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Faculty Experiences with Undergraduate Engineering Student Mental Health

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Abstract

This research paper explores engineering faculty experiences related to undergraduate student mental health. The prevalence of mental health problems on college campuses is of increasing concern. While this concern is not limited to engineering students, a national study of college students indicated that engineering students are significantly less likely to seek help for a mental health concern than are college students pursuing other majors. Faculty often become aware of undergraduate students' mental health concerns through teaching and advising. The purpose of this study was to better understand faculty experiences with and perceptions of undergraduate engineering students' mental health. A survey was sent to faculty specializing in diverse engineering disciplines at private and public institutions. Of the 106 faculty who responded, 38 were non-tenure track, 17 were tenure track, and 47 were tenured. Five respondents were administrators. Participants reported a range of experience (> 1 year to over 20 years) and student interaction (teaching less than 30 to over 200 students per year) in their roles.

Of the 106 respondents, a majority had experienced a discussion with at least one student about anxiety (87%), difficulty coping with stress (81%), depression (75%), discrimination (53%), and/or a neurodevelopmental/intellectual disability (53%). In addition, 21% of faculty had discussed suicidal thoughts and/or behaviors with a student. Faculty felt most confident in their ability to talk to students about difficulty coping with stress, discrimination, and anxiety; they felt least confident in their ability to talk to students about eating disorders, trauma, substance abuse, and suicidal thoughts and/or behaviors. Sixty-seven percent of faculty felt there was an increase in the prevalence of mental health disorders across their career, with 47% believing there was an increase in the severity. Surprisingly, 31% of faculty had never received training related to student mental health. The results of this study highlight faculty experiences with undergraduate student mental health and could guide the development of targeted training to prepare engineering faculty for interacting with students with mental health concerns.

Introduction

It has been said that colleges and universities are experiencing a "mental health crisis," with a significant increase in the prevalence of mental health concerns across campuses [1]. There are many reasons why college students are at increased risk for mental health problems during their undergraduate careers. Many mental health concerns do not manifest until emerging adulthood (i.e., 18-25 years of age) [2], and the significant life changes of adjusting to living on campus can amplify psychological stress [3]. Additionally, mental health conditions can develop or be exacerbated by factors such as maladaptive lifestyle choices (e.g., sleep habits, drug and alcohol use) and the high levels of academic and/or social stress that are common in college [4]. Students' overall mental health is predictive of their academic success and retention [5-7]. Depression has been associated with decreased academic performance (measured by GPA) and increased dropout rates [8], further driving the need for mental health intervention. In response to

the trends of increasing mental health concerns and in an attempt to improve student access to mental health care, many institutions have increased the level of mental health resources available on campus. The percentage of students who reported having used mental health services "within the past year" increased from 18.7% in 2007 to 33.8% in 2017 [9]. Similar patterns were found among students' reported use of therapy and medication. Despite this, students at highest risk are often less likely to seek help. In a study of college students at high risk for suicide, 66% did not seek help due to the perception that help was not needed [10].

While there is little research specifically on the engineering student population, national data suggest that engineering students are less likely than the general student population to self-report symptoms associated with mental health disorders such as depression and anxiety [11-13]. Concerningly, those engineering students who report signs of mental distress are significantly less likely to seek help from a mental health professional than are non-engineering students [11-13]. This represents a mental health treatment gap for engineering students, which, if addressed, can improve the prognosis of mental health problems and reduce the potential for progression to more chronic or severe disorders [14].

Faculty and staff often have significant contact with students and are an important resource for identification of signs of mental health concerns, such as absenteeism, changes in behavior, or changes in personal hygiene [15]. Additionally, as faculty build relationships with students through teaching and advising, students are more likely to share their mental health experiences. Despite this, previous studies have found that 58% of faculty and staff do not feel adequately prepared to recognize signs of distress, and 60% of faculty do not feel prepared to reach out to students about their concerns [16]. The purpose of this study was to better understand faculty experiences with and perceptions of undergraduate students' mental health in the context of engineering. Questions covered such topics as faculty perceptions of engineering student mental health, frequency and focus of mental health discussions with students, and referral of students to campus mental health resources, and prior faculty training and confidence having these discussions.

