

# Adolescents' Use of Alcohol, Tobacco, and Marijuana: The Gateway to Other Drugs

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**Abstract** Substance use among adolescents is a significant public health concern. Many surveys and studies indicate that substance use is highly prevalent among the adolescent population. Alcohol, tobacco (nicotine) and marijuana (cannabis) are described as the “gateway drugs”. Junior and high school students use these substances most frequently. The paper attempts to discuss the prevalence, epidemiology, theoretical models, risk and protective factors of substance use and abuse among the youth at risk. Health professionals and school counselors can make a significant difference in the quality of life of their clients by identifying the causes of the adolescents' substance use as early as possible. This article seeks to provide helpful and relevant information for mental health professionals who encounter adolescent clients with substance abuse issues.

**Keywords** Alcohol, Tobacco, Marijuana, Gateway drugs

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## 1. Introduction

Alcohol, tobacco (nicotine) and marijuana (cannabis) are significant “gateway drugs” and are the most common substances children and adolescents pass enroute to the use and abuse of other illicit substances (Freshman, 2004; Strasburger, 2002). The term is better known as “gateway” progression through drugs (Kandel, Kessler & Margulies, 1978). The gateway theory has been used to explain the phenomenon in which an individual's initial substance use starts with legal substances such as tobacco or alcohol, progressing to illicit but “softer” drugs such as marijuana, and finally escalating to more addictive drugs such as crack/cocaine methamphetamines, or heroin (Brunner, 2003). Gateway theory seeks to predict a pattern of substance use but does not explain what leads youth to begin using substances. But progression from one stage indicates there is a possibility of abstinence, maintenance of drug use, or progression to the next level. Examination of previous research on the gateway theory across various populations has revealed some inconsistencies. In studies of normative, non-clinical populations, the gateway progression through substance use appears to be the modal pathway (Fergusson & Horwood, 2000). When considering “serious substance users” (Golub & Johnson, 1994) or deviant arrestees (Kane & Yacoubian, 1999), marijuana is actually the first drug of use in the gateway progression.

It is in this regard that the paper aims to address the

prevalence, epidemiology, theoretical models, and risk protective factors of adolescents' substance use and abuse in the light of the gateway theory.

### 1.1. Definition of Terms

Throughout the paper, the term adolescence is used to refer to middle and high school students that begin at 12 years and end at 18 with particular reference to middle and high school students. The paper defines substance use as simply a student's previous or current use of alcohol or other drugs (Burrow-Sanchez & Hawken, 2007). The use, misuse, and abuse of alcohol, tobacco and marijuana substances by children and adolescents pose important and difficult problems for society. Among other problems, psychoactive substance use among adolescents increases risk for motor vehicle accidents, suicide, pregnancy and high-risk sexual behavior. Adolescent substance abuse has been related to numerous social, economic, and societal problems, including juvenile delinquency, deaths, or mental health problems, and the need for drug and alcohol treatment (Hawkins, Kosterman, Maguine, Catalano & Arthur, 1997; Voelkl & Frone, 2000). Since 1992, there is an increase in the prevalence of alcohol, tobacco, and marijuana use among high school students in the United States (Hawkins, Kosterman, Maguine, Catalano & Arthur, 1997). Beyond these three substances, the use rates for other substances decrease, with slight variations across demographic subgroups, e.g., gender, race/ethnicity. (Burrow-Sanchez & Hawken, 2007). For example, in 1997, close to one-third of high school students nationwide reported drinking alcohol and about 10% had tried marijuana before age 13. Although alcohol use is illegal for all secondary school students, 84% of students have some lifetime experience drinking alcohol

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by Grade 12 (Voelkl & Frone, 2000). Alcohol use by the teenagers in all three grades continued its long-term decline in 2014 in the proportion of students reporting any alcohol use in the 12 months prior to the survey; the three grades combined dropped from 43 percent to 41 percent, a statistically significant change.

Cigarette smoking also reached historical lows among teens in 2014 in all three grades. For the three grades combined, the rate was down to 8 percent in 2014 from 28 percent in the prior month in 1997. As with alcohol, there has been a substantial reduction in the proportion of students who say cigarettes are easy for them to get, and this decline continued into 2014. Increasing disapproval of smoking also has accompanied the decline in use, as well as an increased perception that smoking carries a "great risk" for the user. Marijuana use, after five years of increasing among teens, actually declined slightly in 2014, with use in the prior 12 months in a modest decline from 26 percent to 24 percent for the three grades combined. Personal disapproval of use is also down some in 8th and 12th grades.

Many adolescents experiment with these substances or use them occasionally, but do not go on to develop substance abuse problems. For example, if a student is using or has used a substance this does not necessarily mean he or she is abusing that substance (Burrow-Sanchez & Hawken, 2007).

One symptom of substance abuse is a behavior or emotion related to the problem, such as excessive absences from school due to drug use.

