Depressive Symptoms in Adolescents Living in Rural America

Ann R. Peden, ARNP-CS, DSN;[1] Deborah B. Reed, RN, PhD;[1] and Mary Kay Rayens, PhD[1]

ABSTRACT: ***Purpose:*** *The purposes of this pilot study were to examine prevalence of depressive symptoms among rural adolescents and identify related social and environmental variables.* ***Methods:*** *A convenience sample of 299 14- to 18-year-old agriculture class students at 5 rural high schools in Kentucky and Iowa completed a survey that included demographic information, family farm history, experience with suicide, perception of school environment, and indicators of farm injuries and risky behaviors. Participants also completed the Center for Epidemiologic Studies Depression Scale (CES-D) as well as scales to assess the number of major life events in the last year, active coping use, and family closeness.* ***Findings:*** *The prevalence of a high level of depressive symptoms (CES-D $\geq$ 16) in this sample was 34%. Nine percent had seriously considered suicide in the last year. Unlike previous reports, boys reported as many depressive symptoms as girls. Although the literature reports that engaging in risky behavior is associated with depressive symptoms, the only risky behavior linked with depressive symptoms in this sample was operating a 4-wheel all-terrain vehicle. Other predictors of depressive symptoms included poor family relationships and poor active coping.* ***Conclusions:*** *Interventions to identify and prevent depressive symptoms in rural adolescents are needed. Boosting active coping and improving family function may also prevent the development of clinical depression in rural adolescents.*

The purpose of this cross-sectional study was to investigate the mental health of adolescents who live in rural America. Rural adolescents have been identified as being more at risk for serious mental illness than their urban peers.[1] Historically, studies of depression and other mental health issues among rural residents portrayed the farm environment as conducive to good mental health, citing the peaceful and simple life enjoyed by farm families. However, this portrayal was challenged during the farm crisis of the 1980s. Ortega et al[2] established a direct relationship between the economic downturn of agriculture and depressive symptoms among farmers. Other studies have linked increased alcohol and drug use, motor vehicle deaths, depression in adolescents, suicide, and child and spousal abuse to the decreased vitality of the agricultural economy.[3] For rural youth, poverty, lack of transportation, and lack of support services have been identified as increasing the risk of mental health problems.[4] For the purposes of this paper, the term ''rural'' refers to areas not designated as metropolitan statistical areas by the Office of Management and Budget. The specific aims of this study were to:

1. Determine the prevalence of depressive symptoms among farm and nonfarm rural adolescents.
2. Determine the correlates of depressive symptoms among rural adolescents.
3. Compare farm and nonfarm adolescents on the prevalence of depressive symptoms.
4. Identify predictors of depressive symptoms in rural adolescents.

Adolescent Depression. Adolescent depression is a serious mental health problem. According to the National Institute of Mental Health,[5] 8.3% of adolescents are depressed. In the National Longitudinal Study of Adolescent Health (AddHealth), 9% of adolescents reported moderate to severe depressive symptoms.[6] Depression results in poor school performance, increased risk-taking behaviors, loneliness, and suicide.[7] In the 2001 Youth Behavioral

[1]University of Kentucky College of Nursing, Lexington, Ky.

This project was funded by the Delta Psi Chapter of Sigma Theta Tau International and an internal grant from the University of Kentucky College of Nursing. The authors would like to acknowledge the careful editorial reviews provided by Lynne A. Hall and Carol Donnelly.

For further information, contact: Dr. Ann Peden, College of Nursing, University of Kentucky, 760 Rose Street, Lexington, KY 40536-0232; e-mail arpede01@uky.edu.

Risk Factor Surveillance System (YBRFSS),[8] 29.4% of the youth reported they felt sad or hopeless for at least 2 weeks out of the last year. Puskar et al,[4] in a study of optimism in rural adolescents (N = 624), found that rural youth were less optimistic, which was defined as taking a less hopeful view of events when compared to national norms. They concluded that the prevalence of single industries in rural areas with low income bases may be associated with greater risks for psychological disorder and loss of optimism.

