

Effective Prevention of Adolescent Substance Abuse – Educational versus Deterrent Approaches

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Substance abuse, especially among adolescents, has long been an important issue in society. In light of the adverse impact of substance abuse, scholars, educators, and policy-makers have proposed different approaches to prevent and reduce such abuse. This paper investigates the effectiveness of the two prominent approaches—educational and deterrent—in preventing and reducing adolescent substance abuse. The educational approach (e.g., school-based prevention programming) tends to be more comprehensive and better grounded in theories than the deterrent approach (e.g., drug testing). The educational approach not only targets multiple psychosocial factors contributing to substance abuse, but it is also supported by empirical studies showing that school-based prevention programming is effective in preventing substance abuse and has long-lasting positive influences on adolescent development. Practical implications of implementing school-based prevention programming are also discussed.

L'abus d'alcool ou d'autres drogues, surtout chez les adolescents, constitue depuis longtemps une préoccupation importante de la société. À la lumière de l'impact défavorable de cet abus, les chercheurs, enseignants et décideurs ont proposé différentes approches pour le prévenir et le limiter. Cet article porte sur l'efficacité de deux approches importantes, l'une pédagogique, l'autre dissuasive, visant la prévention et la réduction de l'abus d'alcool ou d'autres drogues chez les adolescents. L'approche pédagogique (par ex. les programmes de prévention en milieu scolaire) est, de façon générale, plus globale et mieux fondée sur les théories que l'approche dissuasive (par ex. dépistage des drogues). Non seulement l'approche pédagogique cible-t-elle les divers facteurs psychosociaux qui contribuent à cet abus, elle est de plus appuyée par des études empiriques indiquant que les programmes de prévention en milieu scolaire sont des outils efficaces dans la prévention de l'abus d'alcool ou d'autres drogues et qu'ils ont un impact positif à long terme sur le développement des adolescents. Nous discutons des répercussions pratiques de la mise en œuvre des programmes de prévention en milieu scolaire.

Adolescence is a transition period of growth that involves (a) major physiological changes (e.g., developing secondary sex characteristics), (b) psychosocial changes (e.g., establishing one's identity), and (c) cognitive changes (e.g., developing abstract reasoning skills; Bergen, 2008; Ruffin, 2009). During adolescence, peer acceptance becomes more important among teenagers; peer groups exert great influence on adolescents' thinking and behaviors (Wodarski & Feit, 1995). In the process of fitting into a peer group and establishing identity, it is not surprising that adolescents engage in high-risk behaviors such as drinking and experimenting with drugs.

According to the Health Canada's (2010) drug and alcohol use statistics, 26.3% of adolescents and young adults (ages 15-24) indicated their use of cannabis, and 5.5% used at least one other illicit drug. In particular, the use of cannabis in this age group was almost fourfold compared to that in adults (age 25 or older). The prevalence of drug use in adolescents is a concern. Specifically, there is a deleterious impact of drug use on teenagers' (a) academic performance (e.g., inability to focus), (b) cognitive and physical development (e.g., cognitive impairment and organ dysfunction), and (c) psychosocial well-being (e.g., depression; Crowe & Bilchik, 1998; Newcomb & Bentler, 1988).

Given the vulnerability of adolescents to drug use and the adverse impact of substance abuse, strategies to effectively prevent and reduce such abuse are a *hot* discussion topic in the field of education and mental health. Scholars and policy-makers have debated the effectiveness of educational prevention compared to punitive deterrence as means to reduce adolescent substance abuse. The goals of this paper are twofold:

1. to evaluate the educational approach against the deterrent approach in terms of preventing and reducing adolescent substance abuse, and
2. to discuss the practical implications of using the educational approach.

Educational versus Deterrent Approaches on Preventing and Reducing Adolescent Substance Use

Scholars and policy-makers are concerned about the prevalence of adolescent substance abuse. According to the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA, 2010) and Carboni (2007), an effective prevention framework is comprised of three tiers—universal, selected, and targeted. Universal prevention targets the general adolescent population; it aims to equip adolescents with necessary knowledge and skills in order to prevent substance abuse. Selected prevention focuses on providing strategies (e.g., techniques for refusing drug offers) to groups of adolescents who have some risk of using drugs; it aims to reduce initial drug experimentation. Targeted prevention aims to provide interventions to high risk adolescents in order to reduce their substance use. Based on this prevention framework, scholars have discussed two prominent approaches: (a) school-based prevention programming, and (b) random drug testing, to prevent and reduce substance use.