Methods

During the summer of 2020, engineering faculty specializing in diverse engineering disciplines at private and public institutions were invited to participate in an anonymous survey. Faculty were recruited for participation through professional organization listservs and social media advertisements. The study was approved by the institutional review board at the University of Kentucky. Respondents were first asked to describe themselves and their institutions. Several Likert-type scale and multiple-choice questions were used to better understand faculty concerns related to undergraduate student mental health. Participants were asked to report their level of concern about undergraduate student mental health from *not at all concerned* (1) to *extremely concerned* (5). They were then asked to describe how the COVID-19 pandemic has changed their concern, with responses of "My concern has decreased," "My concern has stayed the same," and "My concern has increased." All respondents were asked to explain their answer to this question. They were also asked to describe their perception of the change (increase, decrease or no change) in prevalence and severity of mental health concerns in undergraduate students across their careers. Next, they were asked if they have ever received training related to student mental health and about the availability of resources on their campuses. If they answered yes, they were asked to describe this training. Finally, participants were asked whether they discussed mental health in the classroom. If they answered yes, they were asked to describe how mental health was discussed in the classroom.

In the next series of questions, faculty were asked to identify the mental health concerns that undergraduate students had discussed with them. The options were: difficulty coping with stress, anxiety, depression, eating disorder, substance use, trauma/post-traumatic stress disorder (PTSD), suicidal thoughts and/or behavior, discrimination (e.g., racism, sexism) and neurodevelopmental or intellectual disability (e.g., ADHD, autism). They were then asked to identify how many engineering students per year they spoke to about each mental health concern with response options of *none*, *1-3 students per year*, *4-6 students per year*, *7-10 students per year*, and *>10 students per year*. They were also asked to report their confidence in their ability to navigate a conversation with a student about each mental health concern with answers of *not confident at all*, *somewhat confident*, *moderately confident*, and *extremely confident*. Finally, they were asked to identify if they had ever reported a student to an on-campus mental health service for a mental health concern and how many students per year they typically referred.

Results

Survey participants

A summary of the positions and engineering discipline of the respondents can be seen in Table 1.

Table 1. Position, institution type and engineering discipline of the 106 faculty who participated in the survey.

Position type	
Non-tenure track	38
Pre-tenure	17
Tenured	47
Administration	5
Engineering discipline	
Biomedical	4
Biosystems	4
Chemical	43
Civil	2
Computer engineering	5
Computer science	1
Electrical	18
Environmental	2
Industrial	5
Materials	1
Mechanical	9
Mining	2
Other	11

Of the 106 individuals who responded, 38 were non-tenure track, 17 were tenure track, and 47 were tenured. Five respondents were administrators. Respondents represented a variety of majors, with most faculty (40%) from chemical engineering. The demographics of respondents can be seen in Table 2.

Table 2. Gender and race/ethnicity of the 106 faculty who participated in the survey.

Gender	
Man	47
Woman	49
Non-binary	2
Prefer not to answer	3
Race/Ethnicity	
Biracial/Multiracial	4
Black or African American	3
Latino/a/x or Hispanic	6
Asian or Asian American	3
Jewish	4
Non-Hispanic White or Caucasian	81
Prefer to self-describe	3
Prefer not to answer	6

There was an equal distribution of self-identified men (44%) and women (46%), with two faculty that self-identified as non-binary. Eighty-one faculty (76%) were Non-Hispanic White or Caucasian. Faculty were asked to describe their institution, program and time in academia (Table 3).

Table 3. Institution, program and experience of the 106 faculty who participated in the survey.

Type of institution	
Public	88
Private	11
Community college	1
Liberal arts college	1
Size of institution	
< 5,000	11
5-10,000	4
10-15,000	6
15-20,000	16
> 20,000	63
Size of program	
< 30	14
30-49	13
50-74	22
75-100	19
> 100	32
Undergraduate students taught per year	
< 30	10
30-49	10
50-99	29
100-149	19
150-200	17
> 200	16
Undergraduate students advised per year	
< 10	20
10-19	26
20-34	18
35-49	8
50-100	9
> 100	2
Time in academia	
<5 years	23
5-10 years	24
10-15 years	14
15-20 years	14
> 20 years	27

A majority of respondents were from public institutions (83%) with > 20,000 students (59%). The size of the programs, undergraduates taught or advised per year and time in academia varied widely across the respondents.

