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Investigating The Relationship Between Loneliness and Stress in College Students

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Investigating The Relationship Between Loneliness and Stress in College Students

by

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ABSTRACT

Loneliness in college students has been identified as a contributing factor to worsened mental health leading to greater rates of symptoms of depression, anxiety, stress, and others. The COVID-19 pandemic increased the severity of loneliness due to social isolation, however the relationship between loneliness and stress may have changed now in a post-COVID-19 world. This study hypothesized that loneliness does contribute to greater rates of stress in college students and that demographic factors such as gender, race/ethnicity, and first-generation student status influence that interaction. A survey was conducted at the University of Central Florida and acquired 47 total complete responses. Data gathered from the survey aligned with the hypotheses except for data pointing towards identifying as White behaving as an influencing factor rather than identifying as a racial/ethnic minority. Findings from the survey may be used to better reach vulnerable populations as well as information on how to better allocate institution resources.

ACKNOWLEDGEMENTS

Special thanks to Dr. Fernando Rivera and Dr. Angela Vergara for being amazing mentors.

Thank you to all my friends and family who assisted me in the completion of this project.

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LIST OF ACRONYMS AND ABBREVIATIONS

PSS: Perceived Stress Scale

MSPSS: Multidimensional Scale of Perceived Social Support

IRB: Institutional Review Board

STEM: Science, Technology, Engineering, and Math

ANOVA: Analysis of Variance

INTRODUCTION AND LITERATURE REVIEW

College students are a population of individuals that are under levels of stress due to rapidly changing life circumstances and other pressures such as academic, familial, and social. Greater rates of stress in college students have been observed for quite some time and there is a large body of work investigating possible causes and correlates for the significant increase in stress compared to the general population. One study found that there was a 34.5% prevalence of stress in a large random sample of college students (Ramon-Arubes et al, 2020). Suggesting that prevalence in the general population is approximately at those levels, showing that investigating the factors and mediators of stress in college students is a very pressing matter, which is the focus of this study. Some obvious causes for stress in college students are academic and professional stress as students are under the burden of both higher-level coursework and being a new member in the workforce. The current direction of literature in this field is to discover relationships between stress and other negative mental health symptoms, as well as to look for potential demographic identifiers that may increase the risk of experiencing any of these negative symptoms. For example, a sample of female Chinese college students exhibited significantly greater levels of anxiety compared to their male peers (Gao, 2020). Another similar study done found that the students who exhibited the greatest levels of stress are those who were transfers, upperclassmen, or those living off campus (Beiter, 2015). Both of the aforementioned studies provide some evidence that there are other possible contributing factors to stress that are linked to demographics. Other studies have also identified identifying as a first-generation college student is also correlated with negative mental health symptoms including anxiety and stress (Rockwell, 2023). It has also been seen that the 2020 COVID-19 pandemic worsened these levels of stress due to forced social isolation (Giovenco et al, 2022). Another study done investigating the effect of the COVID-19 pandemic found that students across the board experienced worsened mental health due to stress that had been exacerbated by the pandemic (Barbayannis, 2022). It is interesting to investigate the effect loneliness still has on stress now that it is four years removed from the height of the pandemic.

Previous studies have established a relationship between loneliness and other negative mental health symptoms such as anxiety and depression, with a 2019 finding evidence for loneliness behaving as a mediator for both in a population of college students (Moeller 2019). With evidence supporting loneliness as a mediator for depression and anxiety in a college population it would be fair to expect a similar relationship between loneliness and stress. One study did find a significant positive relationship between loneliness and neuroticism in college students (Li, 2023). With neuroticism being very closely related to stress the notion that the two variables are correlated is only strengthened. Another study done investigating such relationship also found

evidence that race plays a factor in the relationship between loneliness and psychological distress (Yung, 2023).