A substance abuse syndrome comprises many symptoms related to the problem, such as excessive school absences, problems with others due to drug use (e.g., arguments with parents), and legal problems due to drugs, e.g., charges of drug possession (Burrow-Sanchez and Hawken, 2007). A set of symptoms or a syndrome is called a disorder when it meets the specific diagnostic criteria in the Diagnostic and Statistical Manual of Mental Disorders, fourth edition, text revision (DSM-IV-TR; American Psychiatric Association, 2000).

The term substances refers to all drugs that are illegal for students in junior or high schools to possess or use (Burrow-Sanchez & Hawken, 2007). Certain substances of abuse are legal and can be readily purchased, including alcohol and tobacco. These substances are legal for persons that meet specific age requirements in the United States (e.g., age 21 for alcohol). Other substances of abuse are only legal when prescribed by a medical doctor, including narcotics-based pain medication like Oxycontin and certain psychostimulants like Ritalin. Furthermore, other substances of abuse are generally illegal irrespective of the situation, including marijuana, methamphetamine, and hallucinogens.

## 2. Prevalence of Adolescent Substance Abuse: Alcohol, Tobacco and Marijuana

The initiation and early stages of abuse of these substances have their roots in adolescence (Pumariega, Kilgus & Rodriguez, 2005). Adolescent substance use occurs almost exclusively in a social context (Fields & Teitelbaum, 2012). Indeed, experimentation often begins with "gateway" drugs that are readily available, such as tobacco, alcohol, and other drugs that are inhaled (Greydanus & Patel, 2003). Research has shown that if adolescents use tobacco or drink alcohol, they are 65 times more likely to use marijuana than children who never smoked or drank. Also, marijuana use translates to an individual being 104 times as likely to use cocaine compared to peers who never used marijuana (Belcher & Shinitzky, 1998). According to Freshman (2004), the DSM-IV was utilized to diagnose substance use disorders in adolescents in spite of the fact that it was developed primarily based on observations of adult populations. As applied to adolescents, research supports the utility of the DSM-IV construct that dependence, tolerance, withdrawal, and medical problems present differently in adolescents than in adults, suggesting limitations in the use of the DSM-IV criteria (Pumariega, Kilgus & Rodriguez, 2005). During the 1990s, the onset age of alcohol, tobacco and marijuana usage steadily decreased.

The younger a child begins to use tobacco, alcohol, marijuana or other drugs, the higher the risk for severe health problems and abuse carrying over into adulthood (Strasburger, 2002).

### 2.1. Epidemiology

Alcohol is a known killer, with more than 100,000 deaths annually in the United States attributed to excessive consumption. It is the most commonly abused drug by children aged 12 to 17 years (Freshman, 2004; Strasburger, 2002). Although Alcohol use by adolescents has increased, it has persisted as the number one drug problem. Recently, alcohol consumption has been associated with an increase in adolescents carrying a weapon for both males and females. Reported daily use of alcohol in eighth graders is 0.7%, 1.8% for tenth graders, and 3.5% for twelfth graders (Pumariega, Kilgus & Rodriguez, 2005). Alcohol use remains extremely common, with nearly 78% of students claiming to have tried it by the end of high school and 62% of twelfth graders having reported being drunk at least once (Freshman, 2004). Older children and preteenagers experiment with alcohol first, before other drugs. Alcohol abuse is most closely associated with such severe consequences as automobile accidents, homicides, suicides, drowning, teen pregnancy, and violence (Freshman, 2004; Strasburger, 2002).

The United States is not the only country experiencing increasing rates of adolescent substance abuse. According to Strasburger (2002), a survey of nearly 8,000 (age 15 and 16) throughout the United Kingdom showed that nearly all had tried alcohol, and half had engaged in binge drinking. Similarly, a survey of 10% of all 12-to-15-year-old school children in Dundee, Scotland, two thirds reported having an alcoholic drink and, by age 14 years, more than half reported

having been intoxicated.

Adu-Mireku (2003) reported in a study of 894 senior secondary students in Accra (56.9% female and 43.1% male; mean age of 17.4 years), using a modified version of the Youth Risk Behavior Survey questionnaire, that the prevalence rate of lifetime alcohol use was 25.1%. Among lifetime users, 46.2% were using alcohol. Reports from school surveys in countries across Africa show that the use and abuse of substances by adolescents and young adults start with alcohol and cigarettes. A study by Peltzer (2009) on substance use among school-going adolescents in six African countries (Kenya, Namibia, Swaziland, Uganda, Zambia, Zimbabwe) found that the prevalence of 12.6% tobacco use (past month). Furthermore, Morojele et al. (2002) in their study of high school students reported lifetime prevalence rates of 64% for alcohol, 41% for cigarettes, and 19% for marijuana in South Africa.

Tobacco is among the most addictive substances, and dependence is common after one smokes as few as 100 cigarettes (Heyman, 2002a). There is still reason for concern because in 2002, more than half of U.S teens reported having tried cigarettes, and by twelfth grade, one-quarter were regular users (Freshman, 2004).