Educational Approach

School-based prevention programming aims to

1. educate adolescents about the effects and consequences of substance abuse—universal prevention,
2. develop their refusal skills to protect themselves in problematic situations—selected prevention, and
3. train them in the necessary social and self-management skills to reduce substance use—targeted prevention (Lemstra et al., 2010).

This approach is primarily oriented towards empowering adolescents to make informed decisions and to pursue a healthy lifestyle, which in turn reduces their likelihood to abuse substances. Fundamentally, such an approach, operating across the three tiers, aims to assist adolescents in making informed decisions that are good for their personal growth and development.

Deterrent Approach

In light of the adverse impact of substance abuse in adolescence, some policy-makers advocate using deterrent-based methods—anti-drug use school policies, zero-tolerance of substance use, and drug testing—that impose negative consequences on students when they are found to abuse drugs. These consequences include (a) notification of school principals and parents, (b) referral to corresponding authorities, (c) suspension of certain in-school activities, and (d) school suspension (Evans-Whipp et al., 2004; Ringwalt et al., 2009). Among these deterrent methods, random drug testing has been widely advocated and used in school systems (Goldberg, et al., 2003). This deterrent approach, therefore, is oriented towards preventing adolescents from using drugs by making a clear statement on zero-tolerance in school environments. Although deterrent-based prevention (drug testing) may reduce adolescent substance abuse, it operates on the targeted prevention tier, identifying drug-using adolescents and imposing negative consequences in order to deter their substance abuse. This approach, however, might not take into consideration the root causes and origins of such abuse.

In summary, the educational approach might be considered to be a more comprehensive form of prevention, whereas the deterrent approach is a more specific and targeted preventive strategy. In the literature, findings tend to support the educational approach over the deterrent approach. The following sections provide theoretical support and empirical evidence regarding the use of educational prevention programming.

Theoretical and Empirical Support for an Educational Approach

Effective intervention needs to be grounded in theories and supported by empirical evidence. In this paper we review the more common educational prevention approach, school-based programming, across four areas:

1. knowledge of substance abuse,
2. unique adolescent psychosocial experience (i.e., identity development and social skills, social learning, and self-efficacy),
3. school attachment, and
4. decision making, on the basis of developmental theories and research findings.

Knowledge of Substance Abuse

To make informed and rational decisions, adolescents should be taught about the effects of substance abuse. Although children develop abstract reasoning skills in adolescence, Elkind suggested that they are still in the egocentrism stage (as cited in Bergen, 2008). In particular,

adolescents consider themselves unique and invulnerable; a teen does not think negative consequences will be equally applied to him or her even if he/she does exactly the same things as someone who uses drugs and consequently suffers from, for example, organ dysfunction. Hence, adolescents may perceive that they are invulnerable to the negative effects of drug use. Without sufficient knowledge about the effects of substance abuse, adolescents may not be able to decline a drug offer.

Not only is the teaching of knowledge of substance abuse supported by theoretical frameworks, but empirical evidence also supports its utility in reducing adolescent substance abuse. Werch, Moore, DiClemente, Bledsoe, and Jobli (2005) used a randomized experimental approach to investigate the effectiveness of an intervention that taught the effects of alcohol and drug use to adolescents. They found that students in the intervention group showed a reduction in alcohol consumption, and cigarette and marijuana use, suggesting preventive educational programming addresses one of the important aspects in reducing adolescent substance abuse, that is, teaching teenagers the fundamental knowledge of the effects of such abuse (e.g., cognitive impairment and depression). By discussing the adverse effects of substance abuse in an intervention program, adolescents can be better prepared to reason and make sensible decisions when they receive drug use offers.

In contrast, drug testing simply imposes negative consequences to deter adolescent substance abuse. As mentioned, adolescents perceive that they are invulnerable and “exceptional,” that they are not likely to be caught in drug testing. Without proper education on the effects of substance abuse, adolescents are not equipped with the necessary knowledge to judge what behaviors are appropriate or inappropriate. Furthermore, Goldberg et al. (2003) confirmed the limitations of drug testing. The authors found that students in the drug testing group thought that there were fewer negative consequences to drug use than did those in the control group after the drug testing intervention. Their results were worrisome. Although self-reported substance abuse might be reduced in drug testing schools, adolescents’ knowledge about the adverse effects of substance abuse was insufficient, which may have hampered their ability to make informed and rational decisions in potential drug-use situations. Thus, drug testing is limited to deterring substance abuse only during the period when the policy is effective, and it lacks usefulness to equip adolescents with necessary knowledge about the effects of drug use. A school-based prevention program on the other hand targets the vulnerability underlying adolescent substance abuse.

