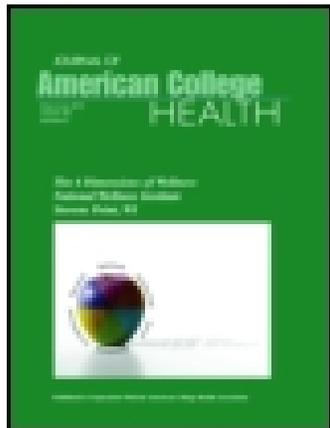


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Variations in Student Mental Health and Treatment Utilization Across US Colleges and Universities

Sarah Ketchen Lipson^{ab}, S. Michael Gaddis^{cd}, Justin Heinze^e, Katie Beck^e & Daniel Eisenberg^a

^a Department of Health Management and Policy, University of Michigan School of Public Health, Ann Arbor, Michigan

^b Center for the Study of Higher and Postsecondary Education, University of Michigan School of Education, Ann Arbor, Michigan

^c Robert Wood Johnson Foundation Scholars in Health Policy Research, University of Michigan School of Public Health, Ann Arbor, Michigan

^d Department of Sociology, The Pennsylvania State University, University Park, Pennsylvania

^e Department of Health Behavior and Health Education, University of Michigan School of Public Health, Ann Arbor, Michigan

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Major Article

Variations in Student Mental Health and Treatment Utilization Across US Colleges and Universities

Sarah Ketchen Lipson^{1,2}; S. Michael Gaddis^{3,4}; Justin Heinze⁵; Katie Beck⁵; Daniel Eisenberg¹

¹Department of Health Management and Policy, University of Michigan School of Public Health,
Ann Arbor, Michigan

²Center for the Study of Higher and Postsecondary Education, University of Michigan School of
Education, Ann Arbor, Michigan

³Robert Wood Johnson Foundation Scholars in Health Policy Research, University of Michigan
School of Public Health, Ann Arbor, Michigan

⁴Department of Sociology, The Pennsylvania State University, University Park, Pennsylvania

⁵Department of Health Behavior and Health Education, University of Michigan School of Public
Health, Ann Arbor, Michigan

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Abstract. Objective: On US college campuses, mental health problems are highly prevalent, appear to be increasing, and are often untreated. Concerns about student mental health are well-

documented, but little is known about potential variations across the diversity of institutions of higher education. **Participants:** 43,210 undergraduates at 72 campuses that participated in the Healthy Minds Study from 2007-2013. **Methods:** Multivariable logistic regressions focus on associations between institutional characteristics and student mental health and treatment utilization. **Results:** The following institutional characteristics are associated with worse mental health: doctoral-granting, public, large enrollment, non-residential, less competitive, and lower graduation rates. Among students with apparent mental health problems, treatment utilization is higher at doctorate-granting institutions, baccalaureate colleges, institutions with small enrollments, and schools with strong residential systems. **Conclusions:** Although high rates of mental health problems and low treatment utilization are major concerns at all types of institutions of higher education, substantial variation occurs across campuses.

Keywords: help-seeking, institutional characteristics, mental health

INTRODUCTION

In college student populations, mental health problems are highly prevalent¹ and appear to be increasing.^{2,3} Roughly one-third of undergraduates exhibit significant symptoms of a mental health problem such as depression, generalized anxiety, or suicidality.⁴ Despite availability of effective treatment options, the majority of these students are not receiving mental health services.^{5,6} Over 80% who die by suicide have never been seen by their campus mental health services.^{7,8} Among young adults, mental health is related to many other important outcomes, including social connectedness,⁹⁻¹¹ academic performance and retention,^{12,13} and future economic productivity.¹⁴ Thus, high rates of mental health problems and low rates of treatment utilization present significant concerns for campus administrators, parents, and other stakeholders.

The current state of college student mental health can be viewed not just as major public health problem, but also as a unique opportunity. There are more than 20 million students enrolled in US higher and postsecondary education, and approximately half of all young adults attend college.¹⁵ Nearly three-quarters of lifetime mental illnesses have first onset by the mid-20s.¹⁶ Campus settings provide a unique opportunity to identify, prevent, and treat mental illness during adolescence and young adulthood. By their scholarly nature, institutions of higher education are well positioned to develop, evaluate, and disseminate best practices for mental health treatment and prevention.¹⁷ Campus mental health practice and policy has and continues to be informed by research elucidating unique needs and variations across individual subgroups (e.g., racial/ethnic minority students).⁴ Just as there is substantial diversity of students and variations in mental health across demographic groups,⁴ there is also institutional diversity.

