

# *An exploration of Asian engineering students' mental health conditions, support, and stigma-related barriers to help-seeking.*

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**Abstract**— This research full paper explores how Asian cultural tenets and engineering culture may affect Asian engineering student mental health conditions and help-seeking attitudes in the U.S. context. This exploratory qualitative study framed under social identity theory and intersectionality used one-on-one interviews with eleven Asian-identifying students to explore their experience with mental health conditions, the strategies for support they would seek, and the different types of stigma that most commonly affect their help-seeking attitudes.

Students reported on experiencing depression, stress, and anxiety, which were often intertwined with their experiences of the high demands of an engineering degree, which provides additional evidence for the problematic aspects of engineering culture and contributes to the eradication of the model minority stereotype. Friends and family were often cited as the hypothesized first barrier of support for most participants in the study, highlighting the relevance of opportunities to create strong networks of support and destigmatization of MHCs. Social interactions, along with acculturation to Western society, are also shown to be a deciding factor in positive help-seeking attitudes among international Asian students. Finally, cultural, familial, and self-stigma were identified in students' attitudes towards help-seeking, which demonstrates that there is still a lot of work to do across culturally relevant destigmatization of MHCs.

**Keywords**—mental health, stigma, support, Asian, Asian American, engineering curriculum, overrepresentation, marginalization, stress, depression

## I. INTRODUCTION

In the Engineering Education space, there is often little room to discuss the roots and impacts of mental health conditions among engineering students. Mental health conditions (MHC) have historically been stigmatized [1], and although there have been recent gains in their destigmatization [1], it can still negatively affect students' ability to seek and access the help they need while in higher education [2]. This challenge takes specific shape among particular student subpopulations. This is especially true for the US Asian engineering students in higher education, as most come from a cultural background that does not support nor discuss mental health [3]. Asian culture traditionally has held high public and individual perceived stigma regarding MHC [4]. We hypothesize that such stigmas can continue to perpetuate challenges for Asian engineering students to procure their mental health. In addition, because Asians in US engineering are an overrepresented group that is subjected to their own marginalizing experiences derived from stereotypes such as that of model minority [5], [6], [7] it is critical to explore how such layers influence the mental health experiences of Asian students in engineering.

Therefore, this research seeks to recognize and understand the different shapes that stigma of MHC takes among college-level Asian engineering students, as well as the most common types of support used by this group.

The main research questions this paper seeks to answer are:

1. What are the mental health conditions reported by Asian engineering students and how they related them to their experiences in engineering?
2. What kinds of support do Asian engineering students use when facing mental health conditions?
3. What are the types of stigmas that most commonly affect Asian engineering students help-seeking attitudes?

## II. LITERATURE REVIEW

### A. Asians in STEM

The Asian and Asian American (As/AsAm) population in the United States is defined as “people having origins in any of the original peoples of East Asia, Southeast Asia, or the Indian subcontinent” [8]. This group currently makes up about seven percent of the national population, and it is expected to grow to four-times its current size by 2060 [9]. According to the National Center for Education Statistics, in Fall 2022 Asians composed 7.8% of U.S. resident students that were enrolled in degree granting institutions [10]. However, Asian students composed 14.2% of STEM bachelor’s degrees conferred to U.S. citizens and permanent residents. Such proportions have been recognized as an overrepresentation of Asians in STEM [10]. Nevertheless, it has also been documented that such overrepresentation does not reflect in equitable experiences for this group [6].

The experience of Asians in STEM aligns with those of the general Asian population in the United States. *Asianization* refers to “the process by which Whiteness racializes certain bodies as ‘Asian’” [6, p.6] and as such, Asians are often associated with the ideals of neoliberal projects such as meritocracy, forever foreigner, and most commonly, the Model Minority Stereotype. The Model Minority Stereotype (MMS) is often perpetuated in educational spaces, and particularly in STEM fields. The MMS is a stereotype that posits Asians as an example of successful assimilation into United States culture through economic success, hard work, and study [5]. This stereotype has five main facets, deeming Asians as extremely intelligent, hardworking, holding high economic goals, seeking educational prestige, and being uncomplaining when it comes to racial issues [5]. These facets of the MMS are not only inaccurate as they could describe any racial group, but they have been historically used to hinder the Civil Rights fights of other minorities [5]. As a result, the Asian community have been separated from other racial groups, and in some extreme cases, are not viewed as a “minority group” at all.