Unique Psychosocial Experience

In adolescence, teenagers often experience confusion and tension in relationships (Bergen, 2008). Therefore, it is important to understand, based on theoretical perspectives and empirical support, how school-based prevention programming addresses adolescents’ unique psychosocial experiences and achieves its goals in preventing and reducing adolescent substance abuse. Three key adolescent developmental issues—identity development and social skills, social and peer group influence, and development of self-efficacy—deserve our attention as to how school-based prevention programming addresses those issues.

Identity development and social skills. Transitioning from childhood into adolescence, teenagers often seek to establish their identities by trying different roles and behaviors. According to Erikson’s (1968) theory, adolescents experience an *Identity* versus *Role Confusion* crisis that involves developing a strong ego and establishing an identity (as cited in Bergen,

2008). Adolescents struggle with the challenges of gaining a unique identity that is accepted by their peers. Internal forces (e.g., the effort to establish identity), and external forces (e.g., peer group influence) interact and affect how an adolescent develops his/her identity.

Given that peer influence has a huge effect on an individual's tendency to explore various situations (e.g., experimenting with drugs), school-based prevention programming addresses such a possibility through the provision of social skill training and thus targets one of the core vulnerabilities in adolescent substance abuse. The training in social skills, in particular refusal skills, is supported by psychosocial theories (Bandura, 1977; Jessor & Jessor, 1977). Provided with social skills training, adolescents develop (a) self-management skills (e.g., networking with non-drug users), and (b) assertiveness (e.g., skills in resisting social pressure to use drugs). In particular, peer pressure and the desire to fit into groups are two major social factors influencing adolescent substance abuse. If adolescents are unable to develop fidelity and a strong sense of self, they will lack direction and become easily influenced by peers, and imitate those whom they identify with.

In light of the unique social-emotional development of adolescents, prevention programs that offer self-management and social skills were successful in reducing adolescent drug use (Botvin, Griffin, Diaz, & Ifill-Williams, 2001). Botvin et al. employed a large-scale longitudinal study of more than 3,000 students to investigate the effectiveness of school-based drug prevention programming between the intervention and control groups. Students were taught anti-drug information and norms, and general social skills in the intervention group. Compared to students in the control group, pupils in the intervention group reported less frequent use of cigarettes, alcohols, inhalants, and polydrugs (i.e., licit and illicit drugs) one year after the intervention, thus supporting the effectiveness of school-based intervention programming. Not only does educational programming seem to reduce drug use behaviors, it also reduces adolescents' intention to abuse substances and fosters anti-drug attitudes (Faggiano et al., 2008).

Sun, Skara, Sun, Dent, and Sussman (2006) likewise found long-term benefits of school-based programming among adolescents in the intervention group. By receiving training in social skills and decision-making skills, adolescents reported that they used hard drugs significantly less frequently than did those in the control group five years later. Hence, when adolescents develop appropriate social skills, they are more likely to refuse and reduce drug use after the intervention and in the years following.

Establishing identity is closely related to social factors, in particular peer pressure to fit into a group. School-based preventive programming addresses adolescent developmental changes and their vulnerabilities to substance abuse by providing pertinent social skills training. In contrast, drug testing primarily focuses on imposing negative consequences such as suspension. Given that adolescents are establishing their identities, a healthy and safe social environment, such as school, plays an important role in assisting their development. Employing drug testing creates the possibility of a conflicted adolescent-school relationship, particularly in schools emphasizing zero-tolerance of substance abuse (Shamoo & Moreno, 2004). Although some studies (Goldberg et al., 2003) showed a reduction in adolescent substance abuse in drug testing schools, students may have just changed their patterns of drug use making them less easily detected or have been absent from school as suggested by McWhirter (2005). Specifically, if adolescents' truancy is a consequence of their desire to avoid being tested, these students may be potentially diverted to other drug use situations (Roche, Bywood, Pidd, Freeman, & Steenson, 2009). Research has shown that students, in particular, those who have already used drugs, did

not change their drug use behaviors even though their schools had enforced random drug testing policies (Yamaguchi, Johnston, & O'Malley, 2003). Based on these findings, we propose that drug testing is a less effective mechanism to prevent adolescent substance abuse.

School-based prevention programming addresses adolescents' vulnerabilities in drug use, and it can effectively prevent such abuse by providing adolescents with training in social skills. In light of peer pressure in adolescent identity development, school-based prevention addresses potential social learning factors underlying teenagers' substance abuse.

