

Stressors and Coping Strategies Among International Graduate Engineering Students: A Preliminary Review

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Abstract

This preliminary literature review examines the challenges and coping strategies faced by international graduate students in the U.S., based on studies published between 2020 and 2024. Through an analysis of 14 selected papers, including general international graduate student studies and engineering-specific studies, and four papers that specifically cover construction engineering and management students, this review identifies stressors such as academic pressure, cultural adjustment, language barriers, and social isolation. The findings reveal different coping mechanisms at individual, institutional, and social support levels, such as mindfulness training, peer support programs, and family connections. The review also highlights gaps in current research and provides recommendations for universities to enhance mental health support services for international graduate engineering students.

Keywords: international graduate students, mental health, stressors, coping strategies, engineering, construction engineering and management

Introduction

The mental health of international students in the U.S. has emerged as a critical concern, as these students often face unique stressors that can lead to severe psychological distress. According to the American College Health Association's National College Health Assessment (ACHA-NCHA), international students experience challenges such as cultural adjustment, financial constraints, and social isolation, which contribute to their mental health vulnerabilities [1]. Despite these significant challenges, mental health concerns among international graduate students have received insufficient attention from public health agencies like the Centers for Disease Control and Prevention, likely due to fragmented data collection systems that fail to disaggregate international student populations or difficulties integrating these students' experiences within broader national health statistics frameworks [2]. Compounding this problem is the persistently low utilization of mental health services. The cultural stigma surrounding mental health, unfamiliarity with available resources, and financial barriers deter many from seeking psychological support. Data from the National Alliance on Mental Illness (NAMI) suggests that less than 50% of students never access campus counseling services, even when facing significant mental health challenges [3].

The U.S. Department of Homeland Security report [4] indicates that in 2023, there were 1,503,649 active SEVIS records for F-1 and M-1 students. Engineering programs, a significant component of the science, technology, engineering, and mathematics (STEM) programs, were identified as leading disciplines among international students. In 2023, 122,101 international students participated in STEM OPT [4]. Engineering students, particularly at the graduate level, constitute one of the most stressed groups within academia due to the demanding nature of their studies. This stress is compounded for international students who must navigate additional challenges, such as visa restrictions, language barriers, and cultural transitions. In addition, demanding coursework, competitive research environments, and the pressure to secure

internships or employment exacerbate their stress levels. Male students often report stress related to academic performance and career expectations. In contrast, female students face additional challenges, such as gender discrimination, underrepresentation in STEM fields, and balancing professional aspirations with societal expectations. However, few studies have explored the stressors and coping strategies of international graduate students in engineering programs, or how these may differ by gender.

Within the broader engineering disciplines, construction engineering and management students face distinctive stressors that merit specific research attention. These students must simultaneously master technical engineering principles while developing proficiency in business management, finance, contract law, and leadership, creating a uniquely interdisciplinary cognitive load. Unlike many engineering fields that operate primarily in controlled environments, construction engineering and management students must prepare for unpredictable field conditions affected by weather, labor shortages, supply chain disruptions, and stringent safety regulations. Furthermore, these students must navigate complex certification pathways that span both engineering and management domains, while developing specialized communication skills to effectively interface with stakeholders ranging from laborers to executives across the fragmented construction industry.

This paper conducted a preliminary literature review focusing on studies published between 2020 and 2024. There are three research questions to be answered in this paper:

- RQ1: Are there any research studies focusing on international graduate students in engineering programs and examining differences between male and female students' experiences regarding stressors and coping strategies? Specifically, how are these dynamics represented in construction engineering and management programs?
- RQ2: What are the specific stressors faced by male and female international graduate students in engineering programs? What additional or unique stressors do the students in construction engineering and management programs experience?
- RQ3: What coping strategies do international graduate students in engineering apply, or what resources or support do they get from the university, families, or friends? How do these coping mechanisms and support systems work for the students in construction engineering and management programs?

Methods

The literature search was conducted using Google Scholar and Web of Science. Specific search terms were applied. In Google Scholar, the search was performed using the keywords "mental health" and "international graduate students," excluding "undergraduate" to maintain focus on graduate students. Similarly, in Web of Science, the search term "mental health of international graduate students" was used, with additional keyword filters applied to include "graduate," "international," and "mental health" while explicitly excluding "undergraduate."

