abstain from alcohol use are largely characterized by morals or values. The findings of this analysis suggest that females are more likely than males to endorse wanting to abstain from alcohol use because of a fear of losing control.

It is important to note that typical healthy developing adolescents of either gender are biologically incapable of thinking abstractly about future outcomes, as this area of the brain doesn't fully mature until adulthood (Forbes & Dahl, 2010). Although, brain development does not allow adolescents to have the ability to fully think about these future outcomes they are able to abstain morals and values. These morals and values are impacted by biological, and social environmental factors. Reasons to abstain from alcohol use largely fall into the category of morals or values. One possible explanation for this finding is the great influence of social environmental factors on an individual's system. In particular, for chronically ill adolescent

there is evidence that they may not want to loose control because of disease specific reasons.

Patients with chronic illness have extensive disease management such as: daily medications, symptom management, disease-specific dietary restrictions, disease-specific exercise regiments, disease-specific routine adherence tests (blood tests, glucose monitoring etc.), routine care visits, and cost of healthcare treatment on the individual and family. As a result, chronically ill patients work extremely hard to achieve remission or stable health status and don't want to loose control of their health. Therefore, adolescents specifically may hold this moral/value to a higher level than that of males and therefore this may be the reason gender differences are seen.

Another possible explanation for this finding is the influence of social-environmental factors on an individual's system. For example, females might receive different messages than male counterparts regarding loss of control while drunk. These messages may come from people in their social environment, such as family members, friends, health care team members, teachers, coaches, and religious leaders (Irwin & Millstein, 1986). Research in typically developing adolescents has shown that females are more likely to hear messages that parallel social norms, such as that females are more "vulnerable" than males and therefore more likely to lose control while drunk. In addition, drinking alcohol is perceived as a masculine activity and considered unfeminine. Furthermore, females are more likely than males to believe that drinking or excessive alcohol use will not just affect themselves. Rather, that the activity affects a female's current family and may negatively affect the ability to have a child. These messages seem to be exaggerated by cultural and social norms. However, it is important to note that females are typically more likely than males to be victims of sexual assault while drinking alcohol. Females identified as "not in control" were likely targets of sexual assault. Therefore,

females are more likely than males to receive these messages by peers in their social environment.

Given this sensitive population, it is particularly important for clinicians to understand the reasons adolescents provide for not wanting to engage in alcohol use. This information is needed to deliver the most effective personalized intervention to detect and deter adolescents from engaging in risky behavior, more research is needed to fully understand additional reasons for abstaining from alcohol that are important to males and females with chronic illness. Additionally, we must continue to identify gender differences regarding these reasons given that a combination of biological, psychological, and social factors appears to play a role in an adolescent's decision-making process regarding risk-taking behaviors.

Are there gender differences in self-report of being screened by a doctor or health care team member?

No gender differences were observed in self-reports of being screened by a doctor or health care team member in the logistic regression model. These findings support the contention that there are no gender differences in the screening of adolescents with chronic illness. Therefore, males and females are as equally as likely to be screened by a clinician or a member of their healthcare team. Interestingly, it was observed in the logistic regression model that when past year alcohol use (ref= no past year alcohol use) was entered in the model it became statistically significant. Given these findings one can conclude that past year alcohol users are twice as likely as non-past year alcohol users to report being screened by a clinician or member of their healthcare team.

To guide one's understanding into the statistically significant finding, it is useful to understand clinician's views when screening adolescents. Many clinicians do not follow

professional guidelines to screen all of their adolescent patients for alcohol use, often citing a lack of confidence in their alcohol management skills as a barrier (Millstein & Marcell, 2003). To guide one's understanding into the statistically significant finding, it is useful to understand the risk-taking behaviors through the theoretical framework of the biopsychosocial model of risk-taking (Irwin & Millstein, 1986). Therefore, a clinician or member of a health care team may consider an adolescents biological system that may contribute to their inability to abstain from risk-taking behaviors. For example, their patient is exhibiting signs of: depression, anxiety, ADHD, or low impulse controls are more likely to engage in risk-taking behaviors such as alcohol use. Particularly for adolescents with a chronic illness, clinicians may hold a bias that the disease itself is a protective factor, and therefore will not screen for substance use. However, we know from the literature that substance use is just as likely for adolescents with chronic illness as their typically developing peers (Weitzman et al., 2015). In addition to the biological factors, the psychological factors such as an adolescent's personal morals and values play a vital role in an adolescent's decision to engage in risk-taking behaviors. For example, if an adolescent discloses that they want to try substances, as they do not believe drinking is bad for them. This information may influence a clinician or healthcare team member to screen for substance use. Where as, the contrary could also happen if an adolescent discloses for example, they will never drink because they work to hard to achieve stable health and they don't want to ruin that. Therefore, this statement may influence the clinician to believe they have high morals and values regarding substance use, and therefore screening is not necessary.

