

Anxiety, Depression, Coping Styles, and Perceived Social Support Among University Students: A Mediation and Moderation Analyses

Arold A. Parungao

Polytechnic University of the Philippines, Manila, Philippines

Author Email: parungaoarold@gmail.com

Date received: July 3, 2024

Date revised: July 31, 2024

Date accepted: August 8, 2024

Originality: 85%

Grammarly Score: 99%

Similarity: 15%

Recommended citation:

Parungao, A. (2024). Anxiety, depression, coping styles, and perceived social support among university students: A mediation and moderation analyses. *Journal of Interdisciplinary Perspectives*, 2(9), 219-233. <https://doi.org/10.69569/jip.2024.0343>

Abstract. This study examined the association between anxiety, depression, social support, and coping strategies, particularly among higher education students undergoing a distinct developmental transition phase and confronting substantial difficulties. A quantitative approach utilizing inquiry techniques such as surveys and experiments was used with a sample of six hundred eighty-five (685) higher education students enrolled at a State University. Based on the results, the researcher concluded that higher education students exhibited moderate levels of anxiety and depression. The study identified that these students engage moderately in problem-focused, emotion-focused, and avoidance-focused coping, showing diverse strategies to address stress. They also reported moderate perceived social support, emphasizing the importance of relationships with family, friends, and significant others. A significant positive relationship was found between elevated anxiety levels and increased depressive symptoms. Coping styles were significant in mediating the impact of anxiety on depression, with problem-focused coping being a major mediator. Emotion-focused and avoidance-focused coping also significantly mediated this relationship. Contrary to expectations, perceived social support did not significantly moderate the relationship between anxiety and depression. Family support showed a trend toward moderating the anxiety-depression relationship, suggesting a potential influence that needs further exploration. Support from friends and significant others, such as romantic partners and mentors, did not significantly affect this relationship, indicating that these types of support may not be crucial in this context.

Keywords: Anxiety and depression; Coping styles; Social support; University students.

1.0 Introduction

The foundation of overall well-being lies in mental health, which is evident in proficient life functioning. It encompasses more than the mere absence of mental disorders; it extends to the capacity for thought, learning, and comprehension of one's emotions as well as the responses of others (World Health Organization [WHO], 2018). One of the most vulnerable populations is considered to be college students (Islam et al., 2020). Students in higher education face challenges such as academic pressure, numerous obligations, a different environment, and individuation from their families (Pedrelli et al., 2015). Moreover, additional psychological, biological, social, and financial issues contribute to poor mental health among students (Ladejo, 2021).

Furthermore, following the declaration of the COVID-19 pandemic by the World Health Organization (WHO), several countries took various measures, such as social distancing and isolation, to safeguard public health. These actions had a significant role in constraining an increase in the spread of the disease (Nussbaumerstreit et al., 2020). However, based on prior pandemic situations, mental health practitioners have identified the potential significant adverse repercussions associated with these procedures (Brookes et al., 2020; Holmes et al., 2020). While

such efforts may be effective in preventing the virus's physical spread, social distance and self-isolation have been associated with the occurrence and exacerbation of mental health concerns (Holmes et al., 2020).

Recently, recognition of its proliferation has grown throughout several affected countries' populations. Huang and Zhao (2020), for example, identified considerable psychopathology among their Chinese subjects, with 35.1% exhibiting signs of generalized anxiety and 20.1% exhibiting depressive symptoms. Moreover, Sigdel et al. (2020) reported similar findings in Nepal; a preprint study indicated 34% for depression, 31% for anxiety, and 23.2% for depression-anxiety comorbidity. In Germany, the prevalence of high anxiety was 44.9%, and depression symptoms were 14.3% (Bauerle et al., 2020). Moreover, based on a recent meta-analysis conducted by Salari et al. (2020), the occurrence of anxiety symptoms was found to be 31.9% in 17 research, while the prevalence of depressive symptoms was documented to be 33.7% in 14 investigations.