Social learning. Given the influences of social factors on the development of adolescents and on their vulnerability to engage in high-risk behaviors such as substance abuse, school-based prevention programming often adopts a social-influence model (Lemstra et al., 2010). In the transition to adolescence, teenagers acquire their beliefs and learn certain behaviors through observation, in particular from those they identify as role models (Petraitis, Flay, & Miller, 1995). According to social-cognitive theory, adolescents who are involved in substance abuse situations and identify drug-using peers as role models begin to observe and imitate drug use behaviors, especially when they are given peer reinforcement and support in using substances (Ford, 2008; Petraitis et al., 1995). Observing close friends using drugs, adolescents may also change their beliefs and attitudes towards drug use; when engaging in a social group that uses drugs, non-drug-using adolescents may experiment with drugs. If peer groups and close friends display positive attitudes towards substance abuse, those non-drug-using adolescents may also be less hesitant to try drugs.

Petraitis et al. (1995) found that adolescents who observed how their friends obtained and used drugs increased their substance abuse tendency, whereas witnessing how their friends resisted substance abuse enhanced their refusal skills when confronted with similar situations. In light of the importance of refusal skills in drug use situations, prevention programming develops adolescents' skills in refusing substance abuse and being assertive in not experimenting with drugs. Thus, consistent with the social influence model (Cuijpers, 2002), school-based preventive programs can effectively prevent and reduce adolescent drug use by engaging students in learning how to resist social pressure to use drugs across a range of scenarios. Lemstra et al. (2010) found that teaching students refusal skills effectively reduced adolescent drug use. In line with the Lemstra et al. study, Tobler et al. (2000) evaluated components in reducing substance abuse. They found that social influence (i.e., understanding peer influence on one's decision making) had a substantial effect on reducing students' drug use.

In addition, to resist social pressure for drug use, adolescents should know and distinguish between socially acceptable norms and peer normative beliefs. Unlike drug testing, which only emphasizes the negative consequences of drug use, prevention programs educate adolescents about different norms and beliefs. Scholars have found that education programs focusing on norms and developing adolescent commitment and intention not to use drugs were successful (Cuijpers, 2002). Educational programs that foster adolescents' appropriate normative beliefs toward substance abuse and enhance their confidence and commitment to resist social pressure regarding drug experimentation are effective in reducing substance abuse during the intervention period and in the future.

In contrast, systematic studies on the effectiveness of drug testing are scant. Among these, Yamaguchi et al. (2003) found non-significant difference on adolescent substance use between the drug testing and control groups. McWhirter (2005) also argued against drug testing and further elaborated that drug testing does not address the complex psychosocial factors such as peer pressure and social learning which are known to influence drug use. On one hand, drug

testing may not achieve its goals in preventing and reducing substance abuse. On the other, adolescents may simply be absent from school to avoid being tested (Roche et al., 2009).

Given that social learning is one of the important factors in adolescent substance abuse, the literature suggests that students are taught to resist such abuse in a school-based prevention program, which in turn reduces their drug use. Beyond enhancing adolescents' refusal skills, school-based programming also addresses the underlying factors that contribute to the development of refusal skills.

Self-efficacy. Not only do peer pressure and identity crisis affect adolescents' risk-taking behaviors, but their self-efficacy—a contextual evaluation of an individual's confidence to perform a particular action (Bandura, 1977)—also plays an important role in whether or not they engage in high-risk behaviors. Educational prevention programming is not only grounded in social-learning theories but also builds on cognitive-affective theoretical frameworks. Based on Bandura's social cognitive theory, adolescent self-beliefs about substance abuse affect their actions (as cited in Bergen, 2008; Petraitis et al., 1995). In addition to peer pressure, adolescents' ability to self-direct and self-regulate affects their behaviors. The extent of one's self-efficacy to carry out certain behaviors impacts an individual's subsequent performance. In particular, an individual's self-efficacy to refuse substance abuse negatively predicts his/her future drug use (Lozano, Stephens, & Roffman, 2006). The higher the adolescents' refusal self-efficacy is, the lower their rates of drug use would be; refusal self-efficacy serves as a protective factor against adolescent drug use (Walker, Neighbors, Rodriguez, Stephens, & Roffman, 2011).

