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# STATE OF MENTAL WELL-BEING FOR CONSTRUCTION MANAGEMENT STUDENTS IN THE UNITED STATES



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**State of Mental Well-Being for Construction Management Students  
in the United States**

**Synopsis:**

Mental well-being is a topic of increased concern since Covid-19. Data shows a large percentage of college students face mental health issues at least once during college. Similarly, a large percentage of workers in the construction profession report issues with mental well-being. This paper will report on a study that investigated the mental well-being of college students majoring in construction management in the United States.

# State of Mental Well-Being for Construction Management

Mental health has become a topic of increasing awareness in recent years. In the United States 1 in 5 adults report fighting issues with mental illness. This is much higher for college-age adults. According to Beresin (2017), around 73% of college students experience a mental health crisis during their time in school. At an even more staggering rate are those that work in the construction profession. Nearly 83% of those working in the field indicate they are facing a mental health issue, and a suicide rate 4 times higher than the general population (Huff, 2022). With such an alarming rate of mental health concern in college students and those in the construction profession, this raised the question with researchers if students in construction management majors were at a higher risk for issues with mental well-being during college. This research looked to further understand the levels of depression, anxiety, stress, and burnout U.S. college students majoring in the construction management discipline are experiencing. The research used a survey developed from three different established survey instruments – the DASS-21, MBI-SS, and DSM-5. A total of 205 students majoring in construction management were surveyed. Results suggest that students in construction management programs, on average, do not rank above the level of concern for depression, anxiety, stress, and burnout. However, in some aspects of these areas more than 50% of respondents ranked themselves above the level of concern. The extent is somewhat dependent on school load and workload, but it is not a clearly linear relationship. The study indicates mental well-being for many college students in construction management has room for improvement.

**Key Words:** Stress, Burnout, Anxiety, Depression, Construction Management, College Students

## Introduction

With 1 in 5 (28%) United States adults experiencing mental illness each year, mental health, and the importance of understanding it, has become an increasing concern (*Mental Health by the Numbers*, 2022). The mental health issues experienced by so many in the United States most commonly take the form of stress, anxiety, depression, and burnout (National Alliance on Mental Illness, 2023). According to the American Psychological Association (2022), stress is a physical or mental reaction to an external cause, such as a fight with a loved one, while anxiety is an emotion associated with persistent and excessive worries, even without the influence of an external stressor. Depression is a mental condition that can have varying symptoms such as severe sadness, loss of interest, frustration, fatigue, and difficulty sleeping, which persists nearly daily for a minimum of two weeks (National Institute of Mental Health, n.d.). Burnout is “a psychological syndrome characterized by emotional exhaustion, feelings of cynicism, and reduced personal accomplishment” (Koutsimani, Montgomery, & Georganta, 2019).

These mental health struggles are at a higher proportion amongst people in demanding environments. Nearly 83% of construction workers face mental health issues, and a suicide rate nearly 4 times higher than the general population, (Huff, 2022). College students are also at a higher risk for mental health concerns (Laidlaw, A., McLellan, J., & Ozakinci, G., 2016; Castillo, L. G., & Schwartz, S. J., 2013). Almost 73% of college students experience a mental health crisis during their time in school (Beresin, 2017). According to the American College Health Association (2019), 41.3% of college students were diagnosed or treated by a professional for depression or anxiety. These levels tend to persist as students' progress through their programs, typically culminating in an extremely high level of both stress and burnout in their final year of school (Robins et al., 2018). With this, students majoring in the construction management field find themselves at a crossroads of two environments with concerning levels of mental health issues. Because of this, it is important both for the industry and educators to gain insight into this topic and understand the state of mental well-being for college students majoring in the construction management field.

