Board 310: Improving the Validity of an Instrument to Measure Mental Health Help-Seeking Beliefs for Diverse Institutional Contexts

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Research in the Formation of Engineers: Improving the validity of an instrument to measure mental health help-seeking beliefs for diverse institutional contexts

Abstract

National data show that engineering students experiencing mental health distress are significantly less likely than their peers to seek professional psychological help. While treatment gaps exist for cisgender men, persons of color, and first-generation students, disparities are further pronounced in engineering. Interventions targeted at reshaping engineering culture to support professional mental health help seeking could increase academic success and retention while improving the mental health of the workforce. Utilizing results from an NSF Research Initiation in Engineering Formation grant, this Research in the Formation of Engineers proposal applies a mixed-methods approach to improve and refine an Engineering Mental Health Help-seeking Instrument (EMHHI) based on the Integrated Behavioral Model (IBM) to characterize key mental health help-seeking beliefs in diverse undergraduate students. Through this project, we will identify key help-seeking beliefs that can illuminate intrapersonal, interpersonal, and structural targets for mental health help-seeking interventions in varied institutional contexts nationally.

The EMHHI was designed to measure beliefs relevant to engineering students with diverse identities at a research-focused, predominantly White institution. Therefore, over the first year of the project, we aimed to ensure that the instrument was inclusive of help-seeking beliefs of students at other institutions. Through collaborations with a Historically Black College or University and a Hispanic-serving Institution, we conducted focus groups to identify novel beliefs that were not represented within the first version of the EMHHI. Through this process, beliefs were identified such as, "My seeking help from a mental health professional in the next 3 months…": 1) would require me to work with someone who doesn't understand my cultural background, 2) would make me feel overwhelmed or defeated and 3) would make me feel like an imposter in engineering. These novel beliefs were incorporated into an improved version of the instrument that improved the validity of the instrument to measure mental health beliefs across diverse institutional contexts. Moving forward, the instrument will be used in large-scale studies to determine mental health help-seeking beliefs that predict intention to seek help for a mental health concern. These beliefs will inform mental health interventions with a goal of improving help seeking within the undergraduate engineering student population.

Project overview

Through this NSF funded proposal, we aim to address concerns about mental health in engineering through a theoretically grounded, multi-institution study of the beliefs influencing professional help seeking in diverse student populations. Using a mixed-methods approach based on the Integrated Behavioral Model (IBM), we aim to improve, refine, and utilize the Engineering Mental Health Help-seeking Instrument (EMHHI) developed through a NSF Research Initiation in

Engineering Formation (RIEF) grant (NSF Award 2024394). The core products of this proposal will be (a) an improved and refined EMHHI to assess diverse engineering students' beliefs related to help seeking, (b) a standardized protocol for creating institutional help-seeking profiles that summarize mental health status and identify help-seeking belief targets for future interventions, and (c) a comprehensive list of key help-seeking beliefs for a diverse array of engineering student demographic subgroups. Based on the completion of our first year of this project, this paper will focus on answering the following research question: How can the original EMHHI be improved to enhance validity for diverse students in different institutional contexts?

Undergraduate Engineering Student Mental Health

Within undergraduate engineering students, the prevalence of mental health distress can vary from institution to institution. In analysis of national data, engineering students report fewer symptoms of anxiety and depression when compared to students from many non-engineering majors [1]. That being said, a concerning trend is that students who are historically excluded from engineering are often differentially impacted by symptoms of mental health distress. For instance, women [2, 3], first generation [2], gender expansive [4], LGBTQ+ [5], and Hispanic [6] students self-report higher rates of mental health distress than students from majority groups. Because mental health distress has been linked to negative academic outcomes [7], it is important to implement institutional structures that can support mental health and well-being in engineering students. Further, engineering students experiencing mental health distress are less likely to access professional help than students from many other non-engineering majors [1]. Because professional help seeking for a mental health concern can reduce the progression of mental health distress to more severe or chronic disorders [8], this puts engineering students at risk for worsening mental health symptoms. Together, this highlights the importance of efforts aimed at improving engineering student mental health and increasing professional help seeking, especially for students who are historically excluded in engineering.

