Advances in Social Sciences Research Journal – Vol. 12, No. 07
Publication Date: July 25, 2025
DOI:10.14738/assrj.1207.19031.
Prieto, D. N., Ding, Y., Cho, S.-J., Ridgard, T., & Zhang, A. (2025). Binary Gender as a Psychosocial Parameter for Stress, Adaptation, and Coping Among U.S. College Students. *Advances in Social Sciences Research Journal*, 12(07). 33-48.

Binary Gender as a Psychosocial Parameter for Stress, Adaptation, and Coping Among U.S. College Students

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ABSTRACT

The present study explored the relationship between binary gender, stress, adaptation, and coping in college students during the COVID-19 pandemic. Study participants were college students ages 18+, attending an institution of higher education in the United States during the global crisis. Because male and female students have been known to experience stress, adaptation, and coping differently, this study randomly selected males (n=91) and females (n=102) and analyzed their responses to validated scale items focusing on the effect of gender, coping, and school adjustment on stress and adaptation to COVID-19 across various domains. Results indicated that gender significantly influenced certain aspects of adaptation, with social and attachment adjustment (6.2% and 5.6% variance explained) being significantly higher among female students, while male students reported greater perceived social support during COVID-19 (5.2% variance explained). Although no significant overall effect of gender on stress and COVID-19 adaptation was found,

female students demonstrated a greater reliance on escape-avoidance coping strategies, while male students showed higher perceived social support. Gender differences in discriminatory impact approached significance, suggesting potential disparities in experiences during the pandemic. These findings highlight the need for institutions to implement targeted mental health and academic support interventions to address gender-specific adaptation patterns during crises.

Keywords: Higher Education, Adaptation, Coping, Stress, College Students, Academic Adjustment.

INTRODUCTION

Although the pandemic has officially ended, the impact of the global health crisis—along with the resulting isolation, disruptions to education, social interactions, and lifestyle—has continued to raise concerns about individuals' psychological well-being and adjustment, particularly in terms of stress, coping, and overall adaptation [1-5]. Although the COVID-19 pandemic is our most recently studied period of quarantine to avoid illness transmission, researchers have previously explored the mental health effects of quarantine in the context of public health crises [1,6,7]. Health-related isolation has been linked to fear, frustration, boredom, exhaustion, sadness, attentional issues, and post-traumatic stress disorder symptoms [1,6,7]. Isolation, even as a disease prevention measure, is linked to prolonged mental health distress and maladaptive coping [1,6,7].

Psychosocial determinants have also been linked to mental health disparities and stress, adaptability, and coping. Before COVID-19 research, female gender was one of the most common predictors of psychological distress [8-13], with symptoms of internalizing disorders more common in females under chronic stress. Isolation and quarantine research support such findings [15,6]. As developmental differences in coping strategies exist across the lifespan, college students are positioned in a unique period of independence with distinct facilitators and barriers that support or hinder adjustment [16]. As such, individuals in the developmental periods of young and middle adulthood, the typical timeframe for higher education, will naturally differ in their coping skills. Thus, knowing age and gender as psychosocial predictors of stress, adaption, and coping in a college-attending sample is essential to supporting institutions of higher education (IHEs) as they assess crisis efforts.

Research on gender differences in coping, stress, and adjustment among university students has yielded mixed findings. Some studies have identified significant gender differences in stress levels and coping strategies among students in higher education [6, 11, 16, 4, 17], while others have reported inconsistent or negligible effects [18, 17, 3]. However, most of this research has been conducted outside the context of a global public health crisis. The additional stressors introduced by COVID-19, including public health measures aimed at minimizing transmission, likely compounded students' already high allostatic load. Given the limited research on how COVID-19 has affected student stress, adjustment, and coping, particularly in relation to gender differences, this study aims to address this gap.

Gender, Stress, and COVID-19

Stress in university students is a critical issue that needs to be addressed. Gender disparities in student perceptions of stress are a key factor to consider. Research has consistently shown that

females experience higher levels of perceived stress than males [8–13]. Females reported more stress over relationships, finances, and daily struggles than males [14]. University-aged females reported higher levels of continuing stress than males during COVID-19 [1, 15, 6, 2, 4, 5]. Furthermore, the effects of COVID-19 have added to the stressors of academic milestones and transitions, including quarantine and disease preventive procedures, which resulted in increased rates of sadness, anxiety, and perceived stress among students [19, 15, 5]. Females reported higher depressive symptoms, including suicidal thoughts and ideation [15, 5]. These findings suggest that gender disparities in coping strategies and support services for university students need to be addressed to mitigate the negative impacts of stress on mental health and academic success.