Tobacco is associated with more than 430,000 deaths each year more than alcohol, cocaine, heroin, homicide, suicide, car accidents, firearms, and acquired immunodeficiency syndrome (AIDS) combined. Nearly 90% of adults who smoke took up the habit before age 19 years. While fewer than 25% of adults smoke, nearly one in three high school seniors do so on a regular basis (Heyman, 2002b; Pumariega, Kilgus & Rodriguez, 2005).

Marijuana is the most frequently used illicit drug (freshman, 2004; Pumariega, Kilgus & Rodriguez, 2005). It is potentially debilitating to adolescents because it suppresses motivation ("aberrant motivational syndrome" or "chronic cannabis syndrome") leading to a decline in academic performance, which then leads to increased use to cope with anxiety about performance. The daily prevalence for marijuana use in high school seniors is 6.0%, 3.9% in tenth grade students, and 1.2% in eighth grade students (Pumariega, Kilgus & Rodriguez, 2005).

Data collected by Wallace and colleagues in 2003, indicated that the difference between the use rates of male and female students across drug categories is relatively small, with the male students reporting higher use rates than female students with respect to each substance (Burrow-Sanchez and Hawken, 2007).

## 2.2. Adolescents' Developmental Stage

Erikson's theory (1968) describes the developmental stage of adolescence as characterized by dramatic change, readjustment to new stresses and anxieties, and increased vulnerability to peer pressure. Erikson's (1968) theory describes the adolescent period as the psychosocial stage of identity vs. role confusion (12-18 years), a time of transition between childhood and adulthood. Major conflicts include

clarification of self-identity, life goals, and life's meaning. Failure to achieve a sense of identity results in role confusion. The "Identity vs. Identity Confusion" is a time of physical and social change adolescents begin to find answers to their identity questions: Who am I? What is my place in the society?

Adolescence is also marked by increased autonomy from parents and increased reliance on peers for validation and direction. Peers are vital to teenagers' emotional and psychological development. These teenagers assess themselves and their behaviors through the reactions of their peers. While acceptance by peers is critically important, rejection can be devastating. Risk taking increases during adolescence, and teenagers engage in risk taking for both experimentation and exhilaration. Consequently, adolescents have a sense of invulnerability-an attitude of "it won't happen to me."

## 3. Theoretical Models

A number of theoretical models have been proposed for understanding the development of adolescent substance use or abuse.

### 3.1. Biologically Based Theories

The biologically based theories of substance abuse are concerned with examining the interaction of the brain and drugs, and how genetics influence substance use behavior among family members (Burrow-Sanchez and Hawken, 2007).

*The disease model:* This model is based on the premise that individuals abuse substances because they have underlying disease- that is, the disease of addiction (Burrow-Sanchez & Hawken, 2007). The disease model is based on the work of E.M. Jellinek in 1949 who proposed that alcoholism is a disease within the person. The disease model is not limited to alcohol; it has been applied to other drugs of abuse. The model contends that alcoholism and other substance abuse is a disease and should be treated as such. Consequently, the model implies that alcoholism, for instance, should be regarded as a chronic and incurable condition.

*Brain chemistry:* Individuals who abuse a substance actually alter their brain chemistry, and this alteration produces experiences of euphoria and subsequent craving for the drug (Burrow-Sanchez & Hawken, 2007). The brain is composed of billions of neurons that are used to communicate between its many parts. These neurons are very close together but do not touch; instead, they use chemical messengers called neurotransmitters to communicate with each other. One neurotransmitter that has been studied extensively in relation to substance abuse is dopamine. Dopamine is found in the central nervous system (i.e. the brain and spinal cord) and has been linked to mood regulation, experiences of pleasure and reward, and motivation. Drugs of abuse affect the central nervous system

by increasing the levels of dopamine in specific brain regions, such as the medial forebrain bundle.

*Genetic factors:* Genetically based theories of substance abuse typically revolve around the idea that the genes a child inherits from the parents contain information that can influence later substance use behavior (Burrow-Sanchez & Hawken, 2007). Genetic theories answer such questions as “How much can substance abuse be explained by genetics versus the environment?” or “Does substance abuse run in families?” Genetic factors are thought to explain approximately 50% of the reasons why individuals use or abuse substances (Burrow-Sanchez & Hawken, 2007). Some studies have strongly associated genetic factors with cannabis dependence. One study suggested that, at least for women, marijuana abuse and dependence are highly heritable, with genetic factors accounting for 60% to 80% of the variance liability (Gruber & Pope, 2002).

### 3.2. The Stage Theory

The stage theory suggests that adolescent substance involvement moves through several stages, from experimentation to dependence (Kodjo & Klein, 2002). The likelihood of an adolescent developing dependence decreases with age (perhaps because of adolescent brain development) and provides additional impetus to attempt to delay initiation of substance use.

### 3.3. Biopsychosocial Model

The biopsychosocial models propose that adolescents engage in substance use, as a way to cope with unwanted emotions or to induce desirable feelings and those adolescents often does not have the social skills to reject substance use. The biopsychosocial model integrates two areas of research that have often been considered separately: (1) the relationship of biological development to psychosocial processing during adolescence, and (2) the relationship of risk-taking behaviors to psychosocial correlates of these behaviors (Sales & Irwin, 2009). According to this model, biological, psychological, and social or environmental factors influence adolescent risk-taking behaviors (Irwin & Millstein, 1986; see Kodjo & Klein, 2002).