Based on the literature that was reviewed for this study it was clear that college students are both at risk for greater levels of stress and loneliness. As well as that loneliness and factors such as race and gender may possibly correlate with greater levels of stress. There exists a need for a study to investigate whether stress and loneliness along have a relationship, as well as what possible factors effect this relationship. This study will attempt to fill that gap in the literature through surveying students at the University of Central Florida. The survey that will be used incorporates verified measures that have been used in other similar studies. The main objective of this study is to find evidence supporting the hypothesis that there does indeed exist a relationship between loneliness and stress in the sample of college students, with loneliness behaving as an independent variable and stress the dependent variable. Other hypotheses for this study include that gender, race, and first-generation college student status will be identified as factors that have a significant effect on the relationship between the variables of interest.

METHODOLOGY

The participants for this study were recruited via an email sent out to students belonging to the sociology department of a university in Florida. Criteria to participate in the study is that respondents were 18 years of age or older and an active student enrolled at the university to which the sociology department belonged to. The email sent to potential participants included a link to an online survey conducted through Qualtrics, which is an online survey tool. The survey sent out contained 29 questions. Included in the survey was an IRB approved document to explain the nature of the study to be able to obtain informed consent from the participants. The survey then collected demographic information that would be utilized as variables in analysis such as gender, race, and whether the respondents were first-generation college students or not. The survey then utilized two survey instruments to quantify loneliness and stress in the population. To quantify loneliness the MSPSS (Multidimensional Scale of Perceived Social Support) was used. The MSPSS is a 12-item tool that gathers data on the how much support the respondent feels, the tool provides 1 total score of perceived loneliness and 3 sub-scores that describe how much perceived support comes from either a significant other, family, or friends (Zimet et al, 2010). For the variable of stress, the PSS (Perceived Stress Scale) was used. The PSS is a 10-item tool that asks a wide range of questions to provide a comprehensive score on perceived stress experienced in the past month (Cohen et al, 1983). Both tools included instructions on how to properly code the questions and what numerical value to provide to responses for analysis of the data.

The responses on the MSPSS were given values ranging from 1-5, with scores for each scale being the averages of the total score from questions indicated by the instructions on use of the instrument. The total score was simply the average score of all questions. Scores for each scale will range from 1-5. Higher scores on the MSPSS indicate greater perceived social support or lower perceived loneliness. The responses on the PSS were given values ranging from 1-5, with the total score of the instrument being the sum of the value of all questions. Scores range from 10-50. Higher scores on the PSS indicate greater levels of perceived stress.

Table 1; Survey Tool Score Frequencies

	Stress	Total Loneliness	Significant other sub score	Family sub score	Friend sub score
Mean	29.34	4.14	4.40	3.84	4.19
Median	29.00	4.25	4.75	4.00	4.25
Std. Deviation	6.69	0.84	0.72	0.90	0.84

A total of 52 responses were collected, 47 of which were fully completed. Gender was coded as either male, female, or non-binary/other; with there being 19 male respondents and 28 female respondents. There was one response from an individual that identified as non-binary/other, but they were excluded from analysis to prevent skews in the data. In the survey race/ethnicity was as coded as White/non-Hispanic, Black/ African American, Native American/Indigenous Alaskan, Asian, Hawaiian/Pacific Islander, White/Hispanic, Mixed race, or Other. In analysis race/ethnicity was coded as White or Non-White to account for small sample size. First-generation college student status was coded as either yes or no. In analysis all of these responses were given a numerical value ranging from 1-2.

Table 2; Demographic Frequencies

Gender	n	Race/Ethnicity	n	First-generation student	n
Male	19	White/non-Hispanic	22	Yes	16
Female	28	Black/African American	3	No	31
		Native American/Indigenous Alaskan	0		
		Asian	3		
		White/Hispanic	13		
		Mixed race	4		
		Other	2		

The main goal of the study is to establish a correlative relationship between the independent variable of loneliness and the dependent variable of stress. Supplementary goals of the study are to identify influencing factors on the relationship between the independent and dependent variables, possible factors are gender identify, racial/ethnic identity, and status as a first-generation college student. To analyze the data IBM SPSS software was used. To identify relationships between variables and factors linear regression tests were performed along with ANOVA tests. To identify the nature of the relationship between the variables a Pearson's r-test was performed. Finally, a Chi-squared test was performed to test the effect of demographic differences on the data. All tests performed utilized a p-value of .05.

