



Contents lists available at ScienceDirect

Journal of Affective Disorders

journal homepage: www.elsevier.com/locate/jad

Research report

Persistence of mental health problems and needs in a college student population

Kara Zivin^{a,b,*}, Daniel Eisenberg^c, Sarah E. Gollust^d, Ezra Golberstein^e^a Department of Veterans Affairs, Health Services Research and Development (HSR&D) Center of Excellence, Serious Mental Illness Treatment Research and Evaluation Center (SMITREC), Ann Arbor, MI, United States^b Department of Psychiatry, University of Michigan Medical School, Ann Arbor, MI, United States^c Department of Health Management and Policy, School of Public Health, University of Michigan, Ann Arbor, Michigan, United States^d Robert Wood Johnson Foundation Health & Society Scholar program, University of Pennsylvania, Philadelphia, PA, United States^e Department of Health Care Policy, Harvard Medical School, Boston, MA, United States

ARTICLE INFO

Article history:

Received 25 August 2008

Received in revised form 30 December 2008

Accepted 4 January 2009

Available online xxxx

Keywords:

College student

Depression

Anxiety

Eating disorders

Suicidal ideation

Self-injury

ABSTRACT

Background: Cross-sectional studies indicate a high prevalence of mental health problems among college students, but there are fewer longitudinal data on these problems and related help-seeking behavior.

Methods: We conducted a baseline web-based survey of students attending a large public university in fall 2005 and a two-year follow-up survey in fall 2007. We used brief screening instruments to measure symptoms of mental disorders (anxiety, depression, eating disorders), as well as self-injury and suicidal ideation. We estimated the persistence of these mental health problems between the two time points, and determined to what extent students with mental health problems perceived a need for or used mental health services (medication or therapy). We conducted logistic regression analyses examining how baseline predictors were associated with mental health and help-seeking two years later.

Results: Over half of students suffered from at least one mental health problem at baseline or follow-up. Among students with at least one mental health problem at baseline, 60% had at least one mental health problem two years later. Among students with a mental health problem at both time points, fewer than half received treatment between those time points.

Limitations: Mental health problems are based on self-report to brief screens, and the sample is from a single university.

Conclusions: These findings indicate that mental disorders are prevalent and persistent in a student population. While the majority of students with probable disorders are aware of the need for treatment, most of these students do not receive treatment, even over a two-year period.

© 2009 Published by Elsevier B.V.

1. Introduction

College is an important setting in which to evaluate and address mental health. Most mental disorders have first on-

set by young adulthood (Kessler et al., 2005b), and approximately half of young adults attend post-secondary education (US Department of Education, 2007). Thus, preventing, detecting, and treating mental disorders among college students are promising avenues for addressing the population burden of early-onset mental disorders. Moreover, doing so may have broad benefits given the significant impact that these disorders have on educational, economic, and social outcomes (Andrews et al., 2006; Andrews and Wilding, 2004; Berndt et al., 2000; Kessler et al., 2001; Kessler et al., 1995; Mowbray et al., 2006).

* Corresponding author. University of Michigan Medical School, Department of Psychiatry, Rachel Upjohn Building, 4250 Plymouth Road, Box 5765, Ann Arbor, MI 48109, United States. Tel.: +1 734 769 7100x56009; fax: +1 734 845 3249.

E-mail address: kzivin@umich.edu (K. Zivin).

National surveys of college counseling directors indicate that the prevalence and severity of significant mental health problems are increasing in the college student population (Gallagher, 2007). To date, however, epidemiological studies on prevalence of mental disorders and service utilization among college students have largely been cross-sectional and have focused on single disorders (such as depression (Givens and Tjia, 2002) or suicidal ideation (Brener et al., 1999; Schwartz, 2006)). As a result, little is known about the longitudinal course of mental health problems among college students or about students' help-seeking behavior over time. Important unanswered questions include: 1) to what extent are students' mental health problems transient (perhaps related to the many developmental changes and/or temporary stressors associated with college life) as opposed to persistent over time, 2) to what extent do students with probable mental disorders perceive a need for help and actually use services over time, and 3) to what extent does perceived need for or use of services influence the longitudinal course of disorders (e.g. if students do or do not need or use care, does that lead them to be more or less likely to have persistent disorders over time). Knowing more about the longitudinal patterns of persistent mental problems and help-seeking is important for a fuller understanding of the scope of mental health problems among college students, and young adults in general. Such information can help providers, campus support services, and insurers to plan more appropriate services and target the neediest students.