Exploring potential variations in prevalence and treatment utilization across institutional characteristics is an important next step towards understanding the environmental contexts that shape and are shaped by student mental health. In the present study, we take a first step in this direction by examining variations in student mental health and treatment utilization using data from 72 colleges and universities that participated in the Healthy Minds Study between 2007 and 2013. We do not aim to make causal claims about the impact of institutional characteristics on student mental health, but rather we use broad strokes to present descriptive associations between institutional characteristics and student mental health outcomes.

METHODS

Sample and Data Collection

Since 2007, we have conducted the Healthy Minds Study (HMS) for college and university student populations in the US. HMS is an annual web-based survey that examines mental health and related issues (e.g., depression, anxiety, and substance use) and service utilization. The present paper is the first to report findings using all six years of data through 2013 (2007, 2009-2013) and the first to focus on variations across institutions. By examining mental health issues and treatment utilization across a number of institutional characteristics, we hope to highlight potential mechanisms that could lead to improved policies and further research in this area.

This analysis includes 72 unique institutions that participated one or more times in the study during 2007-2013. For institutions that participated in HMS more than once, only their most recent year of data is included. At each institution with more than 4,000 students, we recruited a random sample of 4,000 from the full student population; on campuses with less than

4,000 students, we recruited all students. In 2007 and 2009 (N=28 schools), students were invited via postal mail (with a \$2 incentive) followed by email reminders. Since 2010, we have conducted recruitment entirely by email. All students were informed that they were entered into a cash sweepstakes regardless of their participation. To engage non-responders, we sent up to three reminders over the month-long data collection period. The survey was administered using DatStat Illume online survey software. The study was approved by the Institutional Review Boards at all participating institutions. The present analysis focuses on undergraduate students and excludes graduate students. Students were presented with an online consent form and voluntarily granted consent before entering the survey.

To adjust for potential differences between survey responders and non-responders, we constructed sample probability weights. For students in the initial random samples, we obtained administrative data from participating institutions, including gender, academic level, race/ethnicity, and grade point average. We then constructed response weights, equal to 1 divided by the predicted probability of survey response, using a logistic regression to estimate the predicted probability of response based on these variables. Thus, weights are larger for respondents with underrepresented characteristics, ensuring that all estimates are representative of the full population in terms of basic demographic and other characteristics.

Measures

Institutional Characteristics (independent variables)

Institutional Type. Using the “Basic Classification Categories” of the Carnegie Foundation for the Advancement of Teaching,¹⁸ we categorized colleges and universities as either doctorate-granting, master’s colleges and universities, or baccalaureate colleges. The

institutional type variable captures several important characteristics that may influence student mental health and wellbeing, including organizational complexity, availability and delivery of mental health services, and degree of emphasis on undergraduate student life and learning. In our sample of schools, there are 33 doctorate-granting institutions, 26 master's colleges and universities, and 13 baccalaureate colleges (see Table 1). Due to small numbers we omitted from the analyses "specialty" schools, including schools of art and design and medical schools (N=6 schools).

Sector. We categorized colleges and universities as being public (N=46 schools) or private (N=26 schools), as listed in the US News and World Report (USNWR) Rankings.¹⁹

Enrollment. Institutional size is an important measure to include because it is related to institutional structure, campus culture, and other factors that could influence psychosocial outcomes. Based on the Carnegie Foundation's classification of institutional size,¹⁸ we sorted our sample of colleges and universities into three groups: small (<3,000 students, N=12 schools), medium (3,000-9,999 students, N=24 schools), and large (\geq 10,000 students, N=36 schools).

Housing. Residential life can be an important reflection of the campus environment, student population served, and the types of programs and services offered at an institution. We used the Carnegie Foundation's classification of "residential character," which is based on two attributes: the proportion of undergraduates who attend full-time and the proportion living in campus-owned, -operated, or -affiliated housing.¹⁸ Using the "Institution Lookup" feature, we categorized our sample of colleges and universities as non-residential (N=17 schools), residential (N=34 schools), or highly residential (N=21 schools).