### 3.4. Problem Behavior Theory

The problem behavior theory is a psychosocial model (Jessor & Jessor, 1977) attempts to explain behavioral outcomes such as substance use, deviancy, and risky sexual behaviors. The model suggests that problem behaviors are interrelated and that engagement in a problem behavior can be explained by the adolescent’s personality traits, perceptions of the environment, socialization patterns, and demographics. This theory emphasizes that these factors are present before the problem behavior begins (Kodjo & Klein, 2002).

### 3.5. Social Learning Theory of Substance Abuse

Social learning theory developed by Albert Bandura expands on problem behavior theory by explaining a wider spectrum of adolescent involvement in substance use (Kodjo & Klein, 2002). Social learning theories can be broadly understood as a social behavioral approach that emphasizes the “reciprocal interaction between cognitive, behavioral and environmental determinants” of human behavior (Bandura, 1977). This theory is based on the premise that individuals learn things within the context of their environments through observing others. An adolescent’s use of substances can be more or less problematic depending on social influences and the extent to which she/he is rewarded for the behavior. The adolescent may learn positive as well as negative consequences associated with the behavior from social influences. (Burrow-Sanchez and Hawken, 2007; Kodjo & Klein, 2002). Social learning theory can be considered an extension of behavioral and cognitive theories, in that it includes such things as observational modeling and people’s thoughts/ beliefs about engaging in behaviors (Burrow-Sanchez & Hawken, 2007; Kodjo & Klein, 2002).

*Modeling:* Albert Bandura contended that much social leaning occurs through casual or direct observation of behavior (Burrow-Sanchez & Hawken, 2007). Bandura emphasized the role of modeling in the initiation and maintenance of behavior. According to social learning theory, individuals observe behavior from their total environment and tend to model the behaviors that are represented as “normal.”

## 4. Developmental Psychopathology

Developmental psychopathology perspective is relevant to investigating risk and protective factors and early identification of children at risk for different types of psychopathology (Cicchetti and Cohen, 1995; Sroufe, 1989). Thus, discussing a developmental psychopathology framework can similarly assist in the development and provision of prevention and intervention to individuals who are at high risk for or who have developed psychopathology of substance use. According to Rutter & Sroufe (2000), developmental psychopathology is the study of the origins and course of individual patterns of behavioral maladaptation, whatever the age of onset, whatever the causes, whatever the transformations in behavioral manifestation, and however complex the course of the developmental pattern may be. Developmental outcomes are seen as the result of a number of interacting factors: behavioral, emotional, neurobiological, genetic, familial, social and cultural. The effect of any one influence depends on the context provided by all the other influences (Sroufe, Carlson, Levy, & Egeland, 1999). The extensive developmental changes and the significance of family life during the preschool years may potentially set a child on a

course of adaptation or maladaptation, and more specifically a path to one type of disorder rather than another (Campbell, 1995). The early child and family risk factors for different types of disorders and their classification of psychopathology across ages can be grouped according to their proximity to the child (Bronfenbrenner, 1979). The first category includes child disorders, both emotional/behavioral and physical, that logically represent the closest and most integral part of the subject of investigation. The second category includes aspects of the parent-child relationship (e.g., insecure attachment) and parenting strategies (e.g., physical punishment), that represent context risk factors directly related to the child. The third category includes general adverse family circumstances, such as low socio-economic status, stressful life-events, and family psychopathology that posit a potential negative influence on the child, but are not necessarily directly related to or aimed at the child. Decades of research have helped to identify several patterns of risk and protective factors contributing to alcohol and drug use in children, adolescents and in later life. The presence and impact of these factors and their interactions with one another can vary depending on the population for which prevention interventions are planned. Most researchers agree on the influence of risk and protective factors on the development of substance abuse in children and adolescents. Individual, peer, family, school and community factors play a role at putting adolescents at risk for substance use. Cognitive risk factors include lack of knowledge about the risks of substance use and believing that use is "normal." (Ries, Fiellin, Miller & Saitz, 2009). Limiting risk factors while strengthening and increasing the availability of protective resources will help to reduce substance abuse and create healthier individuals and communities. Below are some of the most important risk and protective factors identified in the literature.

#### 4.1. Individual Risk Factors

A risk factor is typically defined as anything that increases the probability of a person using drugs; whereas a protective factor is anything that decreases this probability (Burrow-Sanchez & Hawken, 2007). For example, a risk factor for substance abuse is having a parent with a drug abuse problem, and a protective factor is high academic achievement. The higher the number of risk factors for a given adolescent, the greater his or her risk will be for developing substance abuse.