Given these gaps in the existing literature, we conducted a longitudinal survey of a random sample of college students, with the goal of improving understanding of several factors related to the longitudinal course of mental health and treatment. Specifically, we examined: 1) the persistence and change in individuals' mental health status over a two-year period, as measured by several mental health problems common in student populations (including anxiety, depression, eating disorders, self-injury, and suicidal ideation), and, 2) the persistence and change in individuals' help-seeking over a two-year period, as measured by perceived need for and use of mental health services (psychotherapy and medication).

2. Methods

2.1. Sample and weighting

As a longitudinal extension of the Healthy Minds Study (Eisenberg et al., 2007a,b), we conducted a follow-up web-based survey in fall 2007 among students who completed the baseline survey in fall 2005. The original baseline sample was drawn from the full population of enrolled undergraduate and graduate students at a large, Midwestern, public university. An initial sample of 5021 students was randomly selected and recruited to participate. Of these students, 2843 (57%) completed the baseline survey. In the fall of 2007, all students who had completed the baseline survey in 2005 and were still enrolled at the university ($N=1272$) were asked to complete a two-year follow-up survey, with a nearly identical set of measures. Of those re-contacted, 763 (60%) of students completed the second survey. The present study examines data from these 763 students who completed both the 2005 and the 2007 survey. Because the primary goal of the study is to examine

changes over time between the two time points, we constructed survey sample weights that adjust for non-response at follow-up. We constructed the survey weights by estimating logistic regressions of survey response at follow-up on baseline variables including mental health, service use, and demographic characteristics. This means that our weighted sample is representative (in terms of these baseline variables) of the full group of students who were eligible for the follow-up survey.

2.2. Measures

Depression was measured using the Patient Health Questionnaire-9 (PHQ-9) (Kroenke et al., 2001), a widely used and clinically validated depression screening instrument. We used the standard PHQ-9 algorithm to code students as screening positive for depression if they had a positive screen for either major depression or "other" depression (dysthymia or depression not otherwise specified) according to the standard PHQ-9 algorithm.

Anxiety was measured using the PHQ anxiety module. We used the standard PHQ algorithm to code students as having a probable anxiety disorder if they screened positive for either generalized anxiety or panic disorder over the past 4 weeks (Spitzer et al., 1994).

Probable eating disorders were measured using the SCOFF screening instrument (Morgan et al., 1999), a five-item questionnaire asking respondents about symptoms of disordered eating. Respondents endorsing two or more items on the SCOFF were considered to have a probable eating disorder. This measure has been validated in male and female college student samples (Cotton et al., 2003; Parker et al., 2005).

The measure of self-injury was designed specifically for this study, and asked students about whether they had engaged in common forms of self-injurious behaviors without suicidal intent, including cutting, burning, head banging, scratching, punching, hair pulling, biting, and/or interfering with wound healing. More details about this measure can be found elsewhere (Gollust et al., 2008). In the baseline survey we asked about self-injury in the previous four weeks, whereas in the follow-up survey we asked about self-injury in the previous year. We changed this measure to be consistent with other studies of self-injury among college students (Whitlock et al., 2006), and because we found very low prevalence estimates for these behaviors when only examining the prior four weeks and wanted to include a larger segment of the population during follow up.

The assessment of suicidal thoughts was based on a question from the National Comorbidity Survey Replication that asks respondents whether they have seriously thought about committing suicide (Kessler et al., 2005a). As in the case of the self-injury item, at baseline we asked about suicidal ideation in the previous four weeks whereas at follow-up we asked about the previous year.

Medication use was measured by asking students if they had taken any of the medications included in a list of the most common psychotropic medications. As in the Healthcare for Communities Study (Wells et al., 2005), respondents were asked to include only those medications they had taken several times a week for at least a month. Students were also asked if they had used therapy or counseling services for their mental or emotional health. Perceived need for mental health services

was measured using a question from the Healthcare for Communities study on mental health services use (Wells et al., 2005). Students were asked if they felt they needed help for emotional or mental health problems such as feeling sad, blue, anxious, or nervous over the past year (Eisenberg et al., 2007a). For each of the measures of service utilization and perceived need, in the baseline questionnaire we asked about utilization and need over the *previous year*, whereas in the follow-up questionnaire we asked about the *previous two years* (and specified “since fall 2005”, when respondents answered the baseline questionnaire). We asked about the previous two years in the follow-up questionnaire so as to cover the full period that elapsed between the two surveys. Thus, we are able to ascertain whether, for instance, students who screened positive for depression at the first time point had received any mental health services during the following two-year time period.