Theoretical Framework

The IBM is utilized to identify beliefs influencing behavior within a given population [9], which is grounded in research indicating that intention strongly predicts behavior [10, 11]. In the context of this project, the IBM asserts that the key driver for help-seeking behavior is the intention to seek help (Figure 1). Intention is influenced by three help-seeking mechanisms—attitude, perceived norm, and personal agency— which are shaped by help-seeking beliefs. Attitude reflects an individual's overall evaluation (positive or negative) of help-seeking, considering outcome beliefs (anticipated positive or negative outcomes) and experiential beliefs (emotional reactions to seeking help). Perceived norm accounts for societal pressure from sources of influence, which is shaped by beliefs about others' expectations and behavior regarding seeking help. Finally, personal agency is the evaluation of one's ability to seek help, considering beliefs about perceived control and self-efficacy.

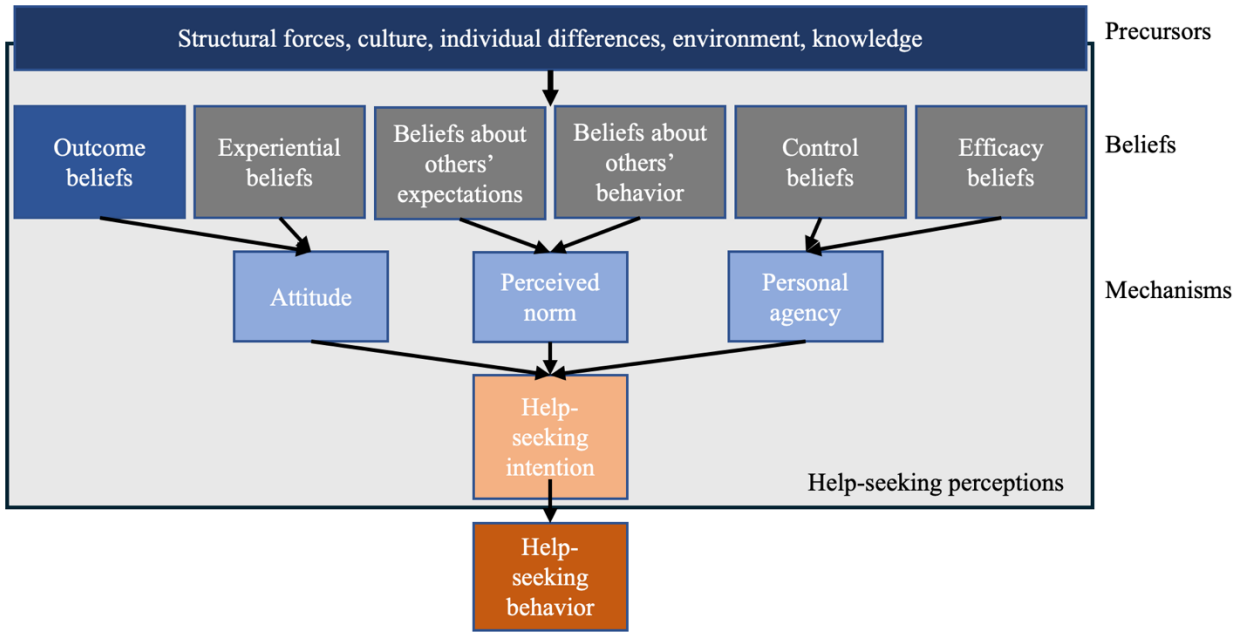

Figure 1. The precursors, beliefs, and mechanisms influencing intention to seek help per the Integrated Behavioral Model.

In turn, six types of help-seeking beliefs (e.g., outcome beliefs) influence their respective mechanisms. Lastly, these beliefs are influenced by precursors such as structural forces (e.g., racism), cultural influences (e.g., norms), individual differences (e.g. personality), environment (e.g., logistical barriers), and knowledge (e.g., about mental illness and professional mental health care options). Help-seeking precursors, mechanisms, and intention are measured with direct measures, whose items are averaged to create a mean score that represents the degree of that construct. For example, a measure of attitude involves individuals evaluating mental health help-seeking using a bipolar scale such as "My seeking help from a mental health professional would be [good/bad]." In contrast, help-seeking beliefs are measured with indirect measures, whose items are topically heterogenous and designed to be analyzed at the individual item level. For example, a measure of outcome beliefs may contain items that ask individuals to express their agreement or disagreement with statements such as "My seeking help from a mental health professional would be a sign of weakness." Therefore, the indirect measure of outcome beliefs allows the identification of specific beliefs shaping respondents' overall evaluation of their potential help seeking as a good or bad behavior. Identifying these beliefs is crucial for understanding the drivers of help-seeking behavior and pinpointing evidence-based targets for future interventions.

