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Graduate Student Mental Health: Needs Assessment and Utilization of Counseling Services

Jenny K. Hyun Brian C. Quinn Temina Madon Steve Lustig

This study examined the mental health needs, knowledge, and utilization of counseling services among graduate students at a large university in the western United States. Almost half of graduate student respondents reported having had an emotional or stress-related problem over the past year, and over half reported knowing a colleague who had had an emotional or stress-related problem over the past year. Self-reported mental health needs were significantly and negatively related to confidence about one's financial status, higher functional relationship with one's advisor, regular contact with friends, and being married. Utilization of counseling services was positively associated with an index of depression symptoms, the number of semesters in school, and identifying as female. Those students who had experienced a significant mental health event in the past year and had higher functional relationships with their advisors were significantly more likely to utilize counseling services. Findings suggest a need for increased attention to graduate student mental health needs, especially the role of financial confidence in student well-being and the relationship of graduate students with their advisors.

According to the U.S. Department of Education, there were approximately 1.9 million graduate students in American universities in 2001 (U.S. Department of Education &

National Center for Education Statistics, 2003). In addition to the diversity of educational programs and teaching environments, graduate students themselves possess an equal diversity of personal, professional, intellectual, and psychological traits and abilities (Committee on the College Student, Group for the Advancement of Psychiatry, 1999). Graduate students face many unique challenges. Because of demographic and social changes in recent decades, graduate students are more likely to have multiple familial and financial responsibilities entering graduate school than did students in the past. Moreover, graduate school represents a departure from the formal structure of undergraduate studies. In contrast to the experience of undergraduates, graduate students generally operate in an environment with less guidance requiring significant self-motivation in structuring progress through graduate programs (Peters, 1997).

Most of the research on mental health needs at U.S. universities has focused on undergraduate students (S. A. Benton, Robertson, Tseng, Newton, & Benton, 2003); has failed to distinguish between undergraduate and graduate student status (O'Neil, Lancee, & Freeman, 1984; Pledge, Lapan, Heppner, Kivlighan, & Roehlke, 1998; Westefeld & Furr, 1987); or has studied only small subsamples of the graduate student population,

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such as medical or psychology graduate students (Givens & Tjia, 2002; Nelson, Dell'Oliver, Koch, & Buckler, 2001; Nogueira-Martins, Fagnani Neto, Macedo, Citero, & Mari, 2004; Toews et al., 1997). Studies of graduate students illuminate the particular vulnerabilities and needs of this population. In comparison to medical students and residents, graduate students in the sciences had higher levels of overall stress and higher presentation of mental health problems (Toews et al.). Graduate students are particularly vulnerable to pressures related to conducting research and teaching, publishing, and finding employment, in addition to stress from the often ambiguous expectations of advisors. Multiple studies of graduate student mental health have found that financial stress was a major reason for seeking counseling (Furr, Westefeld, McConnell, & Jenkins, 2001; Nogueira-Martins et al.; Toews et al.; Westefeld & Furr). Researchers found that graduate students had significantly higher frequency of thoughts on quitting their studies than both medical students and residents (Toews et al.). Untreated mental health problems are significant contributors to graduate student dropout (Turner & Berry, 2000; Wilson, Mason, & Ewing, 1997).

Studies have also documented that graduate program characteristics are associated with students' emotional well-being and the likelihood of completing one's graduate program. These characteristics include a focus on professional versus academic degrees; a high level of administrative, social, and financial support provided by the department; a more democratic supervisory structure; mentoring; and utilization of counseling services are positive, protective factors in the psychological transition to and successful completion of graduate programs (T. Benton, 2003; Committee on the College Student, Group for the

Advancement of Psychiatry, 1999; Goldberg, 1998; Johnson & Huwe, 2002).

Reports on mental health indicate that frequent mental distress among adults is on the rise across the U.S. The Centers for Disease Control reported that between 1993 and 2001, the prevalence of frequent mental distress in U.S. adults rose from 8.4% to 10.1% (Centers for Disease Control and Prevention [CDC], 2004). The conventional wisdom in the field of university counseling is that the severity of mental health problems on campus has been steadily increasing. In their landmark study, S. A. Benton et al. (2003) found that over the course of 13 years, there has been a marked increase in the percent of students seeking counseling for problems related to developmental and situational problems, depression, academic skills, grief, and medication use. The authors concluded that university counselors are seeing students with more complex problems, which may reflect changes in the prevalence of mental distress at large within the population, changes in the university environment, and increasing psychiatric medication use by students before entering college (S. A. Benton, Benton, Newton, Benton, & Robertson, 2004; Rudd, 2004; Sharkin, 2004). A significant drawback to the much-cited S. A. Benton et al. (2003) investigation is that the study design captured data only for those students who used counseling services. Although this study is helpful in ascertaining the prevalence of problems presenting at university counseling centers, other studies suggest that the majority of students who may be most at risk do not seek counseling (Furr et al., 2001; Givens & Tjia, 2002).

Studies have also documented differences in the prevalence of mental health problems between men and women. Although the prevalence of frequent mental distress has increased for the population in general, the

prevalence remains higher for women than for men (CDC, 2004). This finding is particularly relevant for graduate school administrators and advisors because women constitute approximately half of the graduate school population. The average age for master's students is 32.6 and for doctoral students is 33.6 (Choy, Geis, & Malizio, 2002), which directly coincides with women's child-bearing and prime career development years. Studies confirm that women continue to bear a greater proportion of household and child-rearing duties (Suitor, Mecom, & Feld, 2001) in addition to the unique challenges of graduate studies. Women in graduate school experience higher levels of stress and role conflict than their male counterparts (Malinckrodt & Leong, 1992; McLaughlin, 1985; Toews et al., 1997). Women, however, are more likely to seek counseling, although the trend is improving for men (S. A. Benton et al., 2003; Pledge et al., 1998).