In addition to these measures, we created two composite variables: any mental health problems (if students had a positive screen for anxiety, depression, eating disorders, self-injury, or suicidal thoughts), and any treatment use (counseling/therapy or medication).

2.3. Statistical analysis

We calculated the proportion of students in categories defined by mental health problems and service use at each time period (e.g., the proportion of students who had probable depression at both time points, one or the other time point, or neither). We also conducted multivariable logistic regressions to explore associations between mental health at baseline and

Table 2

Prevalence of mental health problems, treatment use, and perceived need for help ($N=763$)

Variable	Time 1 (2005)		Time 2 (2007)	
	N	% ^a	N	% ^a
Depression (positive PHQ-9 screen)	117	15.36	100	12.93
Anxiety (positive PHQ screen)	35	4.75	52	6.97
Eating disorder (positive SCOFF screen)	139	18.27	148	18.93
Self-injury ^b	73	9.90	103	13.93
Suicide thoughts ^b	20	2.77	47	6.45
Any of the above mental health problems	270	35.30	285	36.79
Medication use ^c	79	10.57	110	14.37
Therapy use ^c	111	13.81	170	21.53
Any treatment (medication or therapy) ^c	141	17.65	202	25.36
Perceived need ^c	259	32.93	331	42.87

^a Percentages are weighted to reflect all students eligible for the follow-up survey, as described in the Methods section.

^b The 2005 questionnaire asked about the prior four weeks, whereas the 2007 questionnaire asked about the prior year.

^c The 2005 questionnaire asked about the prior year, whereas the 2007 questionnaire asked about the prior two years (the period since the baseline questionnaire).

mental health two years later. All analyses were conducted using SAS 9.1 and were weighted using the nonresponse weights discussed above.

3. Results

Table 1 presents the demographic characteristics of the respondent population, with the proportions weighted to

Table 1

Sample characteristics as of baseline (fall 2005) ($N=763$)

	N	% ^a
Age		
Age 18–22	391	55.16
Age 23–25	163	19.30
Age 26–30	139	16.87
Age 31+	70	8.67
Gender		
Male	319	47.34
Female	444	52.66
Race		
White	472	60.09
Black	25	3.92
Hispanic	26	3.09
Asian	163	22.47
Other race	16	2.35
Multi race	42	5.34
Nationality		
US	643	84.61
International	120	15.39
Sexual orientation		
Gay/lesbian/bisexual/transgender	45	5.44
Heterosexual	715	94.56
Degree program ^b		
Bachelor's degree	339	48.44
Master's degree	127	17.59
JD degree	22	3.61
MD degree	32	5.00
PhD degree	280	30.56

^a Percentages are weighted to reflect the full student population at this university.

^b Students could be enrolled in more than one degree program at a time.

Table 3

Cross-tabulations of mental health problems in 2007 by mental health problems in 2005^{a, b}

	No depression 2007	Depression 2007
No depression 2005	578 (89.61%)	68 (10.39%)
Depression 2005	85 (73.08%)	32 (26.92%)
	No anxiety 2007	Anxiety 2007
No anxiety 2005	687 (94.20%)	41 (5.80%)
Anxiety 2005	24 (69.65%)	11 (30.35%)
	No eating disorder 2007	Eating disorder 2007
No eating disorder 2005	548 (89.71%)	67 (10.29%)
Eating disorder 2005	55 (41.10%)	81 (58.90%)
	No self injury 2007	Self injury 2007
No self injury 2005 ^c	583 (88.83%)	73 (11.17%)
Self injury 2005	42 (59.61%)	29 (40.39%)
	No suicidal thoughts 2007	Suicidal thoughts 2007
No suicidal thoughts 2005 ^c	691 (94.34%)	40 (5.66%)
Suicidal thoughts 2005	13 (64.98%)	7 (35.02%)
	No MH problem 2007	MH problem 2007
No MH problem 2005	370 (75.83%)	123 (24.17%)
MH problem 2005	108 (40.08%)	162 (59.92%)

^a Percentages are weighted to reflect all students eligible for the follow-up survey, as described in the Methods section.