Studies looking into mental health of construction management students have shown these students are under an immense amount of pressure, leading to increased stress, anxiety, and other mental health concerns (Scott-Young et al., 2020). Australian construction management students showed significantly higher levels of burnout than other majors, especially in the latter years of their courses (Lingard et al., 2007; Moore & Loosemore, 2014). Stress levels are no better, with students experiencing high levels of stress throughout their undergraduate years (Lingard et al., 2007; Scott-Young et al., 2020). It was found that students in Hong Kong seemed to have the lowest levels of mental wellbeing (Lingard et al., 2007; Turner et al., 2021). Other studies comparing resilience and mental wellbeing amongst students in Australia, Hong Kong, Vietnam, the US, and Singapore found that "students from the US demonstrated the highest levels of resilience, followed in order by Singapore, Australia, and Hong Kong" (Turner et al., 2021; Kamimura, A., et al., 2018).

While these studies provide evidence of higher occurrence of mental well-being issues for construction management students, they are limited and predominantly from countries outside the United States. In addition, some studies did not use proven measurement tools for assessing mental well-being. According to the literature, a few different tools are frequently cited for assessing mental well-being.

#### *DASS-21*

The DASS-21 (Depression, Anxiety, and Stress Scale) is a tool used to measure the shared causes of the mental health issues depression, anxiety, and stress. Overall, this tool has been found to be fairly accurate with the total score correlating highly with scores of mixed symptoms (Osman et al., 2012). However, its scores for measuring each of the three categories separately did not correlate quite as high.

#### *MBI-SS*

The MBI-SS was designed to measure students' feelings associated with mental exhaustion, cynicism, feelings of incompetence as a student, and an overall uninvolved attitude towards school. These different aspects of the measurement tool have been found to have a good level of dimensionality and showed no differential item functioning based on gender, showing that the

rating scales are appropriate for research (Pérez-Mármol & Brown, 2019). Because of its high level of validity, the MBI-SS has also been used in several studies concerning burnout and stress.

### *DSM-5*

The DSM-5 (Diagnostic and Statistical Manual of Mental Disorders), specifically the DSM-5 level 1 measure, uses a 5-point Likert scale to measure 23 symptoms associated with 13 areas of mental health issues. While this specific tool has been found to have some shortcomings in diagnosing clinical patients, it has been found to perform very well with samples of college students. Research has shown that the DSM-5 “could have incredible value as a brief, comprehensive measure of mental health among college students” (Bravo et al., 2018).

By employing standardized means of measurement, such as the DASS-21, MBI-SS, and DSM-5 studies can provide increased reliability and results more easily comparable to with other studies. Recognizing the current gap in the literature, the goal of this research is to better understand levels of stress, anxiety, depression, and burnout among U.S. construction management students. By measuring and analyzing these using proven measurement tools, this research will provide better understanding about the state of mental well-being for construction management students in the U.S.

### *Research Aim and Objectives*

This research examines the levels of depression, anxiety, stress, and burnout experienced by construction management students in 4-year degree programs, in the U.S. through the following objectives:

1. Identify perceived levels of stress, anxiety, depression, and burnout for construction management students in the United States.
2. Compare levels of stress, anxiety, depression, and burnout with year of study, gender, course load, and extracurricular activities/workload to identify any relationships.

### *Research Question*

1. What levels of stress, anxiety, depression, and burnout are experienced by students in the construction management discipline?
2. How do these levels relate to the student’s year of study, course load, and overall academic life?
3. How do the levels experienced by students in the U.S. compare to levels found by studies in other countries and disciplines?

## Research Methods

This study collected quantitative data from a web-based survey to gather information regarding stress, anxiety, depression, and burnout among construction management students. The survey was distributed to faculty from construction management programs through the email listserv of the Associated Schools of Construction (ASC) (Associated Schools of Construction, 2023). ASC universities/colleges were selected for the survey because these schools represent the predominant group of 2 and 4-year construction education programs in the U.S. The ASC is divided into eight (8) regions, however, the population for this study was limited to regions 1 through 7, which includes 152 universities/colleges. Region 8 was not included in the survey because it includes only construction programs outside the United States.

The survey included demographic questions and questions from the three validated measurement tools previously mentioned.