The selection process followed predefined inclusion and exclusion criteria (Figure 1). Only studies published between 2020 and 2024 were considered to ensure the inclusion of recent research. Studies were selected based on their relevance to international graduate students studying in the U.S. and explicitly addressed mental health challenges. Papers focused on

undergraduate students, non-U.S. contexts, or discipline-specific perspectives that did not contribute to a general understanding of mental health among international graduate students were excluded. The initial search yielded 650 studies, with 600 identified from Google Scholar and 50 from Web of Science. After removing 51 duplicate records, 599 studies were screened based on their titles, abstracts, and keywords. Then, 556 studies were excluded because they did not align with the research focus, leaving 43 for full-text retrieval. Due to access limitations, one study behind a paywall could not be retrieved through our university library and was therefore excluded from this review. This reduces the number of articles assessed for eligibility to 42. After a thorough review, 28 papers were excluded because they were irrelevant to the research focus of this paper. Therefore, 14 studies were selected for inclusion in the final analysis, which provided key insights into stressors and coping mechanisms among international graduate students in the U.S., including those in engineering programs.



Figure 1. Screening process of literature.

Following the systematic selection of 14 studies focused on international graduate students, an additional targeted search was conducted to identify literature specific to construction engineering and management students. This supplementary search was undertaken to gain a

contextual understanding of stressors and coping mechanisms within this particular engineering discipline. The review of construction engineering and management literature revealed no studies specifically addressing international graduate students in these fields within the U.S. context. However, four papers were identified that examined mental health challenges and coping mechanisms among undergraduate construction engineering and management students in the U.S. context. Of these, three focused exclusively on undergraduate students, while only one included both undergraduate and graduate populations in its analysis. While these studies did not meet the original inclusion criteria focused on international graduate students, they were included to provide disciplinary context and identify gaps specific to construction engineering and management education.

Following the identification of relevant studies, data were systematically extracted and analyzed. Key themes were categorized based on the challenges faced by international graduate students, gender-based differences, coping strategies, and the role of the institutional and external support systems.

Results

International Graduate Students

Figure 2 shows how the 14 selected papers, focusing on international graduate students, were distributed from 2020 to 2024. Regarding the disciplinary focus, 4 of the 14 papers focused on engineering graduate students. The remaining papers represented a diverse range of academic disciplines. [8] focused on social work programs, while [6] concentrated on natural science PhD programs. [11] included participants from various disciplines, including business, music, counseling, biology, computer science, civil engineering, sports psychology, theology, and education. Several other papers [5, 7, 9, 10] have examined the experiences of international graduate students across multiple disciplines without specifying particular fields of study.



Figure 2. Number of papers each year from 2020 to 2024.

The reviewed studies from Table 1 show diverse geographical representation in their sampling. Asian countries, particularly China, India, and South Korea, emerged as prominent sources of international graduate students. For instance, [5] included participants from China (10 students),

South Korea (8), India (3), and Thailand (1). Similarly, [9] reported a significant proportion of participants from mainland China, Hong Kong, and Taiwan (105), followed by South Korea (36) and India (24). Sample sizes varied considerably across studies. While some studies employed smaller, qualitative approaches, such as [10] with 8 female participants and [11] with 14 participants (8 male and 6 female), others conducted larger-scale investigations. For example, [8] included 179 participants, and [9] surveyed 177 students, providing more extensive quantitative data. The gender distribution in the studies generally showed a balanced representation, although with some variations. [8] reported a notable gender difference among international students, with 70% female (21) and 30% male (9). In contrast, [9] demonstrated a more balanced distribution with 51% female (90) and 49% male (87). Several studies [15, 16] also acknowledged nonbinary gender identities in their demographic reporting, reflecting evolving approaches to gender representation in academic research. Regarding graduate programs, the studies encompassed a variety of disciplines. Engineering programs were prominently featured in [15, 16, 17, 18], while other studies focused on social work [8], natural sciences [6], and multiple disciplines [11]. Some studies [5, 7, 9] examined graduate student experiences across various programs without a specific disciplinary focus.