Faculty experiences with student mental health

Faculty were asked to describe their overall concern about undergraduate student mental health and how that concern has changed due to the COVID-19 pandemic. Approximately 70% of faculty reported being moderately or extremely concerned about undergraduate student mental health. Only 4% of faculty were not at all concerned about student mental health. Additionally, 70% of faculty reported that their concerns had increased due to the COVID-19 pandemic and only 2% (2 faculty) reported that their concerns had decreased. When asked to explain (via brief open-ended response) why their concern had changed due to the pandemic, many faculty felt that the increased isolation (40 of 92 responses) and additional stress of online learning (20 of 92 responses) was contributing to student mental health concerns. Across their careers, 67% of faculty felt that the prevalence of mental health concerns has increased, with only one faculty member indicating a decrease. Additionally, 47% felt that the severity of mental health concerns had also increased, while 49% felt that there was no change in the severity. About 68% of faculty reported having discussed mental health in the classroom through efforts such as sharing of campus resources and sharing of personal mental health journeys.

Faculty were asked to report the frequency with which they had discussed specific mental health concerns with individual students (Figure 1).

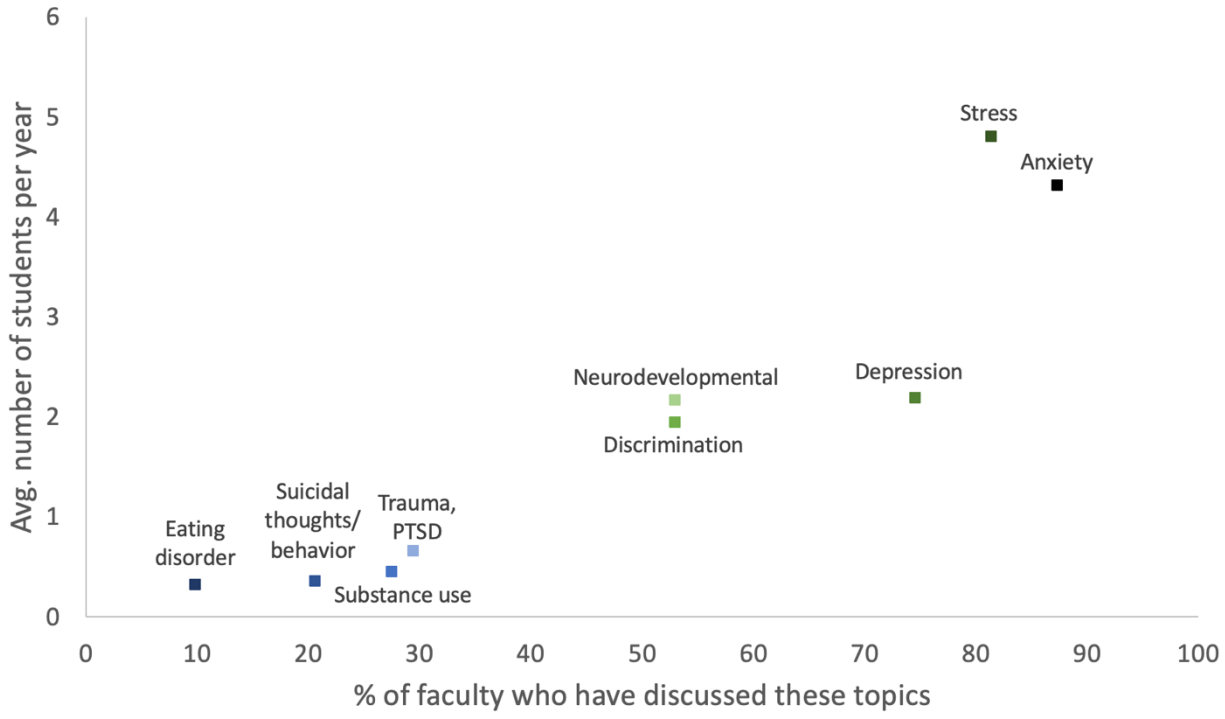

Figure 1. Frequency of faculty discussions with students about specific mental health concerns. The x-axis represents the percentage of faculty surveyed who had spoken with students about each topic. The y-axis represents the average number of students that faculty talked with about these topics per year.

Overall, the highest percentage of faculty reported having discussions with students about anxiety (87%), stress (81%), depression (75%), neurodevelopmental disorders (53%), and discrimination (53%). On average, faculty talk to 4 students per year about anxiety, nearly 5 students per year about stress, and about 2 students per year about depression, neurodevelopmental disorders, and discrimination. Trauma/PTSD, substance use, suicidal thoughts, and/or behavior and eating disorders were least discussed with the faculty respondents. Approximately 21% of faculty had discussed suicidal thoughts and/or behavior with a student. About 70% of faculty had referred a student to a campus resource for a mental health concern, with 25% of those faculty referring 0-1 student per year and 35% referring 1-3 students per year.

