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Suicidality, depression, and alcohol use among adolescents: A review of empirical findings

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Abstract

Suicide is a serious health problem as it is currently the third leading cause of death for teenagers between the ages of 15 and 24 years. Depression, which is also a serious problem for adolescents, is the most significant biological and psychological risk factor for teen suicide. Alcohol use remains extremely widespread among today's teenagers and is related to both suicidality and depression. Suicidality refers to the occurrence of suicidal thoughts or suicidal behavior. The consensus in empirical research is that mental disorders and substance abuse are the most important risk factors in both attempted and completed adolescent suicide. Therefore, it is incumbent upon researchers to identify the factors that can lead to their prevention among today's youth. This review compiles the existing literature on suicidality, depression, and alcohol use among adolescents spanning over the past 15 years. Both Problem Behavior Theory and Stress-coping Theory can explain the relationships among suicidality, depression and alcohol use. The prevention of suicidality is critical, especially during the early school years, when it is associated with depression and alcohol use. Suicidality, depression and alcohol use are three phenomenon that noticeably increase in adolescence marking this time period as an ideal opportunity for prevention efforts to commence. Future empirical work is needed that will further assess the impact of adolescent depression and alcohol use on suicidality. In sum, this review of empirical research highlights critical results and limitations, as well as indicates a need for continued efforts in preventing suicidality, depression, and alcohol use among adolescents.

Keywords

Adolescent; depression; suicidality; substance abuse; review; USA

INTRODUCTION

Adolescence is a developmental period when youth begin to experience a desire for intimacy and increased responsibilities both socially and academically (1). A number of factors influence how adolescents navigate this period of change. Positive outcomes are more likely if adolescents engage in healthy activities, have adequate social support, and are connected with their families. However, the negotiation of developmental tasks in adolescents may also be quite challenging and difficult, leading to the onset of adolescent depression, substance use, and ultimately suicide. The term "suicidality" refers to the occurrence of suicidal thoughts or ideation or suicidal behavior, including attempts and completed suicide (2).

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Suicidal ideation is part of a generalized risk profile for some adolescents and represents a unique risk behavior for others (3). Although ideation is broadly spread across the adolescent population, the shift from ideation to action is highly concentrated among multiple-problem youth, those who exhibit two or more problem behaviors such as alcohol use, cigarette smoking, illicit drug use, and delinquent behavior (4).

Many correlates of suicidality have been empirically documented. The overwhelming and convergent empirical evidence is that mental disorders and substance abuse are the most important risk factors in both completed and attempted adolescent suicide (5). This review focuses on depression and alcohol use among teenagers, as the rate of comorbidity for depression and substance abuse (mostly alcohol) is among the highest of any combination of diagnoses for adolescents. Moreover, adolescents who concurrently exhibit more than one correlate are at high risk for suicidality.

METHOD

This paper is a critical review of 30 empirical studies. A systematic procedure was undertaken to obtain the current literature for published studies relevant to adolescent suicidality, depression, and alcohol use. The literature search for studies included the use of PsycINFO, Medline, and references cited in various articles and web sites related to suicidality. The literature search covered the period from 1990 to 2005. All studies included in the review were limited to those investigating suicidality, depression, and alcohol use among adolescent samples, and to English language articles. With respect to sample populations, the majority of the reviewed studies included community samples (83%) among predominantly Caucasian adolescents. The age range across the studies included adolescents from 9 to 20 years of age. The majority of the studies reviewed employed a cross-sectional (87%) design.