- Demographics/Work-Study Life (Year of study, gender, extracurricular involvement, work commitments, academic life/culture, and course load)
- DASS-21 Questions (Validated Instrument Measures levels of depression, anxiety, and stress using questions answered on a Likert scale (Lee, B., & Kim, Y. E., 2022))
- DSM-5 Level 1 Questions (Measures 23 self-rated symptoms on a 5-point Likert Scale to capture 13 mental health domains)
- Additional questions to measure levels of burnout using the Maslach Burnout Inventory for students (MBI-SS)

With inclusion of the four elements, the survey was quite long – consisting of 61 total questions. This created concern about survey fatigue and potential low response rates. Prior to distributing the survey, a pilot study was conducted to validate the tool and address any potential issues with survey fatigue. By employing a pilot study with an interview process, the questionnaire is able to be “evaluated for substantive and structural validity” (Bhattacharjee et al., 2013). Four students from the researchers’ home institution were selected from various year levels in the construction management program. The participants were asked to complete the survey and answer the questions below:

1. Were each of the questions clear in what they were asking? If not, which ones were not clear?
2. Were there any specific words or phrases in the questions that were not clear? If so, which ones?
3. Do you feel that you devoted the needed mental effort to answer each of the questions, or did you find yourself clicking through them?
4. Did you find yourself wanting to tell the truth when answering the questions or were you reluctant?
5. Were the categories or answer options a sufficient match for you, or did you find yourself looking for a “best match”?

6. Did you find anything in the survey that seemed to be a flaw or mistake?
7. In question 5, how did you interpret “Mental health services” and how did you interpret the scale for it? Are there any descriptors you feel would be more accurate?
8. Is a 10-point scale necessary or would a different number of scale points be more efficient?

Results of the pilot study indicated no significant changes needed. The participants indicated some of the questions seemed redundant but not bad enough to create frustration. This is not surprising due to including the DASS-21, DSM-5, and MBI-SS, as there is some overlap between the three instruments in the type of questions being asked. Minor revisions were made based on feedback from the pilot.

After receiving IRB approval, the survey was sent out on September 21, 2023, via email to faculty from the 152 ASC programs. The recruitment email asked faculty to distribute the survey link to students within the CM programs for completion. A reminder was sent out to the same email list three weeks later. Participation in the survey was voluntary and the responses were anonymously collected in Qualtrics.

## **Results**

The survey reached professors and department heads at 152 schools – approximately 950 individuals. While there is no way of knowing how many forwarded it to their students, and which of those students responded, the survey received 205 responses prior to being closed. Of the 205 responses, 13 respondents answered “no” to the first question, meaning they were not eligible to participate in the questionnaire. An additional 42 respondents did not fully complete the questionnaire, so they were removed. There were 150 responses which were deemed “usable”. With 150 of the 192 eligible respondents finishing the survey, this resulted in an attrition rate of 22%.

Of the usable responses, 76% of respondents identified as male, and 24% female. Participants were asked to indicate their year level in school, credit hours of course load being taken, and if they were doing any kind of work outside of school. The largest proportion of participants indicated being in their third year of school, taking a standard credit load of 12 to 15 credit hours per semester. Hours working outside of school were pretty evenly disbursed between not working and 20 to 30 hours per week. Figure 1 illustrates the breakdown of demographics for the respondents.