Racial and ethnic differences also exist in the presentation of mental health problems and in the utilization of mental health services. Cultural and social factors, as well as economic conditions, are significantly related to mental health inequalities. In the general population, there seems to be equal need for mental health services but significantly different patterns of access to and utilization of mental health services. For example, Asians, African-Americans, and Hispanics are less likely than White adults to utilize mental health services (U.S. Department of Health and Human Services [HHS], 2001).

In addition to demographic factors, social and professional support may play an important role in the development of mental health problems and in the utilization of services. O'Neil et al. (1984) found that, although the severity of mental health problems was the greatest predictor of seeking

counseling, graduate students were more likely to seek counseling because of their distance from other sources of social support. Graduate students may also be more likely to access other sources of institutional support, such as faculty advisors or peer counselors. Although advisors may be more able to recognize significant signs of distress, they are less able to recognize subtle emotional disturbances that may precede significant emotional distress (Backels & Wheeler, 2001). Additionally, graduate students' dysfunctional relationships with advisors may contribute to poor mental health (Johnson & Huwe, 2002). In comparison to medical students and residents, graduate students in the sciences are significantly more likely to report turning to teachers or supervisors for help and less likely to turn to their classmates (Toews et al., 1997). Discipline-specific norms and academic culture can impact attitudes toward mental health as well as utilization of services (Gottlieb, 1961; Nogueira-Martins et al., 2004; Toews et al.).

This study provides results from a survey on graduate student mental health at a large western university. The paper addresses four key research questions: What is graduate students' self-reported need for mental health services? How knowledgeable are students about the services available to them on campus? How likely are students to use mental health services? And what factors make them more or less likely to utilize services?

This study differs from previous work on a number of important dimensions: First, our survey captures mental health needs present in the general graduate student population, regardless of utilization of counseling services. Second, unlike many epidemiological studies of mental health problems, this study uses self-reported data, not information provided by counselors and counseling centers. Reliance on

TABLE 1.
Demographic Characteristics of Survey Respondents (SR) and University
Graduate Student Population (GSP)

Characteristic	SR (%)	GSP (%)	Characteristic	SR (%)	GSP (%)
<i>Age Distribution</i>			African-American	1.5	3.2
24 years and younger	16.3	18.8	Other	7.7	3.8
25-29	51.3	49.0	International Student	18.1	19.2
30-34	23.3	21.8	<i>Relationship Status^b</i>		
35-39	5.5	6.2	Single	44.4	
Older than 40 years	3.6	4.2	Partner	27.0	
<i>Gender</i>			Married	24.1	
Female	53.3	46.5	Divorced	1.2	
Male	46.7	53.5	Separated	0.7	
<i>Degree Program^a</i>			Other	2.6	
Doctoral	67.9	58.6	<i>Children^b</i>		
Master	22.2	41.4	None	91.5	
Professional	8.7		1-2	7.8	
Other	0.1		3 or More	0.7	
<i>School</i>			<i>Sexual Orientation^b</i>		
Science and Engineering	40.4	36.0	Heterosexual	87.9	
Professional	26.4	34.6	Gay	5.4	
Social Science	19.6	19.6	Bisexual	4.8	
Humanities	11.4	8.1	Other	1.9	
Other	2.1	1.7	<i>Insurance^b</i>		
<i>Race/Ethnicity</i>			University-Sponsored Only	82.0	
White	54.4	46.2	Private Only	8.0	
Asian/Pacific Islander	14.5	16.5	Both University-Sponsored and Private	7.9	
Hispanic	3.8	5.8	Other	2.0	
		<i>continues</i>	No Insurance	0.1	

^a University data does not differentiate between master's and professional degrees. For comparison purposes, professional degree was combined with master's degree for student respondents.

^b University data is not available on relationship status, children, sexual orientation, and insurance.

administrative data creates a focus on narrow clinically-acceptable definitions of depression. This study uses a generic description of depressive symptoms with a marker of self-perceived deficits in academic performance. Third, this study represents a diverse cohort of students from different cultural and academic backgrounds. Finally, this study provides important new information specific

to graduate students, a population that has been under-examined in the mental health literature.

METHOD

Participants

The data for this study come from a cross-sectional survey administered at a single large

western university during the spring 2004 semester. The survey population consisted of all full-time graduate students who were enrolled during that semester and had valid email addresses ($N = 9,231$). A total of 3,121 students completed the web survey, yielding a response rate of 33.8%.

The characteristics of respondents and the university graduate student population in general are presented in Table 1. The mean age of the respondents was 28.8 years ($SD = 5.2$). The majority of graduate student respondents were between 25 and 29 years old. Only 16.3% of the respondents were younger than age 24, and 32.4% were age 30 or older. Female students comprised 53.3% of the respondents, and men represented 46.7%.

Nearly 68% of respondents were doctoral students. Master's degree students represented 22.2% of the respondents, and the remaining 8.7% were working towards professional degrees. The greatest percentage of students (40.4%) represented the science and engineering disciplines. The remaining students were distributed among professional schools (26.4%), social sciences (19.6%), the humanities (11.4%), and other programs that could not be classified in one of the preceding categories (2.1%).