PREVALENCE RATES

Although the majority of adolescents successfully negotiate this often tumultuous developmental period without any psychopathology, there is a significant proportion who exhibit suicidality, depression, and self destructive behaviors, including substance abuse. Suicide among young people is a serious public health concern (5) and rates are alarmingly high. In the Surgeon General's Call to Action to Prevent Suicide 1999 (6), the rate of suicide among those 10–14 years of age was reported as having increased by 100% from 1980–1996, with a 14% increase for those ages 15–19. In this latter group, suicide was the fourth leading cause of death. Suicide is an epidemic as it is the third leading cause of death for teenagers 15–24 years old, and suicide rates are increasing for children 14 years and younger (7). A focus of this prevention-related agenda was to put strategies into place that will reduce the stigma associated with mental illness or substance abuse, which can inhibit people from seeking help, which subsequently would reduce suicidality (8). Alarmingly, 12 people between the ages of 15–24 commit suicide every day in the United States (9). The rate for completed suicide among children aged 10–14 was 1.6 per 100,000, for teenagers aged 15–19 was 9.7 per 100,000 (10). Grunbaum et al (11) showed that almost 9% of high school students had attempted suicide at least once. In addition, 19% reported having seriously considered attempting suicide, with almost 15% of students having made a specific plan for how they would do it. Locke and Newcomb (12) found that over three-quarters of their sample reported a history of suicidality and one-quarter had attempted suicide.

Between 20% and 40% of adolescents report depressed mood (13). Estimates of the lifetime prevalence of MDD (Major Depressive Disorder) in adolescence range from 15% to 20% (14–16). Adolescents report an estimated point prevalence between 3% and 8% and annual

incidence between 3% and 11% (17). The variability in the estimate of the number of adolescents suffering from depression can be attributed to (a) the use of different diagnostic criteria (e.g., DSM criteria, K-SADS); (b) differing definitions of adolescent depression (e.g., as a mood, symptom, or clinical diagnosis); (c) the use of different assessment measures (e.g., self-report, structured interviews, multiple sources of information other than the adolescent); or (d) the use of heterogeneous samples (clinical versus community).

Alcohol use, more than other drugs, is extremely widespread among adolescents. The Monitoring The Future Study found that more than 3 out of 4 (77%) have consumed alcohol by the end of high school; and nearly half (44%) have done so by 8th grade (18). More than half of 12th graders reported having been drunk at least once in their life (18). Therefore, we chose to specifically include only alcohol use in relation to suicidality and depression.

THEORETICAL BACKGROUND

Hence, given the prevalence of these three phenomena during adolescence, we review the current literature that examines the synergistic relationships among them. Both Problem Behavior Theory (PBT)(19) and Stress-coping Theory can explain these relationships evident among today's youth. According to PBT, youth who engage in behaviors that deviate from the norm, including substance (mis)use or suicidality, are at an increased risk for other health problems, such as depression. For example, problem drinking can either contribute to adolescent depression or be a manifestation of depression (e.g., self-medication), which in turn can lead to suicidality. Both involvement in a deviant peer group (e.g., those who use alcohol) and low commitment to prosocial values are expected to increase a youth's risk for depression and suicidality (20,21).

According to the Stress-coping Theory, coping responses may mediate the relationship between stress and depressive symptoms. Maladaptive coping mechanisms include drug use (e.g. alcohol) as a means of temporarily dealing with social and emotional problems (22) that typically characterize adolescence. Such coping strategies may be ineffective and provide only an immediate respite from stressful situations, and may even exacerbate the problems that the adolescent is currently experiencing. How adolescents cope with life stressors directly impacts their functioning. Lewinsohn et al (23) found that adolescent suicide attempters endorsed maladaptive coping patterns associated with depression.

COMORBIDITY

Major Depressive Disorder (MDD) is the psychiatric diagnosis most commonly associated with completed suicide, and about 2/3 of people who commit suicide are depressed at the time of their deaths (9). Existing literature demonstrates that depression is a risk factor for suicidality among adolescents (24–26). The risk of suicide is increased to more than 50% in depressed individuals (9). More than 90% of adolescents who die by suicide have been diagnosed with at least one psychiatric disorder (27), typically major depression (28,29), which is considered to be the most significant psychiatric risk factor for suicide among adolescents (30). This undeniably direct association between depression and suicide underscores the need for identifying those adolescents most at risk for depression to treat their symptoms and prevent suicidal behavior (31,32).

Alcohol and other drug use has been associated with suicidality among adolescents (33–36). Deykin et al (37) found that 16 to 19 year old females were more than six times as likely to experience depression if they were alcohol abusers than if they were not, and that drug abuse was strongly associated with a lifetime prevalence of depression. Locke and Newcomb (12) found that drug use had both a direct and indirect influence on suicidality.