Faculty were asked to report their confidence in communicating with students about specific mental health related topics (Figure 2).

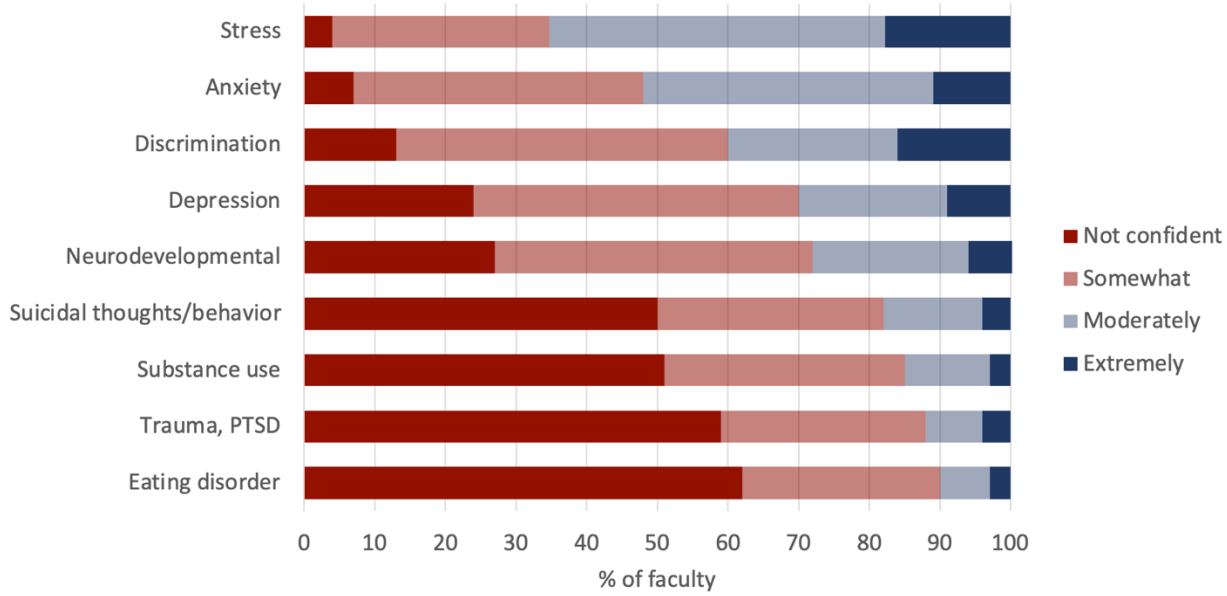

Figure 2. Faculty confidence in communication with students about specific mental health topics.

Faculty felt most confident talking about those mental health concerns that were most frequently encountered in conversations with students, such as stress and anxiety. For all other mental health concerns, 60% or more of faculty felt only somewhat or not confident to handle conversations about these topics. Additionally, 50% or more of faculty felt not confident in their ability to navigate conversations about suicidal thoughts and/or behavior, substance use, trauma/PTSD, and eating disorders.

Despite low confidence in navigating conversations about most mental health concerns, a majority of faculty (60%) report having participated in some type of mental health training. These trainings were offered in a variety of formats including presentations about on campus resources, online trainings and in-person suicide prevention, and mental health first aid courses. Eighty-seven percent of faculty reported that they knew where to direct students for a mental

health concern, but 40% of faculty felt that their institution did not have sufficient resources to support student needs. Additionally, 31% of faculty felt that students did not have sufficient access to these resources.

Discussion

Faculty represent an important resource for recognizing signs of mental health distress in undergraduate students. Results from this study indicate that a majority of faculty were concerned about student mental health and feel that the frequency of mental health concerns has increased across their career. This is in line with national data that shows that mental health concerns are increasing on college campuses [1]. Additionally, a majority of faculty have also discussed mental health in the classroom, showing an interest by faculty to engage with students about their mental health. Prior studies have found that a majority of faculty are open to supporting student mental health [17]. In fact, 95% feel that part of their role is to connect students in psychological distress with mental health services [16]. It is clear from this study that faculty are engaging in conversations with students about their mental health, with over 75% of faculty reporting that they have talked to a student about anxiety, depression, or general stress.