Admissions Selectivity. We used selectivity scores reported in Barron's Profiles of American Colleges (2003), which range from 1 (noncompetitive) to 6 (most competitive); for a comprehensive discussion of Barron's selectivity scores, see Bastedo and Jaquette (2011). In our institutional sample, there are no schools classified as noncompetitive, 10 as less competitive, 29 as competitive, 16 as very competitive, six as highly competitive, and eight as most competitive. Three schools did not have Barron's scores.

Graduation Rate. Mental health problems are negatively associated with student retention;¹³ thus we were interested in exploring campus-level correlations between mental health outcomes and graduation rates. We used graduation rates (the percentage of an entering class that graduated within six years) as reported in the USNWR Rankings¹⁹ to assign colleges and universities into five categories: very low ($\leq 50\%$ graduation rate, N=19 schools), low (51-60% graduation rate, N=15 schools), medium (61-70% graduation rate, N=14 schools), high (71-84% graduation rate, N=11 schools), and very high ($\geq 85\%$ graduation rate, N=11 schools). Graduation rates are missing for two schools.

Mental Health (dependent variables)

Depression. We measured symptoms of depression in the past two weeks using the Patient Health Questionnaire-9 (PHQ-9), a validated screening instrument based on the core symptoms of a major depressive episode.^{21,22} We created a binary measure (positive/negative screen) using the instrument's standard algorithm. Across multiple settings and populations, scholars have found the PHQ-9 internally consistent and highly correlated with clinical diagnosis.^{23,24} The PHQ-9 has high internal consistency in college student surveys (Cronbach's alpha=0.84).²⁵

Anxiety. We also used the PHQ to measure anxiety (symptoms of panic disorder and generalized anxiety disorder). The PHQ anxiety module measures symptoms over the past four weeks and has been validated in diverse populations.²² Scholars have found the PHQ anxiety module highly sensitive and specific— 81% and 99%, respectively, for panic disorder, and 63% and 97% for generalized anxiety disorder.²² We used the standard algorithm to create a binary measure, categorizing students as screening positive/negative for any anxiety. In 2013, we switched our anxiety screen to the GAD-7;²⁶ for consistency we therefore limit our analyses involving anxiety measures to the 2007-2012 sample (59 schools, N=33,492). A positive screen on the GAD-7 in the 2013 sample is included in the operationalization of “any mental health problem,” however (see below).

Suicidal Ideation. We used a single question to measure suicidal ideation: “In the past year, did you ever seriously think about committing suicide?” Beginning in 2010, the word “committing” was replaced by “attempting”. Students answered “yes” or “no” and were categorized according to their response.

Non-Suicidal Self-Injury (NSSI). We used one survey item to assess self-injurious behavior²⁷: “This question asks about ways you may have hurt yourself on purpose, without intending to kill yourself. In the past four weeks, have you ever done any of the following intentionally?: Cut myself, burned myself, banged my head or other body part, scratched myself, punched myself, pulled my hair, bit myself, interfered with wound healing, other (specify), or no, none of these.” Students are instructed to “select all that apply”. We created a binary measure of NSSI (any vs. no reported behaviors).

Any Mental Health Problem. We created a binary measure of any mental health problem, defined as the presence of one or more of the above-mentioned problems (a positive screen or "yes" response to any of the conditions) or the absence of all of the above-mentioned problems (all negative screens and "no" responses).

Mental Health Treatment Utilization. We created a binary measure of any past-year mental health treatment utilization based on two survey items: "In the past 12 months have you received counseling or therapy for your mental or emotional health from a health professional?" and "In the past 12 months have you taken any of the following types of prescription medications?" Students who reported receiving any counseling/therapy and/or medication were considered treatment users. The analysis of treatment utilization is limited to among students who meet the above-mentioned criteria for any mental health problem.

Data Analyses

We linked the institution-level characteristics to the HMS student-level mental health data to explore the associations between the two. First, we conducted basic descriptive analyses to examine the prevalence for the mental health outcomes across each of the institutional characteristics. Next, we ran multivariable logistic regressions controlling for survey year, students' age, gender, race/ethnicity, and parental education. We selected reference categories (listed in parentheses) for each institutional characteristic: type (doctorate-granting), sector (private), enrollment (medium), housing (residential), admissions selectivity (competitive), and graduation rate (average). From the binary and multivariate logistic regression models we report odds ratios (OR) and p-values. Finally, to measure the extent to which the institutional level accounted for overall variance in mental health and help-seeking, we used random-effects

logistic regression models to calculate intraclass correlation coefficients. All analyses were conducted using Stata 12 and were weighted using the sample probability weights described above.