According to Pumariega, Kilgus and Rodriguez (2005), adolescents who use substance are also less likely to be aware of the negative consequences of use, have less negative attitudes about substances, and believe that substances use is normative. They are less likely to have personal competence and decision-making skills that allow them to manage emotional distress. Females with substance abuse disorders have lower levels of constructive thinking and executive function, with these traits also associated with

higher levels of antisocial behavior. O'Connell, Boat & Warner (2009) indicated that alcohol and drug use tends to begin in mid-to-late adolescence, though it is greater among individuals who experience early puberty. The earlier the age at which someone starts drinking the greater the risk that s/he will develop alcohol-related problems later in life. A delay in drinking until 20- to 21-years-old reduces the risk of developing alcohol-related problems (Chou & Pickering, 1992). Personality characteristics that are linked to substance use include low assertiveness, low self-efficacy or self-esteem, low self-confidence, low social confidence, and external locus of control (Pumariega, Kilgus & Rodriguez, 2005). Substance users tend to be more anxious, impulsive, and rebellious. There is a strong relationship between the development of conduct disorder and adolescent substance use, with earlier onset and more serious conduct disorders often sharing many of the personality, cognitive, social, and behavioral risk factors as adolescent substance use. Early aggressiveness or antisocial behavior persisting into early adolescence predicts later adolescent aggressiveness, drug abuse, and alcohol problems (Kodjo & Klein, 2002). Some studies have suggested that inherited biological traits and temperament link genetics and behavior (Burrow-Sanchez & Hawken, 2007). Attention-deficit/hyperactivity disorder (ADHD) in childhood has been found to predict substance abuse disorders in late adolescence, especially when combined with aggressive behaviors or conduct disorders.

#### 4.2. Peer Risk Factors

The period of adolescence is a time when the influence of one's peer group becomes more pronounced; and in relation to substance abuse, peer groups are particularly important (Burrow-Sanchez & Hawken, 2007). For example, adolescents who associate with drug-using peers have consistently been found to have higher levels of drug use. Having friends who use drugs is the strongest predictor of adolescent substance use. Eighty-eight percent of substance users admitted that they had friends who abused drugs. An adolescent who feel isolated may gravitate to and subsequently find acceptance among drug-using peers (Kodjo & Klein, 2002). Thus, associating with drug- or alcohol-using peers, or being rejected by peers, can create problem behaviors and influence attitudes and norms related to substance use (O'Connell, Boat & Warner, 2009). Exposure to peer problem behavior is correlated with increased alcohol and other substance use (Dishion & Skaggs, 2000). Those who drink in a social setting, or who have peers who do so, are more likely to abuse alcohol later in life (Beck & Treiman, 1996).

#### 4.3. Family Risk Factors

The family is a major domain of risk factors for adolescent substance abuse. While most families do provide a context for the healthy development of their children, some students, however, come from families that put them at risk for the use and abuse of substances (Burrow-Sanchez & Hawken, 2007).

Several identifiable poor parenting practices have also been consistently linked to many negative outcomes for children, which include substance abuse and delinquent behavior (Burrow-Sanchez & Hawken, 2007; Kodjo & Klein, 2002). Adolescents who report low parental monitoring are significantly more likely to use a variety of substances (Shillington, Lehman, Clapp, Hovell, Sipan, & Blumberg, 2005). One of the most consistent risk factors for adolescent drinking is perceived parental approval (Donovan, 2004). Parenting practices such as low levels of parental supervision for children, use of inconsistent and harsh discipline tactics, poor display of problem-solving skills, and low levels of emotional support provided to children are linked to negative psychological and behavior outcomes for children. High levels of marital conflict or family stress also place children at risk for negative outcomes such as substance abuse. Adolescents in stressful home situations may use drugs to escape tension. Family conflict may reinforce inconsistency between parent's poor parenting skills and monitoring style (Kodjo & Klein, 2002). Familial alcohol-using behaviors are strong predictors of adolescent alcohol use (Birckmayer, Holder, Yacoubian, & Friend, 2004). In a 2003 study, alcohol initiation most often occurred during family gatherings. Moreover, a family history of alcoholism was a significant risk factor for the development of adolescent problem drinking (Warner & White, 2003). A child who comes from a family in which poor parenting practices are combined with high levels of marital stress will have a low level of bonding to his or her family. Low levels of bonding to the family unit are itself another risk factor for adolescent substance abuse. Furthermore, adolescents whose parents experience mental health problems, such as depression, are at higher risk for mental health problems than are adolescents with mentally healthy parents (Burrow-Sanchez & Hawken, 2007; Kodjo & Klein, 2002).

#### 4.4. School risk factors

Academic problems and substance use often go hand in hand. Adolescents who have poor academic achievement and low commitment to education are more likely to engage in substance use (Burrow-Sanchez & Hawken, 2007; Birckmayer, Holder, Yacoubian, & Friend, 2004; Kodjo & Klein, 2002). Such students also have low commitments to school and view it as a negative place because they experience unpleasant consequences such as detention or suspension. Students who drop out of school are more likely than those who stay in school to use substances. Another risk factor is inappropriate classroom behavior, such as either excessive aggression toward others or excessive withdrawal. One consistent finding is that the younger the age at which a student displays such disruptive or withdrawn behaviors, the more negative the later substance-abuse related outcomes.