Gender, Coping, and COVID-19

The theoretical framework established by Lazarus and Folkman (1984) identified categories for coping strategies, or ways of handling stress. These include: confrontative coping, distancing, self-controlling, seeking social support, accepting responsibility, escape-avoidance, planful problem-solving, and positive reappraisal [20]. Coping strategies that are considered healthy and adaptive include seeking social support, exercising, prayer/religion, and problem-solving [8]. Studies have identified gender as a significant factor related to coping, with women engaging in a more significant role in coping, with women utilizing more negative self-focus, emotional expression, avoidance, support seeking, and religion than men [16]. Female international college students internalized stress with more anxiety, fear, sobbing, despair, and self-blame, while stress caused men to smoke, yell, and solve problems [8]. Brougham et al. found that women used more self-help and self-punishment, whereas males employed self-help for much more stressors [9]. Distractions, active coping, and social-emotional support were the most utilized COVID-19 coping techniques in the general population; males and younger adults specifically tended to reject CDC social-distancing and hygiene guidelines [2]. Although recreational and social substance (e.g., alcohol) use is considered more common in young adults, substance use as a coping mechanism is an added concern for this age group [19]. Females reported more depression than males during the pandemic, but they were also more likely to have high regulatory emotional self-efficacy, which is linked to mental wellbeing [15]. Living with a spouse and practicing mindfulness enhanced adaptive coping among young adult females [6].

Gender and Adjustment

The ability to adjust to changing surroundings is especially important during transition periods. College students encounter transitions frequently. Baker and Siryk's (1989) framework examined school adjustment in four domains: academic, social, personal-emotional, and attachment to the institution. Stress and coping affect student adjustment to variable degrees for both men and women [21].

A study by Leong et al. (1997) found that students' coping techniques were linked to academic and personal/emotional adjustment, but not social or attachment adjustment. The study indicated that active coping predicted academic and personal/emotional adjustment. Academic and personal/emotional adjustment were adversely correlated with suppressing competing activities as a coping strategy. However, binary gender differences in adjustment were not found in this population [17].

However, international research by Al-Qaisy (2010) on first-year student adjustment and residency indicated that male students were more likely to utilize effective adjustment than female classmates regardless of housing status. In the US, gender and living environment both have a relationship to social adjustment outside of the restrictions placed by COVID-19 [22]. Enochs & Roland (2006) found conflicting results comparing binary gender and on-campus residence. This study identified gender variations in student acclimation. However, first-year students who lived in housing designated for them had higher levels of adjustment, notably social adjustment [18].

Purpose

Studies have examined gender-based differences in stress, adaptation, and coping among university students, yielding mixed results. This study aims to explore the relationship between student adaptation to college, coping, perceived stress, and adjustment during COVID-19, specifically among students identifying as male or female. While gender extends beyond the binary, current validated measures and existing literature primarily support data analysis within these two groups. The study will address five key research questions: (1) Is there a significant difference in student adaptation to college (SACQ), difference in coping (WAYS), perceived stress (PSS), and COVID-19 Adjustment Questionnaire scores between male and female respondents? (2) What is the effect of gender on the relationship between adaptation to college, coping, perceived stress, and adjustment during COVID-19? By addressing these questions, this study aims to inform systemic interventions and support programs at the institutional level, particularly in response to the increased allostatic load caused by the global health crisis, prolonged isolation, and abrupt disruptions to education and student lifestyles.

METHODOLOGY

Participants

The original study surveyed 512 university students, ages 18 and older, enrolled in an American IHE at either the undergraduate or graduate level during the Spring of 2020, at the height of the COVID-19 pandemic. Participants were recruited via online student networks and electronic communication and data was collected via Qualtrics experience management software. Eligibility criteria for the original sample included adults ages 18 or older who were identified as university students attending an American university at either the undergraduate or graduate level.

A sample of 193 participants was used for the purpose of this study. The U.S. Department of Education [23] reported that 44% of students enrolled in degree-granting institutions during the 2010-2020 decade were female, 36% of students were male, and no data beyond binary gender was available. As such, 91 males and 102 females comprised the sample. Stratified random sampling was used to select the subset of students included in the present study. Students were selected with considerations to include a representative sample based on international status, whether they were graduate students or undergraduate students, their year in school, and their age.

Demographic Questionnaire

The original study included a demographic questionnaire to gather data regarding student gender, age, race, household income, and relevant academic information.