### B. Asians and Mental Health

There are diverse cultural tenets held by the Asian community, the focus of this paper will be on those relevant to their mental health; in particular, those that influence help-seeking attitudes for mental health conditions, as they have been documented to be influenced by different stigmas manifested in this community [11]. Some values from the Asian

culture that have been identified as potentially conflicting with procuring help for mental health are the restraining of emotions, avoiding shame and saving face [11]. The manifestation of these cultural traits may differ among Asian Americans and Asian International populations, presenting specific challenges for each group [4]. These values fall in line with the collectivistic culture that is heavily present in Asian values and are often times the basis of perceived social and cultural stigma. They also create a dilemma for Asian and Asian American students as they struggle to navigate and balance two different cultures [12].

### C. Asians’ Mental Health stigma and Help-Seeking

Stigma of MHC come in three main forms: public, perceived, and personal stigma [2]. Public stigma consists of stereotypes and beliefs held by the society the person finds themselves in. This may vary depending on the culture of the society, such as Western vs Eastern. This can also be seen in the case of culture that may not be open to mental health help-seeking attitudes. Public stigma influences perceived stigma, which is defined as the perception of public stigma internalized by an individual [2]. This perceived stigma directly influences personal (or self) stigma. This internalized stigma may present issues in help-seeking attitudes of those that may have mental health conditions. The level of stigma among Asian cultures has been identified to be diverse, and public stigma has been identified to be just one of the many additional cultural aspects that are deeply intertwined with the actual inclinations to seek help when necessary [13].

Studies have found self-stigma to be statistically positively associated with perceived stigma and is negatively associated with help-seeking attitudes [4]. Self-stigma and perceived stigma also help perpetuate the cycle of public stigma around mental health. In a study among minority undergraduate and graduate students, it was found that 23% of Asian Americans would think less of those that sought help for mental health related conditions [12], [14]. This in turn will reduce the number of Asians that seek mental health services, greatly setting back the destigmatization of mental health. As a racial group, Asians have been reported to have the lowest percentage of help seeking attitudes, with only 8.6% of Asians being reported in 2022 seeking mental health services [3]. This low representation can be attributed to perceived stigmas, particularly to those coming from the Asian culture and family [4].

The systematic literature review [3] found that acculturation, ethnic identity, stigma, and racism were the main factors influencing Asian American college students’ use of mental health services [3]. *Acculturation*, the process of assimilating into a dominant culture, tends to impact the outlook of mental health conditions and help-seeking. In the case of Asian Americans, the acclimation of Western culture can positively influence help-seeking attitudes, and they are more likely to recognize their own personal need for help [3]. A stronger commitment to *ethnic identity* was found to be associated with lower help-seeking attitudes. This was tied to higher chances to experience discrimination and

microaggressions, as well as intergenerational conflicts, create a strong sense of public and perceived stigma for an Asian college student. Many Asian students have reported the struggle of “balancing between two cultures” as they navigate through college and the stressors presented [3]. The reviewed studies showcased that perceived stigma negatively influenced help-seeking attitudes among Asian students [4], [12]. Finally, the reported studies found that Asian students’ tolerance to stigma and racism were linked to more positive attitudes regarding mental health services [4]

### III. THEORETICAL FRAMEWORK

We frame this study within the scope of Social Identity Theory and Intersectionality. Social Identity Theory assumes that individuals strive to maintain positive social identities [15]. However, any particular individual can grapple simultaneously with positive (i.e. socially desired) and negative (i.e. socially non-desired) identities. For example, while an engineering identity can carry a positive identity given its prestige in U.S. society [16], a MHC identity might carry a negative identity due to the stigma attached to it [15], [17]. This conflict between positively and negatively perceived identities might reflect on prioritizing one over the other, or the intentional hiding of the negatively perceived identity. In the context of stigma of MHC in engineering, we hypothesize that help-seeking attitudes are negatively influenced by such conflicts.

Intersectionality on the other hand, acknowledges that multiple identities and our social locations in hierarchies of power and privilege will uniquely define the experience of an individual and how they interact with systems of oppression [18]. Given the extensive evidence of the marginalizing experiences of Asians in the U.S. [5], [6], [7], [19] and the uniqueness of their experience in STEM [6], [7], we acknowledge that their intersectionality will bring additional nuances to understand challenges related to help-seeking attitudes of engineering students. In addition, acknowledging additional layers of intersectionality, such as those related to gender and international status will also bring valuable insights into the understanding of mental health dynamics in engineering.