Furthermore, certain school characteristics are risk factors in themselves. For example, schools that have low expectations for students, are disorganized and unsafe, or do not have clear expectations regarding appropriate student

behavior place students at higher risk for substance abuse and other problem behaviors (Burrow-Sanchez & Hawken, 2007).

#### 4.5. Community Risk Factors

Availability and presence of drugs in the community also may contribute to favorable norms and lead to increased use (Burrow-Sanchez & Hawken, 2007; Hawkins & Arthur, 1995; Kodjo & Klein, 2002). In general, the more available drugs are in a given community, the more likely it is that adolescents will report using them. Most adolescents know where to get substances and have easy access. Alcohol moreover may be available at home. Availability is determined not only by location but also by cost. Liquor that is inexpensive and easily available is a risk factor for use and abuse in a given geographical region. Low perception of harm towards alcohol and drug use (such as marijuana) in some communities is a risk factor for use (Henry & Slater, Oetting, 2005). Individuals with attitudes or values favorable to alcohol or other drugs in their communities are more likely to initiate substance use (Hawkins, Catalano, & Miller, 1992).

Adolescents living in poverty may be further exposed to substances in their communities (Kodjo & Klein, 2002). Areas with concentrated poverty and social disorganization have high rates of unemployment and may offer limited educational opportunities. Poverty and unemployment also fuel the underground market of drug trafficking and violence.

Individuals from racial and ethnic minority groups (e.g., Mexican American, African American) generally experience higher rates of poverty than individuals from the European American population (Burrow-Sanchez & Hawken, 2007). Thus, adolescents who live in conditions of socioeconomic disadvantage have the highest rates of substance use among the youth. More money is spent advertising tobacco than any drug an estimated \$15 billion per year in the United States of America. (American Academy of Pediatrics, 2006; 2013). The power of advertising to influence children and adolescents (and adults, for that matter) makes smoking and drinking seem like normative activities and may function subtly pressuring teenagers to experiment. Media generally portray favorable images of tobacco and alcohol use through editorial content advertising. Many magazines contain advertisements for alcohol and cigarettes that feature images of sports stars, glamour, and sexuality. Such advertisements glorify substances and portray them as a means to fame and sexual success (Strasburger, Jordan & Donnerstein, 2010). However, antidrug ads have been shown to be highly effective at times (American Academy of Pediatrics, 2013).

#### 4.6. Individual Protective Factors

Protective factors that work to buffer adolescents from developing problems with substance use include good social and problem solving skills, lack of mental health disorders, and positive perceptions of self-worth, such as high

self-esteem (Burrow-Sanchez & Hawken, 2007). Likewise, positive self-esteem and self-image, good self-control, assertiveness, social competence, and academic success are all positive resilience factors (Strasburger, 2002).

Alienation from the dominant values of society, low religiosity, and rebelliousness has been shown to predict greater drug use in adolescence (Hawkins et al., 1997).

#### 4.7. Peer Protective Factors

Peers also influence adolescent behavior and attitudes in many positive ways and can have a significant protective effect (Pumariega, Kilgus & Rodriguez, 2005; Strasburger, 2002). Adolescents choose their own friends, but associating with those not engaged in high-risk activities avoids some exposure to deviant behaviors (Burrow-Sanchez & Hawken, 2007; Kodjo & Klein, 2002).

Peers who do not use drugs and have negative attitudes toward the use of substances are likely to influence similar behavior and attitudes in an adolescent. In addition, an adolescent whose peer group engages in prosocial activities is also more likely to engage in socially sanctioned activities. This does not mean that students whose peers have negative attitudes about drug use and engage in prosocial behaviors will never try drugs. In fact, it is likely that most adolescents will try substances or drugs are more likely to abstain.

#### 4.8. Family Protective Factors

Effective parenting (e.g., authoritative parenting, monitoring, and support) appears to be protective with respect to antisocial behavior (Masten, Hubbard, Gest, Tellegen, Garmezy, & Ramirez, 1999). Effective parents probably avert numerous risk factors for their offspring; thus, children with competent parents are exposed to fewer adverse life events (Gest, Neemann, Hubbard, Masten, & Tellegen, 1993; Masten et al., 1999). Positive parenting practices promote good outcomes for children and adolescents. These practices include appropriate levels of child monitoring, setting clear rules and expectations for children, and expressing high levels of emotional support to children (Burrow-Sanchez & Hawken, 2007; Patterson, Reid, & Dishion, 1992). The use of positive parenting practices can lead to the development of strong bonds and trust between an adolescent and his or her family. Positive parental style and close monitoring by parents result in decrease of adolescents' use of alcohol and other drugs (Stewart, 2002). Adolescents who have a close relationship with their parents are less likely to become involved with alcohol (Birckmayer, Holder, Yacoubian, & Friend, 2004). Furthermore, adolescents who have open communication with their parents and feel supported by their parents are also less likely to engage in substance use. According to Kodjo and Klein, (2002) parents' substance use is listed as a risk factor, it may also repel adolescents from using substances because they have seen and experienced the consequences of addiction. Effective parenting can help to buffer an adolescent's personality traits, and parents who monitor their

children are less likely to have drug-using adolescents (Gerra & Angioni, 2004). By making their expectations about drug use clear, parents can draw the line for younger, concrete-thinking adolescents.