With respect to race and ethnicity, nearly 55% of the respondents were White. Asian/Pacific Islander graduate students represented about 14.5% of the respondents, and 3.8% were Hispanic. Only 1.5% of the student respondents were African-American. The remaining 7.7% classified their race/ethnicity as "other." International students represented 18.1% of the respondents.

The highest proportion of students reported their relationship status as single (44.4%). Approximately one quarter reported that they had a partner and roughly another one quarter reported being married. The

remaining students reported being divorced (1.2%), separated (0.7%), or "other" (2.6%). Nearly 8% of students reported having one or two children, and 0.7% had three or more children. Eighty-eight percent reported being heterosexual. The remaining students reported being gay (5.4%), bisexual (4.8%), and "other" (1.9%).

The majority of graduate students (89.9%) had university-sponsored health insurance, meaning that these students accessed their primary care and counseling services from the university health center. Few graduate students had private health insurance (15.9%), which was significantly correlated with being married ($r = 0.23$, $p < .01$). Approximately eight percent of graduate students had both university-sponsored health insurance and private health insurance. Nearly all (99.4%) of the graduate students who reported utilizing on-campus services had university-sponsored health insurance, and all of the graduate students who reported utilizing off-campus mental health services had university-sponsored health insurance. Although health insurance is an important covariate to include in analyses of health services utilization (Keeler, 1992), it is excluded in these analyses due to a lack of variance among graduate students causing the regression models to be indeterminate.

The survey respondents were representative of the graduate student population with respect to age, gender, degree, academic discipline, race/ethnicity, and international student status. There were no statistically significant differences between the survey respondents and the larger university student population along these dimensions. There were proportionally more female graduate student respondents than represented in the university population. Females comprise 46.5% of the total graduate student popu-

lation, but 53.3% percent of study respondents. We conducted both weighted and unweighted analyses with similar results. Although not statistically different, we believe that the weighted results by gender give a more accurate approximation of the true value of estimators and report weighted results by gender here.

Procedure

Surveys were completed using an online survey instrument developed by the authors and administered through a university administrative research office. Officials in the research office were responsible for managing data collection and maintaining procedures to ensure the confidentiality of respondents. The university's Committee for the Protection of Human Subjects approved the process of distributing and collecting survey information. The survey was conducted over a one-month period in the spring of 2004. All graduate students were sent an email explaining the purpose of the study, confidentiality assurances, and a link to the online survey. In addition to the initial introductory email, non-responding students were sent three reminder emails in the weeks following the initial email.

The survey was designed to address the following topics: (a) graduate student need for mental health services; (b) graduate student knowledge about mental health services available on campus; (c) graduate student utilization of and satisfaction with mental health and counseling services on campus; (d) factors that affect graduate student mental health, including social support and departmental climate; and (e) graduate student demographic characteristics.

One potential problem with survey research is that respondents can be inclined to provide socially desirable responses to questions. This problem can be particularly

troublesome when surveys include sensitive questions that are potentially embarrassing for respondents who do not want to be seen as acting in a socially undesirable manner (Aday, 1996; Dillman, 2000). As a result, sensitive questions can introduce measurement error in the analysis and reduce the reliability of responses. Measurement error can lead to over- or underestimates of true responses, as well as greater variance around estimates (Berk, 1983).

In order to combat the potential problems associated with measurement error from sensitive questions, we took four steps. First, the survey used in this study was self-administered. Self-administered surveys have proven to be effective because they do not require respondents to report sensitive information to another individual, making them more likely to answer honestly in response to potentially embarrassing questions (Bradburn, 1983). Second, by administering the survey online, we eliminated the possibility that respondents would be reluctant to answer sensitive questions out of fear of being overheard, as may happen with face-to-face survey interviews (Dillman, 1983). Third, we ensured respondents of anonymity by providing them with randomly generated and encoded identifiers. Finally, we reminded respondents of the confidential nature of the survey in the introductory email, as well as in the survey instructions. Research suggests that individuals are more likely to respond to sensitive questions given sufficient assurances of anonymity (Aday, 1996).

Measures

Mental Health Needs. The survey assessed self-reported mental health needs through responses on the frequency of feelings of hopelessness, exhaustion, sadness, depression, and being overwhelmed. The responses to these five questions were summed to create an

index of emotional distress, or depression index (Cronbach's $\alpha = 0.86$). Higher scores on the depression index represent greater frequency of negative feelings. The depression index ranged from a minimum score of 5 to a maximum score of 25 with a mean score equal to 13.1 ($SD = 4.1$). In addition, the survey instrument also assessed self-reported need for mental health services by asking students whether or not they had experienced an emotional or stress-related problem in the previous year that significantly affected their well-being or academic performance. This response was coded dichotomously. A convergent validity assessment between these two measures of emotional distress yielded a significant, positive correlation ($r = 0.56$, $p < .01$). The survey also included a question on whether the respondent knew of another graduate student who had experienced an emotional or stress-related problem in the previous year. This response was also coded dichotomously. Lastly, the survey asked respondents if anyone else in the previous year had suggested that they seek care for a mental health problem.

Functional Relationships with Advisors. Scores of agreement to questions related to faculty advisor behavior were summed to create an advisor relationship index. Questions on faculty advisor behavior included student assessments of their advisor's expressions of satisfaction with the student's performance; discussion of the strengths and weaknesses of the student's research/coursework; encouragement of intellectual self-confidence; facilitation of collaborations with other faculty members, post-docs, and other researchers; consideration of the student's personal problems; and directing the student to funding sources and current job opportunities. The advisor relationship index ranged from 7 to 28 with a mean score of 20.1 ($SD = 4.3$;

Cronbach's $a = 0.85$). A convergent validity assessment with a theoretically-related measure, satisfaction with one's advisor, yielded a significant, positive correlation ($r = 0.72$, $p < .01$). We also created an interaction term that captured graduate students' relationships with advisors for those students who expressed having experienced a significant emotional or stress-related event in the past year that significantly affected their academic performance.