Depression is often accompanied by comorbid (co-occurring) mental disorders (such as alcohol or substance abuse), and, if left untreated, can lead to higher rates of suicidality (9). Therefore, not only is depression a dangerous precursor for suicidality, but, individuals who have a dependence on alcohol in addition to being depressed are at greater risk for suicide (26). Research indicates that multiple risk factors and, in particular, comorbidity of substance and mood disorders, represent categories of increased risk in both clinical and community populations (38). Depression and alcohol abuse combine and compound the risk for suicidality. Depression and heavy alcohol use have been found to be risk factors strongly associated with multiple suicide attempts (38). Peruzzi and Bongar (39) found that major depression and acute overuse of alcohol were critical risk factors for suicide. The Canterbury study found that 90% of youth who were suicidal were depressed and had a substance use disorder, including alcohol (40).

In general, the presence of comorbidity of substance abuse with adolescent depression has been associated with more impairment and distress. Although the rate of comorbidity for depression and substance abuse (e.g., alcohol) is among the highest of any combination of diagnoses for adolescents (41), there is a continued debate as to the temporal or causal relationship between depression and substance abuse. Several studies have found that depression was implicated as the initial disorder preceding adolescent substance abuse (37). In contrast, other research has indicated that substance abuse precedes the development of depression (41). Unfortunately, the causal relationship between depression and substance abuse remains unanswered. Nevertheless, the unequivocal relationship is the co-occurrence of substance use and depression (42–44).

PREVENTION AND ETIOLOGY

Because suicidality is a serious public health problem among adolescents (5) that can have fatal consequences, prevention is paramount at this time. The prevention of suicidality is critical, especially during the early school years when it is often associated with depression and alcohol use and is the third cause of adolescent death (7). Suicidality, depression and alcohol use are three phenomenon that noticeably increase in adolescence marking this time period as an ideal opportunity for prevention efforts to commence.

Both PBT and Stress-coping Theory explain the synergistic relationships among suicidality, depression, and alcohol use in adolescents. Hence, there is a need to implement school-based programs that teach adolescents adaptive coping responses and problem solving skills so that they can effectively handle problems and stressors that typically characterize adolescence (45). Therefore, prevention programs should directly target specific risk factors (e.g. alcohol use, depression) that impact adolescent suicidality.

CRITIQUE OF REVIEWED EMPIRICAL STUDIES

Even though current data are fairly accurate on the incidence of adolescent suicidality, depression, and alcohol use, only tentative conclusions can be drawn as previous research has been fraught with methodological problems, generalizability constraints, and mixed conclusions. Based on these limitations, the findings from most of the reviewed studies can be considered suggestive rather than confirmatory.

First, a major criticism of much of the existing literature included in this review is the use of different methods or assessment tools with varied reliability and validity. Since there was no singular measure (e.g., structured interviews, self-report measures, self-made items) or consistent definitions of suicidality (suicidal ideation, suicidal attempts, suicide completion), depression (depressive symptomatology, clinical disorder, dysphoric mood), comparing results across studies was difficult and possibly inappropriate. For example, while

depression may be identified as a single clinical diagnosis or as a symptom, rates of depression vary according to type of measure used or how depression is defined. Therefore, using the term "depression" to represent each of these definitions is misleading and an inaccurate representation of what the adolescent may be experiencing. In addition, substance (ab)use versus alcohol (ab)use probably represent different drug use constructs and amount of drug use that relate to suicidality differently.