RESULTS

Sample Characteristics (Table 1)

The survey sample includes 43,210 undergraduate students at 72 US colleges and universities. The sample is 56% female and is relatively diverse in terms of race/ethnicity, religiosity, relationship status, sexual orientation, financial status, and residence (on- or off-campus).

Mental Health Across Institutional Characteristics (Table 2)

In the overall sample 18.2% of students screened positive for depression and 10.1% for anxiety. 7.8% reported serious thoughts of suicide and 16.5% reported NSSI in the previous year. Overall, 34.4% of undergraduates had at least one of the above-mentioned mental health problems. Among students with an apparent mental health problem, 39.4% received treatment. Figure 1 shows variations in mental health problems across institutions. Prevalence of depression ranges from 10.3% to 28.2%, with a mean of 17.7%. Anxiety ranges from 5.0% to 18.6%, with a mean of 10.5%. Suicidal ideation ranges from 3.3% to 13.4%, with a mean of 7.6%. NSSI ranges from 9.9% to 25.9%, with a mean of 16.5%.

There is notable variation in the prevalence of mental health problems across housing, admissions selectivity, and graduation rates. For depression, anxiety, and suicidal ideation, rates are highest among students on non-residential campuses (21.5%, 11.3%, and 8.7%, respectively) and lowest among students on highly residential campuses (17.0%, 8.4%, and 7.4%,

respectively). Across admissions selectivity, depression ranges from 15.7% at the most competitive institutions to 19.3% at the least competitive institutions. Similarly, anxiety is lowest at the most competitive institutions (8.2%) and highest at the least competitive institutions (11.5%). Rates of suicidal ideation range from 7.3% at competitive institutions to 8.9% at the least competitive institutions. By contrast, NSSI is lowest (15.4%) at the least competitive institutions and highest (18.2%) at the most competitive institutions. For graduation rates, the prevalence of depression ranges from 16.4% on campuses with very high graduation rates to 19.7% on campuses with very low graduation rates. Similarly, anxiety is lowest on campuses with very high graduation rates (7.9%) and highest on campuses with very low graduation rates (12.2%). The proportion of students experiencing suicidal ideation ranges from 6.8% on campuses with very high graduation rates to 8.2% on campuses with average graduation rates. There are no notable variations in the prevalence of mental health problems across institutional type, sector, or enrollment.

For those with an apparent mental health problem, rates of treatment utilization vary greatly by institutional type, sector, enrollment, and housing. Across institutional types, the lowest rate of treatment utilization is among students at doctorate-granting institutions (37.1%) and the highest rate is among students at baccalaureate colleges (46.2%). Rates of treatment utilization are higher at private institutions than at public institutions (43.7% vs. 37.2%). Large institutions have much lower treatment utilization (35.2%) than small institutions (47.0%). Non-residential campuses have lower treatment utilization (33.9%) than highly residential campuses (44.0%). There are no notable variations in mental health treatment utilization across admissions selectivity or graduation rates.

Independent Correlates of Mental Health (Table 3)

In multivariable logistic regression models controlling for survey year, students' age, gender, race/ethnicity, and parental education, there is notable variation in the prevalence of mental health problems across institutional type, sector, housing, admissions selectivity, or graduation rates. Relative to students at doctorate-granting institutions, those at master's colleges and universities are less likely to report NSSI (OR=0.90, $p=0.007$) and to meet criteria for any mental health problem (OR=0.94, $p=0.04$). Relative to students at private schools, those at public schools have higher odds of meeting criteria for depression (OR=1.20, $p<0.01$), anxiety (OR=1.18, $p<0.01$), suicidal ideation (OR=1.21, $p<0.001$), and any mental health problem (OR=1.12, $p<0.001$). Relative to students on residential campuses, those on nonresidential campuses have higher odds of depression (OR=1.27, $p<0.001$), anxiety (OR=1.22, $p<0.01$), suicidal ideation (OR=1.24, $p<0.01$), NSSI (OR=1.22, $p<0.001$), and any mental health problem (OR=1.23, $p<0.001$). Students at highly residential schools have lower odds of screening positive for anxiety (OR=0.82, $p<0.01$). Odds of screening positive for depression are lower at highly and most competitive schools relative to competitive schools (OR=0.83, $p<0.05$ and OR=0.89, $p<0.05$). Odds of screening positive for anxiety (OR=1.17, $p<0.05$) and reporting suicidal ideation (OR=1.28, $p<0.01$) are significantly higher on less competitive campuses. Students at schools with very low graduation rates have higher odds (OR=1.19, $p<0.05$) and students at schools with very high graduation rates have lower odds (OR=0.82, $p<0.01$) of screening positive for anxiety. Similar to the descriptive findings reported above, the multivariable analyses reveal minimal variations in the prevalence of mental health problems across enrollment sizes.