Adolescents' self-efficacy of substance use plays an important role in influencing adolescents' drug-using behaviors. Prior studies (Elliot et al., 2008; Petraitis et al., 1995) have discussed how drug use self-efficacy could be fostered if adolescents believed that they had the ability to obtain drugs (e.g., friends offering free cocaine) and the skill to use them (e.g., knowing how to inhale marijuana); there is a close relationship between social learning and substance use self-efficacy. For example, in a drug-use situation, when non-drug-using adolescents observe their peers using drugs (i.e., social learning), their substance use self-efficacy may increase through such observation.

Educational preventive programming can effectively reduce adolescent drug use by developing and enhancing adolescents' refusal self-efficacy and developing their refusal skills simultaneously (Lemstra et al., 2010). In particular, enhanced refusal self-efficacy and learned skills not only assist adolescents in declining drug offers with greater confidence, but they also foster anti-drug attitudes for adolescents to deal with similar situations later in their lives.

In contrast, drug testing does not promote the development of protective factors and necessary skills for adolescents to deal with drug using peer pressure. Although Goldberg et al. (2003) found a significant reduction in the use of illicit drugs and ergogenic substances in their drug testing intervention group, those same students perceived drug testing to be less effective and unable to provide positive results in preventing substance abuse. Despite reporting less drug use, adolescents participating in the drug testing program were not taught skills for effectively dealing with, that is, refusing use in, potential drug-use situations compared to those receiving educational preventive programming. This poses a concern for educators, given that these adolescents may only be deterred from using drugs by the drug testing policy instead of developing an anti-drug attitude. It is thus reasonable to speculate that if they have a chance to escape from drug testing surveillance (e.g., moving to another school that does not have drug testing policy), these students, especially those who have lower refusal self-efficacy, may experiment with drugs in light of pressure from drug-using peers.

Students' perception towards drug testing also aligns with the aforementioned arguments—drug testing does not address the consequence of drug use or acceptable normative beliefs, nor does it help adolescents develop refusal self-efficacy and skills. Goldberg et al. (2003) found that students did not consider refusing drug use because of a random drug testing policy in their schools: In Goldberg et al.'s study, the intervention schools were self-selected, which may have biased the results. In light of theoretical support and empirical findings, educational prevention program focusing on social skills training and the development of refusal confidence and skills have promising results in preventing and reducing adolescent drug use (Lemstra et al., 2010).

School Attachment

As discussed, adolescent psychosocial development is often influenced by various social factors. Adolescents need pertinent guidance and support when they experience stress and turmoil in overcoming challenges such as changing schools). Preventive educational programming on substance abuse focuses on providing support and resources to adolescents.

Adolescents' problem behaviors can be partially explained by their attachment to their parents. Allen, Aber, and Leadbeater (1990) found that adolescents with insecure relationships with their parents were more likely to demonstrate problem behaviors. Given that adolescents spend most of their time in school (Bergen, 2008), the school environment, and particularly its teachers, plays an important role for these adolescents to develop a positive relationship that buffers teenagers from engaging in high-risk behaviors such as drug use.

Teenagers with a weak attachment to schools and communities that value non-deviant beliefs and behaviors may be less committed to certain values—not using drugs. Given other psychosocial factors in effect—peer encouragement on drug use and pressure to fit in a group—adolescents may be more likely to attach to drug-use peers, who in turn become more likely to use drugs under social pressure (Catalano, Haggerty, Oesterle, Fleming, & Hawkins, 2004; Neighbors, Geisner, & Lee, 2008; Petraitis et al., 1995).

In light of the aforementioned vulnerability, school-based prevention programming not only disseminates anti-drug knowledge and develops adolescents' social skills and refusal self-efficacy and skills, but the support provided by teachers and non-drug using peers also serves to build a stronger attachment between adolescents and schools. An accepting and generous intervention program, therefore, prevents and reduces adolescent drug use by providing students with support and resources, such as active listening to students' experiences and helping them to identify healthy alternatives instead of drug use (Cohen, Plecas, & Watkinson, 2005). School-based prevention programs address this concern by giving adolescents support and greater community-wide collaboration and involvement. This gradually strengthens adolescents' attachment to schools and communities that value anti-drug orientations. In addition, networking with non-drug using peers (e.g., peer leaders) provides positive social influence (Cuijpers, 2002).

Marcos, Bahr, and Johnson (1986) conducted a study to evaluate whether a higher level of school attachment mediated the effects of lower parental attachment on marijuana use among junior and high school students. In line with the theoretical orientation, school attachment significantly mediated the impact of low parental attachment on adolescent marijuana use; the higher the levels at which students were attached to school, the lower the lifetime marijuana use. On the other hand, when adolescents felt detached from school, they were more likely to attach to drug-using friends (Marcos et al., 1986). Consequently, this increased the adolescents'

lifetime use of marijuana given the pressure from drug-using peers to abuse drugs. Similarly, Catalano et al. (2004) found that the stronger the students' connectedness to their schools, the lower their rates of alcohol and drug abuse. Given the important role played by schools, school-based programs address this concern by fostering teenagers' involvement in school and their internalization of anti-drug values.