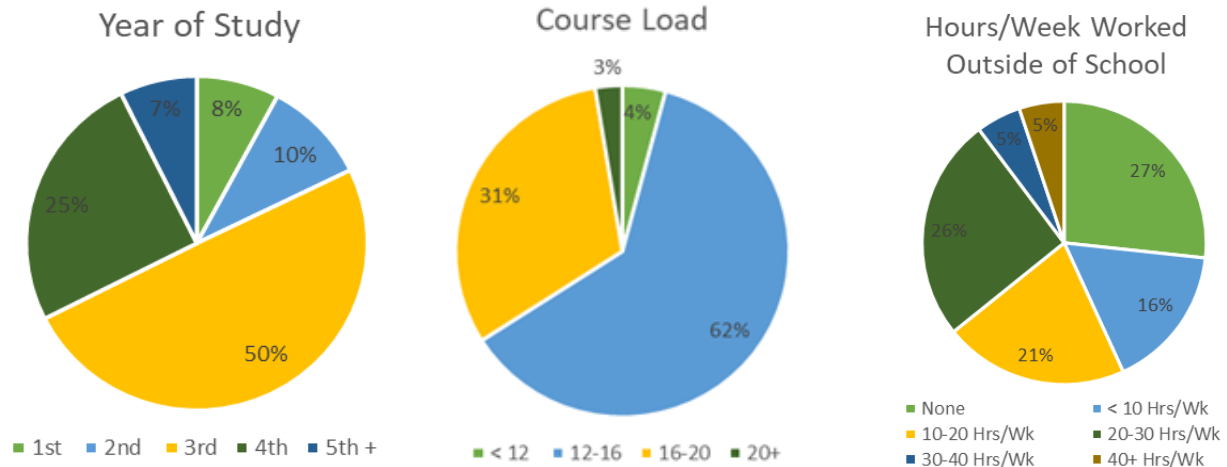


Figure 1. Student Demographic Information

### *Mental Well-Being*

Following the demographic and work/study life section of the questionnaire, respondents were then asked to answer questions from the DASS-21, DSM-5 Level 1, and the MBI-SS.

To score the DASS-21, the administrator must add up the scores from each statement pertaining to a specific domain. Each domain (depression, anxiety, and stress) has seven statements which apply to it. These seven statements for each of the three domains make up the 21 statements of the DASS-21. Once the score for each domain is added together it must then be multiplied by two to gain the final score and be interpreted. Following the domain scoring, scores can then be interpreted for severity. As shown in figure 2 below, different domains contain different ranges of scores for the various levels of severity. While these scales are not used for clinical diagnosing, they have been provided by the creators as “conventional severity labels” and are used in this research as categories for the respondents.

	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely Severe	28+	20+	34+

Figure 2. DASS-21 Scoring Domain Scoring Parameters

The results from the DASS-21 are summarized in the table below. Reported on this table are the average scores in each domain, the ranges of severity, and the number of responses by severity level. The mean reported fell within the “normal” range for each of the domains. However,



around 36% of the respondents scored above the normal range in both depression and anxiety. Almost 26% indicated levels of stress above normal.

Table 1. DASS-21 Summary Results

Severity Level	Depression		Anxiety		Stress	
	(n)	Range	(n)	Range	(n)	Range
Normal	90	0-9	78	0-7	112	0-14
Mild	10	10-13	12	8-9	12	15-18
Moderate	28	14-20	22	10-14	9	19-25
Severe	6	21-27	12	15-19	5	26-33
Extremely Severe	6	28+	16	20+	2	34+
Mean	140	8.11	140	6.87	140	10.07
Std Dev		8.43		7.72		8.28
Range		0 – 34		0 – 40		0 - 30

### DSM-5 Results

The DSM-5 expands on the DASS-21, using a 5-point Likert scale (0-4) to measure 23 symptoms associated with 13 areas of mental health issues (Bravo et al., 2018). These areas include depression, anger, mania, anxiety, somatic, suicidal, psychosis, sleep problems, memory, repetitive thoughts/behaviors, dissociation, personality functioning, and substance abuse. Each area of mental health has corresponding questions on the measure, the number of questions pertaining to a specific area of mental health ranges from one to three. Respondents are asked to answer the questions by rating how often they experienced them in the last two weeks. Figure 2 illustrates an example.

		None Not at all	Slight Rare, less than a day or two	Mild Several days	Moderate More than half the days	Severe Nearly every day
	During the past <b>TWO (2) WEEKS</b> , how much (or how often) have you been bothered by the following problems?					
i.	1. Little interest or pleasure in doing things?	0	1	2	3	4
	2. Feeling down, depressed, or hopeless?	0	1	2	3	4

Figure 2. Example DSM-5 Questionnaire

To find a respondent’s score in a given category, the scorer must go to the questions pertaining to this category and select the highest rated symptom. For example, when trying to score a respondent on depression, the scorer will go to questions number one and two (the two questions pertaining to depression), select the highest rated scale between the two, and mark only this number. If a respondent marked a “3” on question one and “1” on question two, then the score for the depression category would be a “3”.