SACQ—Student Adaptation to College Questionnaire Baker & Siryk's (1999) Student Adaptation to College Questionnaire (SACQ) measured students' university adaptation. The 67-item, 9-point Likert-scale SACQ helps stakeholders identify university students at risk of poor adjustment [24]. This measure has four subscales, allowing stakeholders to intervene [24]. Academic, social, personal/emotional, and institutional attachment are the subscales.

SACQ T-scores were calculated by summing the total responses for each subscale, reverse-scoring indicated items, and calculating score conversion. Higher T-scores showed better adjustment. T-scores varied from 30 to 70 (30=very low, 40=low, 50=average, 60=high, and 70=very high). The academic adjustment subscale (24 items, α = 0.81-0.90) assessed respondents' ability to handle university academic expectations. The social adjustment subscale (20 items, α = 0.83-0.91) assessed respondents' capacity to handle university's interpersonal-societal demands. Personal/emotional adjustment (15 questions, α = 0.77-0.86) assessed mental and physical health. Finally, the attachment subscale (15 items, α = 0.85-0.91) examined respondents' attachment to university [21, 24]

Perceived Stress Scale (PSS)

Cohen's (1994) Perceived Stress Scale (PSS) was used to measure the level of stress respondents believed they experienced during the COVID-19 pandemic [25]. It was developed with the purpose of measuring the level to which respondents found their lives to be stressful, meaning unpredictable, uncontrollable, and overcommitted presently, with the present being defined as a period of over the last 30 days. This measure asks participants to report on the perceived frequency of stress-related feelings or thoughts on a scale of "never" to "very often." Items were totaled with items reverse-scored where appropriate on a scale of 0 to 4, and higher scores indicating higher levels of self-reported stress.

Ways of Coping Questionnaire (WAYS)

Folkman & Lazarus' (1988) Ways of Coping Questionnaire (WAYS) was used to measure participants' coping processes during the COVID-19 pandemic. Developers created the WAYS to measure participant coping responses to a specific event. WAYS measure is a 66-item, 4-point Likert-scale measure questionnaire (α =.78) [20]. The domains measured by the scale are emotion-focused, problem-focused, or avoidance-focused behaviors. Participants' responses were totaled to calculate a score for each subscale. Higher scores indicated higher frequency of behaviors within each respective subscale. In addition to normative scores, relative scores were also calculated to indicate which coping strategies were most frequently used by the respondent.

This study used a subscale within each type of coping domain. The positive reappraisal subscale (7-item, α = .79) measures respondents' emotion-focused efforts to create meaning out of a situation for their personal growth. The planful problem-solving (6-item, α = .68) measures respondents' problem-focused behaviors aimed at changing a situation. The escape avoidance subscale (8-item, α = .72) measures respondents' avoidance-focused behaviors, such as wishful thinking and escape behaviors [20].

COVID-19 Questionnaire

A 37-item, 5-point Likert-scale COVID-19 questionnaire developed by Liu (2020) was adapted for the original study and used to measure the effects of COVID-19 on participants (Appendix

URL: http://dx.doi.org/10.14738/assrj.1207.19031

A) [26]. Liu's (2020) measure was developed to assess the impact of the pandemic on the mental health of students in China. Subscales included in this instrument measured emotionality, adjustment, social support, academic adjustment, discriminatory impact, and regulatory reaction during the start of the COVID-19 outbreak [26].

The emotionality subscale (α = .65) consists of six items measuring respondents' thoughts, emotions, and behaviors surrounding their COVID-19 experience. The adaptive adjustment subscale (α = .53) consists of six items measuring respondents' ability to cope with COVID-19-related stressors. The social support subscale (α = .45) consists of five items measuring respondents' perceptions of support they received during COVID-19. The academic adjustment subscale (α = .83) consisted of eight items measuring respondents' self-reported ability to adapt to COVID-19-related changes to education, such as taking classes remotely. The discriminatory impact adjustment subscale (α = .53) consisted of four items measuring the impact of racism related to and during COVID-19. Lastly, the regulation reaction subscale (α = .54) consisted of six items measuring respondents' compliance and agreement with disease-prevention measures related to COVID-19. Higher scores indicate that participants fared more positively in their respective areas. For scales with less than ten items in the subscale, an alpha of .50 is sufficient for internal consistency [27, 28]. Higher scores on the aforementioned subdomains indicated more successful adjustment during COVID-19. Successful adjustment is indicated by fewer negative thoughts, behaviors, or worries; feeling that one is receiving adequate social support; adjustment to academic changes; lower impact of discrimination; and higher agreement and compliance with imposed regulations.