Second, the majority of the reviewed studies used cross-sectional and/or retrospective data which prohibited any determination of the etiological factors related to suicidality among adolescents. The cross-sectional studies were prohibited from making any causal statements regarding the temporal relationship among suicidality, depression, and alcohol use. Another criticism was that several of the longitudinal studies compared data over a short period of time, of no more than two years, which cannot account for the effects of maturation that may affect the outcome of the studies. Third, the use of clinical samples limits the generalizability of the results to the general population. Rather, these studies would be more useful if they also included control or comparison groups from nonclinical samples of adolescents. From both epidemiological and phenomenological perspectives, it is important to understand the differences between treated cases of suicidality, depression and drug use identified in clinical settings from cases identified within community samples. Fourth, although research investigating the correlates or risk factors of suicidality should be guided by theoretical approaches and premises, the majority of the studies had no clearly stated or implied theoretical basis. This lack of theory-based research fails to expound or increase our ability to test adolescent suicidality in a defined scientific context. Fifth, several studies utilized small sample sizes of less than 50. Not only was the power diminished in these studies, but results were difficult to interpret, replicate, or generalize to other more representative samples. Sixth, a methodological limitation of the majority of the studies was the exclusive use of self-report data, especially on items that were sensitive in nature (e.g. those assessing drug use and suicidal behavior). It is difficult to discern the extent to which the reports were accurate descriptions of the variables being assessed or a result of being suicidal, depressed, and/or an alcohol user. This issue is particularly salient to depression research, as individual's emotional problems may bias their perceptions of their social environments (41) and their answers to personal questions. Clearly, additional research using multiple informants (e.g., parents, siblings, teachers) of variables of interest is warranted.

Finally, the majority of the studies included either "predominantly" Caucasian samples or only Caucasian samples. Surprisingly, several studies failed to even specify the ethnic breakdown of their sample. To date, there is only limited data available, with findings that are often inconclusive, regarding an independent impact of ethnicity on the three adolescent phenomena of suicidality, depression, and alcohol use. Such homogenous studies offer no insight into these risk factors among different cultures, ethnic minority groups, or youths from severely disadvantaged circumstances. As we continue to diversify culturally as a society, it behooves researchers to investigate ethnic differences; which will enhance the probability of being able to transfer results to the general population.

IMPLICATIONS FOR FUTURE RESEARCH

In order to advance our current knowledge of adolescent suicidality, depression, and alcohol use we need to integrate the existing empirical literature into our explanatory models. The gravity of suicidality and high prevalence of alcohol use among adolescents underscores the need to understand the psychosocial antecedents of depression and their reciprocal relationships in order to prevent further self-destruction among our youth. Youth at serious risk for suicide can be targeted fairly accurately (4) to implement early prevention programs.

The models that identify the concurrent risks indicate a reliable way to identify youth most at risk for suicidality. In particular, more longitudinal data is needed to accurately define and establish the causal relationships between these important adolescent phenomenon. Furthermore, unresolved questions regarding these relationships need to be examined within ethnically diverse adolescent populations, representative of the general population.

Future empirical studies should (1) conduct more school-based prevention studies that offer direct training in skills on how the adolescent can deal with suicidality, depression, and alcohol use; (2) investigate the impact of suicidality, depression and alcohol use (as well as other drugs) on later adult functioning; (3) investigate the direct influence of psychosocial risk and protective factors on the emergence and maintenance of these three correlates; (4) obtain data from several sources (e.g., family members, teachers, employers) not limited to just self-report from adolescents who may be suicidal, depressed, and alcohol (ab)users; and (7) to understand more about the implications of comorbidity of these three correlates for prevention, etiology, course, and treatment.