Adolescent depression also is related to family financial distress.[9] Rural families are increasingly experiencing economic hardship and distress. Additional factors related to adolescent depression are female gender,[6] number of negative life events,[10] fair to poor general health,[6] life stressors that disrupt parenting practices,[11] loneliness, low self-esteem,[7] and inadequate mental health services.[7] Puskar and colleagues[10] screened 846 rural adolescents for depression. For these youth, 12.8% reported significant depressive symptoms. Self-reported depressive symptoms were related to female gender, death in family, perceived positive and negative life events including losing a close friend, an increase in number of arguments with parents, trouble with classmates, and trouble with police.

Adolescent Suicide. An unfortunate and preventable outcome of untreated depression is suicide. According to the Centers for Disease Control,[8] the rate of suicide deaths is higher in nonmetropolitan areas for both adults and children. Suicide is the third leading cause of death among 10- to 19-year-olds in the United States. Suicide rates among youth have increased by 75% in the last decade.[8] It is difficult to get an accurate picture of the number of suicide deaths in rural areas because of the potential for underreporting of suicides and the large number of farm injuries and fatalities that could actually be successful suicide attempts. In the 2001 YBRFSS,[8] 17.8% of 14- to 18-year-olds responded that they had considered suicide in the last 12 months. Unfortunately, this survey did not differentiate between urban and rural youth.

Familial clustering of suicide has been identified.[12] With the seeming increase in suicide among rural men, their family members may be at greater risk for suicide attempts.[13] Those who make the most serious attempts are most likely to have a positive family history of suicide.

Not available in the literature are studies that delineate risk and protective factors that may be unique to rural adolescents, particularly those who reside on farms. This pilot study investigated the mental health of adolescents who live in rural America, with particular emphasis on residence, coping skills, and social environment. The findings add to the body of knowledge regarding rural adolescent depression and raise questions for further consideration.

Methods

Design and Sample. A volunteer sample of 320 high school students in Kentucky and Iowa was recruited from agricultural education classes to participate in this cross-sectional study. These states and schools were selected to reflect geographic and commodity diversity, and they also have large numbers of farm youth in the schools' agricultural education programs. Five schools were contacted, and all agreed to participate. Agricultural classes were selected to insure an adequate number of farm youth in the sample. Of the 320 students invited to participate, 303 agreed, and 299 of these were age 18 and below and formed the study sample. The response rate was 95%.

The median age of the study participants was 16 years with a range from 14 to 18. The majority of respondents were male (60%) and white (96%). More than two-thirds (69%) lived with both parents. About one-fifth (21%) indicated they received free lunch at school. The majority of participants (69%) indicated their grade point average (GPA) was 3.0 or above.

Measures. The Farm Teen Survey was developed by the investigators based on existing measures to assess depressive symptoms, suicidal thoughts and experiences, life events, active coping, and family functioning. Additional items assessed living situation, participation in school and community activities, perception of school environment (ie, fairness of teachers, friends at school, and feeling safe there), experience of violence in the past year, incidence of injury in the past 12 months, and engagement in risky behavior. Risky behaviors included alcohol and cigarette use, hunting, operating a 4-wheel all-terrain vehicle, swimming, hiking, or camping alone, and applying pesticides. Personal characteristics, including age, gender, race, GPA, and participation in a free lunch program (as a proxy for family income), also were included in the survey.

Depressive Symptoms. The Center for Epidemiologic Studies Depression 20-item Scale (CES-D)[14] was used to measure depressive symptoms. This scale has been used extensively with adults and adolescents.[15] A summary score is calculated, with higher values indicating a greater level of depressive symptoms. A score of 16 and above as an indication of a high level of depressive symptoms was established by Comstock and Helsing[16] and has been used in other

studies.[17,18] A cutpoint of 20 has been suggested for determining high depressive symptoms in adolescents.[19] In the present study, Cronbach α was .88.