Unlike school-based prevention, drug testing may indeed worsen the adolescent-school relationship, especially in schools that use a variety of sanctions in response to a positive drug test (Roche et al., 2009). Adolescents may perceive that schools are keen on catching drug users, and thus they may not even seek help from teachers if they have any concerns about drug use. This may divert them back to their drug-using friends. Petraitis et al. (1995) stated that when adolescents become attached to their drug-using friends, social learning factors come into play; adolescents observe substance abuse and are potentially rewarded for drug use in such circumstances.

In addition, drug testing accuracy depends on what types of substances are tested and how testing is conducted (Roche et al., 2009). Devices used in school may vary in terms of their accuracy and reliability; this introduces the risk of giving false positive results (Roche et al., 2009). Even with a 95% accuracy of a true positive result, students may still be afraid of being mislabelled and sanctioned accordingly (Roche et al., 2009). Thus, drug testing may harm adolescent-school relationships. Goldberg et al. (2003) also found that student athletes, in the drug testing group, demonstrated significant reductions in their positive attitudes to schools compared to those in the control group. Although Goldberg et al. found reductions in drug use, students' positive attitudes towards school were hampered. It is thus reasonable to speculate that drug testing may potentially weaken students' attachment to school and divert them to deviant social groups.

In light of the importance of school attachment in mediating adolescent drug use, educational prevention programs provide support to students and facilitates them in networking in school settings, which prevents their attachment to drug-using peers and in turn reduces the possibility of their drug use. In contrast, drug testing may weaken or even break adolescent-school bonds if students worry about the accuracy of the drug testing and perceive schools as unsupportive.

Decision Making

School-based prevention programming not only targets adolescents' psychosocial factors and their attachment issue that underlie potential substance abuse, but it also addresses an adolescent's decision making process in a drug-use situation. To guide adolescents making informed decisions, school-based prevention educates students about socially acceptable norms and the influence of friends' expectation, and enhances their intention and commitment not to use drugs (Cuijpers, 2002). Based on social norms theory, adolescents may experiment with drugs in order to conform to their misperception of social norms—that substance use is common and acceptable (Berkowitz, 2003). As Berkowitz argues, such a misperception of social norms may inhibit rational and conventionally acceptable behaviors (e.g., declining a drug offer). Specifically, one of the most influential factors is adolescent peers' rationalization of drug use. Given the importance of seeking one's identity and group membership, adolescents may be persuaded by peer normative beliefs in drug use. To prevent and reduce adolescent substance abuse, students need to know how peers' norms may affect their decisions in addition to what

the social and convention expectations are.

According to Turiel's perspective on social-moral development (as cited in Bergen, 2008) morality is a big issue to adolescents; in particular, they may challenge what they consider socially conventional demands. If adolescents networked with drug-users, not only would they receive social rewards and encouragement, they might also perceive group expectations on drug use. Based on Turiel's theoretical framework, adolescents are being challenged with two conflicting conventional demands—anti-drug use in larger social contexts and substance experimentation and/or abuse in a networking drug using social group. In such circumstances, a conflict between two social conventions pulls adolescents in opposite directions. Adolescents have to decide which social convention they should follow. Given peer pressure, it is more likely that adolescents who network with drug-using friends will follow the group's expectations (Catalano et al., 2004). Consistent with Bandura's social learning theory (Bandura, 1977, 1978), peer pressure has a great influence on adolescent risk-taking behaviors. In light of the relatively heavier emphasis on peer acceptance and relationships, adolescents may be oriented towards the social convention of drug use. This is also in line with the school attachment previously discussed. If adolescents have a stronger attachment to a substance abuse social group, they will possibly endorse the group's value to a greater extent than to those whose drug use reflect non drug-using values.

Scholars have found that interventions that taught about anti-drug norms reduced adolescent substance abuse (Botvin et al., 2001). In particular, Botvin et al. found that peers' norms, defined as peers' beliefs of substance abuse as an acceptable behavior, mediated the intervention effect on inhalant use—the higher the levels of peers' norms to use drugs, the higher the frequency of using the inhalant. In addition, Hansen and Graham (1991) conducted a study to evaluate the effectiveness of (a) teaching a range of normative beliefs (e.g., prevalence and acceptability of peers' drug use), and (b) establishing conventional norms. They found a significant reduction in alcohol consumption, and marijuana and tobacco use in the intervention group. Thus, supported by theories and empirical findings, school-based prevention programs that address peer norms to use drugs can be effective in preventing and reducing adolescent substance abuse (Cuijpers, 2002).