For stressors affecting international graduate students (Table 1), academic challenges emerge as a consistent theme, with most studies highlighting coursework pressure, research requirements, and scholarly expectations [8, 10, 12, 13, 14, 15, 17, 18]. For instance, study [15] identified coursework pressure, qualifying exams, research, and publication as significant stressors among engineering graduate students. Social and cultural challenges form another major category of stressors. [5] reported that international students face issues such as a lack of belonging and social support. This finding is consistent with other studies. For example, [6] noted that social isolation and cultural shock are significant challenges. The problem of discrimination and racism was discussed in [9], specifically highlighting racial discrimination as a key stressor. Financial concerns represent another important stressor category. [10] identified financial constraints, particularly high-interest loans, as a significant source of stress, and [14] mentioned the burden of tuition costs, living expenses, and limited access to financial aid. Language barriers and communication challenges are common in some studies. Study [11] found that limited English proficiency was a significant source of stress for Korean international graduate students, while [12] identified language barriers as a common challenge across different nationalities. Mental health and emotional well-being are considered critical concerns. [17,18] reported anxiety, depression, and impostor syndrome as significant stressors. The pressure of family expectations and cultural values emphasizing academic achievement was particularly noted in Asian students [14].

Table 1.	Stressors	among	international	graduate	students.
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Reference	Sample Size by Country	Sample Size by Gender	Graduate Programs	Stressors
[5]	China (10), Republic of Korea (8), India (3), Thailand (1)	22: 12 males, 10 females	Asian international students	Lack of sense of belonging, unstable immigration status, lack of social support, aggravated anti- Asian racism, academic challenges, and daily challenges

[6]	Bangladesh (2), India (6), Pakistan (2), United States (12)	22: 9 males, 13 females	Natural science PhD students	Prior research experience, networking, culture shock, discrimination, social isolation, logistical issues, lack of awareness of costs, ineligibility for funding, communication barriers
[7]	South Asia (7), East Asia (4), West Africa (3), South America (2), Southeast Asia (1), Eastern Europe (1)	18: 8 male, 10 female	N/A	Lack of engagement with professors, loss of on-campus jobs, loneliness, homesickness, anxiety
[8]	China Mainland (14), South Korea (4), Taiwan (2), Other Asian countries (1), Europe (2), Middle East (2), South America (1), Africa (2), Canada (1)	179: International students: 21 female, 9 male; Domestic students: 124 female, 18 male, 4 non-binary, 3 prefer to self- identify	Social work programs	Coursework, research area, methods, scholarly writing, job market, moving to a new place, feeling unsafe, memories triggered by coursework or research
[9]	China Mainland, Hong Kong, and Taiwan (105), South Korea (36), India (24)	177: 90 female, 87 male	Graduate, exchange student program	Racial discrimination, loneliness, social distancing, and home boundness
[10]	India, China, Brazil, United Kingdom (with Indian heritage), Indonesia	8: all female	N/A	Financial constraints (high- interest loan), isolation, cultural shock, academic pressure, racism, linguistic stress, anti-immigrant sentiment, xenophobia, low motivation, difficulty sleeping
[11]	Korean (15)	14: 8 male, 6 female	Various disciplines	Limited English proficiency, potential shame associated with not meeting their families' expectations, self-blame, difficulty expressing feelings
[12]	Bangladesh, Taiwan, Iran, India, Italy, China, Nepal, Vietnam	16: 9 male, 6 female, 1 non- binary	N/A	Cultural shock, language barriers, intense academic pressure, ethnic discrimination, homesickness, unfamiliarity with the academic environment, pressure to maintain high academic performance, difficulties in accessing support resources

[13]	Not specified	N/A	N/A	Intense workload, academic expectations, social isolation, lack of support, language barriers, cultural differences, financial difficulties, discrimination
[14]	India, China, South Korea, Turkey, Taiwan, Other countries, Total: 52 countries	N/A	N/A	Family expectations, cultural values emphasizing academic achievement, the investment involved in studying abroad, academic stress, the cost of tuition, living expenses, healthcare, and limited access to financial aid
[15]	Phase 1: Other countries (21), USA (37); Phase 2: Other countries (62), USA (95)	157: 73 female, 83 male, 1 transgender	Engineering graduate students	The pressure of coursework, qualifying/preliminary exams, research, publication, isolating social environment, a high degree of dependence on the quality of their relationship with their faculty advisor, anticipation of critical oral academic exams, a lack of coping skills
[16]	Other countries (4), USA (60)	64: 47% women, 50% men, and 3% non-binary	Engineering graduate students	Anxiety, depression, toxic departmental culture, work-life balance, bias, discrimination, imposter syndrome, isolation
[17]	Country not specified.	N/A	STEM including engineering	Fear and worry about their own health and the health of others, difficulty concentrating, disruptions to sleeping patterns, decreased social interactions due to physical distancing, increased concerns about academic performance
[18]	Different countries, such as China and India.	N/A	Engineering graduate programs	Acculturative stress, financial concerns, academic pressure, self- worth, limited access to mental health resources, filial piety