### IV. METHODOLOGY

#### A. Data Collection

This study uses data from a larger study that seeks to understand the effects of stigma on help-seeking behaviors on engineering students. This is an IRB-approved, multi-institutional longitudinal mixed-methods study taking place at the continental United States. The full study has been thoroughly described in previous publications [20]. This particular paper focuses on the qualitative analysis of one-on-one interviews collected throughout the first year of this project. During such first year a total of 32 one-on-one interviews were collected at one of the participating institutions, a large R1 university in the Northeastern United States. Out of these total participants 11 were Asian. We use this subset for the analysis in this paper. Table 1 describes the composition of this

subgroup of participants in terms of their MHC status, gender, major, year and specific ethnic identity when available.

TABLE I. CHARACTERISTICS OF PARTICIPANTS

Pseudo nym	MHC Status	Intl Status	Gender	Engineering Major	Year	Ethnic ID
Emma	No	No	Female	Computer Science	Sophomore	Asian
Chris	Yes	Yes	Male	Computer Science	Freshman	South Asian
Amy	No	No	Female	Civil Engineering	Senior	Latina- Asian
Rob	Yes	Yes	Male	Computer Science	Junior	Asian
Steve	Yes	No	Male	Computer Science	Senior	Asian
Kristen	No	No	Female	Biomedical Engineering	Junior	Asian
Zac	Yes	Yes	Male	Mechanical Engineering	Junior	Indian
Heather	No	Yes	Female	Biomedical Engineering	Junior	Indian
Nick	Yes	No	Male	Aerospace Engineering	Other	Asian
Sean	Yes	Yes	Male	Computer Science	Senior	Asian
Ruth	N/A	Yes	Female	Computer Science	Senior	Asian

#### B. Data Analysis

The audio recorded from the one-on-one interviews was professionally transcribed, verified, and anonymized, and later analyzed using *Dedoose*. We used thematic coding with an inductive approach. Inductive coding allows for the participants’ voices to shine [21], and due to how mental health conditions affect individuals uniquely, this method was chosen as a way to understand what the participants have experienced. Although the larger study had focused on all minorities as the population of interest, the first author had noticed that there were some significant trends amongst the Asian and Asian-American population that should be explored further. These conclusions are revealed through inductive analysis, which was useful in the examination of these transcriptions [22]. The analysis was conducted by the first author, and the alignment between themes and evidence was discussed thoroughly with the second author.

To illustrate the coding process, we present some major themes related to the stigmas identified by participants next:

*Cultural Stigma* was deemed when the participants explicitly stated (or implied) mentions of mental health stigma related directly to their culture, such as “MH is not a thing in my culture.”

*Family Stigma* was deemed when the participants explicitly mentioned families stigmatizing MHC or seeking help. This can include cases of “you’re fine and overreacting”, “you don’t need therapy”, etc. It is possible some of these are in line with the culture and society.

*Societal Stigma* was mapped to participants’ highlights of the society the participant is in influences their views on MHC and help-seeking. For example, if the society is more open to the awareness of MHC and help-seeking, it can positively influence the participant. Self-stigma most commonly took forms such as “I don’t need help” or “I don’t have an MHC”. It is known that

stigma is influenced by perceived stigma (that they would get from society) or family stigma [23]. This is from the fear that they would be judged as weak and emotional.

Other codes included specific mental health conditions, stressors and supports. These categories were utilized when the participants explicitly stated these mental health conditions, types of support and stressors.

### C. Positionality

The authors recognize the significant role that researcher positionality plays in all aspects of the research study. Positionality can shape how researchers understand, collect, and analyze data [24]. The first author identifies as a cisgender East Asian woman currently pursuing a PhD student in engineering education, after formal training as a mechanical engineering. Her intersectionality and lived experiences motivate her to engage in this research as a first exploration to a larger agenda understanding the experiences of Asians in engineering. The second author identifies as an immigrant cisgender Latina engineer committed to challenging the narratives of wellbeing in engineering education spaces, including those related to mental health. The third author is a cisgender Latina engineer who has been an advocate for mental health in her community for the last decade. Collectively, we aim to contribute with a more nuanced understanding of the mental health challenges of the diverse groups in engineering education. In our study, we have chosen to focus on the effects of mental health stigma and the support for mental health on the Asian and Asian-American group based on existing evidence of their specific cultural challenges in relation to help-seeking [4], [12]. However, by focusing on the Asian and Asian-American experiences, we are not in any way negating the experiences of other groups.