Following the scoring of each category, it is important to understand the threshold for concern on each of the categories. In all domains except for Suicidal and Psychosis, a score of 2 or more

(mild or greater) is considered the threshold for concern, meaning that the provider of the test in a professional setting would want to further inquire about these symptoms, leading to a “level 2” measure. Table 2 provides scores for 12 of the 13 areas of mental health (“substance abuse” domain was excluded). The mean scores were below the level of concern for all 12 domains, with “mania” and “anxiety” having the largest average score, 1.83 and 1.81, respectively. In addition, the largest proportion of individual respondents above the threshold for concern belonged to these two domains, with 59% and 58%, respectively scoring above the threshold. While mania was not one of the mental health domains targeted by this research, it has been found to be caused by “a high level of stress and an inability to manage it”(Cleveland Clinic, 2023), meaning this could be attributed to the issue of ‘stress’ targeted by this research. Depression, another issue targeted by this research, had the third highest average score at 1.6, and tied with “anger” for the third highest number of respondents above the threshold for concern at 46%.

Table 2. DSM-5 Summary Results

Domain	Threshold	Range	Above Threshold (n) %	Mean	Std Dev
Depression	2 or more	0-4	65 (46%)	1.6	1.14
Anger			64 (46%)	1.44	1.11
Mania			83 (59%)	1.83	1.21
Anxiety			81 (58%)	1.81	1.31
Somatic			46 (33%)	1.14	1.18
Sleep			52 (37%)	1.25	1.18
Memory			24 (17%)	0.73	0.98
Repetition			36 (26%)	0.84	1.11
Dissociation			31 (22%)	0.86	1.10
Personality			48 (34%)	1.39	1.32
Substance Abuse			----- Not Surveyed -----		
Suicidal	1 or more	0-4	27 (19%)	0.3	0.71
Psychosis			36 (26%)	0.44	0.89

### *MBI-SS Results*

The Maslach Burnout Inventory for Students Survey (MBI-SS) is designed to measure students’ feelings associated with mental exhaustion, cynicism, feelings of incompetence as a student, and an overall uninvolved attitude towards school (Pérez-Mármol & Brown, 2019; Yavuz, G., & Dogan, N., 2014). This survey is an adaptation of the standard MBI, which is used for measuring burnout in the workplace. The MBI provides respondents with 16 statements which they rate on a 7-point Likert Scale (0-7). The respondent is asked to rate how often they suffer from the feelings in the statement on the Likert Scale, with the frequency ranging from never (0) to every day (6) (Figure 3).

**Example:**

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<b>How often:</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
	Never	A few times a year or less	Once a month or less	A few times a month	Once a week	A few times a week	Every day

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<b>How often 0-6</b>	<b>Statement:</b>
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1. \_\_\_\_\_ I feel depressed by my studies.

Figure 3. Example MBI Question

The MBI-SS is scored by adding up the individual scores for exhaustion, cynicism, and professional efficacy subscales. Each of these subscales has corresponding questions in the survey. By totaling the score for each subscale, the researcher gains a total score for each domain. In addition, the researcher can choose to find the average score for each of these subscales by adding up the scores for all questions in the subscale and dividing by the number of questions in the given subscale. For the MBI-SS there are 5 questions for exhaustion, 5 questions for cynicism, and 6 questions for professional efficacy. According to Mind Garden, the copyright holder and owner of the MBI-SS, researchers typically report the average scores for each category.

By looking at these three domains together (Exhaustion, Cynicism, and Professional Efficacy), the level of burnout being experienced by a student can be interpreted. It is important to note that while a high score in the exhaustion and cynicism domain would be considered a negative, a high score in professional efficacy would be considered a positive. So, a high score in exhaustion and cynicism with a low score in professional efficacy would suggest the strongest level of burnout while a low score in exhaustion and cynicism with a high level of professional efficacy would denote a lower level of burnout. It is also important to consider that the MBI-SS is a measure of how frequently a student has felt this way in any period of time (from never to everyday) whereas the last two measures (DASS-21 and DSM-5) looked at one or two week increments of time.