#### 4.9. School Protective Factors

Schools can also be a great source of protective factors for students. The school setting can provide protective factors that greatly reduce the risk for many problem behaviors for a student who comes from a difficult home environment. Positive connections are built when students are involved in school activities, such as participating in sports, clubs, or committees, or have strong bonds or connection (Burrow-Sanchez & Hawken, 2007; Kodjo & Klein, 2002). Furthermore, students who have good academic achievement generally have much more positive attitudes and bonds to school than students who are at risk for academic failure. Characteristics of the school-wide environment such as clear standards for appropriate student behavior limit students' substance use. Examples include the school-wide positive behavior support plan that includes common expectations or "rules" for appropriate student behavior.

Schools that provide a safe physical environment and supportive climates, such as regularly maintaining buildings on campus, promote students' feeling of safety at school and serve as protective factors.

#### 4.10. Community Protective Factors

Communities can provide many protective factors. Adolescents can build strong bonds to their communities by participating in prosocial, community-based activities at such venues as youth centers (e.g., Boys and Girls Clubs), churches, and other positive socializing agents (Burrow-Sanchez & Hawken, 2007). Adolescents who feel positive connections to their communities are less at risk for substance abuse than adolescents who do not. Availability of drugs is another issue. For alcohol, stricter enforcement of the age limit would curb adolescents' purchase and use of alcohol (Kodjo & Klein, 2002). Raising the cost of alcohol would limit access. Illicit drugs, however, are not as easy to regulate without addressing the conditions that foster their trafficking and use. Furthermore, addressing issues of poverty, tribalism, racism, and lack of opportunities would mean reevaluating the status of social equality in the United States.

### 5. Impact on Adolescents' Development

Alcohol, tobacco and marijuana are widely regarded as "gateway" drugs (Freshman, 2004; Strasburger, 2002). Persistent substance abuse of alcohol, tobacco, and marijuana by adolescents often leads to academic difficulties, health-related problems (including mental health), poor peer relationships, and involvement with the juvenile justice system. Furthermore, there are consequences for family members, the community, and the entire society.

### 5.1. Alcohol

Alcohol is a central nervous system depressant. At high blood levels, it leads to respiratory depression, arrest, and death (Coupey, 2002). In addition, elevated blood alcohol levels are found in a substantial percentage of adolescent suicide and homicide victims. Thus, adolescents who abuse alcohol or drugs often develop self-destructive behavior patterns that lead to a form of “slow suicide,” even when there is no indication of intentional suicidal behavior or ideation. Other negative consequences include troubles with family, friends, teachers, police, or dates because of drinking. Drinking alcohol also contribute to premature sexual intercourse, lower grades in school, and experimentation with other drugs.

Alcohol is a known teratogen and seems to have its greatest effect on the developing fetus if consumed in large doses early in pregnancy (Coupey, 2002). Many sexually active adolescent girls fail to use adequate contraception; thus, many fetuses of adolescent girls are exposed to the harmful effects of alcohol and to the secondary effects of inadequate nutrition and multiple drug abuse.

Chronic heavy drinking during adolescence and young adulthood appears to be associated with detrimental effects on brain development, brain functioning, and neuropsychological performance (Tapert, Cardwell, & Burke, 2005). Furthermore, imaging studies have indicated that alcohol-consuming youth exhibit abnormalities in some brain areas that are particularly sensitive to disruption, such as the hippocampus, and in the chemical and electrical processes that occur during brain activity (e.g. in blood flow and the appearance of event-related potential).

### 5.2. Tobacco (Nicotine)

Nicotine is perhaps the most addictive of all substances, and dependence is common after one smokes as few as 100 cigarettes (Coupey, 2002; Heyman, 2002b). Because nicotine is a potent cholinergic analogue, it enhances the release of a number of neurotransmitters, including acetylcholine, serotonin, and endorphin. Thus, its use is associated with enhanced pleasure, appetite suppression, and relaxation.

Many studies have shown that children become as addicted as do adults and have just as much trouble quitting. Seventy percent of adolescent smokers wish they had never started (Heyman, 2002b). Furthermore, most twelfth graders who smoke do not think they will be smoking five years after they graduate. Most adolescents assume they can quit smoking at will, yet surveys have suggested that most will make a number of attempts to quit and that their success rate is no better than that of adult smokers (Heyman, 2002a; Heyman, 2002b).

Tobacco use by adolescents is associated with both immediate and long-term health consequences (Heyman, 2002b). Cigarette smoking seems to decrease the rate of lung development and may negatively affect eventual pulmonary function. Adolescents who smoke have a higher incidence of

respiratory infections and breathing problems as well as chronic cough with phlegm production. They tend to generally be less fit than their nonsmoking peers. The effect on blood lipids, with increased triglycerides and low-density lipoproteins with concomitant decreases in high-density lipoproteins, suggests that smoking may be a major factor in promoting cardiovascular disease in later life.