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REFERENCES

1. Newcomb MD. Adolescence: Pathologizing a normal process. *Counseling Psychol.* 1996; 24:482–490.
2. Van Heeringen K. The neurobiology of suicide and suicidality. *Can J Psychiatr.* 2003; 48:292–300.
3. Flannery WP, Sneed CD, Marsh P. Toward an empirical taxonomy of suicide ideation: A cluster analysis of the Youth Risk Behavior Survey. *Suicide Life Threat Behav.* 2003; 33:365–372. [PubMed: 14695051]
4. Miller TR, Taylor DM. Adolescent suicidality: Who will ideate, who will act? *Suicide Life Threat Behav.* 2005; 35(4):425–435. [PubMed: 16184697]
5. Brent DA. Risk factors for adolescent suicide and suicidal behavior: Mental and substance abuse disorders, family environmental factors, and life stress. *Suicide Life Threat Behav.* 1995; 25 Suppl: 52–63. [PubMed: 8553429]
6. US Dept Health Human Serv. The Surgeon General's call to action to prevent suicide. 1999. <http://www.mentalhealth.org/links/suicide.htm>
7. Nat Center Injury Prev Control. Web-based injury statistics query and reporting system. Website: <http://www.cdc.gov/ncipc/wisqars>
8. DeMartino, RE.; Crosby, AE.; Echo-Hawk, M.; Litts, DA.; Pearson, J.; Reed, GA., et al. A call to collaboration: The federal commitment to suicide prevention. 2003. Website: <http://www.sprc.org/suicideprevention/gout.asp>
9. Am Ass Suicidology. Website: <http://www.suicidology.org/index.cfm>
10. Surgeon General. Website: <http://www.surgeongeneral.gov/library/calltoaction/default.htm>
11. Grunbaum JA, Kann L, Kinchen SA, Williams B, Ross JG, Lowry R, et al. Youth risk behavior surveillance—United States, 2001. *MMWR.* 2002; 54:1–64. [PubMed: 12102329]
12. Locke TF, Newcomb MD. Psychosocial predictors and correlates of suicidality in teenage Latino males. *Hispanic J Behav Sci.* In press.
13. Hankin BL, Abramson LY. Measuring cognitive vulnerability to depression in adolescence: Reliability, validity, and gender differences. *J Clin Child Adolesc Psychol.* 2002; 31:491–504. [PubMed: 12402568]
14. Lewinsohn PM, Rohde P, Seeley JR, Klein DN, Gotlib IH. Natural course of adolescent major depressive disorder in a community sample: Predictors of recurrence in young adults. *Am J Psychiatr.* 2000; 157:1584–1591. [PubMed: 11007711]