The average score for the exhaustion category was approximately a 2.4, meaning the average respondent reported experiencing feelings of exhaustion between once a month and a few times a month. Questions associated with cynicism showed respondents experiencing cynical feelings on average between a few times a year and once a month. These two scores were on the lower half of the extremity range, indicating feelings of exhaustion and cynicism were not felt on a daily or even weekly basis by the average respondent. This points to no signs of a strong level burnout amongst the average respondent. Professional efficacy, which when low, typically indicates burnout, had an average score of 1.9. The average respondent only felt high levels of professional efficacy between once a month and a few times a year. A lower score in the professional efficacy domain can be an indication of burnout in a respondent. So, while the

average respondent indicated a lower level of burnout when it comes to exhaustion or cynicism, they exhibited higher levels of burnout when it comes to professional efficacy.

### Well-Being Related to Gender and Workload

When considering the scores of all three measurements based on gender, females consistently reported higher levels of depression, anxiety, stress, and burnout. While there were significantly more male respondents than female respondents, there are still clear differences shown between the two groups. With respect to burnout, represented by the MBI-SS, females showed higher levels of exhaustion and cynicism. However, they also scored higher than males on professional efficacy. Taking all three metrics into consideration, females overall showed the same level of burnout as males. Figure 4 illustrates the differences by measure.

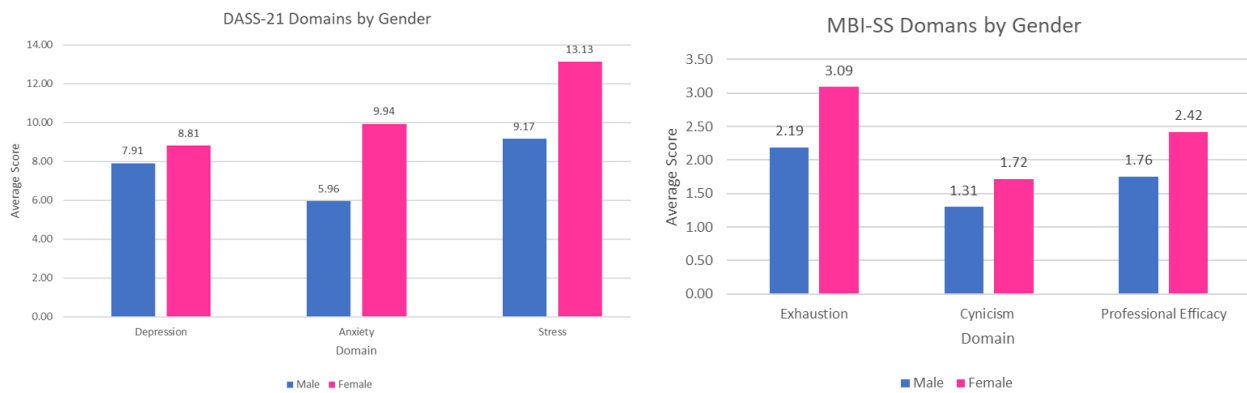


Figure 4. Male vs Female Breakdown of Scores

Workload was defined by course load and hours working outside of school. The highest levels of depression, anxiety, stress, and burnout were identified by respondents taking less than 12 hours per semester. These respondents also indicated working 30-40 hours per week. However, this was the smallest sample set at 5% of the respondents. Figure 5 illustrates the breakdown.