Studies have also suggested that the earlier adolescents take up the tobacco habit, the more likely they are to engage in other high-risk behaviors and to become long-term smokers (Coupey, 2002; Heyman, 2002b). The early smokers show predilections for low academic achievement, dropping out of school, and engaging in violent, delinquent and irresponsible behavior. Long-term effects of cigarette smoking include the development of acute and chronic bronchitis and emphysema, abnormalities of blood lipids, and atherosclerotic cardiovascular disease and lung cancer.

### 5.3. Marijuana (Cannabis)

Moderate doses of marijuana in a safe physical and social setting, typically produce a “high” accompanied by distortions in visual and time perception, and enhancement of various sensations (Gruber & Pope, 2002). High doses of marijuana produce severe anxiety, transient psychotic symptoms, or even delirium. These effects typically resolve within hours without specific intervention other than keeping the person safe.

Although the major effects of marijuana are on behavior, marijuana affects a number of physiological variables although tolerance to most of these develops rapidly. Acute cardiovascular effects of marijuana include transient increases in heart rate up to 50% and blood pressure (Coupey, 2002; Gruber & Pope, 2002). At very high doses, marijuana can cause bradycardia, drowsiness, ataxia, hypotension, miosis, peripheral vasoconstriction, and hypothermia. (Coupey, 2002). Marijuana also exerts a major effect on learning and memory. Students who are regular smokers frequently under the influence of marijuana have poor academic performance. Furthermore, marijuana intoxication impairs coordination and distorts one’s sense of time. These impairments, combined with adolescents’ lack of driving experience and predilection for high-risk behavior, place adolescents intoxicated with marijuana at high risk for motor vehicle accidents.

Marijuana is reported to decrease plasma testosterone, sperm count, and sperm motility. Males who smoke marijuana are found to have changes in ejaculate semen characteristics that could explain the association between infertility and marijuana smoking (Coupey, 2002; Gruber & Pope, 2002). Regular use of marijuana adversely affects effectiveness in school, sports, and other extracurricular activities including learning to initiate and maintain healthy relationships (Coupey, 2002; Gruber & Pope, 2002). Furthermore, the state of marijuana intoxication is disinhibiting and impairs judgment, resulting in participation in risky behavior, such as unprotected sex, exposing a fetus



to marijuana, riding in a vehicle with an intoxicated driver, driving while intoxicated, or other dangerous activities. This ultimately results in diminished life's goals and a decreased ability to attain or even establish goals. This so-called "chronic cannabis syndrome" or "amotivational syndrome" likely represents the effects of almost continuous intoxication. The use of marijuana on a regular basis creates the risk for addiction and dependence, while heavy marijuana use impairs pulmonary function and increases the risk for chronic obstructive lung disease (Gruber & Pope, 2002).

## 6. Implications for Health Professionals and School Counselors

The goal of the present study was to explore the effects of the alcohol, tobacco (nicotine) and marijuana and their impact on middle and high school students. The paper attempted to examine the risk factors of substance abuse and the protective factors. The protective factors on the development of substance abuse among middle and high school students may be effective ways to prevent and reduce students' perceived opportunity to use alcohol, tobacco, and marijuana and other illegal substances.

Experimenting with readily available substances such as alcohol, tobacco, marijuana, including psychoactive substances and other illicit drug has become a part of growing up for middle and high school students. Those students who become heavily involved in substance abuse often have other social, economic, and societal problems, including juvenile delinquency, accidental injury or death, and mental health problems. Furthermore, adolescent substance use has been linked to educational problems such as low motivation, impaired cognitive processing, academic failure, and school dropout. Therefore, substance use among adolescents is an important social and health problem in Africa and other countries in the world. Health professionals in African countries should embark on education programs to educate adolescents on the dangers involved in the use of these drugs. Prevention programs should be designed by school counselors and other health professions to help reduce the use of these drugs.

School counselors and other health professionals in both developing and developed countries should engage in intensive research on substance use (alcohol and marijuana) in the schools to enable stake holders develop effective prevention and treatment programs for students in the junior and senior high schools. Furthermore, current school-based prevention programs should be aimed at preventing adolescents from initiating the use of alcohol, tobacco, marijuana and other illegal drugs use rather than preventing adolescent users from continuing use (Gruber & Pope, 2002).

Adolescents' stage "Identity vs. Identity Confusion", a time of physical and social changes, where a sense of identity becomes the main issue should be a concern for health

professionals and other stakeholders involved in the development of children. Furthermore, development of Psych educational group therapy for adolescents by counselors and psychologists on the negative effects and coping skills of the use of drugs would build their self-esteem and skills of adolescents.

## 7. Conclusions

The paper attempted to discuss the prevalence, epidemiology, theoretical models, risk and protective factors of substance use and abuse among the youth at risk with regard to Alcohol, tobacco and marijuana. Their implications for health professionals and school counselors have been addressed. This theoretical paper provides relevant information for mental health professionals who work with the youth.

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