Methods

Participant Recruitment

To invite students to participate in the focus groups, students were first asked to complete a pre-screening survey. In this survey, they provided their sociodemographic information including information such as their gender, race, sexual orientation, first generation student status, prior experience with seeking mental healthcare and current psychological distress level. This allowed for purposeful stratified recruitment of a diverse set of participants. A total of 65 students were invited to participate in the focus groups, with a total number of participants per focus group ranging from one to six participants. Participants were compensated $25 for their participation.

Focus group

Focus groups were prioritized for this portion of the study to allowed for sharing of experiences across the participants. The goal of the interview was to allow participants to identify novel beliefs that influence their help-seeking across four domains: (a) emotional reactions (i.e., experiential beliefs), (b) barriers and facilitators (i.e., perceived control), (c) sources of influences (i.e., perceived norm), and (d) outcomes. After obtaining informed consent, the facilitator conducted a warm-up round to acclimate participants to the iterative brainstorming and discussion process. For each domain, participants were read a question (see Table 1) by the lead facilitator and given two to four minutes to brainstorm answers on a sheet of paper. Participants were encouraged to brainstorm answers that represent not only their perspectives, but their perception of the beliefs of their peers in engineering. This allowed students to share their ideas without fear of self-disclosing uncomfortable beliefs with their peers.

Table 1. Prompts used to guide participants in brainstorming beliefs related to help seeking

Warm-up	If you were struggling with a mental health concern, what activities might you engage in to manage your stress?
Emotional Reactions	What feelings or emotions might come up when you think about your seeking help from a mental health professional?
Barriers and Facilitators	What would make it easier or harder for you to seek help from a mental health professional?
Sources of Influence	Who might influence your decision to seek help from a mental health professional?
Outcomes	What do you think might happen as a result of seeking help from a mental health professional? What might you like or dislike about seeking help from a mental health professional? What would be the advantages or disadvantages of getting help from a mental health professional?

After brainstorming, students were given an additional two to four minutes to read through a list of beliefs (drawn from the original EMHHI) for that domain and identify beliefs that were not yet represented on the list. Lastly, participants were asked to share any of the novel beliefs that they identified and discuss them with the group.

Participants

A total of 65 students participated in the focus groups across the universities. A summary of the relevant sociodemographic data for these participants can be seen in Table 2.

Table 2. Demographics of engineering students who participated in the focus groups

Gender	**#**	**%**
Men	33	50%
Women	30	46%
Transgender	2	4%
Race/Ethnicity		
Arab or Arab American	4	6%
Asian or Asian American	18	28%
Biracial	4	6%
Black or African American	17	26%
Latino/a/x/e or Hispanic	12	18%
White or Caucasian	9	14%
Prefer not to say	1	2%
Sexual Orientation		
Bisexual	9	14%
Lesbian	1	2%
Pansexual	2	3%
Straight	45	69%
Queer	1	2%
Prefer not to say	7	10%
Prior Help Seeking		
Yes, prior to college	8	13%
Yes, prior to college and since college	6	10%
Yes, since college	16	26%
No, but I wish I could have gotten help	33	51%

Work completed to date

To date, we have conducted the focus groups and utilized the data to identify novel items to integrated into the EMHHI instrument. Here, we will summarize some of the novel beliefs identified within each of the four belief categories: 1) Emotional reactions, 2) Sources of influence, 3) Beliefs about barriers and facilitators, and 4) Outcome beliefs.

Emotional reactions

Across the focus groups, participants identified that the idea of seeking help from a mental health professional would make them feel "overwhelmed" and "defeated." For instance, one participant who talked about feeling defeated mentioned that thinking about seeking help would make her feel "…defeat and desperation. Feeling lost in the sense of not knowing where to start, or how to get help, but then like saying, "I'm fine" in your head, and pushing [the mental health concern] away." Because of the number of resources that exist, it can be easy for students to feel overwhelmed as they navigate the help-seeking process. This has been identified previously as a barrier to help-seeking within the engineering student community [12]. Further, multiple studies have identified

that engineering students are likely to continue to push through and even normalize their experiences of distress rather than seeking help [12-14], which this student connected to their feeling of defeat or desperation.