Table 2 identifies two categories of coping strategies: individual, family, and social support, and university support. Individual coping strategies refer to personal actions and approaches that students independently adopt to manage stress and challenges. Family and social support involve emotional and practical assistance from family members, friends, and social networks. University support encompasses institutional resources, programs, and services that the academic institution provides to assist international students. The authors combined individual, family, and social support into one category, as it was often difficult to differentiate between individual coping strategies and family or social support. For example, seeking family support is an individual coping strategy, but it can also be a form of family support. For individual, family, and social support, academic and professional development strategies are commonly employed. Study [5] found that developing routines and joining study groups helped maximize work effectiveness. Similarly, [8] emphasized the importance of internal motivation and building strong relationships with advisors. Religious practices and physical activity were identified as personal coping mechanisms by [11]. Additionally, [18] underscored the significance of using multiple coping strategies rather than relying on a single approach, incorporating problem-solving, social support, and culturally relevant methods. Maintaining connections with family and friends is a crucial coping strategy. Study [7] noted the value of connecting with family through video calls, while [13] emphasized seeking emotional support from family and friends back home. Social technology plays a role in this aspect, with [12] noting the use of YouTube, inspirational content, and online groups for emotional support.

Some studies identified unique cultural coping mechanisms. [10] noted code-switching (adapting accent and behavior) as a coping strategy, while [18] highlighted the importance of culturally relevant support systems. Developing professional networks and engagement in academic communities was also identified as an effective coping strategy [16].

For university support, several studies emphasize the importance of institutional support mechanisms. [15] highlighted the effectiveness of mindfulness training in improving emotional well-being and research satisfaction. Study [6] recommended promoting open dialogue, peer support programs, and culturally competent mental health services. The PROMISE Engineering Institute (PEI) program [17] demonstrated how creating virtual communities and offering professional development opportunities could help mitigate isolation and other stressors. [18] highlighted the need for universities to provide culturally relevant mental health resources, faculty training, and structured academic guidance to better support international graduate students.

Reference	Individual, Family, and Social Support	University Support
[5]	Developing routines with friends, joining study groups, and emotional support from family, friends, and peers with similar cultural backgrounds	Social support, peer support programs at the department or university level
[6]	Familiar networks, seeking guidance from advisors, and normalizing negative experiences	Promoting open dialogue, peer support, culturally competent mental health services, and bridge programs
[7]	Focusing on "normalcy", support from roommates, connecting with family and friends	N/A
[8]	Internal motivation, seeking counseling when needed, and building strong relationships with advisors or mentors	N/A
[9]	Academic success, social support	Access to mental health counseling, academic support
[10]	Religious practices, code switching (adapting accent and behavior)	N/A
[11]	Engagement in religious activities, physical activity, and building up social connections	N/A

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[12]	Passive engagement with social technology (YouTube, inspirational content, cartoons, funny memes, online groups, etc.) for emotional support, connecting with others on shared experience	N/A
[13]	Emotional support from family and friends back home	N/A
[14]	Reducing perfectionistic concerns, addressing academic stress, academic self-efficacy, and social support	N/A
[15]	N/A	Mindfulness training
[16]	Adapting (setting clear expectations and boundaries, communicating proactively), Cultivating (participating in conferences, publishing, seeking opportunities for skill development, engaging in outreach and community involvement), internalizing (embracing the breadth of their discipline, finding meaning in connecting research to real-world outcomes)	N/A
[17]	N/A	The PROMISE Engineering Institute (PEI) program, creating a virtual community and offering professional development opportunities
[18]	Self-preservation, "push through" mentality, connecting with peers, lab mates, or postdocs, active coping through problem-solving, seeking support from family, friends, peers, or professionals, positively reframing stress, planning strategies for managing stress, balancing academics with leisure and recreation, using culturally relevant coping strategies, practicing self- preservation in hostile environments	Culturally sensitive mental health resources, awareness & help-seeking support, social support and peer mentorship programs, faculty training on student well-being, practical support (housing, academics, language programs), addressing systemic issues (racism, sexism, discrimination), standardized mental health research vocabulary, collecting & sharing standardized student mental health data

Undergraduate Students in Construction and Engineering Programs

The studies presented in Table 3 reveal several key stressors affecting construction engineering and management undergraduate students from the additional 4 studies. Academic pressures are significant, with heavy workloads, grade pressure, and time constraints reported across multiple studies [19, 21]. Mental health concerns are prominent, with [19] highlighting general anxiety and mental health openness as critical issues. Study [21] noted that construction management students experience higher psychological distress compared to the general population.