Financial Status. We assessed financial status by asking students which of the following statements best reflected their financial status at school: (a) I am not sure I will have enough funds to complete my studies, (b) I probably will have enough funds to complete my studies, and (c) I am confident that I will have sufficient funds to complete my studies. Responses were coded continuously based on increasing confidence in their financial situation.

Family Burden. The survey instrument assessed family burden by asking about the number of hours spent on household activities and childcare duties in a typical week over the last 12 months. Respondents reported spending a mean of 8.0 hours per week on household activities ($SD = 9.1$), which was significantly correlated with the number of children that graduate students had ($r = 0.52$, $p < .01$).

Academic Discipline. The survey instrument asked graduate students to select the school or college in which their program belonged. For smaller and interdisciplinary programs that may not have an institutional "home," this allowed students to choose the school to which they felt most institutionally tied. We grouped students in chemistry, engineering, natural resources, physical and biological sciences into the "science and engineering" discipline. We grouped students in the schools of business, journalism, optometry, law, environmental design, infor-

mation management, and public health into the “professional” school discipline. Students in the social sciences, social welfare, education, and public policy schools were grouped in the “social sciences” discipline. Lastly, we grouped students in the humanities disciplines, such as history, English, political science, into the “humanities” discipline.

Program Competitiveness. The survey asked respondents to rate the competitiveness among students in their respective programs on a 6-point scale where 1 indicated *very uncompetitive* and 6 indicated *very competitive*.

Social Support. Students responded to questions about the frequency of communication with their friends and family. Frequency of contact with friends and family was coded on a 0 to 5 scale, where 0 indicated *no contact at all* and 5 indicated *contact at least once a day*.

Race/Ethnicity and International Students. We grouped race/ethnicity into five categories (White, Asian/Pacific Islander, Hispanic, African-American, and Other) and included an additional category for international students. We compared self-identified international graduate students with domestic graduate students.

Utilization of Mental Health Services. The survey instrument collected utilization information through self-report. We asked students if they had ever used on-campus counseling services, off-campus counseling services, or both.

Data Analysis

The analysis in this paper is divided into three parts. The first part examines graduate students’ self-reported need for mental health services, as well as the factors that influence the need for mental health services among graduate students. Particular attention is paid to the differences between male and female

students. The analysis uses a logistic regression model with the dichotomous dependent variable whether the student had or had not experienced an emotional or stress-related problem that significantly affected his or her well-being and academic performance. Independent variables include those identified through previous studies, such as gender (Druss et al., 2000; Malinckrodt & Leong, 1992; McLaughlin, 1985; Silverman, Meyer, Sloane, Raffel, & Pratt, 1997; Toews et al., 1997), ethnicity (HHS, 2001), international student status (Aubrey, 1991), financial confidence (Furr et al., 2001; Nogueira-Martins et al., 2004; Toews et al.; Westefeld & Furr, 1987), academic disciplines (Nogueira-Martins et al.; Toews et al.), social support (Malinckrodt & Leong; O’Neil et al., 1984), and family burden (Suitor et al., 2001), plus variables measuring competitiveness within programs (Toews et al.), functional relationships with academic advisors (Schlosser, Knox, Moskovitz, & Hill, 2003), and the interaction of advisor relationship in graduate students who reported having an emotional or stress-related event in the previous year.

The second step in the analysis examines graduate student self-reported knowledge of available mental health services on campus. We investigate sources of information on counseling services as well. The analysis also explores differences in knowledge between male and female students using chi-square and *t* test analyses.

The final part of the analysis examines the utilization of on-campus and off-campus mental health services. Specifically, we look at the types of mental health services utilized by students and determine how they differ by gender. Analyses of utilization also use a logistic regression. Three different models are presented of on-campus, off-campus, or any on-campus or off-campus utilization. The

sensitivity score is percentage of cases correctly predicted using a .5 probability threshold.

RESULTS

Self-Reported Need for Mental Health Services

Almost half (44.7%) of the respondents reported having an emotional or stress-related problem over the previous year. Another 57.7% reported having a colleague with an emotional or stress-related problem over the last 12 months. Statistically significant differences existed between men and women with respect to both measures. Only 38.6% of male respondents reported having an emotional or stress-related problem, compared with 51.7% of women, $\chi^2(1, N = 2990) = 51.0, p < .01$. Similarly, 51.7% of men versus 64.6% of women reported having a colleague with an emotional or stress-related problem, $\chi^2(1, N = 2971) = 50.9, p < .01$.

Statistically significant differences also existed between men and women on the depression index score ($p < .01$). The mean of all respondents was 13.1, but male graduate students had a mean index score (12.2) that was significantly lower than their female counterparts (14.1), $t(2971) = -12.9, p < .01$. Among the elements comprising the depression index score, 46.3% of students reported feeling overwhelmed and 39.6% of students reported feeling exhausted either “frequently” or “all the time.”

The proportion of survey respondents who considered seeking care was 50.2%. Male respondents were significantly less likely than female students to consider seeking care (38.9% compared with 63.3%, $\chi^2(1, N = 2998) = 177.9, p < .01$). One quarter of respondents had someone else suggest that they seek care. Consistent with the above findings, women were more likely than men

to have others suggest that they seek care, $\chi^2(1, N = 2970) = 45.8, p < .01$.