For students with apparent mental health problem, rates of treatment utilization vary greatly by institutional type, sector, enrollment, and housing. Relative to students with any mental health problem at doctorate-granting institutions, those at baccalaureate colleges are more likely to seek treatment (OR=1.36, $p<0.0001$). Compared to their private school peers with any mental health problem, those at public schools have significantly lower odds of utilizing mental health treatment (OR=0.71, $p<0.001$). Relative to students with any mental health problem at medium-sized institutions, rates of treatment utilization are lower for students on large campuses (OR=0.84, $p<0.001$) and higher for students on small campuses (OR=1.32, $p<0.01$). Odds of treatment utilization are lower for students with any mental health problem on nonresidential campuses (OR=0.86, $p<0.05$) and higher for those on highly residential campuses (OR=1.31, $p<0.001$). As in the descriptive findings described above, the multivariable analyses reveal no notable variations in mental health treatment utilization across admissions selectivity or graduation rates.

Intraclass Correlation Coefficients

In random-effects logistic regression models (not shown in tables), the ICCs were small but statistically significant: 0.01 ($p<0.001$) for depression, 0.01 ($p<0.001$) for anxiety, 0.003 ($p<0.001$) for suicidal ideation, 0.004 ($p<0.001$) for NSSI, 0.01 ($p<0.001$) for any mental health problem, and 0.02 ($p<0.001$) for treatment utilization. This indicates that even though campus-level prevalence varies substantially as shown in Figure 1, campus-level variation is still small when compared with the overall variation in student mental health and help-seeking.

COMMENT

This study extends previous research on college student mental health by examining variations across institutional characteristics. Using data from over 43,000 undergraduates on 72 college campuses, we find that mental health problems are more prevalent at institutions with the following characteristics: large enrollment, public, and non-residential. Students at public institutions are more likely to screen positive for depression and anxiety and to report suicidal ideation, while students at large institutions are more likely to screen positive for depression and report NSSI. Students at non-residential institutions are more likely to screen positive for depression and anxiety and to report suicidal ideation and NSSI.

In US college populations, as in other populations, the treatment gap—the proportion of people with apparent mental disorders who are not receiving treatment²⁷—is large, with estimates as high as 60%²⁹ and 80%⁵. In the present study we explore variations in student help-seeking behavior across institutional characteristics, finding that treatment utilization is lowest at institutions with the following characteristics: large enrollment size, public, non-residential, and low graduation rates. On average, students at public institutions have access to fewer resources than students at private schools³⁰ and these differences likely are present in areas such as mental health outreach, clinic hours, and number of mental health professionals employed by the institution. Students on campuses with larger enrollment may have access to more social interactions but may feel more anonymous and less connected to their community. Similarly, students at non-residential institutions spend less time on campus and thus likely have fewer social ties and interactions. These findings are consistent with the concept of horizontal stratification: although college access has increased steadily over time, the college experience is unequal across institutions and social inequalities are likely to persist. In the present study, both

prevalence of mental health issues and lack of treatment seem to be correlated with characteristics that suggest more impersonal college experiences (e.g., large and non-residential).

Implications. This research has implications for campus mental health policy and future research. Mental health problems appear to be highest and treatment utilization lowest at institutions that tend to have fewer resources: large institutions, public institutions, non-residential institutions, and institutions with low graduation rates. At the national or state level, policy interventions may be warranted to allocate additional resources that might mitigate disparities. At the campus level, there may be ways for administrators to more successfully advocate for resources within the institution using an economic case for mental health services. Administrators may want to highlight that mental health problems are significant predictors of functional outcomes that are central to institutional missions. In separate analyses with HMS data, we have examined how mental health predicts academic outcomes by linking students' survey responses to academic records. We found that a positive screen for depression was associated with an approximately two-fold increase in the risk of dropping out, controlling for prior academic performance and other covariates.¹³ In addition, symptoms of depression, anxiety, and eating disorders were significantly correlated with grade point average. These findings confirm the important connection between mental health and academic performance, suggesting that mental health services can play a valuable role in supporting persistence and promoting academic success. Reducing mental health problems may increase retention, leading to increased tuition revenue for the institution and increased lifetime productivity and earnings for the students. Based on the logic described in our previous research¹³, every dollar invested in effective mental health programs and services would be expected to yield at least two dollars in

tuition revenue and more than four dollars in productivity and earnings for the student (and society).