RESULT

Sample Characteristics

As shown in Table 2, a total of 193 participants were included in this study, with 91 identifying as male (47.2%) and 102 identifying as female (52.8%). The racial composition of the sample was 49.22% Asian (n = 95), 37.31% White (n = 72), 4.66% Biracial/Other (n = 9), 2.07% Black or African American (n = 4), 1.96% Hispanic or Latino (n = 1), and 1.04% Native Hawaiian or Other Pacific Islander (n = 2). Regarding academic standing, the sample included 29.02% first-year students (n = 56), 17.62% second-year (n = 34), 16.06% third-year (n = 31), 27.46% fourth-year (n = 53), 7.25% fifth-year (n = 14), and 2.59% students in their sixth year or beyond (n = 5). Participants represented diverse fields of study, with 45.6% (n = 88) majoring in Social Sciences, 29.53% (n = 57) in STEM fields, 8.29% (n = 16) in Medical or related fields, 6.74% (n = 13) in Business, 4.15% (n = 8) in Humanities, 1.04% (n = 2) in Law, and 4.66% (n = 9) in other disciplines.

Table 1: Quantitative Participant Demographics (n = 193)

	Male		Female		Total	
	n	%	n	%	n	%
Binary Gender	91	47.2%	102	52.8%	193	100%
Race						
White	30	32.97%	42	41.18%	72	37.31%
Black or African American	3	3.3%	1	0.98%	4	2.07%
Hispanic or Latino	9	9.9%	2	1.96%	1	5.7%
Asian	41	45.05%	54	52.94%	95	49.22%
Native Hawaiian or Other Pacific Islander	1	1.1%	1	0.98%	2	1.04%

Other (Biracial)	7	7.7%	2	1.96%	9	4.66%
Year in School						
1st	28	30.77%	28	27.47%	56	29.02
2nd	14	15.38%	20	19.61%	34	17.62
3rd	14	15.38%	17	16.67%	31	16.06%
4th	26	28.57%	27	26.47%	53	27.46%
5th	7	7.69%	7	6.86%	14	7.25%
6th or higher	2	2.2%	3	2.94%	5	2.59%
School Major						
STEM	33	36.27%	24	23.53%	57	29.53%
Humanities	4	4.4%	4	3.92%	8	4.15%
Social Science	30	32.97%	58	56.86%	88	45.6%
Medical or related field	7	7.69%	9	8.82%	16	8.29%
Law	1	1.1%	1	0.98%	2	1.04%
Business	9	9.89%	4	3.92%	13	6.74%
Other	7	7.69%	2	1.96%	9	4.66%
University Level						
Undergraduate	50	54.95	37	36.27	97	50.26
Graduate/Professional	41	45.05	55	53.92	96	49.74
International/Domestic						
Domestic	62	68.13	67	65.69	129	66.84
International	41	45.05	35	34.31	64	33.16
University Location						
Outside of Met NYC	53	58.24%	67	65.69%	120	62.18%
Metropolitan NYC	38	41.76%	35	34.31%	73	37.82%
Original Spring 2020 Housing						
On-campus	22	24.18%	24	23.53	46	23.83%
Off-campus	52	57.14%	60	58.82%	112	58.03%
Home with family	17	18.68%	17	16.67%	34	17.62%
Other	0	0.0%	1	0.98%	1	0.52%

An independent sample t-test was conducted to compare student adaptation to college (SACQ), perceived stress (PPS), ways of coping (WOC), and COVID-19 adjustment (COVID) between male and female students. As shown in Table 2, the results revealed a statistically significant difference in SACQ scores, with female students (M = 5.14, SD = 0.65) reporting higher adaptation to college than male students (M = 4.64, SD = 0.63), t (100) = -2.52, p = .013, d = -0.80.

Table 2: Results of Independent Samples t-Test on School Adjustment Factors and Perceived Stress

	Male		**Female**		**Levene's Test F**	**Sig**	**t**	**p**	**Cohen's d**
	M	SD	M	SD					
SACQ	4.64	0.63	5.14	0.65	0.13	0.72	-2.52	0.01	-0.80
Ways of Coping	1.12	0.38	1.16	0.51	2.08	0.152	-0.302	0.764	-0.20
COVID	14.09	1.80	13.50	2.24	1.02	0.32	0.99	0.32	0.32
Perceived Stress	2.179	0.45	2.23	0.41	0.072	0.789	-0.86	0.39	-0.125

Note. *p < 0.05.