## V. RESULTS

We present our results in the order of our research questions, offering the relevant quotes to support our interpretation. We use our participants' pseudonyms to refer to their specific comments.

### A. Mental Health Conditions and Engineering Stressors

The three mental health conditions reported among the Asian engineering students in this study were Depression, Stress, and Anxiety. Some participants had a diagnosis before college, yet they describe some correlations between their conditions and the tough engineering curriculum and heavy courseloads. For Nick, a student diagnosed with depression and anxiety during high school, the new challenges faced in college, such as those related to self-management confounded with his mental health challenges, describing:

in college, it's definitely impacting you a lot as well because it's not so much as a strict schedule, which does help, I feel, so you can plan things out. It's more of you have to do it on your own and you are on your own. And because of that, it's a lot easier to slip into episodes of mental health things that make it so you don't do anything. Basically, you could just say, "I don't want to do anything today" and then you lay down all day and then the next

day you just get deeper and deeper into it. And then before you know it, you have five weeks' worth of work and you're just laying in bed not caring because you don't care, and you can't pull yourself out of it because you don't see a point in caring." (Nick)

Demonstrating that depression can affect student performance in engineering, as well as present itself as a barrier to help-seeking attitudes.

Such need to self-manage your time together with the traditionally heavy engineering curriculum and courseload were also discussed as playing a large role in the stress that Asian engineering students face. Some participants discussed such loads and its derived stress as potentially leading to other mental health conditions, such as anxiety. A female participant discussed:

I mean, for me, personal experience is that, exams is just like a lot of stress and just you have exams more frequently and it's time constrained and all that, but projects, you know what you're gonna have to do and you know when it's due, and you know when you need to start. So it's on you. If you don't do it then you don't do it, you had enough time. But I think that's like the time-- I don't have that much of a short time constraint which, the anxiety I couldn't deal with it every week I couldn't do it. (Ruth)

In other cases, students made a reference to the rigidity of engineering curriculums, and the higher expectations that it held when compared to other majors as an issue for those that are dealing with their mental health conditions:

if you're studying right now, I would say that engineering is definitely a lot more work, it's more strenuous, so there's a lot more stress tied to your day-to-day life and that could exacerbate the conditions that you do have, if you do have a mental health condition. Professors are kind of understanding. I'm not sure how understanding they are if you go ahead and say, like, "Oh I have a mental health issue, can you postpone my assignment?" I've never tried, I don't really know anyone who has, I'm not sure how that would play out. There are a bunch of assignments, but it's always a pain ... whether you do have mental health conditions or not. (Steve)

Among other non-engineering sources for Anxiety, some international participants, in particular, reported a link between this condition and being away from their loved ones, as illustrated by Zac's quote:

So, it's been almost three years now that I kind of used to have like all these anxiety stuff, all the modes of anxiety and the most important reason was staying away from my parents and it has been like over the years you have never done that. And suddenly that thing happens to you. For the first few months you feel okay. But after that, there is that emptiness or there is you need a shoulder to you know, to back you, someone should be there okay. But that's when the mental health starts to decline, and that's how I think mental health is very important because that is something that you have to maintain in order to be successful.

### B. Support for Asian Engineering Students experiencing Mental Health

The deep familial relationships presented in the previous section were also documented in the expected strategies for support described by participants. With students reporting

having different sources, including friends, but specially how their friends and family influence was critical for their inclination to seek professional help if deemed necessary.

Many participants indicated that they would expect engineering students to be more likely to seek professional help if the advice was given by their family and friends, particularly those that they are close with. For example, Steve stated:

I would definitely say friends. Friends for sure. You have issues, first person you go to usually is your friends, or your parents for some people, most people, friends I would say. Peer pressures a thing, like your friends say like- all your friends are saying, "yeah, you could go to a therapist." Odds are you gonna go to the therapist. And if you're super close with your parents, a lot of people will listen to their parents if they tell them to go to therapy or not.

Some participants discussed their own perceptions about using family as catalyst agents for their help-seeking. For example, Kristen described:

me personally, I would feel comfortable talking to my parents. Mainly because, for example, with my sister, I know that they- my parents I'm very glad, are very supportive.