This research has additional policy implications at the campus level. While current mental health intervention and prevention programs on college campuses typically account for individual student characteristics and needs, our data suggest that practitioners need to account for institutional characteristics as well when creating or adapting programs. As suggested here, non-residential campuses show higher rates of depression, anxiety, suicidal ideation, and NSSI, and lower rates of treatment utilization; having a strong residential community appears to be an important protective factor for student mental health and help-seeking. Other studies suggest that living on campus predicts retention rates and possibly academic performance.³¹ Intervening at the housing level by improving and increasing residential housing options and requirements for students may help to promote student well-being by increasing social interaction, and thereby increasing social capital for students on non-residential campuses. In terms of treatment utilization, which was found to be lowest at large institutions, housing policies may also be considered as a point of intervention. Within existing residential systems, administrators can implement living-learning communities in order to create a greater sense of community and cohesion, thus making a large campus feel smaller to students.³² Relatedly, given that it seems easier for students in need to fall through the cracks at large institutions, there may need to be more intentional identification and treatment linkage efforts embedded within students' normal routines (e.g., through academic advisors, with whom students regularly meet). Taking advantage of these naturally occurring interactions could prove a cost-effective way of improving campus mental health treatment and prevention.

From a research perspective, it will be important to more deeply examine, perhaps through surveys or qualitative interviews, characteristics and practices at small, private colleges that successfully promote increased service utilization. This could lead to new understanding of best practices for campus mental health treatment and prevention. Another important extension of the present study will be to explore relationships between institutional characteristics and student mental health at community colleges and specialty schools, two categories that were unrepresented in the data used here.

Limitations

This study has several limitations that should be considered when interpreting the results. First, across all years of data included in these analyses, the survey had an overall response rate of just under 30.0%. The sample probability weights adjust for potential differences between responders and non-responders along several known characteristics of the full student population, but these adjustments do not necessary correct for response bias due to other unobserved characteristics. Second, the Healthy Minds Study is a cross-sectional study, allowing us to identify important correlations but we cannot infer causality due to possible unobserved confounding factors or reverse causation. Third, while we measured depression and anxiety with validated screening tools and suicidal ideation and NSSI with widely used survey items, these assessments do not represent clinical diagnoses. Not all students with positive screens would meet criteria for a clinical diagnosis. Fourth, the sample is comprised of colleges and universities that chose to participate in the Healthy Minds Study. Certain types of institutions (particularly community colleges) are notably lacking from this sample. Beginning in 2014, HMS expanded to include community colleges, thus opening new opportunities for research and practice.

Finally, HMS does not ask about specific mental health resources on each campus. Moving forward, it will be important to examine how student-reported survey data align with institutional data about the availability of programs and services. HMS researchers are currently exploring opportunities for pairing student-reported data to national initiatives that collect relevant institution-level information.

Conclusions

This research shows that there are important variations in the mental health and treatment seeking behaviors of college students across different types of universities. Although we cannot make causal claims with our cross-sectional data, this research represents an important first step in understanding the links between institutional characteristics and student mental health and treatment utilization. Although we suspect that the availability of institutional resources and social capital are some of the mechanisms driving these relationships, future research should more fully explore the causes of these disparities and the potential institutional policy implications.

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ACCEPTED MANUSCRIPT

Note

For comments and further information, address correspondence to Sarah Ketchen Lipson,
University of Michigan School of Public Health, Department of Health Management and Policy,
1415 Washington Heights, Ann Arbor, Michigan 48109, USA (e-mail: sklipson@umich.edu).