Suicidal Thoughts and Experiences. Four items from the Youth Behavioral Risk Factor Surveillance Survey (YBRFSS)[8] were selected to measure suicidal thoughts and experiences during the past year. These items included serious contemplation of suicide, a suicide attempt, and attempted or completed suicide by a friend or family member.

Life Events. Ten items from the Life Events Checklist (LEC)[20] were included. These events, such as moving to a new home, death of a close friend, parental separation, breaking up with boyfriend or girlfriend, and trouble with teacher, were chosen for their relevance to adolescents. A summary score was created by adding the number of life events experienced.

Active Coping. The 12-item John Henryism Scale (JHS)[21] was used to measure the use of active coping to overcome obstacles. A summary score was calculated with higher scores indicating a greater use of this type of coping behavior. Cronbach α was .83.

Family Closeness. Six items from the Family Functioning Questionnaire (FFQ)[22] assessed the family's closeness and availability. The summary score was created so that higher totals were indicative of more positive assessments. Cronbach α for these items was 0.61.

Procedure. The study was approved by the University of Kentucky Medical Institutional Review Board. Passive parental consent was solicited through a letter distributed by the school to parents of students in grades 9 through 12. The study was explained to students via a letter and a verbal explanation by the agricultural education teacher before administration, and participation was voluntary. Students completed the anonymous survey privately while in class and returned it to the investigators in an enclosed self-addressed, stamped envelope. Each participant received $2.

Data Analysis. Descriptive statistics, such as means and standard deviations or frequency distributions, were used to summarize the sample. Bivariate analyses, including *t* tests, Pearson product-moment correlations, and χ^2 tests of associations, were used to determine the interrelationships among study variables. Multiple linear regression was used to determine the predictors of depressive symptoms. The presence of multicollinearity was assessed using variance inflation factors. All statistical analyses were performed using SAS for Windows, version 8.2[23]; an α level of .05 was used.

Results

More than half of the participants (56%) lived on a farm, and of these, 89% of the farm families owned most of their farm's land. More than four-fifths of all respondents (81%) said they would prefer to live on a farm rather than in town.

As shown in Table 1, respondents were relatively active in their school and community, particularly in sports, clubs, and worship activities. Most respondents perceived their school environment as positive, yet nearly one-fifth had been in a fight, injured, or threatened. In addition, these students were familiar with suicide. Overall, the respondents participated in risky behaviors, with operating a 4-wheeler, swimming alone, and gun hunting the most prevalent. More than one-fourth of participants indicated they had smoked cigarettes within the last 30 days, and an even larger percentage had used alcohol during that time. More than half of the participants received 1 or more injuries in the preceding year, and a third received an injury requiring medical attention.

Comparisons Between Farm and Nonfarm Participants. When living preference (farm versus town) was compared with actual living situation, the association was significant: 94% of those living on farms said they would prefer to live on a farm, whereas only 34% of nonfarm respondents said they would prefer to live in town ($\chi^2 = 32.6$, $P < .0001$). Those living on farms reported higher GPAs than nonfarm respondents ($t = 2.2$, $P = .03$). The percentage of respondents receiving free lunch at school differed by whether they lived on a farm or not: of those on farms, 16% received lunch, whereas 26% of those not on farms did so ($\chi^2 = 5.6$, $P = .02$). Three-quarters of participants living on farms lived with both their parents, compared to 59% of nonfarm respondents ($\chi^2 = 8.9$, $P = .003$). Participants living on farms were more likely to belong to school clubs and less likely to have been in a physical fight, injured, or threatened in the past year, compared to nonfarm respondents ($\chi^2 = 14.4$, $P = .0001$ and $\chi^2 = 4.3$, $P = .04$, respectively). Those living on farms were more likely to have ever hunted with a gun ($\chi^2 = 7.1$, $P = .008$). Although there were no differences between farm and nonfarm respondents on CES-D, LEC, and FFQ, farm residents had significantly higher scores on the JHS measure of active coping than their nonfarm counterparts ($t = 2.5$, $P = .01$).