Lastly, the combination of biological, psychological, and social environmental factors may impact a clinician's decision to screen. Social environmental factors may consist of parental monitoring, peer groups, significant others, and other social groups. These influences may

impact one's moral and value system. For example, if an adolescent discloses that they have peers and/or significant others who engage in substance use, and/or other risk-taking behaviors they may be more inclined to screen this adolescent. In opposition, if an adolescent discloses that their peers and/or significant other never drinks, and that their parents and family members monitor them closely and won't let them go to parties they may be less likely to engage in substance use, influencing a clinician to not screen for substance use. Parents often monitor adolescents with chronic illnesses more closely in order to carry out disease management. For example, a parent may be in charge of making doctors appointments, administering medication, monitoring labs, and other disease related necessities. Therefore, clinicians may assume parents are monitoring their adolescent's substance use, and therefore are less likely to screen for substances.

Conclusions and Implications for Practice

The first objective of this study was to identify if gender differences exist in chronically ill adolescents with respect to reasons for abstaining from alcohol use. It was hypothesized that females were more likely than males to endorse select reasons to abstain from alcohol. In fact, findings show that there are no gender differences for four of the five reasons to abstain. However, for one reason to abstain and state gender differences are seen. Therefore, this study provided evidence that females are more likely than males to endorse wanting to abstain from alcohol use out of fear of losing control while drunk. Given this finding, more research is needed to identify if there are other gender differences in values and beliefs regarding reasons to abstain from alcohol use, as this study was limited to only five select reasons to abstain. However, gender may not be a significant factor when implementing tools for prevention and intervention

for adolescents with chronic illness. However, age was statistically significant in the model and therefore designing these materials. These results will help to inform clinicians specific messages that resonate with patients with chronic medical conditions, in hopes of providing tailored messages in order to best prevent substance use. More research is needed in order to explore what tailored messages adolescents with chronically illness are likely endorse in order to create successful prevention and intervention materials.

In respect to the second objective of this study no statistically significant gender differences were observed in the model with regard to past year screening. Therefore, gender appears to have no influence how clinicians or members of their healthcare team screen adolescents with chronic illness. However, the model was statistically significant in regard to past year alcohol use and therefore this warrants further investigation. This finding is important, as screening provides clinicians the opportunity to provide patients preventative messages regarding substance use. In addition, it provides clinicians the opportunity to deliver interventions in order to influence the adolescent to stop engaging in risk-taking behaviors. Therefore, this result brings awareness that past year alcohol users are disproportionately being screened to non-past year alcohol users. This puts non-past year alcohol users at a disadvantage because they are not being screened, and therefore may not receive prevention and interventions around not engaging in risk-taking behaviors. These results help to inform clinicians that more screening is needed for this vulnerable population of chronically ill adolescents who are at risk for even greater health disparities than their healthy typically developing peers. In addition, research is needed to identify why adolescents with chronic illness who self report past year alcohol use are being screened more than those who self report no past year alcohol users? In addition, to identify a

standardized screening tool particularly for this vulnerable population with the goal to screen alcohol users and non-alcohol users equally.

It is known that this vulnerable population of chronically ill youth engage in alcohol use (Weitzman et al., 2015); therefore, this study contributes to understandings that few if any gender differences exist in the reasons adolescents provide for abstaining from alcohol use, as well as there appears to be no gender differences in their self-reports of being screened by a doctor or healthcare team member. However, that future studies should focus on past year alcohol use and screening for adolescents with chronic illness. These results suggest the need for further exploration into tailored prevention and intervention methods. As well as the need for a standardized screening tool for this medically vulnerable population.