^b Percentages reflect row totals indicating the probability of (not) having a disorder in 2007, given (not) having the disorder in 2005.

^c The 2005 questionnaire asked about the prior four weeks, whereas the 2007 questionnaire asked about the prior year.

Table 4
Multivariable logistic regression models of 2007 mental health problems

Predictor (2005)	Any depression (2007)	Any anxiety (2007)	Eating disorder (2007)	Self-injury (2007)	Suicidal thoughts (2007)	Any disorder (2007)
Depression	2.81 (1.77,4.46)	1.62 (0.85,3.09)	1.83 (1.11,3.02)	1.14 (0.69,1.88)	1.18 (0.61,2.26)	1.81 (1.22,2.68)
Anxiety	0.78 (0.36,1.72)	3.09 (1.35,7.08)	1.00 (0.45,2.18)	0.99 (0.46,2.12)	0.85 (0.32,2.29)	1.17 (0.60,2.31)
Eating disorder	1.45 (0.94,2.25)	1.84 (1.03,3.28)	13.44 (9.09,19.87)	1.59 (1.03,2.44)	1.65 (0.89,3.06)	4.48 (3.15,6.37)
Self-injury	1.25 (0.72,2.17)	1.45 (0.72,2.91)	1.18 (0.66,2.10)	4.71 (2.97,7.46)	1.58 (0.80,3.11)	2.04 (1.31,3.19)
Suicidal thoughts	1.95 (0.82,4.61)	2.85 (1.06,7.64)	0.66 (0.25,1.74)	1.21 (0.51,2.88)	3.29 (1.33,8.17)	4.11 (1.53,11.06)
Therapy	0.60 (0.33,1.12)	0.73 (0.34,1.56)	0.74 (0.42,1.30)	1.03 (0.59,1.81)	1.22 (0.62,2.38)	0.71 (0.45,1.13)
Medication use	1.16 (0.60,2.24)	1.51 (0.70,3.27)	1.17 (0.65,2.13)	1.09 (0.59,2.01)	2.14 (1.07,4.31)	1.79 (1.09,2.92)
Perceived need	2.01 (1.31,3.07)	2.07 (1.16,3.71)	1.75 (1.15,2.66)	1.92 (1.25,2.93)	4.40 (2.35,8.24)	2.58 (1.86,3.59)

Each column represents a separate regression, with the dependent variable listed at the top and independent variables on the left. Model controls for gender, student nationality, sexual preference, race, degree program, and age. Significant predictors in bold.

adjust for nonresponse at follow-up. The sample included 763 respondents, of which 53% were females. It was roughly evenly split between undergraduates (48% at baseline) and graduate students (52%).

Table 2 presents the prevalence of mental health problems, treatment, and perceived need at baseline and follow-up. At both study waves, more than one-third of students had some form of mental health problem, with the highest prevalence for depression (13–15%) and eating disorders (18–19%). At time 1, 18% of all students had received any mental health treatment in the previous year, while at time 2, 25% of students had received any mental health treatment in the previous two years.

Table 3 quantifies the changes in students' mental health status between baseline and follow-up two years later. This table demonstrates that mental health problems persist over time for a substantial proportion of students. Sixty percent of students who had a mental health problem in 2005 still had a problem in 2007, whereas 24% of students who did not have a problem in 2005 developed one by 2007. However, the persistence varied across types of disorders. For instance, while only 27% of students with probable depression in 2005 also screened positive for depression in 2007, 59% of students with a probable eating disorder in 2005 still screened positive for a probable eating disorder in 2007.

Table 4 provides information related to whether the patterns in Table 3 hold even after controlling for covariates, and also whether having one mental health problem (e.g. depression) is predictive of having another mental health problem (e.g. anxiety) two years later. Table 4 shows the multivariate, baseline predictors of mental health status at follow-up for each separate condition, controlling for demographic characteristics as well as mental health services utilization and perceived need at baseline. Of note, in each model, baseline mental health and perceived need were strong predictors of mental health status at follow-up. In particular, perceived need in 2005 was a significant predictor in every model of 2007 mental disorder and service use. Eating disorders in 2005 were also significant predictors of

anxiety disorders and self-injury in 2007, and suicidal thoughts in 2005 were predictive of anxiety disorders in 2007.