RESULTS

To confirm the existence of a relationship between the independent variable of loneliness, which was measured through the MSPSS, and the dependent variable of stress, which was measured through the PSS, an analysis of variance (ANOVA) test was performed. The test showed that the measured variables exhibit a significant relationship with a p-value of 0.013 and a F-value of 6.635. The values yielded from the test provides evidence supporting the hypothesis that loneliness has a significant effect on stress as measured through the scales utilized in this study. We then sought to understand the nature of the relationship between the measured variables.

Table 3; Loneliness and Stress Linear Regression ANOVA

Model	Sum of Squares	df	Mean Square	F	Significance p>0.05
Regression	264.51	1	264.510	6.635	0.013

Dependent Variable: Stress Predictors: (Constant) Loneliness

To understand the nature of the relationship between the measured variables a Pearson's r-test was performed. The Pearson's r-test revealed that the correlation between the scores of the scales is a statistically significant negative one with a value of -.358 as seen in Table 4, meaning that as the score of one scale increases the score of the other scale will decrease and vice versa. As stated earlier a higher score on the MSPSS indicates greater perceived support or less loneliness, while a higher score on the PSS indicates higher perceived stress. Therefore, a negative correlation indicates that the lonelier an individual feels, the greater their stress will be, provided further evidence for the hypothesis made at the beginning of the study.

Table 4; Pearson r-test

	Loneliness	Significant Other	Family	Friends
Pearson Correlation	-0.358	-0.358	-0.118	-0.305
Significance (2-tailed)	0.013	0.013	0.428	0.037
N	47	47	47	47

Dependent Variable: Stress

To analyze the relationship between the variables Pearson's r-tests were also performed between the dependent variable of stress and each of the subscales of the independent variable of loneliness. The MSPSS creates three subscales of perceived support from a significant other, family, or friends. The tests showed that perceived support from a significant other and friends have a significant correlation with the dependent variable with both having a negative

relationship as expected, with correlation values of -0.358 and -0.305 respectively. Table 4 also shows that perceived support from family does not have a significant correlation with stress, despite its negative relationship with a correlation value of -0.118, as its p-value is 0.428. The results acquired from the performed tests provides further insight into how perception of support and loneliness from different sources can have greater effects on stress and potentially other negative mental health symptoms.

Once the relationship between the main variables of interest was confirmed and its nature further investigated, further ANOVA were performed to investigate whether gender, race/ethnicity, or first-generation college student status behaved as influencing factors. Table 5 shows the results from the ANOVA performed between the variables of stress and loneliness with identifying as White as a predictor. Yielded results show that identifying as White is a significant predictor between the relationship of the measured variables with a p-value of 0.001 and an F-value of 15.96.

Table 5; Regression accounting for identifying as White ANOVA

Model	Sum of Squares	df	Mean Square	F	Significance p> 0.05
Regression	347.01	1	347.01	15.96	0.001

Dependent Variable: Stress Predictors: (Constant) Loneliness

Table 6; Regression accounting for identifying as non-White ANOVA

Model	Sum of Squares	df	Mean Square	F	Significance p> 0.05
Regression	23.88	1	23.88	0.44	0.514

Dependent Variable: Stress Predictors: (Constant) Loneliness

Table 6 shows the results of the ANOVA performed on the main variables with identifying as non-White as a predictor. The results from the test show that belonging to a racial/ethnic minority is not a significant predictor on the relationship between the main variables of the study with a p-value of 0.514 and an F-value of 0.44. Results from both ANOVA do show that race as a whole does have a significant effect on the relationship between the measured variables.