Students reported a number of reasons for why they would have sought help for their stress-related problems. More than one third of students reported that they would seek care for an academic problem; one quarter reported that they would seek care for career-related problems. More than half of the students said they would seek care for emotional problems. An additional 13.7% of the respondents reported that they would seek care for financial concerns, and 30.6% reported that they would seek care for relationship problems. In each of these cases, female graduate students were significantly more likely to seek care for these reasons. Approximately 2% of students would seek care for a sexual identity problem, and 4.7% would seek care for an “other” problem. There were no significant gender differences with respect to these measures.

Table 2 presents marginal probabilities (MP) from the results of logistic regressions of the self-reported mental health needs on a series of demographic and psychosocial factors. A marginal probability expresses the change in probability per incremental unit change of the independent variable (Gujarati, 2003). Self-reported mental health needs is a dichotomous measure of responses to the question asking students if they had an emotional or stress-related problem in the previous year that significantly affected their well-being, academic performance, or both. The results suggest that there is a statistically significant association between the self-reported mental health needs and several of the independent variables.

Self-reported mental health needs were significantly and positively associated with the following factors: competitiveness between students in one’s program (MP = 3%), the number of semesters spent in school (MP = 1%),

TABLE 2.
Logistic Regression of Factors
Affecting Graduate Student Self-Report
of an Emotional or Stress-Related
Event in the Last Year

Measure	Marginal Probability
Intercept	0.63***
Financial Confidence	-0.11***
Functional Relationship with Advisor	-0.01***
Competitiveness Between Students	0.03***
Academic Discipline	
Science and Engineering	-0.08
Social Sciences	-0.01
Humanities	0.11*
Other	-0.01
Contact with Family	-0.01
Contact with Friends	-0.05***
Semesters in School	0.01***
Female	0.10***
Married	-0.13***
Hours Spent on Housework	0.00
Number of Children	-0.02
International Student	-0.05
Race/Ethnicity	
Asian	-0.07*
African-American	-0.01
Hispanic	0.06
Other	0.00
Doctoral Student	-0.08*
Percentage Correctly Predicted ($p = .5$)	62.9
Likelihood Ratio	166.24***

Note. Omitted group are graduate students who are in professional schools, male, not married, domestic, White, enrolled in non-doctoral programs.

* $p < .10$. *** $p < .01$.

and identifying as female. Female respondents were 10% more likely than men to report having mental health needs. All results were significant at the $p < .01$ level. There was moderate significance of academic discipline on the probability of reporting an emotional or stress-related problem over the previous year. Specifically, students in the humanities were 11% more likely to report mental health needs than students in professional schools ($p < .10$). Self-reported mental health needs were significantly and negatively associated with confidence about finances (MP = -11%), higher functional relationship with one's advisor (MP = -1%), regular contact with friends (MP = -5%), and being married (MP = -13%). All results were significant at the $p < .01$ level. There was marginal significance of doctoral students versus master's-level or professional-degree students of self-reporting mental health needs. Students in Ph.D. programs were 8% less likely than non-doctoral students to report need ($p < .10$). No other independent variables were found to have a statistically significant association with self-reported need. The predicted probability for this model using a probability threshold of .5 was 62.9%.

Knowledge of Available Services

Table 3 presents information on students' knowledge of available on-campus counseling mental health services. Nearly three quarters of students were aware of counseling services on campus. More than 82.1% of female students knew on-campus counseling services were available to them as students, but only 67.2% of men were aware of those services ($p < .01$).

Among those who were aware of on-campus counseling services, roughly one quarter learned about them from the university health services website. Nineteen percent of

respondents reported learning about services from orientations, and approximately the same proportion learned about services from flyers posted around the campus. Fourteen percent learned about on-campus counseling services from a friend and 9.4% from a physician at the university health center. Female graduate students were more likely than men to report getting information on counseling services from a physician at the university health center (11.6% versus 7.5%). Female graduate students were much more likely to report learning about on-campus counseling services from the university health center website (26.1% versus 21.3%), from friends (16.3%

versus 12.1%), and other graduate students (11.3% versus 6.4%) than their male counterparts. All differences were significant at the $p < .01$ level.

Utilization of Mental Health Services

Analysis of self-reported utilization of mental health services among respondents revealed that 30.9% of graduate student respondents reported ever having utilized some form of mental health services while in graduate school. Twenty-six percent of respondents reported having utilized on-campus counseling services, and 10.5% reported utilizing off-campus services. Utilization of both on-

TABLE 3.
Knowledge of Available Mental Health Services for Graduate Students and Sources of Information

Measure	Total	Male	Female	<i>p</i>
Knowledge of Campus Counseling Services	74.2	67.2	82.1	
<i>Source of Information About Campus Counseling Services^a</i>				
Website	23.5	21.3	26.1	***
Orientation	19.1	18.4	19.9	
Flyer	18.9	17.7	20.2	*
Friend	14.0	12.1	16.3	***
Physician at University Health Center	9.4	7.5	11.6	***
Other Graduate Students	8.7	6.4	11.3	***
Graduate Assistant	3.1	2.8	3.5	
Roommate	1.5	1.3	1.7	
Other Faculty	1.2	1.4	0.9	
Faculty Advisor	1.1	1.1	1.1	
Family	0.8	0.9	0.8	
Other	13.2	12.1	14.4	*

^a For students who were aware of campus counseling services; multiple responses were allowed.