Limitations

A limitation of this study is the collection of data through self-reporting. As for all studies that use self-reporting methodology, it is difficult to determine whether participants accurately and honestly responded. The study conducted was a secondary data analysis and therefore these results are only representative of a smaller sample of only adolescents, and therefore this finding may not translate to younger patients with chronic illness. The race of the participants were white, and therefore these results may not be replicated across other races. However, it is important to note that the diagnosis of the chronic-illnesses included in this paper largely affect a majority white, and therefore these diseases may not impact a significant amount of adolescents in other races.

In addition, a limitation to the study was the screening question. As the question asked participants to consider recalling information from the previous year. Literature has shown that recalling information for participants may be difficult, and therefore accuracy could have been

comprised. In addition, the screening question did not include the physicians report of whether they screened participants, and therefore this question relies only on participants answer about being screened. It is also unknown whether participants disclosed drinking to their doctor or healthcare team member. This may be problematic, as it may not represent all the information needed to understand how adolescents with chronic illness are being screened.

References

- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change.
Psychological Review, 84(2), 191-215. doi:10.1037/0033-295X.84.2.191
- Belsky, J. (2011). Family experience and pubertal development in evolutionary perspective.
Journal of Adolescent Health, 48(5), 425–426.
- Bolland, J. M., Tomek, S., Devereaux, R. S., Mrug, S., & Wimberly, J. C. (2016). Trajectories of
adolescent alcohol use by gender and early initiation status. *Youth & Society*, 48(1), 3.
- Centers for Disease Control and Prevention. (2015). Tobacco use among middle and high school
students-United States, 2011-2014. *Morbidity and Mortality Weekly Report*, 64(14), 381-
385
- Cohn, L. D., Macfarlane, S., Yanez, C., & Imai, W. K. (1995). Risk-perception: Differences
between adolescents and adults. *Health Psychology*, 14(3), 217–222.
- Donovan, J.E. (2009). Estimated blood alcohol concentrations for child and adolescent drinking
and their implications for screening instruments. *Pediatrics* 123(6).
- Engel, G. L. (2012). The need for a new medical model: A challenge for biomedicine.
Psychodynamic Psychiatry, 40(3), 377.
- Ernst, M., Bolla, K., Mouratidis, M., Contoreggi, C., Matochik, J. A., Kurian, V., . . . London, E.
D. (2002). Decision-making in a risk-taking task: A PET study.
Neuropsychopharmacology : Official Publication of the American College of
Neuropsychopharmacology, 26(5), 682-691. doi:10.1016/S0893-133X(01)004146
- Fleury, M., Grenier, G., Bamvita, J., & Caron, J. (2014). Determinants and patterns of service
utilization and recourse to professionals for mental health reasons. *BMC Health Services*
Research, 14(1), 161-161. doi:10.1186/1472-6963-14-161

Forbes EE, Olinos TM, Ryan ND, Birmaher B, Axelson DA, Moyles DL, Dahl (2010) Reward-related brain function as a predictor of treatment response in adolescents with major

depressive disorder. *Cognitive, Affective, and Behavioral Neuroscience*. 10(1)107-118

Forbes, EE and Dahl (2010) Pubertal Development and Behavior: Hormonal Activation of Social and Motivational Tendencies. *Brain and Cognition*. 72(1)66-72

Forbes, EE, Ryan, ND, Phillips, ML, Manuck, SB, Worthman, CM, Moyles, DL, Tarr, JA,

Sciarrillo, SR, Dahl (2010) Healthy adolescents' neural response to reward: Associations with puberty, positive affect, and depressive symptoms. *Journal of the American*

Academy of Child and Adolescent Psychiatry, 49(2)162-172

Forbes, H. and Dahl (2010) Pubertal Development and Behavior: Hormonal Activation of Social and Motivational Tendencies. *Brain and Cognition*. 72(1)66-72

Freimuth, M. (2010). The “new look” in addiction assessment: Implications for medical education. *Annals of Behavioral Science and medical Education*, 16(1), 30-34.

Furby, L., & Beyth-Marom, R. (1992). Risk-taking in adolescence: A decision-making perspective. *Developmental Review*, 12, 1–44.

Gassman, R. A., & Weisner, C. (2005). Community providers' views of alcohol problems and drug problems. *Journal of social work practice in the addictions*, 5(4), 101-115.