In contrast, drug testing does not target this risk factor. In Goldberg et al.'s (2003) study, despite a reduction of self-reported drug use, students in the drug testing group reported significantly higher levels of drug use among peers as a norm compared to those in the control group. At first glance, it seemed that drug testing achieved its goals in the reduction of drug use. On closer inspection, however students being drug tested perceived drug use to be more normative and considered drug use as acceptable behavior (Goldberg et al., 2003). As McWhirter (2005) argued, drug testing does not target risk factors in adolescent substance abuse, but education on normative beliefs does address the underlying factors about teenagers' drug use.

Summary

School-based prevention programming is reported to be more effective in preventing and reducing adolescent substance abuse than drug testing. Not only is school-based intervention grounded in developmental theories, it is also supported by empirical evidence. School-based prevention programming addresses (a) the cognition, (b) complex psychosocial factors (i.e., identity issues, peer group pressure, and social learning), (c) attachment issues, and (d) the

decision making processes that underlie adolescent substance abuse.

School-based prevention programming is more comprehensive in addressing adolescent substance abuse, compared to drug testing, which predominantly relies on negative consequences. School-based programs (a) provide anti-drug knowledge (cognitive), (b) teach social skills, (c) establish adolescent refusal self-efficacy (psychosocial), (d) strengthen adolescent-school connectedness (attachment), and (e) build socially acceptable conventional normative beliefs (social norms, value and morality) to help adolescents make informed and rational decisions when they encounter a drug offer. Although drug testing may reduce self-reported drug use, it does not address the risk factors that may contribute to adolescent substance abuse. In particular, drug testing may harm adolescent-school attachments and lower students' positive attitudes towards school and conventional values. These impacts can have an adverse impact on adolescent development and may divert them to membership of deviant social groups and drug-use situations.

In summary, school-based substance abuse prevention programming can be considered preferable over drug testing in terms of theoretical and empirical support, and through its comprehensiveness in addressing the underlying risk factors of adolescent substance abuse. The effectiveness of school-based programming in preventing and reducing adolescent drug use has promising implications.

Practical Implications of Employing the Educational Approach

In light of the theoretical and empirical support for school-based substance abuse prevention programming, it is reasonable to put such programs in place in school systems to prevent and reduce adolescent drug use. Although educators may be familiar with school-based programs, it is important to consider how these programs might be implemented to effectively prevent and reduce adolescent substance abuse. This section will discuss three key considerations identified in the literature (Porath-Waller, Beasley, & Beirness, 2010; Steiker, 2008) when implementing a school-based prevention program: (a) target audience, (b) program adaptation, and (c) program facilitator.

Target Audience

The first step to implement a prevention program is to identify the target audience. Despite well-designed research on the effectiveness of school-based prevention programming, there is no definite answer to whom the program should be targeted. Identifying the target audience becomes a challenge to schools and educators in implementing school-based prevention programs. Thus, educators should also consider potential demographic risk factors (i.e., age and minority adolescents from low socioeconomic status [SES] families) before deciding on their target audience.

Targeting age. Porath-Waller et al. (2010) showed that school-based programs that targeted students 14 years of age or older have a greater effect on the prevention and reduction of cannabis use than students younger than 14 years of age. But, in a survey done by Smith, Stewart, Poon, and Saewyc and the McCreary Centre Society (2010), 26% of adolescents reported that they first used drugs before 14 years of age, suggesting that prevention programs should be implemented in advance in order to effectively prevent drug use in adolescence. It is good to disseminate knowledge of substance abuse at an early age; yet, discussion of normative

beliefs and social skills training seems more appropriate to be provided later (e.g., in Grades 8-9) as this provides a platform for adolescents to discuss and apply what they learn when peer pressure and social influence start having greater influence on teenagers' development (e.g., Botvin, 2000; Epstein, Collins, Thomson, Pancella, & Pauley, D., 2007; Hopfer et al., 2010).