Table 5 displays the results for individual patterns of mental health treatment use and perceived need for treatment at time 1 and time 2 in three ways. First, it shows the proportions of students at each time point who perceived a need for services and utilized services among the entire study population (N=763). Next, it displays these proportions only among those students who screened positive for a mental

Table 5
Cross-tabulations of help-seeking (perceived need and treatment use) in 2007 by help-seeking in 2005^{a, b, c}

Entire sample (N=763)		
No perceived need 2005	No perceived need 2007	Perceived need 2007
361 (74.11%)	132 (25.89%)	132 (25.89%)
Perceived need 2005	No treatment 2007	Treatment 2007
58 (22.28%)	98 (14.95%)	98 (14.95%)
No treatment 2005	Treatment 2005	104 (73.93%)
524 (85.05%)	37 (26.07%)	104 (73.93%)
Among students with MH problem at baseline (N=270)		
No perceived need 2005	No perceived need 2007	Perceived need 2007
74 (60.81%)	51 (39.19%)	51 (39.19%)
Perceived need 2005	No treatment 2007	Treatment 2007
28 (18.86%)	42 (20.26%)	42 (20.26%)
No treatment 2005	Treatment 2005	54 (77.38%)
157 (79.74%)	17 (22.62%)	54 (77.38%)
Among students with MH problem at baseline and follow-up (N=162)		
No perceived need 2005	No perceived need 2007	Perceived need 2007
34 (49.87%)	36 (50.13%)	36 (50.13%)
Perceived need 2005	No treatment 2007	Treatment 2007
15 (15.14%)	30 (25.94%)	30 (25.94%)
No treatment 2005	Treatment 2005	36 (78.39%)
85 (74.06%)	11 (21.61%)	36 (78.39%)

^a Percentages are weighted to reflect the full student population at this university.

^b The 2005 questionnaire asked about the prior year, whereas the 2007 questionnaire asked about the prior two years.

^c Percentages reflect row totals indicating the probability of (not) having treatment/need in 2007, given (not) having treatment/need in 2005.

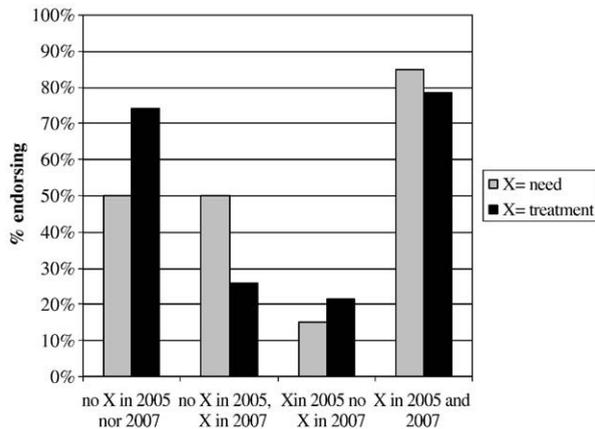


Fig. 1. Cross-tabulations of help-seeking (perceived need and treatment use) in 2007 by help-seeking in 2005 among students with MH problem at baseline and follow up ($N=162$). ‡Percentages are weighted to reflect the full student population at this university. †The 2005 questionnaire asked about the prior year, whereas the 2007 questionnaire asked about the prior two years. *Percentages reflect row totals indicating the probability of (not) having treatment/need in 2007, given (not) having treatment/need in 2005.

health problem in 2005 ($N=270$). Finally, it shows these proportions among those students who screened positive for a mental disorder in both 2005 and 2007 ($N=162$) (i.e., those students with persistent mental health problems over the full time period).

The results in Table 4 indicate a relatively high degree of persistence in help-seeking behavior, in the sense that perceived need and service utilization at baseline were highly correlated with perceived need and service utilization at follow-up, regardless of mental health status. For example, among students who screened in for a probable disorder at baseline and did not perceive a need for help at baseline, only 39% perceived a need for help by the two year follow-up (see Table 5). Similarly, among students who screened in for a probable disorder at baseline and did not use services in the year before baseline, only 20% used services by the two year follow-up.

Among the subgroup that screened in for probable disorders at both baseline and follow-up, only half of those students who did not perceive a need for help at baseline perceived a need for help by the follow-up, and only 26% of those students who did not use services in the year before baseline used services by the follow-up (see Fig. 1). However, among those students who perceived a need in 2005, 85% still did in 2007, and most who were getting treatment in 2005 still were in 2007 (78%).