### C. Mental Health Stigmas

Despite the general perception about their potential support strategies, participants shared how awareness of the existence of mental health conditions could present itself as a barrier to students that may be dealing with mental health conditions and can stem from both cultural and familial influences. For example, Ruth, an international Indian student recognized:

I think just not-- for me it was never a thing. Mental health was never a thing. My parents never had it. India never had it. No one talks about mental health in India. I didn't even know we had therapists in India until I guess I was in college and I was like, "I wonder if India has therapists." (Ruth)

Some participants discussed the pressures of *cultural stigma* on their understanding of mental health conditions and help-seeking attitudes, for Asian American students, they linked their cultural heritage with negative perceptions about MHC. On this space, Steve said:

definitely takes someone to swallow their pride because a lot of the time, mental health issues are associated with weakness, especially in Asian culture. If you, if you need to talk about that, I'm sure like, I don't have too strong experience with it because I don't really experience very many if any mental health issues. And you know, I live in America. But I have family back in Taiwan. And from my understanding, um, you know, if you have mental health issues, you're more seen of like just being crazy ... I'm sure this happens in a lot of ethnic cultures and whatnot, I've heard from my friends as well. (Steve)

Students may want to seek help for their MHCs but struggle to find support within their families. *Family stigma* can play a significant role in reducing help-seeking behavior, as shown by Heather's experience:

I think there are a lot of barriers. Sometimes it can just be age and be like, "oh, I'm just young and it's, you know, my struggle period and everybody goes through this at this time, it's not that different." Sometimes it can be your parents and they're like, "no, we're not going

to pay for that. We don't believe in that. You don't need to go to therapy." I had to deal with that because my parents--I mean, it's better now but in the beginning when I wanted to start getting help reaching out, they were very against the idea of that because they were like, "there's nothing wrong with you, you're just young and you're struggling with your grades. That's it." And I was like, "I never said there's anything wrong with me, I just said that I need help. That I, I don't know--" (Heather)

When mental health is not commonly discussed in a particular culture and society, it can typically lead to low awareness of mental health conditions. Zac recognized elements of *social stigma* through comparisons between his home country, India, and how it contrasted to his experience in the U.S.

Honestly there's -- well people say that I have depression, I have anxiety. Coming from what-- I'm coming from a country or a state which honestly, I don't know how long it has been in the United States that people know about depression and anxiety and stuff like this. But back in India, I did not know what depression or anxiety meant until I was like, what 15, 16. I had no clue about it. And when you don't have the clue about it, when you don't know these words, it doesn't even affect you. Like, what is anxiety? I mean, I used to ask when some of these new words used to pop up, I used to "what is anxiety? What happens to you in anxiety?" Because I never felt it, and nobody has heard of that word how can you even feel that?" (Zac)

### D. Acculturation and Mental Health

Those with an international status bring up an important piece of the effects of acculturation on mental health stigma. In particular, that awareness of MHC has increased globally, but may still be stigmatized in Asian countries. The acculturation of Asian students has helped them become more aware of the topic of mental health and enhance their knowledge about it rather than promoting the stigmatization of mental health conditions. As illustrated by Zac, an international student from India:

So this thing just has recently popped up even in India, this anxiety, this depression, this mental health and especially after COVID. ... very bad time when people and their mental state had completely declined. And yes, that is when all of this anxiety, mental health issues and awareness started to increase back in India even, I mean, in the United States, yes, it was already there, the awareness of mental health. The first day, I think the first week, the orientation week, I was given a talk about mental health, I guess. So yeah, that is what the point is for me that if-- I mean, I did not know it long back, but when I know it now I need to give attention to it because yes, it can happen to anybody. But it shouldn't be-- that person who faces something like this, he shouldn't be made to feel, I don't know if the right word is dejected, or like dejected by the society or something, it's not something that's gonna affect you if it's affecting him in, the same way, maybe. He might be going through something and the only thing you could do for that is support him. (Zac)

## VI. DISCUSSION

Our exploration of Asian students' description of their mental health conditions and their link to their experiences in

engineering resulted on a prevalence of depression, stress, and anxiety. Many times, such conditions were intertwined, such as the cases where high stress led to anxiety. Similarly, it illustrated how depression and anxiety could affect their performance in engineering. While it has been previously documented that the stress culture in engineering affects undergraduate students in general [25], this result takes relevance under the light of the model minority stereotype to which Asian students are held to. While the image of Asian students tends to be that of high-performers, it is critical to acknowledge that they face the exact same challenges derived from essential issues in engineering culture such as high and often unrealistic time demands [25].