The mean CES-D score was 14.0 (see Table 2). Of the 299 respondents, 35% had a score of at least 16,

Table 1. Prevalence of "Yes" Responses for Various Experience, Perception, and Behavior Items in a Sample of Rural Adolescents (N = 299)

Characteristic	%
School and community activities:	
School sports or teams	51
School clubs	60
Band or orchestra	9
Teen clubs in town	8
Boy or Girl Scouts	1
Teen activities in worship place	53
Perception of school:	
Teachers treat students fairly	57
I have friends at school	99
I feel safe at school	87
In the last 12 months:	
Been in a physical fight, injured, threatened	18
Been the witness or victim in a shooting, stabbing, or assault	8
In the past 12 months:	
Seriously considered attempting suicide	9
Actually attempted suicide	2
Family member attempted/ completed suicide	10
Friend attempted/ completed suicide	0.16
Received 1 or more injuries in the past year	56
At least 1 injury in past year required medical attention	33
Risky behaviors:	
Smoke cigarettes in last 30 days	28
Drink alcohol in last 30 days	38
Ever operate a 4-wheeler	81
Ever bow hunt	28
Ever gun hunt	58
Ever swim alone	66
Ever camp or hike alone	48
Mix/apply pesticides in past year	26

and 23% scored at or above 20 on this measure of depressive symptoms. The descriptive summaries of all the scales are displayed in Table 2.

Correlates of Depressive Symptoms. Participants who participated in teen clubs in town had lower CES-D scores than those who didn't ($t = 2.5$, $P = .02$).

Table 2. Descriptive Summaries of the Scales for a Sample of Rural Adolescents (N = 299)

Scale	Mean (SD)	Actual Range	Potential Range
CES-D (depressive symptoms)*	14.0 (9.4)	0-52	0-60
LEC (life events)†	2.1 (1.9)	0-9	0-10
JHS (active coping)‡	38.7 (5.3)	23-48	12-48
FFQ (family closeness)§	22.4 (3.6)	10-26	6-30

* Center for Epidemiologic Studies Depression Scale; higher scores indicate a greater level of depressive symptoms.
† Life Events Checklist; higher scores indicates a greater number of life events.
‡ John Henryism Scale; higher scores indicates greater use of active coping.
§ Family Functioning Questionnaire; higher scores indicate more positive family functioning.

Depressive symptoms scores differed according to the perception of the school environment, with those who felt more positive about their school exhibiting lower CES-D scores than their counterparts who did not (t test P values range from $<.0001$ to .03 for these comparisons). Those who had experienced a shooting, stabbing or assault in the last 12 months had higher scores than those who did not ($P<.0001$); similarly, those who had seriously considered suicide or attempted suicide and those who had a friend attempt or complete suicide had higher CES-D scores than those without these experiences (P values for the t tests are all $<.0001$). The relationship between injury status and CES-D was marginally significant ($t = 1.8$, $P = .07$); respondents who had received at least 1 injury in the past year had higher average CES-D scores than those who were not injured. CES-D was related to several of the risky behaviors. Smokers had higher CES-D scores than nonsmokers ($t = 3.3$, $P = .001$), and a similar pattern of CES-D scores held when those who had used alcohol in the past month were compared to those who had not ($t = 2.2$, $P = .03$). Respondents who had operated a 4-wheeler had a higher mean CES-D score compared to those who had not ($t = 2.0$, $P = .05$). CES-D score was positively correlated with LEC ($r = .22$, $P = .0003$) and negatively correlated with JHS ($r = -.35$, $P<.0001$) and FFQ ($r = -.37$, $P<.0001$). There was no difference in level of depressive symptoms between boys and girls or by family economic status. Except for operating a 4-wheeler ($t = 2.3$, $P = .05$), there were no differences in mean CES-D scores between those who participated in risky behaviors and those who did not.