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Table 1. Institutional Characteristics (N=43,210 undergraduates at 72 colleges/universities)

	Categories	N (campuses)	N (students)	% of students
Institutional Type (categorical)	Doctorate granting institution (D)	33	20,681	47.86
	Master's institution (M)	26	17,068	39.50
	Baccalaureate institution (BA)	13	5,461	12.64
Sector (binary)	Public (Pub)	46	28,759	66.56
	Private (Priv)	26	14,451	33.44
Enrollment (ordinal)	Small (S)	12	4,571	10.58
	Medium (M)	24	15,480	35.83
	Large (L)	36	23,159	53.60
Housing (ordinal)	Non-residential (NR)	17	10,324	23.89
	Residential (R)	34	20,910	48.39
	Highly residential (HR)	21	11,976	27.72
Admissions Selectivity (ordinal)	Noncompetitive (NC)	0	0	0.00
	Less competitive (LC)	10	4,196	9.71
	Competitive (C)	29	17,750	41.08
	Very competitive (VC)	16	9,973	23.08
	Highly competitive (HC)	6	3,036	7.03
	Most competitive (MC)	8	6,845	15.84
Graduation Rate (ordinal)	Very low (≤ 50) (VL)	19	8,706	20.15
	Low (51-60) (L)	15	9,275	21.46
	Average (61-70) (A)	14	8,902	20.60
	High (71-84) (H)	11	6,603	15.28
	Very high (≥ 85) (VH)	11	8,626	19.96
	Missing	2	1,098	2.54

Table 2. Prevalence of Mental Health Problems and Treatment Utilization, Overall by Institutional Characteristics

		<u>Depression</u>	<u>Anxiety</u>	<u>Suicidal Ideation</u>	<u>NSSI</u>	<u>Any MH problem</u>	<u>Tx</u>
		%	%	%	%	%	%
Institutional Type	D	18.49	9.34	7.65	17.34	35.07	37.08
	M	17.82	10.58	7.70	15.28	33.34	38.15
	BA	18.16	10.77	8.22	17.29	35.06	46.20
Sector	Pub	18.61	10.32	8.04	16.43	34.71	37.20
	Priv	17.31	9.49	7.30	16.76	33.82	43.74
Enrollment	S	17.71	10.77	7.64	17.40	34.69	46.99
	M	17.15	9.98	7.75	15.32	32.73	41.61
	L	19.04	9.93	7.87	17.06	35.45	35.17
Housing	NR	21.53	11.34	8.65	17.48	38.02	33.90
	R	17.15	10.22	7.59	15.64	33.10	39.85
	HR	16.99	8.42	7.38	17.27	33.50	43.99
Admissions Selectivity	LC	19.29	11.46	8.90	15.42	34.51	40.00
	C	17.88	10.06	7.26	16.24	33.69	39.28
	VC	18.89	10.12	7.97	17.37	35.56	39.55
	HC	15.70	8.53	8.08	16.19	33.32	41.51
	MC	16.41	8.20	7.83	18.24	33.94	39.65
Graduation Rate	VL	19.72	12.23	8.16	16.05	35.21	39.72
	L	16.52	9.77	7.85	15.96	32.30	38.88
	A	19.60	9.91	8.23	16.88	36.37	40.84
	H	16.83	8.45	7.53	17.25	34.43	41.85
	VH	16.38	7.89	6.76	16.98	32.56	38.32

Notes: Anxiety excludes 2013; NSSI=non-suicidal self-injury; Tx is among students with at least one apparent mental health (MH) problem. For institutional type, D=doctorate granting institution, M=Master's institution, BA= Baccalaureate institution. For sector, Pub=Public, Priv=Private. For enrollment, S=small, M=medium, L=large. For housing, NR=non-residential, R=residential, HR=highly residential. For admissions selectivity, LC=less competitive, C=competitive, VC=very competitive, HC=highly competitive, MC=most competitive. For graduation rate, VL=very low, L=low, A=average, H=high, VH=high.

Table 3. Multivariable Correlates of Mental Health Problems and Treatment Utilization*(logistic regressions)*