This indicates a moderate to large effect size, suggesting that gender plays a meaningful role in college adaptation. For perceived stress (PPS), no significant gender difference was found, t

URL: http://dx.doi.org/10.14738/assrj.1207.19031

(100) = 0.35, p = .724, d = 0.11, indicating that male (M = 2.18, SD = 0.45) and female (M = 2.13, SD = 0.54) students experienced comparable levels of stress. Similarly, ways of coping (WOC) did not differ significantly between male (M = 1.12, SD = 0.38) and female (M = 1.16, SD = 0.51) students, t (100) = -0.30, p = .764, d = -0.10. This suggests that both groups engaged in coping strategies at similar levels. Regarding COVID-19 adjustment, no significant gender difference was observed, t (100) = 0.99, p = .323, d = 0.32, despite male students (M = 14.09, SD = 1.80) reporting slightly higher adjustment scores than female students (M = 13.50, SD = 2.24). Although the effect size was small to moderate, it did not reach statistical significance.

MANOVA was conducted to examine the effect of gender on college adaptation, coping strategies, perceived stress, and adjustment during COVID-19 at subscale levels. As shown in Table 3, the results of the multivariate tests, which indicated a statistically significant effect of gender on the combined dependent variables, Pillai's Trace = .325, F (14, 87) = 2.987, p < .001, partial η^2 = .325. This finding suggests that there are meaningful differences between male and female participants across the measured variables. As shown in Table 4, results also indicated significant gender differences in SACQ attachment (F (1, 100) = 6.57, p = .012, partial η^2 = .062), SACQ social adjustment (F (1, 100) = 5.89, p = .017, partial η^2 = .056), and COVID social support (F (1, 100) = 5.43, p = .022, partial η^2 = .052). These findings suggest that female participants reported significantly higher scores in attachment adaptation (M = 6.10, SD = 0.75) and social adjustment (M = 5.97, SD = 1.08) compared to male participants (M = 5.50, SD = 0.73 and M = 5.12, SD = 1.10, respectively). However, male participants reported significantly higher COVID social support (M = 16.30, SD = 2.76) compared to female participants (M = 14.20, SD = 2.69). SACQ academic adjustment, SACQ emotional adjustment, perceived stress, coping strategies (escape avoidance, planful problem solving, ways of coping, and positive reappraisal), and most COVID-19 adjustment factors did not show significant gender differences (p > .05). However, COVID discriminatory impact adjustment approached significance (F(1, 100) = 3.27, p = .074, partial η^2 = .032), suggesting a trend where female participants (M = 6.18, SD = 2.82) reported slightly higher perceptions of discriminatory impact than male participants (M = 4.92, SD = 2.10), though this effect did not reach conventional significance levels. The results suggest that gender plays a role in specific aspects of college adjustment and perceived social support during COVID-19. Female participants demonstrated greater attachment and social adaptation, while male participants reported greater perceived social support during COVID-19 (Table 3: Multivariate Test).

Table 3: Multivariate Test

Effect		F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Gender	Pillai's Trace	2.987[b]	14.000	87.000	<.001	.325
	Wilks' Lambda	2.987[b]	14.000	87.000	<.001	.325
	Hotelling's Trace	2.987[b]	14.000	87.000	<.001	.325
	Roy's Largest Root	2.987[b]	14.000	87.000	<.001	.325

Table 4: Gender's Effect on College Adjustment

	Gender	M	SD	F	df	p	Partial η^2
Academic Adjustment	Male	2.95	0.54	0.77	1,100	0.78	0.001
	Female	2.99	0.94				
Personal/Emotional Adjustment	Male	4.99	120	1.91	1,100	0.17	0.019
	Female	5.52	1.34				
Attachment	Male	5.50	0.73	6.57	1,100	0.012	0.062