In our exploration of the types of support that Asian students rely on, we identified that they mostly recognized friends and family as the hypothetical first line of support shall they face mental health issues. Which demonstrate the relevance of promoting the creation of healthy networks of support among engineering peers [25], and the advancement of destigmatization of MHCs [12], [25].

Exploring the stigmas held by Asian students we found that 9 out of 11 participants (i.e. 82%) mentioned cultural and family stigma as a part of their mental health experience. In our analysis, 82% of participants showcased evidence of self-stigma associated with mental health conditions, and 8 out of 11 participants (i.e. 73%) showcased evidence of social stigma as a factor in their help-seeking attitudes.

The most common types of stigmas that affect Asian engineering students are cultural, family, and self-stigma. With a unique intersectionality of being overrepresented, yet marginalized in STEM fields, Asian Americans often find some “difficulty balancing two cultures” [12]. In many cases of the participants, this extends to limited mental health condition and assistance awareness. The data shows that 6 out of 11 participants (i.e. 55%) of the participants experienced and attribute cultural stigma with low help-seeking attitudes. This is unsurprising given that the cultural tenets of Asian culture generally call for avoiding shame and restraining [3], [4], behaviors that become more evident when considering cases like Steve’s. Many Asian engineering students are reluctant to seek help when facing mental health conditions out of fear of being seen as “weak” or “crazy”. The effects of this perceived cultural stigma trickles down into self-stigma, where students like Ruth and Rob feel the need to put help-seeking off or refuse help.

One of the main factors that affect the perspectives and awareness of mental health conditions and resources is the acculturation of Asian engineering students. As shown in the systematic literature review presented by Nguyen et al. [3], students that are more acculturated in United States society are more likely to recognize their mental health needs, and that is the case for students such as Zac. Asian engineering students that move to the United States for study often experience acceptance for mental health conditions for the first time and are more aware of the mental health conditions they may have but were not discussed in their home countries. This can have a positive effect on Asian engineering students that are struggling

with mental health conditions, as they feel less alone in their struggles and are more likely to seek help.

Nearly 91% of participants reported that friends are the most effective support when they are facing mental health conditions. This support can range from simply talking out things that may be stressing the student to encouraging the student to seek professional resources. Participants reported that talking to their friends helped validate their feelings and hanging out with their friends had reduced their stress. In many cases, participants were reluctant to seek mental health services due to their self-stigma and family stigma, but encouragement from a trusted friend made a difference.

While there is more future work to be done on the subject of educational interventions and support, we would make the following suggestions for reducing mental health stigma and bring on mental health support for Asian and Asian-American students:

- Educators must explore their own awareness of the *Model Minority Stereotype* and how it might influence any different expectations they could hold with respect to Asian and Asian American students. Based on the evidence presented in this study, it is a safe to assume that this group of students is not less impacted by mental health challenges than other demographic groups, despite the perceptions that the model minority stereotype could promote.
- Furthermore, it is critical to eradicate narratives that strengthen the model minority stereotype in engineering education spaces and could be tied to the stigmatization of MHCs and discourage help seeking attitudes of this demographic group.
- While our evidence indicated that many international Asian students experienced a reduction of stigma in the US compared to their home countries, there is still a lot more to do to enhance the discussion of mental health as an essential aspect of engineering education experiences. With such discussions being limited to short and incomplete postings in syllabus. It is critical to start discussing mental health as a legitimate need for the execution of high-quality engineering work.
- As a consequence, we recommend engineering educators to be aware of the resources for students available on campus for their mental health support. Sharing them widely and thoroughly through Syllabus and course resources is an essential step towards advancing the de-stigmatization of MHCs. This is something that could benefit not only Asian/Asian American students’, but all students.
- Similarly, reviewing expectations for success in their courses. Reviewing how specific elements might be stress or anxiety inducing, and envisioning ways to reduce such effect in students. For example, expanding the clear description of expectations in assignments, sharing rubrics, flexible periods of submission, could be good strategies to consider as the heavy load of engineering work is recognized to have a heavy toll in the mental health of students.