15. McGee R, Feehan M, Williams S, Partridge F, Silva PA, Kelly J. DSM-III disorders in a large sample of adolescents. *J Am Acad Child Adolesc Psychiatr.* 1990; 29:611–619.
16. Roberts RE, Lewinsohn PM, Seeley JR. Screening for adolescent depression: A comparison of depression scales. *J Am Acad Child Adolesc Psychiatr.* 1991; 30:58–66.
17. Lewinsohn PM, Hops H, Roberts RE, Seeley JR, Andrews JA. Adolescent psychopathology: I. Prevalence and incidence of depression and other DSM-III-R disorders in high school students. *J Abn Psychol.* 1993; 102:133–144.
18. Johnston, LD.; O'Malley, PM.; Bachman, JG.; Schulenberg, JE. Monitoring the future national results on adolescent drug use: Overview of key findings. Bethesda, MD: Nat Inst Drug Abuse; 2004. 05-5726, 2005
19. Jessor, R.; Jessor, SL. Problem behavior and psychosocial development: a longitudinal study of youth. New York: Acad Press; 1977.
20. Downs WR, Rose SR. The relationship of adolescent peer groups to the incidence of psychosocial problems. *Adolescence.* 1991; 26:473–492. [PubMed: 1927677]
21. Simons RL, Whitbeck LB, Conger RD, Melby JN. The effect of social skills, values, peers, and depression on adolescent substance use. *J Early Adolesc.* 1991; 11:466–481.
22. Kandel DB, Raveis VH, Davies M. Suicidal ideation in adolescence: depression, substance use, and other risk factors. *J Youth Adolesc.* 1991; 20:289–309.
23. Lewinsohn PM, Hops H, Roberts RE, Seeley JR, Andrews JA. Adolescent psychopathology: I. Prevalence and incidence of depression and other DSM-III-R disorders in high school students. *J Abn Psychol.* 1993; 102:133–144.
24. Groholt B, Ekeberg O, Wichstrom L, Haldorsen T. Suicidal and nonsuicidal adolescents: Different factors contribute to self-esteem. *Suicide Life Threat Behav.* 2005; 35:525–535. [PubMed: 16268769]
25. Esposito CL. Psychiatric symptoms and their relationship to suicidal ideation in a high-risk adolescent community sample. *J Am Acad Child Adolesc Psychiatr.* 2002; 41:44–51.
26. Kovacs M, Goldston D, Gatsonis C. Suicidal behaviors and childhood-onset depressive disorders: A longitudinal investigation. *J Am Acad Child Adolesc Psychiatr.* 1993; 32:8–20.
27. Brent DA. Risk factors for adolescent suicide and suicidal behavior: Mental and substance abuse disorders, family environmental factors, and life stress. *Suicide Life Threat Behav.* 1995; 25:52–63. [PubMed: 8553429]
28. Lewinsohn PM, Rohde P, Seeley JR. Psychosocial risk factors for future adolescent suicide attempts. *J Consult Clin Psychol.* 1994; 62:297–305. [PubMed: 8201067]
29. Stoelb M, Chiriboga JA. process model for assessing adolescent risk for suicide. *J Adolescence.* 1998; 21:359–370.
30. Shaffer D, Gould MS, Fisher P, Trautman P, Moreau D, Kleinman M, et al. Psychiatric diagnosis in child and adolescent suicide. *Arch Gen Psychiatry.* 1996; 53:339–348. [PubMed: 8634012]
31. Gutierrez PM, Watkins R, Collura D. Suicide risk screening in an urban school setting. *Suicide Life Threat Behav.* 2004; 34:421–428. [PubMed: 15585463]
32. Reynolds WM. A school-based procedure for the identification of adolescents at risk for suicidal behaviors. *Fam Community Health.* 1991; 14:64–75.
33. Borowsky WI, Ireland M, Resnick MD. Adolescent suicide attempts: Risks and Protectors. *Pediatrics.* 2001; 107(3):485–493. [PubMed: 11230587]
34. Thompson EA, Moody KA, Eggert LL. Discriminating suicide ideation among high-risk youth. *J School Health.* 1994; 64:361–367. [PubMed: 7877277]
35. Woods ER, Lin Y, Middleton A, Beckford P, Chase L, DuRant RH. The association of suicide attempts in adolescents. *Pediatrics.* 1997; 99:791–796. [PubMed: 9164770]
36. King RA, Schwab-Stone M, Flisher AJ, Greenwald S, Kramer RA, Goodman SH, Lahey BB, Shaffer D, Gould MS. Psychosocial and risk behavior correlates of youth suicide attempts and suicidal ideation. *J Am Acad Child Adolesc Psychiatr.* 2001; 40:837–846.
37. Deykin EY, Levy JC, Wells V. Adolescent depression, alcohol and drug abuse. *Am J Public Health.* 1987; 77:178–182. [PubMed: 3492151]

38. Rosenberg HJ, Jankowski MK, Sengupta A, Wolfe RS, Wolford GL, Rosenberg SD. Single and multiple suicide attempts and associated health risk factors in New Hampshire adolescents. *Suicide Life Threat Behav.* 2005; 35:547–557. [PubMed: 16268771]
39. Peruzzi N, Bongar B. Assessing risk for completed suicide in patients with major depression: Psychologists' views of critical factors. *Professional Psychol Res Pract.* 1999; 30:576–580.
40. Beautrais A. Suicide in New Zealand II: A review of risk factors and prevention. *NZ Med J.* 2003; 116:1–13.
41. Rohde P, Lewinsohn PM, Seeley JR. Comorbidity of unipolar depression: II. Comorbidity with other mental disorders in adolescents and adults. *J Abn Psychol.* 1991; 100:214–222.
42. Aseltine RH, Gore S, Colten ME. The co-occurrence of depression and substance abuse in late adolescence. *Dev Psychopathol.* 1998; 10:549–570. [PubMed: 9741682]
43. Hansell S, White HR. Adolescent drug use, psychological distress, and physical symptoms. *J Health Soc Behav.* 1991; 32:288–301. [PubMed: 1940211]
44. Hawkins JD, Catalano RF, Miller JY. Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: implications for substance abuse prevention. *Psychol Bull.* 1992; 112:64–105. [PubMed: 1529040]
45. Frydenberg E, Lewis R, Bugalski K, Cotta A, McCarthy C, Luscombe-Smith N, Poole C. Prevention is better than cure: Coping skills training for adolescents at school. *Educ Psychol Pract.* 2004; 20:117–134.