	Female	6.10	0.75				
Social Adjustment	Male	5.12	1.10	5.89	1,100	0.017	0.056
	Female	5.97	1.08				
SACQ	Male	4.64	0.63	6.33	1,100	0.13	0.59
	Female	5.14	0.65				
PSS	Male	2.18	0.54	0.13	1,100	0.724	0.001
	Female	2.13	0.54				
Positive Reappraisal	Male	0.92	0.52	0.00	1,100	0.99	0.00
	Female	0.92	0.73				
Escape Avoidance	Male	1.22	0.54	0.302	1,100	0.584	0.003
	Female	1.32	0.72				
Planful Problem Solving	Male	1.21	0.55	0.007	1,100	0.933	0.00
	Female	1.23	0.58				
Ways of Coping	Male	1.12	0.73	0.091	1,100	0.764	0.001
	Female	1.16	0.38				
CVOID Emotionality	Male	11.05	3.76	1.237	1,100	0.269	0.012
	Female	9.73	3.52				
COVID Adaptive Adjustment	Male	15.04	4.36	0.223	1,100	0.638	0.002
	Female	14.03	5.73				
COVID Social Support	Male	16.3	2.76	5.434	1,100	0.022	0.052
	Female	14.2	2.69				
COVID Academic Adjustment	Male	16.3	5.59	0.02	1,100	0.887	0.00
	Female	16.09	6.82				
COVID Discriminatory Impact Adjustment	Male	4.92	2.10	3.266	1,100	0.074	0.032
	Female	6.18	2.82				
COVID Regulation Reaction	Male	20.82	3.01	0.201	1,100	0.655	0.002
	Female	20.36	4.68				
COVID 19 Questionnaire	Male	14.09	1.80	0.98	1,100	0.32	0.10
	Female	13.50	2.23				

DISCUSSIONS & IMPLICATIONS

The current study investigated the impact of gender on college adaptation, coping strategies, perceived stress, and adjustment during the COVID-19 pandemic. Compared to the T-test, which can only detect the difference between groups of a single dependent variable, MANOVA can analyze multiple dependent variables at the same time and consider the relationship between these variables. Therefore, even if individual variables do not reach a significant level in the T-test, MANOVA may still find a significant difference in the overall pattern. In addition, MANOVA improves the statistical efficiency of analysis by reducing the Type I error (false positive rate) caused by multiple comparisons, making the study more robust and comprehensive. Gender had a significant effect on the overall pattern (Pillai's Trace =.325, $p < .001$, $\eta^2 = .325$), indicating systematic differences between men and women in college adjustment, coping strategies, perceived stress, and COVID-19-related adjustment. However, univariate T-test results show that not all dependent variables differ significantly between genders. For example, gender differences were significant in the sectoral dimensions of COVID-19 adaptation, such as social support and emotional regulation, but not in academic adjustment or avoidance-avoidance coping strategies. This phenomenon reflects the fact that the T-test focuses primarily on the independent effects of a single variable, while MANOVA focuses on the overall trend of how gender forms a consistent pattern of influence across multiple related variables. Therefore, even if some variables are not statistically significant when tested

separately, MANOVA can still reveal gender differences in overall psychological adaptation and coping styles, making the research results more holistic and explanatory.

Overall, the results indicate that gender significantly influences the psychological and academic experiences of students during crises. Female students demonstrate a greater degree of social and attachment adaptation, but they also report higher stress and a greater reliance on maladaptive coping skills. Conversely, male students perceived a greater degree of social support during the COVID-19 pandemic. Social Adjustment refers to the ability to interact with others on campus and Social Support refers to an individual's perceived sense of support. Prior research has found that female students tend to value interpersonal relationships and emotional connections [9,16], which aligns with their higher social adjustment scores in this study. However, their higher stress levels and lower perceived social support indicate that these networks may not always serve as effective buffers against stress. In contrast, male students perceived greater social support, which may suggest a qualitative difference in how males and females utilize social networks. It is possible that male students rely on smaller, but more stable sources of social support, such as close friends circle, familial connections, or structured peer groups [19]. Another possible explanation is that men may be less likely to acknowledge social struggles or stressors in self-reported measures due to traditional gender norms that discourage emotional vulnerability [12].

Moreover, the current study aligns with prior research showing that female students experience significantly higher levels of perceived stress than male students [8, 9, 11]. More importantly, females exhibited a greater tendency to use escape-avoidance coping strategies, reinforcing the idea that they may internalize stress rather than engaging in active problem-solving [20]. The reliance on escape-avoidance coping is particularly concerning because this strategy has been linked to increased risks of anxiety, depression, and burnout [16]. It suggests that while female students may be highly engaged in their social environments, they may also feel overwhelmed by the demands of academic and social life, particularly in the context of a crisis. The results indicate universities should not only encourage female students to seek social support but also ensure that they have access to effective stress-management and resilience-building programs. The study also found that females perceived a greater discriminatory impact related to COVID-19 than males, although this effect did not reach conventional significance. Still, this finding aligns with previous research suggesting that women, particularly in times of crisis, may be more vulnerable to societal stressors, including discrimination and systemic inequalities [3]. The perception of discriminatory impact could be attributed to gender-based disparities in access to resources, healthcare, and academic support, or it may reflect broader societal patterns where women are more likely to report and recognize discrimination [6]. Even though this effect was marginally significant, it highlights an important equity issue in higher education. Universities should assess whether their pandemic response efforts were equitably distributed and consider whether certain student populations, such as female students or other marginalized groups, faced additional barriers to academic success during a global crisis.