## VII. LIMITATIONS AND FUTURE WORK

This qualitative exploratory study is not aiming to generalize the results obtained to all Asian or Asian American students in engineering. Instead, it provides initial pointers for further inquiries in which we can engage for future study. Also, this study was conducted in the U.S. context, and while Asian international students are present in many other countries we do not aim to draw any type of generalization for such locations. We acknowledge that the specific challenges faced by such subgroups must be explored in a context-specific fashion.

Future work includes expanding the analysis to the subset of Asian and Asian American students in the second institution for which data has been collected, as well as including evidence of the data collected during the second year of the larger project.

## VIII. CONCLUSIONS

Asian and Asian American students experience depression, stress, and anxiety derived from aspects of engineering training that have been previously documented to be problematic for all students, such as the high time and effort demands. This result can motivate a departure from the Model Minority Stereotype that has hinder Asian American students. The study has found that the main supports that Asian engineering students use are friend support, mental health resources on campus, and family support. Acculturation also plays a role in the awareness and acceptance of mental health conditions, as those that are more acculturated are more likely to be aware of their mental health struggles and are more likely to keep an open mind about mental health help-seeking attitudes. Finally, mental health remains a highly stigmatized topic in Asian culture, and as a result, Asian engineering students often are subject to cultural, familial, and self-stigma. This research aimed to recognize and understand the stigmas and support surrounding mental health conditions, with a focus in Asian engineering students in the continental United States.

## ACKNOWLEDGMENT

We thank the interview participants in this study. We acknowledge the valuable help of Ali S. Kamal and Dr. Anne M. McAlister in the data collection process for this paper. This material is based upon work supported by the National Science Foundation under Grants No. 2147193 and 2147194. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