While a majority of faculty have had some level of training related to student mental health, their confidence in their ability to navigate these conversations remains low. Per respondents' self-report, the nature of this training varied significantly. Sometimes this training was limited to brief informational sessions on what mental health resources are available on campus, with no time spent on how to recognize, discuss, or refer students in distress. Just as a one-hour standalone diversity training is unlikely to make a person multiculturally competent, a one-hour mental health training may not necessarily make a person confident and/or competent with these support skills. Rather, mental health training that is evidence-based, skills practice focused, and ongoing is more likely to help faculty achieve confidence and competence.

Mental health concerns come in a variety of forms, severity levels, and observable presentations; having training or personal experience with some facets of distress does not make one an expert in recognizing and discussing others. This was borne out by the results of this study, which indicated varying degrees of confidence, depending on the nature of the concern. There can also be ambiguity around what is or is not appropriate for faculty to do and discuss with students when it comes to mental health. Most engineering faculty are not licensed mental health professionals, and faculty often know they are not appropriate persons to be providing "treatment" to students. However, the line between providing "treatment" and "support," the latter of which is an important task of faculty, may feel fuzzy. This ambiguity may lead some faculty to shy away from conversations about mental health, lest they cross that line.

When it comes to the appropriate behaviors of recognition, initial discussion, and referral to campus mental health resources, faculty may also avoid these behaviors due to personal beliefs about mental illness and seeking behavioral healthcare. Faculty are people first and faculty second, and many people hold beliefs, often unconscious/implicit, that stigmatize mental illness and the act of seeking help for it [18]. Even mental health professionals are not immune from endorsing such stigma [19]. Therefore, to be effective supporters of students in distress, engineering faculty must not only have had the opportunity to develop skills to facilitate these conversations, but they must have an explicit and implicit desire to facilitate them. This requires reducing mental health stigma—particularly of the implicit kind—among engineering faculty.

To address these concerns and increase faculty preparedness, there are several training programs available that have been proven effective in the context of higher education. The REDFLAGS Model is a cost-free training model developed specifically for faculty and staff in higher education. The model uses an acronym to train faculty and staff to recognize eight behavioral indicators of mental health distress [15]. Implementation of this model resulted in increased odds of faculty having made a referral for a student over a mental health concern [20]. Suicide prevention courses that implement gatekeeper training have also been shown to increase suicide prevention knowledge, skills, and self-efficacy on college campuses [21]. Additionally, there is evidence that at-risk students who have participated in training experience a reduction in suicidal ideation and behaviors [21]. Mental Health First Aid is a comprehensive course aimed at teaching participants to identify signs of mental distress, respond to those in a mental health crisis, and encourage appropriate help-seeking [22]. A meta-analysis showed that the 9- to 12-hour Mental Health First Aid training is effective in increasing participants' mental health knowledge and increases their supportive behaviors toward individuals with mental health concerns [23]. In addition to their youth and adult programs, the program offers a specialized training for higher education that addresses how college culture can influence mental health and specific stressors that influence those in higher education [24].

Conclusions

The results of this work show that most engineering faculty are concerned about the mental health of their students and many have actively engaged with their students about mental health both in the classroom and through one-on-one conversations. Despite many of the faculty having some level of training related to student mental health, a majority of faculty were not confident in their ability to engage in conversations with students about their mental health concerns. These results should be viewed in context with the limitations of this study. While the survey was administered to faculty of all engineering majors, there was a high proportion of responses in chemical engineering. While it is not anticipated that engineering major would significantly influence faculty beliefs or experiences, further analysis would be needed to confirm this. Additionally, there was likely a self-selection bias in those that chose to participate in a survey

about undergraduate student mental health. Those faculty who elected to participate likely view student mental health as a concern or priority in their position, which could misrepresent how the general population of engineering faculty feel about student mental health. Finally, this survey focused on faculty self-reported confidence levels about communicating with students about different mental health concerns rather than quantifiable skill levels. Literature shows that even with trained therapists, there is little relationship between confidence and competence when it comes to treatment efficacy. In fact, it has been found that therapists who have higher levels of self-doubt can help facilitate better patient outcomes [25]. This is possibly due to positive self-reflections that result in improved therapeutic interventions. As a result, lack of confidence does not necessarily mean that faculty are not being effective in how they engage with students about their mental health. Moving forward, faculty should be provided with resources and training so that they feel prepared (even if not fully confident) to provide student support. They should be encouraged and empowered to advocate for their students through recognizing signs of distress and ensuring that students are getting the help that they need.

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