Financial concerns emerge as a consistent stressor, with studies [19, 21, 22] all identifying financial stress or economic uncertainty as significant challenges. Work-related stressors are particularly notable in this field, including long working hours [20, 21, 22], unpredictable schedules [20], job insecurity [21, 22], and burnout [21, 22]. Study [21] revealed that students simultaneously managing employment and academic responsibilities experienced significantly elevated levels of burnout, with the competing demands of work schedules and academic deadlines creating particularly acute stress patterns.

Gender differences in stressors are evident in several studies. Study [19] indicated that female construction students typically experience heightened stress and anxiety compared to male

students. [21] revealed variations in resilience between genders across different cultural contexts, with Australian males showing a higher capacity for maintaining perspective than females. In contrast, Hong Kong females demonstrated stronger network-building abilities than males. Study [22] found that female students prioritized career success more highly and felt a stronger career responsibility than male students.

Study [21] demonstrates that international student status is a significant additional stressor, with students studying abroad reporting markedly lower happiness levels. Furthermore, this same study revealed how cultural factors substantially shaped stress experiences, noting that gender differences in resilience varied considerably across cultural contexts, often reflecting deeply embedded societal gender roles and expectations.

Reference	Origin (Sample Size)	Sample Size by Gender	Gender-based Comparison	Stressors
[19]	United States (50): White (46), Black or African American (2), Asian (1), and Hispanic or Latino (1)	50: 43 males, 7 females	Female students experience heightened stress and anxiety compared to males	Personal, academic, and industry stressors, including anxiety, financial concerns, job urgency, mental health stigma, communication challenges, and discrimination issues
[20]	United States (Cal Poly Construction Management Department): No. of students not specified	N/A	Study focused on male construction workers: 2.5% reported suicidal ideation; 30% experienced regular psychological distress (no female data mentioned)	Psychological and physical factors, including long hours, unpredictable schedules, economic uncertainty, body strain, and lack of control
[21]	Australia (183), Hong Kong (45), Singapore (86), United States (52)	366: 275 male (75%), 87 female (23.8%), 4 unidentified (1.2%)	Gender-specific resilience patterns vary by region: Australian males excel in perspective, Hong Kong females in networking; cultural gender roles influence findings	Elevated psychological distress, heavy academic workload, industry pressure, work-study imbalance, financial concerns, and international student challenges
[22]	Turkey (259), United States (98)	357: 284 male, 73 female	Career values: Females prioritize career success and responsibility; males more concerned with social norms around parenting; both intend to work after having children	Occupational stressors, including excessive hours/workload, time pressures, job insecurity, burnout, and work-family conflict

Table 3. Stressors among construction engineering and management students.

Table 4 highlights various coping strategies employed by construction engineering and management students from the additional four studies. Individual strategies include mindfulness practices [19], developing emotional intelligence [19], prioritizing physical and mental health through exercise and a balanced diet [20, 21], and establishing strong personal routines [21]. Family and social support networks are consistently identified as crucial coping mechanisms [19, 20, 21, 22]. Specifically, [21] highlights the importance of building networks and seeking emotional support.

Institutional support plays a vital role in helping students manage stress. Universities can integrate stress management into curricula [19, 20], offer time management courses [19, 20], provide career counseling [19], and create opportunities for real-world project experiences [19]. [21] emphasizes the importance of fostering a sense of belonging and aligning academic experiences with career goals. At the same time, [22] suggests that universities should address industry-specific challenges, such as long working hours, through education and preparation.

Work-life balance emerges as a critical coping strategy, with [20, 22] emphasizing the importance of maintaining a balanced lifestyle and developing personal work-life balance plans. Gender differences in coping are notable in [22], which found variations in how male and female students approach work-life balance, particularly in terms of childcare responsibilities and career continuity after becoming parents.