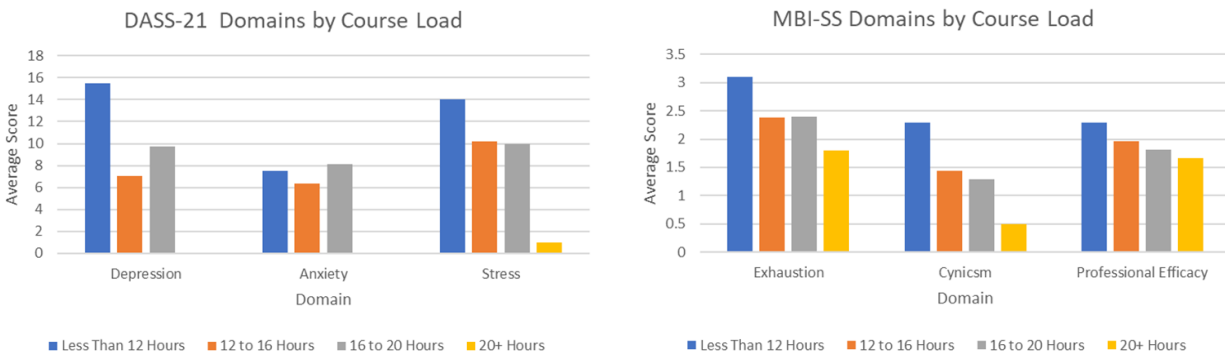


Figure 5. Depression, Anxiety, Stress, and Burnout by Course Load

When isolating for hours worked outside of school, this same group had a significantly higher burnout rating than the other groups. Figure 6 illustrates the breakdown.

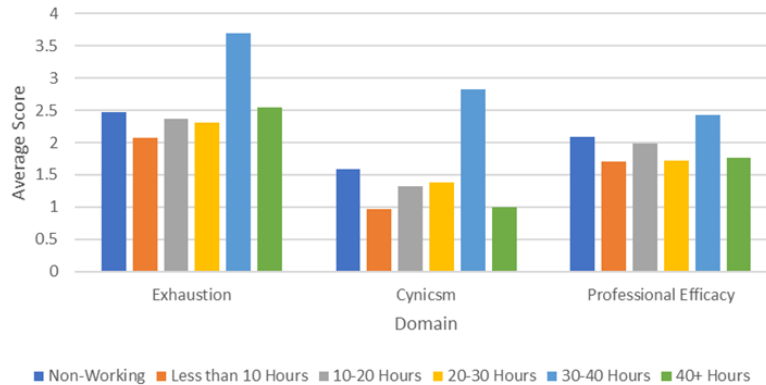


Figure 6. Burnout by Hours Worked Outside School

## Discussion and Conclusion

Mental well-being is a serious issue for many in the United States. Research shows this to be especially true for those working in the construction profession, and college students. However, research examining mental well-being of college students majoring in the construction profession has been limited, and the current literature is focused outside the US. This research examined U.S. construction management students' perceived levels of depression, anxiety, stress, and burnout. While average scores did not find construction management students above the "normal" level for a population, a large percentage of students had individual scores above the threshold of concern.

When breaking down the population by gender, females tended to score higher in all domains of the measures. On average females felt higher levels of depression, anxiety, and stress, even scoring above the "normal" range for anxiety in both the DASS-21 and DSM-5 measures. In addition, the female population tended to feel higher levels of exhaustion and cynicism towards schoolwork. However, females indicated higher levels of Professional Efficacy than males, ultimately making both genders equal on level of burnout.

In relation to students' academic life, students taking less than 12 credit hours tended to score highest in levels of depression, anxiety, and stress. While this may be the opposite of what most would expect, all respondents in this category indicated working outside of school at least 20 hours per week. When controlling for work hours alone, those working 30-40 hours per week scored at significantly higher levels of depression, anxiety, stress, and burnout. All other levels of hours worked scored at nearly the same levels. This would suggest those students working 30-40 hours per week have the greatest work/life imbalance and may need some greater consideration. However, since many of the respondents scores were above the threshold for concern, this suggests that students may be taking on too much and further research should be done to explore the potential impacts of such.

This research has provided a good introductory look on U.S. undergraduate construction management students' mental well-being. However, aspects of online survey deployment, gathering student perceptions at a single moment in time, and inability to know current situations of respondents created limitations of the findings. Future research should consider:

1. How students' perceptions change as they progress through their years of study.

2. Research into other unexplored disciplines using standardized questionnaires for comparison with construction management students.
3. Further exploration into construction management students' demographics and modality of education to see how they affect the levels explored in this study.
4. Regression analysis to explore the most significant factors affecting student mental well-being and the possibility to develop a predictive model that helps students be setup for the greatest success.

Mental well-being continues to be a challenge for today's society. Increased pressures of everyday life have given rise to frequency of mental well-being challenges and suicide rates. Increasing awareness of these issues can help educators be better prepared to help provide their students the most effective educational experience, preparing them for their future.

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