Predictors of Depressive Symptoms. The variables significantly related to CES-D in the bivariate analysis were included as potential predictors of this depressive symptoms measure in a multiple linear regression (see Table 3). Although associated with CES-D, items that assessed the respondent's personal experience with suicidal thoughts or attempts were not included as predictors because the presence of depressive symptoms typically precedes suicide. Higher scores in family closeness (FFQ) and the use of active coping (JHS) were significant protective factors for predicting depressive symptoms; factors that were predictive of increased depressive symptoms included operating a 4-wheeler and having a friend who attempted or completed suicide. Thirty-four percent of the variability in depressive symptoms was explained by these variables ($F_{12,236} = 10.3$, $P < .0001$). Active coping was the strongest predictor of depressive symptoms, followed closely by the family closeness scale and having a friend who attempted or completed suicide. The variance inflation factors (VIFs) for the predictors in this model were all less than 1.5; these low values indicate multicollinearity is not causing distortion of the regression parameters.

Table 3. Multiple Linear Regression With CES-D as the Outcome Variable (N = 249)

Regressor	Parameter Estimate	Standard Error	Standarized β
JHS (active coping)†	−0.56	0.11	−.31***
FFQ (family closeness)‡	−0.60	0.16	−.23**
LEC (life events)§	−0.16	0.29	−.03
Ever operate 4-wheeler	3.01	1.28	.13*
Teen club in town	−0.55	1.80	−.02
Teachers treat students fairly	−0.81	1.12	−.04
Friends at school	−6.17	7.89	−.04
Safe at school	−2.14	1.73	−.07
Witness/victim in shooting, stabbing, assault	3.50	2.14	.09
Friend attempted/ completed suicide	5.00	1.41	.20**
Cigarettes in last 30 days	1.84	1.25	.09
Alcoholic drink in last 30 days	0.0036	1.16	<.01

* $P < .05$; ** $P < .005$; *** $P < .0001$.
† John Henryism Scale.
‡ Family Functioning Questionnaire.
§ Life Events Checklist.

Discussion

The percentage of rural youth with a high level of depressive symptoms (34%) is alarming. Similar studies using a CES-D cutoff score of 16 have reported prevalence rates of 29%.[6] There was no difference in prevalence of depressive symptoms between farm and nonfarm residents. This pilot may be the first to compare farm and nonfarm youth on mental health variables. Within this sample, boys reported as many depressive symptoms as girls. It may be that rural male adolescents feel the marked economic downturn of rural areas more acutely than their female counterparts. Rural boys historically have been able to find gainful employment on farms and in other rural-based businesses. Such employment is part of their culture. Rural girls, on the other hand, have always had limited economic opportunities in rural areas. In recent years, jobs in rural areas have become increasingly difficult to find, and rural boys may face an uncertain future, not only financially but also culturally, as work becomes more scarce.[24] The average score on the CES-D (14.0) also was higher than the score of 12.2 reported in the National Longitudinal Study of Adolescent Health (AddHealth),[6] which includes both urban and rural youth. Family economic status was not related to depressive symptoms. Depressive symptoms were associated with negative perceptions of school environment, experiences in the last year with a shooting, stabbing, or assault, smoking, and drinking alcohol in the last month. These correlates are similar to those reported in current literature related to depressive symptoms in adolescents.