Gerrard, M., Gibbons, F. X., Benthin, A. C., & Hessling, R. M. (1996). A longitudinal study of the reciprocal nature of risk behaviors and cognitions in adolescents: What you do shapes what you think, and vice versa. *Health Psychology*, 15, 344–354.

Grella, C. E., Greenwell, L., Mays, V. M., & Cochran, S. D. (2009). Influence of gender, sexual orientation, and need on treatment utilization for substance use and mental disorders:

Findings from the california quality of life survey. *BMC Psychiatry*, 9(1), 52-52.

doi:10.1186/1471-244X-9-52

Griffiths, AM and Buller HB. (2000) Inflammatory bowel disease. In: Walker WA, Durie PR, Hamilton JR, et al. (Eds), *Pediatric gastrointestinal disease. 3rd ed. Hamilton, Canada: B.C. Decker Inc.* 613-652.

Hall JA, Irish JT, Roter DL et al. (1994) Gender in medical encounters: an analysis of physician and patient communication in a primary care setting. *Health Psychology*(13) 384–92.

Harris, S. K., & Knight, J. R. (2014). Putting the screen in screening: Technology-based alcohol screening and brief interventions in medical settings. *Alcohol Research : Current Reviews*, 36(1), 63.

Hensing, G., & Spak, F. (2009). Introduction: gendering socio cultural alcohol and drug research. *Alcohol and Alcoholism*, 44(6), 602-606.

Irwin CE, Jr., Millstein S.G. (1986). Biopsychosocial correlates of risk-taking behaviors during adolescence. *Journal of Adolescent Health Care*, (7):82S-96S.

Jessor R. and Jessor S.L. (1977) Problem behavior and psychological development: A longitudinal study of youth. New York: Academic Press.

Johnston L, O'Malley P, Miech R, Bachman J, Schulenberg J. (2015) Monitoring the Future National Survey Results on Drug Use: 1975-2014: Ann Arbor, MI: Institute for Social Research

Lakon CM, Hipp JR. On social and cognitive influences: relating adolescent networks, generalized expectancies, and adolescent smoking. *PloS One*. 2014;9(12):e115668.

- Lavery, B., Siegel, A. W., Cousins, J. H., & Rubovits, D. S. (1993). Adolescent risk-taking: An analysis of problem behaviors in problem children. *Journal of Experimental Child Psychology*, 55(2), 277–294.(Piquero, Gover, McDonald, & Piquero, 2005),
- Levy S., Sherritt L., Gabrielli J., Shrier L.A, & Knight J.R. (2009). Screening adolescents for substance use-related high-risk sexual behaviors. *Journal of Adolescent Healing*, 45(5): 473–477
- Loonen H.J., Grootenhuis M.A., Last B.F., et al. (2002). Quality of life in pediatric inflammatory bowel disease measured by a generic and a disease-specific questionnaire. *Academy of Pediatrics*, 91(3): 348-354.
- Loonen H.J., Grootenhuis M.A., Last B.F., et al. (2002). Quality of life in pediatric inflammatory bowel disease measured by a generic and a disease-specific questionnaire. *Academy of Pediatrics* 91(3): 348-354.
- Miller WR. (1996) Motivational interviewing: research, practice, and puzzles. *Addiction Behavior* (21)835–42.
- Ozer, E. M. and Irwin, C. E. 2009. Adolescents and Young Adult Health. *Handbook of Adolescent Psychology*. (1)III:18
- Rhodes, A. E., Goering, P. N., Williams, J.I. (2002). Gender and outpatient mental health service use. *Social Science and Medicine* 54, 1–10.
- Rivara, F.P., Park M.J., Irwin C.E., Jr. (2009). Trends in Adolescent and Young Adult Morbidity and Mortality. In Di Clemente RJ, Santelli J, & Crosby RA (eds.), *Adolescent Health: Understanding and Preventing Risk Behaviors*. San Francisco: Jossey-Bass. pp. 7-29.
- Roter DL, Hall JA, Aoki Y. (2002) Physician gender effects in medical communication: a meta-analytic review. *JAMA* (288)756–64.