* $p < .10$. *** $p < .01$.

campus and off-campus counseling services was reported by 5.7% of respondents.

There were significant differences with respect to utilization between men and women. Women were more likely than men to utilize any services (41.4% versus 21.9%), utilize on-campus counseling services (34.8% versus 18.7%), utilize off-campus services (14.3% versus 7.2%), and utilize both on-campus and off-campus counseling services (7.7% to 4.0%; $p < .01$ for all comparisons).

Table 4 presents logistic regression results of factors affecting utilization of services. The dependent variable in Model 1 is any utilization of mental health services. The results suggest that the likelihood of utilization is associated with several factors. Utilization of any mental health services was positively and significantly associated with higher scores on the depression index (MP = 2%), an interaction term of stress and the advisor index (MP = 1%), the number of semesters spent in school (MP = 3%), and identifying as female. Female respondents were 12% more likely than male respondents to utilize any services. Utilization of any services was negatively associated with having a more functional relationship with one's advisor (MP = -1%), being enrolled in a science or engineering program (MP = -14%), and being married (MP = -12%). International students (MP = -27%), as well as Asian (MP = -14%) and African-American (MP = -36%) graduate students were significantly less likely than White graduate students to utilize any counseling services. These findings were all statistically significant at the $p < .01$ level. The predicted probability in Model 1 using a .5 probability threshold was 72.0%.

Models 2 and 3 regress utilization of on- and off-campus counseling services, respectively, on the same independent variables. Again, the results suggest that the probability

of utilizing on-campus counseling services is positively associated with higher scores on the depression index (MP = 2%), an interaction term of stress and the advisor index (MP = 1%), the number of semesters spent in school (MP = 2%), and identifying as female (MP = 9%). Utilization of on-campus counseling services was negatively associated with having a more functional relationship with one's advisor (MP = -1%), being enrolled in a science or engineering program (MP = -11%), and being married (MP = -10%). These findings were all statistically significant at the $p < .01$ level. Ratings of competitiveness within one's program were significantly and negatively associated with utilization of on-campus counseling services (MP = -2%, $p < .05$). Again, international graduate students were less likely than domestic graduate students (MP = -22%) to utilize on-campus counseling services, but there were no significant differences among race/ethnicity groups. The predicted probability in the model for on-campus counseling service utilization using a .5 probability threshold was 74.1%.

The factors that influence the likelihood of using off-campus counseling services are different than those influencing on-campus service utilization. Students' relationships with their advisors, identifying as female, and being married were not significant factors in the utilization of off-campus counseling services. Similar to the utilization findings for on-campus services, higher scores on the depression index (MP = 6%), an interaction term of stress and the advisor index (MP = 3%), and the number of semesters spent in school (MP = 7%) were significant predictors of off-campus counseling utilization. These findings were all statistically significant at the $p < 0.01$ level. Students in the sciences and engineering (MP = -74%, $p < .01$) were significantly less likely to use off-campus counseling services

TABLE 4.
Logistic Regressions of Factors Affecting Mental Health Service Utilization

Measure	Marginal Probability		
	Any Utilization	On-Campus	Off-Campus
Intercept	-0.22	-0.22	-2.66***
Depression Index	0.02***	0.02***	0.06**
Financial Confidence	-0.02	-0.02	-0.05
Functional Relationship with Advisor	-0.01***	-0.01***	-0.01
Competitiveness Between Students	-0.02*	-0.02	-0.07
<i>Academic Discipline</i>			
Science and Engineering	-0.14***	-0.11***	-0.74***
Social Sciences	-0.04	-0.01	-0.03
Humanities	-0.07	-0.05	-0.15
Other	0.08	0.06	0.47
Contact with Family	-0.03	-0.03	-0.10
Contact with Friends	0.01	0.01	0.15
Stressed * Advisor Index ^a	0.01***	0.01***	0.03***
Semesters in School	0.03***	0.02***	0.07***
Female	0.12***	0.09***	0.26
Married	-0.12***	-0.10***	-0.18
Hours Spent on Housework	0.00	0.00	0.00
Number of Children	0.03	-0.04	0.45**
International Student	-0.27***	-0.22***	-0.80***
<i>Race/Ethnicity</i>			
Asian	-0.14***	-0.07*	-1.11***
African-American	-0.36**	-0.25*	-1.23
Hispanic	-0.03	-0.04	-0.16
Other	-0.10*	-0.05	-0.34
Doctoral Student	0.03	0.06	-0.22
Percentage Correctly Predicted ($p = .5$)	72.00	74.10	87.10
Likelihood Ratio	363.43***	319.31***	120.88***

^a "Stressed" identifies those students who reported suffering from an emotional or stress-related problem in the last year.

Note. Omitted group are graduate students who are in professional schools, male, not married, domestic, White, enrolled in non-doctoral programs.

* $p < .10$. ** $p < .05$. *** $p < .01$.

than students in professional school programs. International students (MP = -80%, $p < .01$) were significantly less likely to utilize off-campus counseling services than domestic graduate students, and Asian students (MP = -111%, $p < .01$) were significantly less likely than White graduate students to utilize off-campus counseling services. The predicted probability in the third model using a .5 probability threshold was 87.1%.