## REFERENCES

- [1] B. A. Pescosolido, A. Halpern-Manners, L. Luo, and B. Perry, "Trends in Public Stigma of Mental Illness in the US, 1996-2018," *JAMA Netw. Open*, vol. 4, no. 12, pp. e2140202–e2140202, Dec. 2021, doi: 10.1001/jamanetworkopen.2021.40202.
- [2] D. Eisenberg, M. F. Downs, E. Golberstein, and K. Zivin, "Stigma and Help Seeking for Mental Health Among College Students," *Med. Care Res. Rev.*, vol. 66, no. 5, pp. 522–541, Oct. 2009.
- [3] N. Nguyen, B. Kim, and T. Aronowitz, "Factors that influence Asian American college students use of mental health services: A systematic mixed studies review," *J. Psychiatr. Ment. Health Nurs.*, pp. 1–22, Aug. 2023, doi: 10.1111/jpm.12972.
- [4] L. Maeshima and M. Parent, "Mental health stigma and professional help-seeking behaviors among Asian American and Asian International Students," *Taylor Francis*, vol. 70, no. 6, pp. 1761–1767, Aug. 2020, doi: <https://doi.org/10.1080/07448481.2020.1819820>.
- [5] D. Trytten, A. Wong Lowe, and S. Walden, "'Asians are Good at Math. What an Awful Stereotype': The Model Minority Stereotype's Impact on Asian American Engineering Students," *J. Eng. Educ.*, vol. 101, no. 3, pp. 439–468, Jul. 2012, doi: <https://doi.org/10.1002/j.2168-9830.2012.tb00057.x>.
- [6] J. Yang, A. Antonio, and S. Sheppard, "Overrepresented =/ Not-Marginalized: Unpacking the Racialization of Asians and Asian-Americans in Engineering Education," *Am. Soc. Eng. Educ.*, pp. 1–16, 2023.
- [7] G. Chen and J. Buell, "Of models and myths: Asian(Americans) in STEM and the neoliberal racial project," *Taylor Francis*, vol. 21, no. 5, pp. 607–625, Aug. 2017, doi: <https://doi.org/10.1080/13613324.2017.1377170>.
- [8] "Asian American Health," US Department of Health and Human Services Office of Minority Health. Accessed: May 20, 2024. [Online]. Available: [https://minorityhealth.hhs.gov/Asian-American-Health#:~:text=Overview%20\(Demographics\)%3A%20This%20racial,Asia%2C%20or%20the%20Indian%20subcontinent](https://minorityhealth.hhs.gov/Asian-American-Health#:~:text=Overview%20(Demographics)%3A%20This%20racial,Asia%2C%20or%20the%20Indian%20subcontinent)
- [9] A. Budiman and N. G. Ruiz, "Key facts about Asian Americans, a diverse and growing population," Pew Research Center.
- [10] "IES National Center for Education Statistics," IES National Center for Education Statistics. Accessed: May 20, 2024. [Online]. Available: [https://nces.ed.gov/fastfacts/display.asp?id=1102#:~:text=In%20fall%202022%2C%20there%20were,were%20Pacific%20Islander%20\(source~\)](https://nces.ed.gov/fastfacts/display.asp?id=1102#:~:text=In%20fall%202022%2C%20there%20were,were%20Pacific%20Islander%20(source~))
- [11] M. Shea and C. Yeh, "Asian American Students' Cultural Values, Stigma, and Relational Self-construal: Correlates of Attitudes Toward Professional Help Seeking," *J. Ment. Health Couns.*, vol. 30, no. 2, pp. 157–172., 2008, doi: 10.17744.
- [12] H. Dong, J. Dai, S. Ketchen Lipson, and L. Curry, "Help-seeking for mental health services in Asian American college students: an exploratory qualitative study," *Taylor Francis*, vol. 70, no. 8, pp. 2303–2310, Nov. 2020, doi: <https://doi.org/10.1080/07448481.2020.1851234>.
- [13] C. H. Ng, "The Stigma of Mental Illness in Asian Cultures," *SAGE J.*, vol. 31, no. 3, pp. 382–390, 1997, doi: 10.3109/00048679709073848.
- [14] S. K. Lipson, A. Kern, D. Eisenberg, and A. M. Breland-Noble, "Mental Health Disparities Among College Students of Color," *J. Adolesc. Health*, vol. 63, no. 3, pp. 348–356, Sep. 2018, doi: 10.1016/j.jadohealth.2018.04.014.
- [15] D. Scheepers and N. Ellemers, "Social Identity Theory," in *Social Psychology in Action: Evidence-Based Interventions from Theory to Practice*, K. Sassenberg and M. L. W. Vliek, Eds., Cham: Springer International Publishing, 2019, pp. 129–143.
- [16] S. L. Rodriguez, C. Lu, and M. Bartlett, "Engineering Identity Development: A Review of the Higher Education Literature," *Int. J. Educ. Math. Sci. Technol.*, vol. 6, no. 3, pp. 254–265, 2018, doi: 10.18404/ijemst.428182.
- [17] J. Lally, A. ó Conghaile, S. Quigley, E. Bainbridge, and C. McDonald, "Stigma of mental illness and help-seeking intention in university students," *The Psychiatrist*, vol. 37, no. 8, pp. 253–260, Aug. 2013, doi: 10.1192/pb.bp.112.041483.
- [18] A. Carastathis, "The Concept of Intersectionality in Feminist Theory," *Philos. Compass*, vol. 9, no. 5, pp. 304–314, May 2014, doi: 10.1111/phc3.12129.
- [19] R. Varma, "High-Tech Coolies: Asian Immigrants in the US Science and Engineering Workforce," *Sci. Cult.*, vol. 11, no. 3, pp. 337–361, 2002, doi: 10.1080/0950543022000005078.
- [20] M. Sanchez-Pena, A. McAlister, N. Ramirez, D. Samuel, S. A. Kamal, and X. Xu, "Stigma of mental health conditions within engineering culture and its relation to help-seeking attitudes: Insights from the first year of a longitudinal study," in *American Society of Engineering Education*, 2023.
- [21] J. Saldana, *The Coding Manual for Qualitative Researchers*, Second. SAGE Publications, 2013.
- [22] M. B. Miles and A. M. Huberman, *Qualitative Data Analysis*, Second. SAGE Publications, 1994.

- [23] M. L. West, P. T. Yanos, S. M. Smith, D. Roe, and P. H. Lysaker, “Prevalence of Internalized Stigma among Persons with Severe Mental Illness,” *Stigma Res Action*, vol. 1, no. 1, pp. 3–10, Jan. 2011, doi: 10.5463/sra.v1i1.9.
- [24] S. Secules *et al.*, “Positionality practices and dimensions of impact on equity research: A collaborative inquiry and call to the community,” *J. Eng. Educ.*, vol. 110, no. 1, pp. 19–43, Jan. 2021, doi: 10.1002/jee.20377.
- [25] K. J. Jensen and K. J. Cross, “Engineering stress culture: Relationships among mental health, engineering identity, and sense of inclusion,” *J. Eng. Educ.*, vol. 110, no. 2, pp. 371–392, Apr. 2021, doi: 10.1002/jee.20391.