Salvy S-J, Pedersen ER, Miles JN, Tucker JS, D'Amico EJ (2014) Proximal and distal social influence on alcohol consumption and marijuana use among middle school adolescents.

Drug Alcohol Dependency 144:93-101.

Salvy S-J, Pedersen ER, Miles JN, Tucker JS, D'Amico EJ (2014) Proximal and distal social influence on alcohol consumption and marijuana use among middle school adolescents.

Drug Alcohol Dependency.144:93-101.

Samuelsson, E. (2015). Substance Use and Treatment Needs Constructions of Gender in Swedish Addiction Care. *Contemporary Drug Problems*, 42(3), 188-208.

Samuelsson, E., & Wallander, L. (2014). Disentangling practitioners' perceptions of substance use severity: A factorial survey. *Addiction Research & Theory*, 22(4), 348-360.

Smith, K. L. W., Matheson, F. I., Moineddin, R., Dunn, J. R., Lu, H., Cairney, J., & Glazier, R. H. (2013). Gender differences in mental health service utilization among respondents reporting depression in a national health survey. *Health*, 5(10), 1561-1571.

doi:10.4236/health.2013.510212

Spear, L. P. (2002). The adolescent brain and the college drinker: Biological basis of propensity to use and misuse alcohol. *Journal of Studies on Alcohol. Supplement*, (14), 71-81.

doi:10.15288/jsas.2002.s14.71

Steinberg L. (2004) Risk-taking in adolescence: what changes and why? *Annals of NY Academy* 1021:51–58

Steinberg L. (2007). Risk-taking in Adolescence: New perspectives from the brain and behavioral science. *Current Directions in Psychological Science*, 16:55-59.

Steinberg, L. (2005). Risk-taking in adolescence: What changes, and why? *Annals of the New York Academy of Sciences*, 1021(1), 51-58. doi:10.1196/annals.1308.005

- Testa, M.A. & Simonson D.C. (1996). Assessment of quality-of-life outcomes. *New England Journal of Medicine*, 334 (13): 835-840.
- Testa, M.A. & Simonson D.C. (1996). Assessment of quality-of-life outcomes. *New England Journal of Medicine*, 334 (13): 835-840.
- Torpy, J. M., Campbell, A., & Glass, R. M. (2010). JAMA patient page. chronic diseases of children. *Jama*, 303(7), 682.
- Tucker-Drob, E. M., & Harden, K. P. (2012). Early childhood cognitive development and parental cognitive stimulation: Evidence for reciprocal gene–environment transactions. *Developmental Science*, 15(2), 250-259. doi:10.1111/j.1467-7687.2011.01121.x
- Weitzman E.R. (2004). Poor mental health, depression, and associations with alcohol consumption, harm, and abuse in a national sample of young adults in college. *Journal of Nervous Mental Disorders*, 192(4): 269–277
- Weitzman E.R., Chen Y.-Y. (2005). The co-occurrence of smoking and drinking among young adults in college: national survey results from the United States. *Drug Alcohol Depend*, 80(3): 377–386
- Weitzman, E. R., Ziemnik, R. E., Huang, Q., & Levy, S. (2015). Alcohol and marijuana use and treatment nonadherence among medically vulnerable youth. *Pediatrics*, 136(3), 450-457. doi:10.1542/peds.2015-0722
- Weitzman, E. R., Ziemnik, R. E., Huang, Q., & Levy, S. (2015). Alcohol and marijuana use and treatment nonadherence among medically vulnerable youth. *Pediatrics*, 136(3), 450-457. doi:10.1542/peds.2015-0722

Williams, P. L., Storm, D., Montepiedra, G., Nichols, S., Kammerer, B., Sirois, P. A., . . . Malee,

K. (2006). Predictors of adherence to antiretroviral medications in children and adolescents with HIV infection. *Pediatrics*, 118(6)

Wisk, L. E., & Weitzman, E. R. (2016). Substance use patterns through early adulthood: Results for youth with and without chronic conditions. *American Journal of Preventive Medicine*, 51(1), 33.

Table 1.