DISCUSSION

Mental Health Needs in Graduate Students

The findings in this paper suggest that the prevalence of mental health needs among graduate students is high. Almost half of the graduate students in this study responded that they had experienced a stress-related problem that significantly affected their emotional well-being and/or academic performance within the previous year. An additional 58% reported knowing of another graduate student who had experienced a stress-related problem within the previous year. These findings are consistent with previously published studies of student mental health needs and underscore the extent to which graduate students are coping with mental health issues. A similar prevalence of mental health problems has been reported in another study using self-report, although graduate students represented only 5% of the respondents in that study (Furr et al., 2001). In another survey of both undergraduates and graduate students at a large research university, 74% of respondents reported having had an emotional problem that interfered with their daily functioning (MIT Mental Health Task Force, 2001). Although measures of emotional well-being used in this study are not clinically equivalent, the measure of graduate student well-being used in this study is higher than

the 24% of medical students rated to be moderately to severely depressed using a clinical questionnaire for depression (Toews et al., 1997) and higher than the estimated 10.1% of the national adult population reporting frequent mental distress (CDC, 2004).

In addition to feelings of depression, graduate students report a high frequency of other negative emotional symptoms. Approximately 40% of graduate students reported feeling exhausted, and 46% reported feeling overwhelmed “frequently” or “all of the time.” A better understanding of the personal and institutional sources of these problems is needed to help students manage these stressors and mitigate their effects. Amelioration of systematic sources of distress may enable graduate students to cope more effectively, to accomplish more academically, and to contribute meaningfully to research and teaching. One institutional source of both support and distress is in graduate students’ relationships with research and academic advisors. This study found that better relationships with advisors contributed positively to emotional well-being and to utilization of services in students with mental health needs.

A second stressor that warrants examination is the finding on graduate students’ financial stability. Financial confidence in one’s ability to finish graduate school is a significant contributor to emotional well-being in graduate students. Higher socioeconomic status is generally recognized to contribute positively to mental health across ages and ethnic groups (CDC, 2004). Findings from this study corroborate those from other studies of graduate students, showing that financial stress contributes significantly to emotional distress (Nogueira-Martins et al., 2004; Toews et al., 1997).

These results also suggest that admini-

strators should pay closer attention to the greater prevalence of self-reported mental health among women. Significantly more women than men reported having experienced an emotional problem over the previous year, and significantly more of them reported knowing a graduate student colleague who experienced an emotional problem over the previous year. These findings reinforce those from national studies of mental health needs showing that women are more likely to report mental health concerns (CDC, 2004).

The findings in this study are particularly interesting in light of Holland's theory of careers, which holds that human behavior is explained by the interaction of individuals and their environments. The theory assumes that "(1) people tend to choose environments compatible with their personality types; (2) environments tend to reinforce and reward different patterns of abilities and interests; and (3) people tend to flourish in environments that are congruent with their dominant personality types" (Feldman, Smart, & Ethington, 2004, p. 528). Holland's theory of careers suggests that graduate student academic and social well-being is a function of students' ability to find an appropriate environment. To this point, Feldman et al. found that academic environments can have an important effect on what and how students learn. The findings in this study also suggest that the expressed mental health needs by some students may reflect an inappropriate fit between themselves and their environment.

Knowledge of Mental Health Services

Knowledge of mental health services among graduate students is high but not universal. Nearly one quarter of graduate students are unaware that mental health services are provided on campus. Furthermore, graduate

students are less likely to receive information about mental health services through face-to-face contact from peers or their advisors. Rather, students are more likely to seek out information themselves, from the university health center website, or to gain information through orientations or university health center flyers. Graduate students are not likely to congregate in places like residence halls or student centers and may not regularly visit their administrative program office. Therefore, an effective information dispersal strategy for graduate students would rely on multiple dispersal sources around campus and at satellite campuses, emphasizing electronic and web communications, and satellite counseling sites.

Our findings also suggest that there is a specific opportunity for campus health care providers to increase awareness among male graduate students. Male graduate students were less likely to know about available counseling services from all of the listed sources than female graduate students. It is possible that innovative outreach materials and additional information dispersal sources targeted at male students could increase awareness to this group.

Utilization of Mental Health Services

The number of graduate students who reported using mental health services is significantly lower than those reporting mental health needs. Approximately 46% of graduate students reported significant emotional distress, and 50% reported that they had considered seeking counseling. Yet only 31% of respondents utilized counseling services. This finding suggests that there are important barriers to utilization of services for graduate students. These findings are not limited to this study. Reports of mental health service utilization in this study are slightly higher than

that reported in studies of medical students and in other universities (MIT Mental Health Task Force, 2001; Toews et al., 1997). Differences in utilization rates between those studies and those found in this study are not statistically significant by chi-square analyses.

These findings confirm that mental health needs and mental health service utilization are significantly influenced by psychosocial factors. Graduate students who are in the sciences and engineering disciplines, those who express more functional relationships with their faculty advisors, and those who are married are significantly less likely to utilize counseling services. Students reporting more functional relationships with their advisors overall are less likely to report mental health needs.

For students in distress, contact with sympathetic administrative staff and faculty advisors who are willing to direct them to appropriate services is critical. Students who reported having significant emotional problems over the previous year and had more functional relationships with their advisors were more likely to use mental health services. These findings echo the importance to graduate students of factors like relationship with one's advisor, pedagogical environment, and social support. Findings also suggest that institutional biases and stigma against using mental health services may contribute to lower utilization by graduate students in certain academic disciplines.