Table 7; Regression accounting for identifying as Male ANOVA

Model	Sum of Squares	df	Mean Square	F	Significance p> 0.05
Regression	46.02	1	46.02	1.61	0.22

Dependent Variable: Stress Predictors: (Constant) Loneliness

Table 8; Regression accounting for identifying as female ANOVA

Model	Sum of Squares	df	Mean Square	F	Significance p> 0.05
Regression	272.23	1	272.23	6.71	0.016

Dependent Variable: Stress Predictors: (Constant) Loneliness

Similar ANOVAs were performed on the other predicted factors with Table 7 and Table 8 providing the data on the ANOVA performed on the effect of either identifying as Male or Female. Table 7 shows the data from the ANOVA performed with Male as a predictor, the data acquired shows that its effect is not significant with a p-value of 0.22 and an F-value of 1.61. Table 8 shows that the test performed with identifying as Female as a predictor did yield evidence for a significant effect. The test had a p-value of 0.016 and an F-value of 6.71. Evidence yielded from both ANOVA show that gender does behave as a significant factor on the observed relationship between loneliness and stress.

Table 9; Regression accounting for first-generation student status ANOVA

Model	Sum of Squares	df	Mean Square	F	Significance p> 0.05
Regression	559.94	1	559.94	16.21	0.001

Dependent Variable: Stress Predictors: (Constant) Loneliness

Table 10; Regression accounting for non-first-generation student status ANOVA

Model	Sum of Squares	df	Mean Square	F	Significance p> 0.05
Regression	1.47	1	1.47	0.042	0.839

Dependent Variable: Stress Predictors: (Constant) Loneliness

Tables 9 and 10 show the results acquired from the ANOVAs performed accounting for first-generation status as a predictor. Results in Table 9 show that being a first-generation college student does have a significant effect on the relationship between variables with a p-value of 0.001 and an F-value of 161.21. Table 10 shows that not being a first-generation student does not a significant effect on the relationship between variables with a p-value of 0.839 and an F-value of 0.042. Results from these ANOVA show that status as a first-generation college student does have a significant effect on the relationship between the dependent and independent variables.

A Chi-Square test was performed between the variables of first-generation status and race/ethnicity to ensure that uneven frequencies between those two groups would not have a significant effect on the data resulted in skewed numbers. Table 11 shows the data acquired from the test performed and shows that different frequencies between the two populations does not have a significant effect on the data with a one-sided p-value of 0.503. The counts table shows that there are equal frequencies of white first-generation students and non-white first-generation

students and vice-versa helping provide support for the validity of the results acquired from previous tests.

Table 11; Chi-Square Counts

First-generation student?	White/non-Hispanic	Minority	Total
Yes	7	9	16
No	15	16	31
Total	22	25	47

Table 12; Chi-Square Tests

Model	Value	df	Asymptotic Significance (2-sided)	Exact Significance (2-sided)	Exact Significance (1-sided)
Pearson Chi-Square	0.091	1	0.763	-	-
Continuity Correction	0.00	1	1.00	-	-
Likelihood Ratio	0.091	1	0.763	-	-
Fisher's Exact Test	-	-	-	1.00	0.503

DISCUSSION

The main objective of this study was to establish that perceived loneliness does have a significant effect on perceived stress in the sampled population of college students from the University of Central Florida. The data acquired provided evidence supporting the hypothesis that students with greater perceived loneliness will have greater perceived stress. The statistical tests that were performed utilizing the values acquired from the MSPSS and the PSS provide evidence for the existence of relationship between the two variables and provides context to the nature of the relationship. The Pearson r-test performed provided evidence that loneliness and stress have a direct positive relationship, or one in which the lonelier a student perceives themselves to be, it is likely that they will also exhibit greater perceived stress. This finding is in line with the existing body of literature which correlates loneliness with other negative mental health symptoms such as anxiety and depression (Giovenco et al 2022) (Hefner & Eisenberg 2009). Results from this study also provide evidence for the notion that perceived loneliness' role in perceived stress is not solely a result of the forced social isolation from the 2020 COVID-19 pandemic as this study was performed after the height of the pandemic.