Targeted versus universal. Botvin et al. (2001) stated that while evidence-based school-based prevention was shown to be effective for Caucasians, little research was conducted to evaluate the effectiveness with adolescents from minorities—African-American, Chinese, and Hispanic (Botvin, Schinke, Epstein, Diaz, & Botvin, 1995). Additionally, Wallace and Bachman (1991) reported that Native American adolescents, in particular in low-SES families, showed higher drug use compared to white and Hispanic teenagers. This raised a concern in implementing school-based prevention programs in schools with students from diverse backgrounds.

Botvin et al. (2001) provided evidence that students from low-socio-economic families also demonstrated reduced substance abuse after participating in the intervention program. The National Crime Prevention Centre ([NCPC], 2009) reported that school-based prevention programs targeting at-risk adolescents, who came from low to middle-socio-economic and multi-ethnic families, effectively reduced their substance abuse. On the other hand, the NCPC also found that universal programming was effective in reducing adolescents' substance abuse. Given that empirical studies provided support in both targeted and universal prevention programs, schools can decide how to structure a school-based prevention program that best suits their unique needs.

Program Adaptation

Emphasis has been put on using evidence-based prevention programming. In practice, schools and program facilitators also need to consider whether adaption and/or modification are warranted when implementing prevention programs; identifying unique values and beliefs in the target population, and incorporating an identified cultural specific scenario in program delivery (Steiker, 2008). The rationale is that schools differ in their student composition and resources (e.g., financial, ecological, and expertise) to implement evidence-based intervention. As Steiker discussed, given that adaption to local context is important for program effectiveness, schools should strike a balance between keeping key elements in an effective program and adapting it to its unique environments; increase intensity and duration.

Program Facilitator

The term “school-based” prevention suggests that teachers should be responsible for program development and implementation. However, Porath-Waller et al. (2010) found that programs delivered by non-teachers (e.g., health care professionals and police officers) had a statistically significantly, greater effect in reducing adolescent substance abuse than programs provided by teachers. As Dusenbury, Brannigan, Falco, and Hansen (2003) discussed, the less effective outcomes regarding programs delivered by teachers might be related to their insufficient training in implementing a preventive program, and them not having confidence in their own abilities to deliver a program. To ensure program effectiveness, it would be preferable to have health care professionals who are (a) familiar with both the school system and adolescent development, (b) knowledgeable and skillful in engaging with adolescents in discussion of the

topics, and (c) responsive to adolescents' questions (Dusenbury et al., 2003). Thus, school psychologists, social workers, and school counselors would be the appropriate persons to lead a prevention program, given their training in the above areas. In addition, adolescents can receive support from these professionals, whereas they may be afraid of revealing any of their concerns to police officers throughout the program.

Conclusion

Adolescence is a growth period involving exploration and establishing identity and autonomy. At the same time, adolescents are also prone to engaging in high-risk behaviors, one of which is substance abuse. In particular, such abuse is shown to be related to numerous deleterious effects such as cognitive impairment, drug induced psychosis, and organ dysfunction. The adverse impact also has long-term effects on adolescents' overall development. Given the concerns about the rising rate of early use of alcohol and drugs among youth, an effective approach in preventing and reducing adolescent substance abuse is needed.

In this paper, two prominent prevention approaches (i.e., educational versus deterrent) were evaluated based on developmental theories and empirical evidence. The educational approach was found to be more grounded in theory and better supported by research findings than the deterrent approach. In particular, school-based prevention programming addressed complex factors (i.e., cognition, psychosocial development, attachment, and values) that underlie adolescent substance abuse. By contrast, drug testing only imposes negative consequences to deter substance abuse without addressing the root problems. Therefore, school-based prevention programming is considered a better approach in preventing and reducing adolescent substance abuse.

The question of how to translate the school-based prevention into practice is as important as identifying an effective approach. Three key elements: (a) target audience, (b) program adaptation, and (c) program facilitator were identified and discussed.

1. In order to deliver a school-based program that can effectively prevent and reduce adolescent abuse, schools and educators should consider whether universal prevention, targeted intervention, or a combination of both best suits their unique needs of identified target audience. Research has shown the effectiveness of reducing substance abuse by implementing prevention programming that equips students with knowledge of drug abuse at upper elementary levels, and by continuing the prevention program, in terms of addressing peer pressure and providing refusal skill training, at junior high and high school levels.
2. Given the unique student composition of each school, an adaptation of research-supported prevention programming may be required in order to suit individual school's needs.
3. In light of health care professionals' knowledge and expertise on adolescent development and the topic of substance abuse, schools may consider seeking advice from these professionals about how to develop and implement a preventive program that can effectively reduce drug abuse. Adolescents are the cornerstones of our society; it is important to educate them so that they can make informed and rational decisions in substance-use situations.

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