Social and Demographic Characteristics of Participants By Clinic Site

	Total	1= Asthma n (%)	2= Endocrine n (%)	3= Gastrointestinal n (%)	4= Rheumatology n (%)	7= Pulmonary n (%)	p ^a
Total	260 (100%)	33 (12.69)	65 (25.00)	77 (26.92)	66 (25.38)	19 (7.31)	
Age							
13-14	36 (10.84)	5 (15.15)	9 (13.85)	10 (12.99)	5 (7.58)	2 (10.53)	<.0001
15-16	130 (39.16)	11 (33.33)	26 (40.00)	26 (33.77)	29 (43.94)	5 (26.32)	
17-18	166 (50)	17 (51.52)	30 (46.15)	41 (53.25)	32 (48.48)	12 (63.16)	
Race							
White	249 (76.85)	31 (55.36)	61 (77.22)	75 (88.24)	63 (79.75)	19 (76.00)	<.0001
Non-White	75 (23.15)	25 (44.64)	18 (22.78)	10 (11.76)	16 (20.25)	6 (24.00)	
Gender							
Male	155 (46.69)	15 (45.45)	40 (61.54)	36 (46.75)	24 (36.36)	12 (63.16)	<.0001
Female	177 (53.31)	18 (54.55)	25 (38.46)	41 (53.25)	42 (63.64)	7 (38.64)	
Grade							
9-10	111 (33.43)	8 (24.24)	26 (40.00)	26 (33.77)	20 (30.30)	5 (26.32)	<.0001
11-12	164 (49.40)	21 (63.64)	32 (49.23)	32 (41.56)	34 (51.52)	9 (47.37)	
High School Graduate	57 (17.17)	4 (12.12)	7 (10.77)	19 (24.68)	12 (18.18)	5 (26.32)	
Parent is a college graduate	235 (72.76)	36 (64.29)	57 (73.08)	65 (76.47)	61 (77.22)	16 (64.00)	<.0001

NOTE: Data are presented as number (percentage) of subjects unless otherwise indicated.

^a The χ^2 test for difference across conditions unless otherwise specified.^b Analysis of variance.

Table 2.

Logistic Regression Equations for Reasons to Abstain1 (I don't want to lose control while drunk)

		Equation 1	Equation 2	Equation 3
<i>Predictors</i>		OR (95% CI)	OR (95% CI)	OR (95% CI)
Age (ref= 17-18 years old; Group 3)	1 vs. 3	0.310 (0.017, 1.622)	0.235 (0.013, 1.265)	0.291 (0.015, 1.720)
	2 vs. 3	1.044 (0.461, 2.322)	0.919 (0.398, 2.082)	1.038 (0.414, 2.590)
Parent Education (ref= Not a College graduate)		1.114 (0.473, 2.937)	1.077 (0.447, 2.883)	1.072 (0.443, 2.890)
Gender (ref= male)			0.200 (0.072, 0.482)***	0.200 (0.072, 0.484)***
Past Year Alcohol Use (ref= No Past Year Alcohol use)				1.422 (0.578, 3.507)
R ²		0.0060	0.0485	0.0513
Walds X ²		1.3625	23.7124**	13.3035*
Model chi-square		0.3298	4.1301	7.5688

NOTE: OR = odds ratio.

* $p < .05$ ** $p < .01$. *** $p < .001$

Table 3.

Logistic Regression Equations for Participants Self-report of being Screened by a Doctor or Health Care Team Member

		Equation 4	Equation 5	Equation 6
<i>Predictors</i>		OR (95% CI)	OR (95% CI)	OR (95% CI)
Age (ref= 17-18 years old; Group 3)	1 vs. 3	2.544 (1.038, 6.110)*	2.531 (1.030, 6.095)*	3.430 (0.671, 1.791)**
	2 vs. 3	2.087 (1.142, 3.851)	2.078 (1.134, 3.844)*	2.344(1.323, 4.233)***
Parent Education (ref= College graduate)		1.222 (0.593, 2.657)	1.221 (0.593, 2.656)	0.854 (0.495, 1.489)
Gender (ref= male)			0.958 (0.545, 1.687)	1.094 (0.671, 1.791)
Past Year Alcohol Use (ref= No Past Year Alcohol use)				1.945 (1.107, 3.469)*
R ²		0.0589	0.0590	0.0414
Walds X ²		7.5367	7.5582	12.2664*
Model chi-square		0.0989	1.3320	7.0962

NOTE: OR = odds ratio.

* $p < .05$ ** $p < .01$. *** $p < .001$