I also aimed to better understand the effect that gender, race/ethnic, and first-generation student status has on the relationship between the variables. The data acquired from the tests that were run provided evidence that all three demographic variables influence the relationship, with White, Female, and first-generation student being the statuses that had a significant effect on the relationship. The finding that Females would be more susceptible to greater stress or loneliness agrees with other studies that have similar results such as the 2020 study performed by Gao, W. The finding that first-generation college students are also at higher risk is in line with current literature with studies providing evidence that first-generation students are at higher risk for conditions such as depression (Rockwell & Kimel 2023). The finding that White students are those at higher risk is one that is very interesting as it does not align with other studies done accounting for race, with many having evidence pointing toward the contrary (Cundiff et al, 2022). Interestingly enough, while the size of the population that participated in this study is rather small the demographic proportions of the sample is line with that of the university as a whole, for example the percentage of female respondents in this study is 59.6% and the percentage of students that are female at the University of Central Florida is 55% as seen on their public website. A similar trend can be seen with the racial demographics with 27.7% of respondents identifying as Hispanic and 29.2% of students at the university reporting as Hispanic. While the small sample size of the study does limit how generalizable the claims made in this study are, the representative proportions does provide support for them.

To further understand the conflicting finding that White respondents are more at risk for stress and loneliness I sought to find other potential factors that may affect the variables of interest. I found that socioeconomic status plays a very significant role in that relationship (Baum et al, 1999). While this was not accounted for it may provide a potential explanation if accounted for in future studies. Other potential explanations may result from the difference in appraisal and interpretation of stress and loneliness as a result of belonging to a collectivist or individualistic culture. Most individualistic cultures are European in origin as well as most collectivistic cultures being non-European in origin, there are studies that have found evidence that those belonging to individualistic cultures view stress as something outside the locus of their control which may result in a more negative experience of that stress (Barreto et al, 20220). To better understand this finding further studies should be done accounting for other potential factors.

Implications from this study are that while college students as a whole are at greater risk for stress and loneliness due to their unique set of circumstances as seen from the many studies referenced in the introduction, there are students whose identity puts them at a risk even greater than their peers. This study suggests that our White Female first-generation peers may need greater support in their times of need. While it is important to provide resources for all students of an institution it may be beneficial to target those who are most at risk to improve their experience of their academic careers. While this study provides evidence that there are identifiers for those who may be more at risk, it is important that circumstances are different for all individuals and that those who are not part of the at-risk communities should be ignored or minimalized. It also important to think of why greater perceived loneliness may lead to greater stress. The most obvious potential explanation is that those who lack a support system may have more difficulty with coping with difficult circumstances (Moeller & Seehuus, 2019). While this may be the most common explanation it is important again to understand that individuals' circumstances are drastically different from each other and are subject to the randomness of life.

Findings from this study may be used to help inform university leaders about how to better allocate mental health resources in order to target the most vulnerable populations more effectively. Findings may also be used to help educate students themselves on which of their peers may need more support in difficult times, as well as help those who belong to vulnerable populations to be more conscious of their own feelings and needs.

The limitations of this study include the small sample size that limits the external validity of the study. Another limitation is sampling bias from only contacting students belonging to the department of sociology, as there may be differences between students if they belong to a STEM or non-STEM background. Further sampling bias exists from only surveying students from one single university in the southern United States as regional differences may lead to different results. It is also important to account for how different institutions may have different cultures and

resources available to students which may also play a significant role in how students perceive stress and loneliness.

Future directions include reaching out to a larger more diverse population from the university where the study was conducted, as well as contacting students from other universities both within the state of Florida and outside the state ideally in different regions of the country. Further studies accounting for other possible factors may also yield interesting results, examples include employment status, international students, religion, age, socioeconomic status, and grade point average. Other studies into how institution resources are being allocated may also help reveal how to improve their use and where funding should be allocated to better serve students most at need.