Sources of influence

Novel sources of influence identified through the focus groups include: 1) my religious/spiritual leader(s), 2) my engineering advisors, 3) engineers in industry, 4) medical professionals and 5) public figures (e.g., influencers, celebrities, politicians). For instance, one student talked about the influence of social media on their beliefs about help seeking, "I say, like anyone else that shares their views on mental health. Positively and negatively, especially if there's someone on social media that you might listen to. Those are the most influential ones." Within engineering students and faculty, literature has shown that there is a lack of discussion around mental health [13-15], which could result in engineering students going to outside sources for perspectives on help seeking. Therefore, it is important to recognize the potential influence of sources like social media on student perspectives. Further, another student talked about the influence of engineers in industry, including their engineering mentor: "I will say, engineers in the industry or [my] engineering mentor. My mentor would be very influencing on me to [seek help] too." This highlights the potentially important role that engineering role models, including faculty and alumni, can play on student mental health and help seeking.

Beliefs about barriers and facilitators

Examples of novel beliefs about barriers and facilitators that were identified include having limited access to the on-campus counseling center and having support from someone who had previously sought help. For instance, one student mentioned that they had to skip class to attend an appointment at the on-campus counseling center, "I went to our university's counseling place, and I had to skip class because it was the only way I could go. I had to put my mental health over my academic success." Because engineering students already feel pressure to prioritize academics over mental health, this can act as a significant barrier. Additionally, workload has been identified as a defining stressor in engineering [13], and students often feel like they have to sacrifice not only their time but also their academics to seek help [12]. Further, knowing someone who was seeking help and having a positive experience was seen as a potential facilitator to help-seeking because it would help to support the efficacy of treatment, "Knowing one of my peers who goes and seeks out mental health [help]…knowing that they're seeking help and also receiving help that is working for them is really reassuring that I'm not going for no reason." Because engineering students already feel pressure to prioritize their time for academics, having reassurance that help seeking will lead to positive outcomes can be particularly helpful.

Outcomes beliefs

Across the focus groups, the largest number of novel beliefs were identified in the outcome beliefs category. Examples include that seeking help from a mental health professional would 1) make me feel like an imposter in engineering, 2) result in me being discriminated against in my future career, and 3) require me to work with someone who doesn't understand my cultural background. Beliefs about feeling like an imposter in engineering and result in me being discriminated against in my future career highlight the cultural norms within engineering that de-emphasize the prioritization of mental health. For instance, one student said, "When I previously thought about seeking out mental health professionals, I have always felt like an imposter. If I was actually a good

student…then I wouldn't be struggling with my mental health and be able to handle what I'm going through because that's what every other engineering student has done before me…and so I am not good enough for where I am. I haven't really earned it." This student highlights some of the dangers associated with normalization of stress within engineering. Because students feel like the other engineering students are able to complete their degree without mental health challenges, those students who might be struggling feel like they are not fit to be an engineer. This could lead them to either drop out of an engineering program or to continue to push aside their mental health, which can have significant negative long-term outcomes.

In addition to feeling like help seeking is not acceptable within the engineering environment, some students were concerned that a mental health professional might not understand what they are going through. Because they expect that the mental health professional will not be an engineer, they do not think that the professional will be able to relate to the engineering student experience. For instance, one student said, "For me, my course work and my major have been the cause of my mental health problems, and when you're thinking about a mental health professional, they might not be able to relate to that. They've never experienced the workload or have experienced the courses." This has been identified previously in the literature where a student felt like their mental health concerns were dismissed because what they were experiencing should be expected as an engineering student [14]. Therefore, this emphasizes the important role that mental health professionals play in creating positive experiences for students who are seeking out professional help. Further, other students recognized the challenges that they might face in finding a mental health professional who understands people from their own cultural backgrounds. For instance, one student said, "For me one of the main things is I feel like they just might not understand what I'm going through. Oftentimes when I reach out to a psychologist, they are white, and again as someone coming from an immigrant family, I feel like having someone understand experiences that I went through because of my background is important." Therefore, being able to connect with mental health professionals who understand your background and identity is especially important for students, especially those from historically underserved groups within engineering.

Future work

To summarize, through the first year of our NSF Research in the Formation of Engineers grant, we were able to conduct focus groups to ensure that the EMHHI includes items that represent the help-seeking beliefs of students from diverse backgrounds and institutional contexts. Moving forward, these items will be integrated into the instrument and large-scale data analysis will be used to first validate the instrument and then reduce the length of the instrument while maintaining subgroup validity through removal of items that do not strongly predict help-seeking intention. This will result in a more feasible instrument that can be used to understand the key beliefs that influence help seeking within the engineering student population.

Acknowledgments

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