The prevalence of alcohol use in this sample is high, with nearly 40% of these adolescents having consumed alcohol in the last month. Those who had used alcohol in the last 30 days had higher average depressive symptoms than those who did not. Students who smoked cigarettes reported a higher level of depressive symptoms than nonsmokers. These findings reflect growing national trends of increased alcohol and tobacco use among adolescents and evidence of a relationship between substance use and depressive symptoms in adolescents.[25,26]

There is a growing body of literature that has linked engaging in risky behaviors with increased risk for suicide in adolescents. For this sample, risky behaviors were defined as alcohol use, smoking tobacco, and rural activities associated with high injury prevalence. Although adolescents in this study reported engaging in risky behaviors, only operating a 4-wheeler was predictive of a high level of depressive symptoms. Operating a 4-wheeler has been associated with high injury rates among rural adolescents.[27] The inability of other risk factors to predict depressive symptoms may be related to how rural adolescents define risky behavior. It is possible that behaviors identified as

risky in the literature are not considered risky by rural adolescents.

These youth reported lower incidences of considering suicide when compared to national trends[8]; however, they reported a larger number of family members and friends who had either attempted or successfully committed suicide. The latter is a disturbing finding that supports new reports that suicide among rural adults is increasing.[13] One predictor of depressive symptoms in this study was having a friend who had attempted or completed suicide. This highlights the potential risk for suicide that rural adolescents may face as a result of increased exposure to suicide.

Students in this sample reported being happy living in rural America. For the most part, they reported that their families were close and provided them with positive emotional support, which was a protective factor against depressive symptoms. Those adolescents who had high levels of active coping were less likely to report depressive symptoms. Individuals who use active coping are optimistic, see challenges as opportunities, and routinely use positive thinking. This finding supports the growing body of literature on optimism as a mental health protector in adolescents.[28]

Differences existed between farm and nonfarm participants. Those adolescents who lived on farms seemed to have social and economic advantages. These adolescents also reported more active coping than nonfarm adolescents. Although farm adolescents rated the quality of their social and family environments more positively, there were no differences in prevalence of depressive symptoms, number of stressful life events, or differences in family functioning between the farm and nonfarm residents. Farm adolescents in this sample may have been protected by the quality of their social and family environment, which minimized the prevalence of depressive symptoms.

Conclusion

The predictors of depressive symptoms in this study included experience with suicide, poor family relationships, operating a 4-wheeler, and the lack of active coping strategies. Interventions that bolster the use of active coping and encourage strong family ties may prevent depressive symptoms in rural adolescents. Interventions to prevent depressive symptoms in rural adolescents may prevent the development of depressive illness.

The sample was limited to selected schools in Kentucky and Iowa and is not representative of all rural areas. The study included few minority students, relied on self-report measures, and collected data only from adolescents enrolled in school. However, these findings provide support that rural adolescents are vulnerable to mental health problems and raise the question of possible differences in strategies used by farm and nonfarm rural youth to prevent depressive symptoms.