SCALES

Demographics

1) Do you consent to participate in this survey?
   A) Yes
   B) No
2) Are you 18 years of age or older?
   A) Yes
   B) No
3) Are you a student at UCF?
   A) Yes
   B) No
4) Please indicate your gender identity.
   A) Male
   B) Female
   C) Non-binary/Other
5) Are you a first-generation college student?
   A) Yes
   B) No
6) Please indicate your racial or ethnic identity.
   A) White/non-Hispanic
   B) Black or African American
   C) American Indian or Alaska Native
   D) Asian
   E) Native Hawaiian or Pacific Islander
   F) White/Hispanic
   G) Other

Multidimensional Scale of Perceived Social Support (MSPSS)

Read each statement carefully. Indicate how you feel about each statement.

Circle the "1" if you **Strongly Disagree.**

Circle the "2" if you **Disagree.**

Circle the "3" if you **Neither Disagree or Agree.**

Circle the "4" if you **Agree.**

Circle the "5" if you **Strongly Agree.**

1. There is a special person who is around when I am in need.
2. There is a special person with whom I can share joys and sorrows.
3. My family really tries to help me.
4. I get the emotional help and support I need from my family.
5. I have a special person who is a real source of comfort to me.
6. My friends really try to help me.
7. I can count on my friends when things go wrong.
8. I can talk about my problems with my family.
9. I have friends with whom I can share my joys and sorrows.
10. There is a special person in my life who cares about my feelings.
11. My family is willing to help me make decisions.
12. I can talk about my problems with my friends.

To calculate mean scores:

Significant Other subscale: Sum across items 1,2,5, & 10, then divide by 4.

Family subscale: Sum across items 3, 4, 8, & 11, then divide by 4.

Friends subscale: Sum across items 6, 7, 9, & 12, then divide by 4.

Total scale: Sum across all 12 items, then divide by 12.

Perceived Stress Scale (PSS)

For each question choose from the following alternative:

1- Never
2- Almost never
3- Sometimes
4- Fairly often
5- Very often

1) In the last month, how often have you been upset because of something that happened unexpectedly?
2) In the last month, how often have you felt that you were unable to control the important things in your life?
3) In the last month, how often have you felt nervous and stressed?
4) In the last month, how often have you felt confident about your ability to handle your personal problems?
5) In the last month, how often have you felt that things were going your way?
6) In the last month, how often have you found that you could not cope with all the things that you had to do?
7) In the last month, how often have you been able to control irritations in your life?
8) In the last month, how often have you felt that you were on top of things?
9) In the last month, how often have you been angered because of things that happened that were outside of your control?
10) In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

You can determine your PSS score by following these directions:

First, reverse your scores for questions 4, 5, 7, and 8. On these questions, change the scores like this: 1=5, 2=4, 3=3, 4=2, 5=1

Now add up your scores for each item to get a total.

Institutional Review Board Approval Letter

UNIVERSITY OF CENTRAL FLORIDA

Institutional Review Board
FWA00000351
IRB00001138, IRB00012110
Office of Research
12201 Research Parkway
Orlando, FL 32826-3246

EXEMPTION DETERMINATION

March 14, 2024

Dear Fernando Rivera:

On 3/14/2024, the IRB determined the following submission to be human subjects research that is exempt from regulation:

Type of Review:	Initial Study
Title:	Investigating the Relationship Between Loneliness and Stress in College Students.
Investigator:	Fernando Rivera
IRB ID:	STUDY00006470
Funding:	None
Documents Reviewed:	• NEW-HRP-254 - FORM - Explanation of Research.pdf, Category: Consent Form; • NEW-HRP-255 - FORM - Request for Exemption.docx, Category: IRB Protocol; • Qualtrics Survey Outline.docx, Category: Survey / Questionnaire; • Recruitment Email.docx, Category: Recruitment Materials

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made, and there are questions about whether these changes affect the exempt status of the human research, please submit a modification request to the IRB. Guidance on submitting Modifications and Administrative Check-in is detailed in the Investigator Manual (HRP-103), which can be found by navigating to the IRB Library within the IRB system. When you have completed your research, please submit a Study Closure request so that IRB records will be accurate.

If you have any questions, please contact the UCF IRB at 407-823-2901 or irb@ucf.edu. Please include your project title and IRB number in all correspondence with this office.

Sincerely,

Shameika Daye
Designated Reviewer

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