Reference	Individual, Family, and Social	University Support
	Support	
[19]	Mindfulness sessions, emotional intelligence workshops, communication and teamwork workshops, family and social support networks, and building resilience through personal strategies	Integrating stress management into curricula, time management courses, stress reduction techniques, career counseling, industry webinars, and real- world project experiences
[20]	Prioritizing mental and physical health, relaxation and calming techniques, exercise, sufficient sleep, nutritious diet, developing strong support networks, handling career changes, maintaining a balanced lifestyle	Understanding and identifying stress in construction, time management and communication strategies, conflict resolution, integrating stress management into curricula, and creating a personal work-life balance plan.
[21]	Personal assets and resources, family support, building networks, emotional support, help-seeking behavior, maintaining perspective, managing stress through routines, staying healthy with physical fitness, and a balanced diet	Social support networks, flexible coping styles, resilience-building in academic settings, fostering a sense of belonging, career goal alignment, emotional awareness, regulating emotions, work- study balance, and cooperative interactions
[22]	Balancing work, childcare, housework, leisure, self-development, impact on quality of life, family conflict, job burnout, and gender-related work-life balance challenges	Understanding work-life balance in civil engineering, addressing long work hours, internship experience shaping perceptions, cross- national differences, demographic influences, and strategies to improve industry conditions

Table 4. Coping strategies among construction engineering and management students.

Discussion

This preliminary review provides valuable insights into the challenges and coping mechanisms of international graduate students in the United States. It encompasses both general and specialized engineering disciplines and undergraduate students in construction engineering and management programs. The analysis addresses three central research questions.

Gender-Specific Experiences (RQ1)

Our analysis reveals a significant gap in research examining gender differences in stressors and coping strategies among international graduate engineering students. None of the 14 reviewed studies directly compared the experiences of male and female international students. While studies like [15, 16, 17, 18] focused on engineering graduate students with relatively balanced gender participation, they failed to analyze gender-specific experiences in depth. This research gap is particularly concerning given evidence suggesting gender significantly influences stress experiences. Studies of graduate engineering students have found that female students report higher levels of stress, depression, and anxiety than their male counterparts [27]. This pattern aligns with our findings from construction engineering and management studies, where female students consistently reported heightened stress, anxiety [19], and stronger career responsibility concerns [22].

The literature presents a nuanced picture regarding gender differences in coping strategies. Some research suggests that women college students more frequently employ emotion-focused coping tactics, such as seeking social support [24]. However, other studies specific to engineering students found minimal gender differences in coping mechanisms, with both males and females commonly turning to activities like listening to music, exercising, or practicing relaxation techniques [27].

These mixed findings suggest several interpretations: while female engineering students may experience greater stress, their coping approaches might be broadly similar to males', with significant individual variation. Alternatively, women who enter and persist in engineering programs might self-select for particular coping mechanisms suited to the field's demands. The absence of studies examining international female graduate students in construction engineering, a traditionally male-dominated field, represents a critical oversight that future research should address.

Stressors Faced by International Engineering Students (RQ2)

Academic pressure consistently emerges as a predominant stressor across all engineering disciplines. International graduate students repeatedly report challenges related to coursework demands, research requirements, and scholarly expectations [8, 10, 12, 13, 14, 15, 17, 18]. For engineering students, intense pressure from coursework, qualifying examinations, research obligations, and publication requirements create significant stress [15].

Construction engineering and management students face these common academic stressors alongside discipline-specific challenges that further intensify their stress experiences. Students in these programs must contend with industry-specific pressures, including project-based work environments, strict deadlines, and preparation for fieldwork known for demanding schedules [19, 21, 22]. Financial concerns and job market pressure also emerged as significant stressors [19, 21], reflecting the economic uncertainties frequently associated with the construction industry.

International students confront these academic challenges while adjusting to a new educational system. Language barriers, different pedagogical styles, and unfamiliar academic expectations can heighten stress for international engineers. "Cultural barriers faced by international students" frequently affect engineering graduate students' mental health [18]. Despite these added challenges, some research suggests international graduate students report mental health issues at rates comparable to domestic students [23], which warrants further investigation.