Implications

Current results support the Transactional Model of Stress and Coping [20]. According to current findings, female students may perceive academic and social challenges as more overwhelming, pushing them to find more emotion-focused coping strategies. On the other hand, male students

may lean toward problem-solving approaches and draw strength from structured social support networks. These patterns align with Social Role Theory [29], which emphasizes how societal expectations and socialization shape the ways men and women respond to stress. It is possible that females reported higher emotional stress and avoidance behaviors due to traditional gender expectations that emphasize emotional sensitivity and relational engagement among women. Universities should implement mental health programs that specifically target gender differences in stress and coping. For example, female students may benefit from group-based workshops focused on cognitive restructuring and problem-solving skills to reduce reliance on escape-avoidance coping.

Lastly, current findings align with previous research suggesting that women, particularly in times of crisis, may be more vulnerable to societal stressors, including discrimination and systemic inequalities [3]. The perception of discriminatory impact could be attributed to gender-based disparities in access to resources, healthcare, and academic support, or it may reflect broader societal patterns where women are more likely to report and recognize discrimination [6]. Even though this effect was marginally significant, it highlights an important equity issue in higher education settings.

LIMITATIONS AND FUTURE STUDIES

It should be noted that this study is subject to several limitations that may compromise the generalizability of its findings. First, although secondary data analysis offers numerous benefits, it also presents limitations, particularly related to sampling methodology. While the data used in the present study involved stratification and random selection, the original dataset was based on a convenience sample. Additionally, due to changes in the scope of the original study, some demographic characteristics, such as race, ethnicity [23], and household income [30]—are not fully representative of college students nationwide. As a result, the study did not examine the influence of confounding variables, and findings may not be generalizable across different racial and ethnic groups. This is a particularly important limitation given the impact of racism and misinformation surrounding COVID-19. Notably, over 50% of the sample was identified as Asian or Pacific Islander. Second, this study focused on binary gender (male/female) differences in adjustment-related factors during COVID-19. Consequently, students who were identified outside of the binary—such as non-binary individuals—were excluded from analysis. Although two participants selected “Other” as their gender identity, their data was not included. This exclusion reflects a broader limitation in the field, as few reliable, validated instruments currently exist with normed data for non-binary populations. This limitation is particularly important given that individuals who identify outside the gender binary often face unique forms of marginalization and stress related to their identity and expression.

Finally, it is important to acknowledge that this study was conducted during an exceptional and rapidly evolving global crisis. At the time of data collection, the COVID-19 pandemic was an unprecedented public health emergency, marked by shifting guidelines and widespread uncertainty. While the immediate health threats have largely diminished, the psychosocial effects of prolonged stress, adaptation, and coping strategies developed during that period may have enduring implications for students’ mental health and academic experiences. Understanding how students navigated these challenges offers critical insight into the long-term effects of crisis-induced stress on resilience and institutional support. IHEs were

URL: http://dx.doi.org/10.14738/assrj.1207.19031

positioned to adapt to students' needs while adhering to public health and safety guidelines. These findings can help guide the development of future preparedness strategies and interventions to support student well-being during various crises and transitions.

Future Research

As the research community continues to learn about the psychosocial impact of COVID-19 on the lives of students, mindful consideration should be given to exploring gaps in existing research, including the present study. Future studies should aim to capture a sample that is representative of the college student population in the United States. Moreover, future statistical methods should include analyses that consider confounding factors. Furthermore, on the topic of representation, future research focusing on gender differences in stress, coping, and adjustment should aim to include the experiences of individuals who identify as LGBTQ+. Being mindful of intersecting disparities that might impact students who identify as non-cisgender individuals, and inclusive assessments for all can allow for more robust and culturally-sensitive assessments for studies in the future. As was mentioned above, few publishers were able to provide valid and reliable results for assessments conducted with this subset of the population because the data has not been normalized beyond male and female gender. While the use of qualitative data would support an understanding of non-binary youth's experiences, the lack of validated measures will continue to pose a barrier in the quantitative realm until this is further explored. As such, future research should begin with the validation of existing measures and further development of novel scales to accurately and competently capture the experiences of students who do not identify within the gender binary. Additionally, the cross-sectional design of this study prevents conclusions about causal relationships between gender, stress, coping, and adaptation. A longitudinal approach would enable researchers to examine how gender differences in stress and adaptation change after critical life transitions, especially as many college students experienced significant life transitions during the progression and eventual decline of COVID-19, such as enrolling in college or graduating. Future studies should also explore the long-term effects of the global crisis on students' overall resilience and coping mechanisms.