References

1. Petti TA, Cornely PJ, McIntyre A. A consultative study as a catalyst for improving mental health services for rural children and adolescents. *Hosp Community Psychiatry.* 1993;44:262-265.
2. Ortega ST, Johnson DR, Beeson PG, Craft BJ. The farm crisis and mental health: a longitudinal study of the 1980s. *Rural Sociol.* 1994;59:598-619.
3. Pothier PC. Demythologizing rural mental health. *Arch Psychiatr Nurs.* 1991;5:119-120.
4. Puskar KR, Sereika SM, Lamb J, Tusaie-Mumford K, McGuinness T. Optimism and its relationship to depression, coping, anger, and life events in rural adolescents. *Issues Ment Health Nurs.* 1999;20:115-130.
5. National Institute of Mental Health [Depression Research at NIMH]. Available from: http://www.nimh.nih.gov/publicat/depresfact.cfm. Accessed August 31, 2004.
6. Rushton JL, Forcier M. Schedtman RM. Epidemiology of depressive symptoms in the National Longitudinal Study of Adolescent Health. *J Am Acad Child Adolesc Psychiatry.* 2002;41:199-205.
7. Puskar KR, Tusaie-Mumford K, Sereika SM, Lamb J. Screening and predicting adolescent depressive symptoms in rural settings. *Arch Psychiatr Nurs.* 1999;13:3-11.
8. Centers for Disease Control and Prevention [homepage on the Internet]. Youth 2001 Online [updated June 19, 2003]. Available from: http://www.cdc.gov/nccdphp/dash/yrbs/2001/youth01online.htm. Accessed December 10, 2003.
9. Clark-Lempers DS, Lempers JD, Netusil AJ. Family financial stress, parental support, and young adolescents' academic achievement and depression. *J Early Adolesc.* 1990;10:21-36.
10. Ge X, Lorenz FO, Conger RD, Elder GH, Simons RI. Trajectories of stressful life events and depressive symptoms during adolescence. *Dev Psychol.* 1994;30:467-483.
11. Brage D, Campbell-Grossman C, Dunkel J. Psychological correlates of adolescent depression. *J Child Adolesc Psychiatr Nurs.* 1995;8:23-30.
12. Brent DA, Bridge J, Johnson BA, Connolly J. Suicidal behavior runs in families. A controlled family study of adolescent suicide victims. *Arch Gen Psychiatry.* 1996;53:1145-1152.
13. Singh GK, Siahpush M. Increasing rural-urban gradients in US suicide. Mortality, 1970-1997. *Am J Public Health.* 2002;92:1161-1167.
14. Radloff LS. The CES-D Scale: A self-report depression scale for research in the general population. *Appl Psychol Measure.* 1977;1:385-401.
15. Russell ST, Joyner K. Adolescent sexual orientation and suicide risk: evidence from a national study. *Am J Public Health.* 2001;91:1276-1281.
16. Comstock GW, Helsing KJ. Symptoms of depression in two communites. *Psychol Med.* 1976;6:551-563.
17. Peden AR, Hall LA, Rayens MK, Beebe LL. Negative thinking mediates the effect of self-esteem on depressive symptoms in college women. *Nurs Res.* 2000;49:201-207.
18. Peden AR, Hall LA, Rayens MK, Beebe LL. Reducing negative thinking and depressive symptoms in college women. *J Nurs Scholarsh.* 2000;32:145-151.

19. Roberts R, Lewinsohn P, Seeley J. Screening for adolescent depression: a comparison of depression scales. *J Am Acad Child Adolesc Psychiatry.* 1991;30:58-66.
20. Johnson JH, McCutcheson SM. Assessing life stressors in older children and adolescents: preliminary findings from the life events checklist. In: Sarason IG, Spielberger DD, eds. *Stress and Anxiety,* Vol 7: 111–125. Washington, DC: Hemisphere; 1980.
21. James S, Hartnett S, Kalsbeek W. John Henryism and blood pressure differences among black men. *J Behav Med.* 1983;6:259-278.
22. Reeb KG, Graham AV, Zyzanski SJ, Kitson GC. Predicting low birthweight and complicated labor in urban black women: a biopsychosocial perspective. *Soc Sci Med.* 1987;25:1321-1327.
23. *SAS for Windows, v 8.2.* Cary, NC: SAS Institute, Inc; 1999-2001.
24. Rohde P, Kahler CW, Lewinsohn PM, Brown RA. Psychiatric disorders, familial factors, and cigarette smoking: associations with progression to daily smoking. *Nicotine Tobacco Res.* 2004;6:119-132.
25. Goodman E, Capitman J. Depressive symptoms and cigarette smoking among teens. *Pediatrics.* 2000;106:748-755.
26. Elder GH Jr, Conger RD. *Children of the Land: Adversity and Success in Rural America.* Chicago, IL: University of Chicago Press; 2000.
27. Levenson MS. *All Terrain 2001 Injury and Exposure Studies.* Washington, DC: US Consumer Product Safety Commission; 2003.
28. Clarke G, Hawkins W, Murphy M, Sheeber LB, Lewinsohn P, Seeley J. Targeted prevention of unipolar depressive disorder in an at-risk sample of high school adolescents: a randomized trial of group cognitive intervention. *J Am Acad Child Adolesc Psychiatry.* 1995;34:312-321.