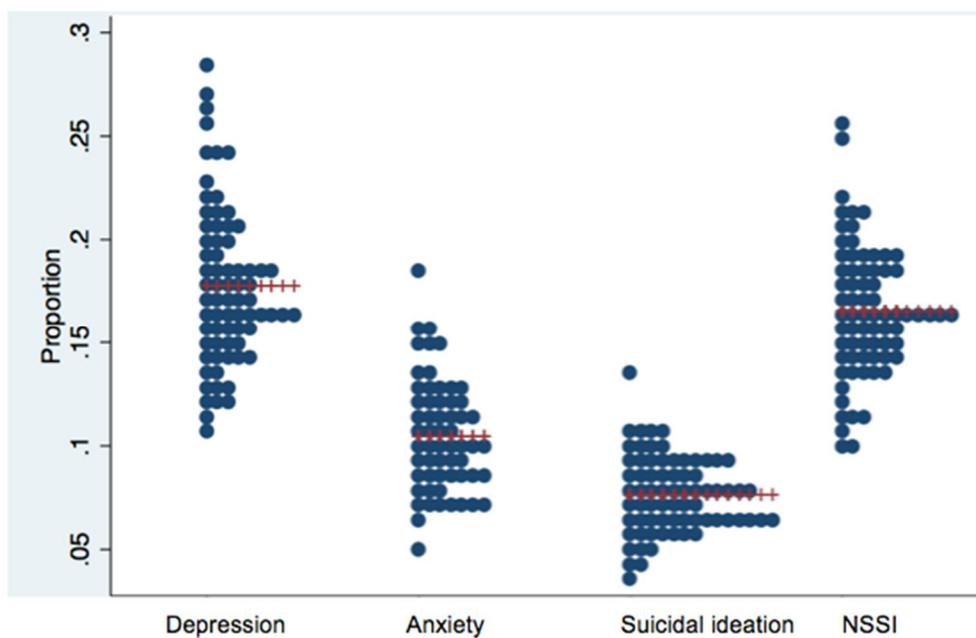
		<u>Depression</u>	<u>Anxiety</u>	<u>Suicidal ideation</u>	<u>NSSI</u>	<u>Any MH problem</u>	<u>Tx</u>
		OR	OR	OR	OR	OR	OR
Institutional Type	D	--	--	--	--	--	--
	M	0.98	1.02	1.00	0.90**	0.94*	0.90
	BA	1.00	1.10	1.10	0.97	0.96	1.36***
	N	39,645	31,916	39,399	38,738	38,827	12,698
Sector	Pub	1.20**	1.18**	1.21***	1.06	1.12***	0.71***
	Priv	--	--	--	--	--	--
	N	39,645	31,916	39,399	38,738	38,827	12,698
Enrollment	S	1.03	0.93	0.91	1.11	1.02	1.32**
	M	--	--	--	--	--	--
	L	1.09*	1.03	1.00	1.12**	1.10**	0.84***
	N	39,645	31,916	39,399	38,738	38,827	12,698
Housing	NR	1.27***	1.22**	1.24**	1.22***	1.23***	0.86*
	R	--	--	--	--	--	--
	HR	0.95	0.82**	0.89	1.05	0.95	1.31***
	N	39,645	31,916	39,399	38,738	38,827	12,698
Admissions Selectivity	LC	1.05	1.17*	1.28**	1.03	1.07	1.09
	C	--	--	--	--	--	--
	VC	1.06	1.05	1.07	1.05	1.09*	1.00
	HC	0.83*	1.14	1.04	1.00	0.98	1.09
	MC	0.89*	0.91	1.00	1.07	1.01	1.14
	N	39,645	31,916	39,399	38,738	38,827	12,698
	VL	1.01	1.19*	1.03	0.99	0.98	0.88
Graduation Rate	L	0.81***	0.96	0.95	0.91	0.85***	0.81**
	A	--	--	--	--	--	--
	H	0.85**	0.93	0.85	0.97	0.90*	1.00
	VH	0.78***	0.82**	0.83*	0.93	0.84***	1.04
	N	38,584	30,861	38,354	37,710	37,794	12,349

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; Anxiety excludes 2013; NSSI=non-suicidal self-injury;

Tx is among students with at least one apparent mental health (MH) problem; all models control for survey year and students' age, gender, race/ethnicity, and parental education. Reference categories are: doctorate-granting for institutional type; private for sector; medium for

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enrollment; residential for housing; competitive for admissions selectivity; and average for graduation rate. For institutional type, D=doctorate granting institution, M=Master's institution, BA= Baccalaureate institution. For sector, Pub=Public, Priv=Private. For enrollment, S=small, M=medium, L=large. For housing, NR=non-residential, R=residential, HR=highly residential. For admissions selectivity, LC=less competitive, C=competitive, VC=very competitive, HC=highly competitive, MC=most competitive. For graduation rate, VL=very low, L=low, A=average, H=high, VH=high.

Figure 1. Variations in Mental Health Problems across Institutions

Notes: Each dot represents a single institution. The + denote the overall institutional average prevalence of each mental health condition.