Overall, the current study provides evidence that gender plays a significant role in shaping college students' experiences of stress, adaptation, and coping during global crises. The findings suggest that female students exhibit greater social and attachment adaptation but also report higher stress and greater reliance on avoidance coping strategies, whereas male students perceive greater social support during crises. These differences have important implications for higher education policies and mental health interventions, highlighting the need for gender-sensitive approaches to supporting students' well-being and academic success.

Funding Statement: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Acknowledgement: This project was based on Denise Prieto's dissertation study mentored by Yi Ding.

Conflict of Interest: The authors declare that they have no conflicts of interest.

Compliance with Ethical Standards: This study closely followed all ethical standards established by the Institutional Review Board (protocol #1517).

Data Statement: The data supporting the findings of this study are available on request from the corresponding author.

Contributor Roles Taxonomy: Denise N. Prieto conducted the research as her dissertation study. Yi Ding provided mentorship, supervision, and contributed to the formation of the original dissertation and the revision process. Su-Je Cho and Tamique Ridgard served as the dissertation readers when Denise N. Prieto worked on her dissertation study. Anqi Zhang assisted in formatting and editing the manuscript and played a key role in its finalization.

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APPENDIX A

COVID Questionnaire

Please answer the questions below based on the following:

1 = strongly disagree 2 = disagree 3 = neither agree nor disagree 4 = agree 5 = strongly agree

1. Since the Coronavirus outbreak, I have experienced the following emotions:
    - Anxiety
    - Depression
    - Tension
    - Anger
    - Fear
    - Sadness
    - Concern
2. Since the Coronavirus outbreak, I am fearful that I will be infected.
3. I feel like the Coronavirus is far from me.
4. I feel judged wearing a face mask in public.
5. I feel supported by my parents.
6. I feel supported by my friends
7. I feel supported by my professors and university
8. I am concerned about staying on top of my academics
9. I have a virtual-learning supportive atmosphere at home (e.g., computer, WIFI, quiet space).
10. I am aware of Asians' experience with discrimination due to the coronavirus.

Below are some descriptions of my personal situation:

11. I think it's a good idea to be well protected.
12. I want to be well protected.
13. I can be well protected.
14. I know how to protect myself.
15. I have complete control over my protection.
16. I advise others to take precautions.

Below are some descriptions of my personal situation:

17. The coronavirus pandemic is stressful to me.
18. The coronavirus pandemic made it difficult for me to relax.
19. The coronavirus pandemic made me feel like I was consuming a lot of energy.
20. The coronavirus pandemic made it difficult for me to calm down.
21. I think the regulations imposed as a result of the Coronavirus are an overreaction (e.g., school closures, restaurant and bar closures, lockdowns)
22. Since the Coronavirus outbreak, I have felt stressed while shopping for supplies (e.g., Food, sanitation, daily use) in grocery shops or other shops.
23. I am satisfied with the communication from my program/university regarding the Coronavirus pandemic.
24. I procrastinate more now than ever before.
25. I am worried about the discrimination Asians are facing due to coronavirus.
26. My family expressed concern about me staying where I was during the coronavirus Pandemic.
27. I feel relieved that schools are closed and classes have moved online.
28. I do not agree with strategies related to preventing the spread of the Coronavirus (e.g., face masks only need to be worn by people who are sick, not touching my face, social distancing).

29. My plans have been disrupted (e.g., Fieldwork, research, academic, professional). I am worried about taking classes and studying online.
30. I am worried about my financial situation as a result of regulations imposed due to the Coronavirus.
31. It was confusing for me to hear the CDC's statement that wearing a face mask would not protect me from the coronavirus.
32. I feel upset when reading or hearing negative comments about China and Chinese people on the coronavirus
33. I feel worried about the shortage of supplies (face masks, cleaning supplies, toilet paper, nonperishable foods) in stores.
34. My friends have said offensive things about Chinese/Asian people because of the Coronavirus.
35. I am worried that my family will get sick with the Coronavirus (e.g., siblings, parents, grandparents).
36. I am frustrated that some people are not paying attention to the dangers of the Coronavirus.