Cultural factors may also serve as barriers against utilizing counseling services. The findings of this study reveal that, although international and domestic students are not significantly different in their report of mental health needs, their utilization patterns are significantly different. International graduate students are significantly less likely than domestic graduate students to utilize on- and off-campus counseling services. Cultural

stigma against the use of mental health services and less acculturation to western cultural norms are barriers to international students seeking counseling (Aubrey, 1991; Zhang & Dixon, 2003). Similarly, Asian and African-American graduate students may be less likely to utilize counseling services compared to White graduate students because of cultural or language barriers and commonality with mental health service providers (Cheng, Leong, & Geist, 1993; Lau & Nolan, 2000; Thompson, Bazile, & Akbar, 2004).

Policy Implications

Prioritization of Mental Health Education and Awareness. University counseling staffs have long believed that mental health issues have been increasing in volume and complexity among students. Recent research has suggested the number of students presenting to university counseling centers has increased and that the types of presenting problems are serious (S. A. Benton et al., 2003). In order for university counseling centers to adapt to changes in student mental health, we recommend that campus leaders regularly examine mental health issues on their campuses and share strategies between schools and departments. In an environment of reduced resources in universities across the nation, students, faculty, and administrators should take steps to safeguard adequate resources for student mental health care. These financial resources are essential for enabling effective outreach programs, as well as maintaining appropriate levels of staffing and services. Universities should take steps to address mental health problems proactively before crises occur. These strategies may prove to be more effective and less costly than reacting to problems after they arise.

Re-examination of the Pedagogical Tradition of Graduate School. The training of graduate

students is often characterized by close apprenticeships with faculty members. Incentives that reward faculty more for research successes and entrepreneurial accomplishments, often at the expense of teaching and mentoring, may shortchange graduate students' academic experiences and personal and professional growth. Positive incentives for mentoring and on-going pedagogical and management training for faculty and graduate student instructors may improve the working relationships between graduate students and their faculty and research advisors.

Building Linkages for Graduate Student Social and Administrative Support. Graduate student life is often very isolating. Long hours in isolated research, behind computers, and working in laboratories can strain social relationships and exacerbate mental health problems. Campus-wide and department-specific peer advisor or mentoring programs may be effective means to mitigate social and professional isolation. Universities may also want to allot specific funding for graduate student social gatherings. Universities and graduate programs should also re-examine accountability for providing adequate funding opportunities for their graduate students enrolled in academic programs and should recognize the importance of administrative links that connect graduate students to various campus resources.

Limitations

There are three important limitations in this study. First, a non-randomized sample selection may have introduced selection effects, which may be exacerbated by the moderate response rate. One likely cause of selection effects in this study is nonresponse bias. Nonresponse bias is introduced into the study when certain individuals choose not to complete the survey, making estimates taken

from the data unreflective of either the population as a whole or specific groups within the population. For example, if some students were too overwhelmed with other school and work commitments to have the time needed to complete the survey, the results may understate the true extent of mental health need on campus. Conversely, if otherwise healthy graduate students perceived mental health issues as unimportant, they may have ignored the survey and the results would overestimate the extent of mental health problems on campus. In either case, if certain groups are underrepresented in the data, the results may not reflect the true extent of the measures (Aday, 1996). Although we cannot control completely for nonresponse bias on the dependent variables, we are confident the sample is representative of the larger student population on an array of characteristics (see Table 1).

The response rate in this study is similar to other studies using like sampling plans (Shaefer & Dillman, 1998; Sheehan, 2001). A population-based sampling approach was used to maximize the diversity of responses from the graduate student population. The study was designed to provide important descriptive information about the graduate student population, and we believe that the benefits of providing such information about an important and under-studied population outweigh the shortcomings in the survey design. With regard to the findings, it is unclear whether the estimates of mental health needs are overestimates or underestimates of the true population need. Data on the utilization of services from the university counseling center showed that 1,264 graduate students used mental health services during the same academic year as the study (S. Bell, personal communication, June 6, 2005). Rates of actual utilization of mental health services

at the university counseling center are lower than the findings from this study, suggesting that the estimates of mental health needs and utilization presented in this study may be higher than actual figures and that knowledge of counseling services may be lower than actual figures. Considering that mental health disorders are under-reported (Kessler et al., 2001), however, we believe that the estimates in this study represent a fair, yet liberal, foundation to support organizational initiatives designed to improve the mental health status of graduate students.

Another potential limitation of this study was the measurement of mental health needs. We chose to focus on perceptions of stress and emotional distress as self-reported by graduate students. The objective was to assess the impact of these self-reports on well-being and academic performance. Many other studies of mental health needs have used clinical measures of mental health needs, such as stress questionnaires and symptom checklists that correspond to clinical measures of emotional distress. Lack of a clinical or symptom checklist limits the ability to compare findings with studies that have differing criteria for mental health needs. Other studies investigating mental health issues in university students have relied on information from students already in counseling. Because the majority of students who have mental health needs do not seek help for their problems, and because we were interested in capturing need in the graduate student population at large, it was not appropriate for us to rely on coun-

seling records for this study.

Directions for Future Research

Graduate student mental health is an important and understudied area of research and policy analysis. Future studies could extend these analyses in several directions. First, future investigations of graduate student mental health should include examination of the organization and delivery of counseling services and their impact on utilization and outcomes for graduate students. These studies may also include the coordination between the medical and mental health units of university health centers. Second, this analysis should be replicated at other universities. This research may indicate whether findings from this study are consistent among other large universities and whether smaller colleges and universities fare differently. Third, research should also consider the unique or common stressors between men and women, older and younger graduate students, and international graduate students. Finally, given the lack of research in this area, studies should not only focus on cross-sectional analysis of graduate student mental health, but extend that analysis to determine how mental health needs, knowledge, and utilization change over time in a dynamic environment.

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