Coping Strategies and Support Systems (RQ3)

Our review identified multiple support mechanisms that international graduate engineering students employ. At the individual level, students develop structured academic routines [5], seek peer support networks [7], and engage in physical and religious activities [11]. Family connections maintained through technology provide crucial emotional support [12, 13]. Construction engineering students similarly emphasize maintaining physical health, following structured daily routines, and developing emotional intelligence [19, 20, 21], with work-life balance emerging as particularly critical [20, 22].

Social support consistently functions as a powerful buffer against stress. Meta-analysis research has concluded that social support significantly reduces acculturative stress among international students [25]. Engineering students often rely on classmates, friends, and family as primary support sources [26]. Peer study groups, venting to friends, or seeking advice from senior students can provide emotional comfort and practical academic assistance. This peer camaraderie is especially valuable for international students far from home. Research has identified a sense of belonging and social connectedness as core themes for positive mental health in engineering graduate students [18].

Universities have implemented various programs at the institutional level to assist international students. The PROMISE Engineering Institute (PEI) program [17] demonstrates how structured support systems can effectively address isolation and academic challenges. Universities have integrated stress management techniques into curricula for construction engineering and management students, offered specialized time management courses, and provided industry-specific career counseling [19, 20]. However, none of these studies evaluated whether these support systems adequately address the unique needs of international students in construction programs.

Unfortunately, students often underutilize counseling and support services. Research has observed pervasive barriers to seeking help, with many students viewing stress as something to be "toughed out" due to engineering culture norms [26]. This reluctance can be even more pronounced for international students, who may face stigma or lack familiarity with campus resources. Studies find that while international and domestic students report similar challenges, international graduate students are significantly less likely to seek support for mental health issues [23]. This lower help-seeking rate stems from stigma, cultural attitudes toward counseling,

or uncertainty about available services in a foreign country.

Institutions are beginning to recognize these gaps and adapt their responses. To better support international students' well-being, universities are urged to develop inclusive mental health services tailored to diverse student populations. Key components for adequate support include counselors cultivating multicultural awareness, incorporating diverse therapeutic approaches, and addressing language, privacy, and trust [28]. The mismatch between available services and utilization patterns raises essential questions about underlying causes. While cultural stigma is frequently cited as a barrier, institutional factors likely play an equally important role, as traditional Western counseling models may not resonate with students from collectivist cultures where mental health is conceptualized differently.

These findings highlight several important implications for higher education institutions. First, engineering programs lack gender-specific analysis. Second, despite various support mechanisms implemented by universities, a significant gap persists between available services and student utilization. For construction engineering programs specifically, tailored support systems addressing industry-specific challenges are essential for preparing students for the demanding work environments they will encounter professionally.

Conclusion

This preliminary review reveals significant insights into the stressors and coping strategies experienced by international graduate students in engineering disciplines in the U.S. The findings underscore three critical insights:

First, international graduate students face complex stressors, including academic pressure, cultural adjustment challenges, financial constraints, and language barriers. These stressors operate simultaneously, creating unique mental health vulnerabilities that require targeted support. For engineering students specifically, the rigorous nature of their programs compounds these challenges, with demanding coursework, research requirements, and publication expectations creating substantial pressure.

Second, construction engineering and management program students encounter additional industry-specific challenges that intensify their stress experiences. These include adapting to unpredictable work environments, preparing for fieldwork known for demanding schedules and physical strain, and developing proficiency across both technical and management domains. The interdisciplinary nature of construction engineering education creates a distinctive cognitive load that warrants specialized support approaches.

Third, while gender-based differences in stress experiences are evident, this dimension remains significantly underexplored in existing literature. The absence of research examining the intersection of gender, international student status, and engineering discipline represents a concerning gap, especially given the traditionally male-dominated structure of construction fields.

Despite the prevalence of various coping strategies, ranging from personal routines and peer

networks to institutional initiatives like mindfulness training, a persistent disconnection exists between support availability and utilization. Cultural stigma, unfamiliarity with resources, and misalignment between Western counseling models and diverse cultural perspectives on mental health contribute to this gap. Furthermore, many current support systems fail to address the specific needs of international students in construction programs, who navigate unique combinations of academic, cultural, and industry-specific stressors.

To address these limitations, future research should prioritize intersectional analyses that explore the complex interplay between gender, international status, and disciplinary context. Studies should investigate the effectiveness of existing institutional support for international students in construction programs and explore culturally tailored interventions that reflect diverse student needs. Longitudinal research tracking how stressors evolve throughout academic programs would provide valuable insights into critical intervention points.

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