4. Discussion

This study provides new longitudinal data on mental health problems, use of mental health services, and perceived need for treatment for a college student population. At both the baseline and the two year follow-up measurements, we found that more than a third of the student population had a mental health problem. Further, 60% of students who had a mental health problem in 2005 also had a problem in 2007, although the degree of persistence varied substantially by type of problem. Depression, for instance, was less persistent than symptoms of eating disorders in this college student population. In addition,

positive screens for specific disorders or problems at baseline were strong predictors of positive screens for the same condition at follow-up, and in some cases also significantly predicted different problems at follow-up.

We also found a high degree of persistence in lack of perceived need for help and in lack of services use, even among those students who screened positive for disorders at both time points. This finding of relatively low services use among those with probable mental health needs is consistent with earlier research (Eisenberg et al., 2007a). Yet the present findings build upon these prior cross-sectional findings by demonstrating that relatively low levels of perceived need for help and service use are *persistent* phenomena.

Thus, there appears to be a relatively large proportion of students with mental health problems that are more than transient issues related to adjustments or other temporary factors. Furthermore, many students within this population do not receive mental health treatment. It is important to understand more about this sub-group. Which factors inhibit or facilitate help-seeking and receipt of care, and what are the consequences (e.g., academic and social) of persistent untreated mental health problems?

Improving understanding of this population is particularly important in a context of limited resources and growing demand for student mental health services (Gallagher, 2007). Our data reveal not only a large group of students with persistent untreated problems, but also a substantial number of service users without positive screens for mental health problems. College administrators and health providers, not to mention insurers, must wrestle with how to prioritize mental health services across these highly heterogeneous groups of students.

In addition to quantifying the persistence of mental health problems and help-seeking, we also found that perceived need at baseline is a strong predictor of mental health problems at follow-up, *even after controlling* for mental health at baseline. This suggests that asking students about their perceived need for help can provide valuable information to supplement standard clinical screens, for the purpose of identifying those who are at risk for developing significant mental health problems. Asking a student whether he or she thinks that she needs help appears to capture some element of risk or vulnerability that is sometimes missed by a set of brief screens.

While our findings provide new longitudinal data on student mental health and treatment, there are some limitations of note. This study was conducted in one large public university in the United States. While the population is demographically similar to the national population of students, this university is not necessarily representative in other ways such as being a large, research institution. In addition, we used brief screening instruments to assess the presence of mental disorders. Although these instruments (such as the PHQ-9 and the SCOFF) have been validated and shown to have acceptable sensitivity and specificity in a range of populations (including college students), these measures are not equivalent to clinical diagnoses.

Despite these limitations, this study reveals important information about students' mental health, their treatment use, and perceived need for treatment. More outreach may be needed to increase rates of treatment among students suffering from mental disorders. Our findings on both the chronic nature of some mental disorders as well as persistent

need for and use of services suggest that campus services need to be available for students with ongoing needs. Future research should examine more students from more universities either more frequently and/or for longer periods to identify the full spectrum and trajectories of student mental disorders. Such research would help to further quantify the persistence of mental health problems and apparent unmet needs in these populations.

Role of funding source

Funding for this study was provided by the Blue Cross Blue Shield Foundation of Michigan and the following sponsors at the University of Michigan: the Comprehensive Depression Center (Pilot Innovation Fund to DE and Rachel Upjohn Clinical Scholars Award to KZ), McNerney Award, School of Public Health, the Office of the Vice President for Research, and Rackham Graduate School. None of the study's funding agencies had any further role in the study design; in the collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the paper for publication.

Conflict of interest

None of the authors has a conflict of interest to disclose.

Acknowledgments

We thank Scott Crawford, Brian Hempton, Sara O'Brien and other members of the Survey Sciences Group for fielding and coordinating the survey. We also thank the many students, administrators, and researchers who provided feedback on the study, and we thank the students who participated in the survey.

References

- Andrews, B., Wilding, J.M., 2004. The relation of depression and anxiety to life-stress and achievement in students. *British Journal of Psychology* 95, 509–521.
- Andrews, B., Hejdenberg, J., Wilding, J., 2006. Student anxiety and depression: comparison of questionnaire and interview assessments. *Journal of Affective Disorders* 95, 29–34.
- Berndt, E.R., Koran, L.M., Finkelstein, S.N., Gelenberg, A.J., Kornstein, S.G., Miller, I.M., Thase, M.E., Trapp, G.A., Keller, M.B., 2000. Lost human capital from early-onset chronic depression. *American Journal of Psychiatry* 157, 940–947.
- Brener, N.D., Hassan, S.S., Barrios, L.C., 1999. Suicidal ideation among college students in the United States. *Journal of Consulting and Clinical Psychology* 67, 1004–1008.
- Cotton, M.A., Ball, C., Robinson, P., 2003. Four simple questions can help screen for eating disorders. *Journal of General Internal Medicine* 18, 53–56.
- Eisenberg, D., Golberstein, E., Gollust, S.E., 2007a. Help-seeking and access to mental health care in a university student population. *Medical Care* 45, 594–601.
- Eisenberg, D., Gollust, S.E., Golberstein, E., Hefner, J.L., 2007b. Prevalence and correlates of depression, anxiety, and suicidality among university students. *American Journal of Orthopsychiatry* 77, 534–542.
- Gallagher, R., 2007. National Survey of Counseling Center Directors, 2006. Monograph Series No. 8P. International Association of Counseling Services, Inc.
- Givens, J.L., Tjia, J., 2002. Depressed medical students' use of mental health services and barriers to use. *Academic Medicine* 77, 918–921.
- Gollust, S.E., Eisenberg, D., Golberstein, E., 2008. Prevalence and correlates of self-injury among university students. *Journal of American College Health* 56, 491–498.
- Kessler, R.C., Avenevoli, S., Ries Merikangas, K., 2001. Mood disorders in children and adolescents: an epidemiologic perspective. *Biological Psychiatry* 49, 1002–1014.
- Kessler, R.C., Berglund, P., Borges, G., Nock, M., Wang, P.S., 2005a. Trends in suicide ideation, plans, gestures, and attempts in the United States, 1990–1992 to 2001–2003. *JAMA* 293, 2487–2495.
- Kessler, R.C., Berglund, P., Demler, O., Jin, R., Merikangas, K.R., Walters, E.E., 2005b. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry* 62, 593–602.
- Kessler, R.C., Foster, C.L., Saunders, W.B., Stang, P.E., 1995. Social consequences of psychiatric disorders. I: educational attainment. *American Journal of Psychiatry* 152, 1026–1032.
- Kroenke, K., Spitzer, R.L., Williams, J.B., 2001. The PHQ-9: validity of a brief depression severity measure. *Journal of General Internal Medicine* 16, 606–613.
- Morgan, J.F., Reid, F., Lacey, J.H., 1999. The SCOFF questionnaire: assessment of a new screening tool for eating disorders. *BMJ* 319, 1467–1468.
- Mowbray, C.T., Megivern, D., Mandiberg, J.M., Strauss, S., Stein, C.H., Collins, K., Kopels, S., Curlin, C., Lett, R., 2006. Campus mental health services: recommendations for change. *American Journal of Orthopsychiatry* 76, 226–237.
- Parker, S.C., Lyons, J., Bonner, J., 2005. Eating disorders in graduate students: exploring the SCOFF questionnaire as a simple screening tool. *Journal of American College Health* 54, 103–107.
- Schwartz, A.J., 2006. College student suicide in the United States: 1990–1991 through 2003–2004. *Journal of American College Health* 54, 341–352.
- Spitzer, R.L., Williams, J.B., Kroenke, K., Linzer, M., deGruy 3rd, F.V., Hahn, S.R., Brody, D., Johnson, J.G., 1994. Utility of a new procedure for diagnosing mental disorders in primary care. The PRIME-MD 1000 study. *JAMA* 272, 1749–1756.
- US Department of Education, 2007. The Condition of Education 2007. NCES 2007-064. National Center for Education Statistics, Washington, DC.
- Wells, K., Sturm, R., Burnam, A., 2005. National Survey of Alcohol, Drug, and Mental Health Problems [Healthcare for Communities] 2000–2001. University of California, Los Angeles, Los Angeles, CA.
- Whitlock, J., Eckenrode, J., Silverman, D., 2006. Self-injurious behaviors in a college population. *Pediatrics* 117, 1939–1948.