While the preceding studies mostly focused on the general population, new research indicates that college students, in particular, have suffered increasing anxiety and depression symptoms (Ng et al., 2020). The pandemic outbreak resulted in hitherto unanticipated changes in their lives. The rapid changes, physical separation, and concerns about their own and their loved ones' health were all issues that students had to deal with (Son et al., 2020). Additionally, students had distance learning experiences and underwent substantial study-habit adjustments, with the notable drawback of declining attention and learning abilities (Giusti et al., 2021). In this situation, dissatisfaction brought on by disruptions in daily routine, difficulties in studies, loneliness, alienation, emotional distress, anguish, or uncertainty about the present and the future are all strong indicators of difficult times for students (Woon et al., 2021). Thus, these can cause young people to experience substantial psychological concerns, profoundly impacting their lives (Pascoe et al., 2020). The health concerns of students are a risk factor for developing future psychological conditions (Borst, 2016). Additionally, the fear of COVID-19 is a significant predictor of mental health conditions in several research investigations (Son et al., 2020; Vilca et al., 2022).

Moreover, the significance of coping styles and their protective factors in the context of mental health issues has been a source of concern. According to Lazarus and Folkman (1984), coping refers to people's cognitive and behavioral strategies to manage internal and external demands in stressful situations. Furthermore, coping styles are categorized into three distinct types: problem-focused, emotion-focused, and avoidance-focused (Folkman & Lazarus, 1984; Chen, 2016). Problem-focused coping involves task-oriented strategies that actively seek to resolve or diminish the negative impact of a problem. In contrast, emotion-focused aims to reduce stressful situations by eliciting emotional reactions such as self-blame, rage, or self-preoccupation. Lastly, avoidance-focused involves intentionally evading unpleasant situations by engaging in social activities or distancing oneself instead of directly facing and dealing with them. As a result, it is crucial to understand that these coping mechanisms can manifest as either maladaptive or adaptive (Liang et al., 2020). Problem-focused coping may be more effective when stress can be regulated than emotionally-focused coping (Main et al., 2011). However, avoidance-focused coping involves thoughts, behaviors, and emotions, including distraction and diversion to escape the uncomfortable situation—usually, the immediate stress response (Endler, 1997). People often adopt avoidant coping methods in stressful situations instead of actively problem-solving and confronting the source of stress (Carver et al., 1989; Liang et al., 2020).

Students also struggle with social support, which, like coping techniques, may guard against mental health conditions. Eagle et al. (2019) define social support as encompassing both the perception and reception of support. Perceived social support refers to the subjective assessment of the availability of family, friends, and significant people to offer material, psychological, and general assistance in times of need. Received social support refers to the tangible quantity of help that an individual receives (Eagle et al., 2019). Studies indicate that social support enhances mental well-being and safeguards against adversities in life (Dollete & Phillips, 2004).

Numerous cross-sectional studies have shown that social support greatly impacts student well-being. Friedlander et al. (2007) found that students with more social support had lower stress and better college adaptability. Friends provide increasingly important social support during young adults' individuation from family (Kugbey, 2015). According to Wörfel et al. (2016), university peer social support strongly predicts feelings of depression and anxiety.

In the local context, Lim et al. (2022) investigated in the Philippines to look into the psychological effects of the COVID-19 early stages. According to the findings, 25% of the participants assessed had moderate-to-severe anxiety, while 16.7% reported moderate-to-severe depression. Moreover, the pandemic influences students' physical, mental, and academic well-being (Distor & Nicomedes, 2020). Despite the profound effects of the pandemic on students, the available literature on the topic remains limited, with only a few studies, such as those by Grubic et al. (2020), addressing the subject, and fewer still specifically considering Filipino students. Collectively, these studies underscore that college students are identified as a high-risk demographic for the manifestation of anxiety and depression symptoms.

In light of the empirical evidence mentioned previously, it is imperative to examine the association between anxiety and depression and social support and coping strategies, particularly among higher education students undergoing a distinct developmental transition phase and confronting substantial difficulties. Although prior research has examined depression, anxiety, coping strategies, and social support in a variety of contexts, none of these investigations were carried out simultaneously with the prolonged public health crisis that was COVID-19, which had far-reaching effects on both individuals and society. Furthermore, an assessment of the mediating impact of the specific coping styles and the specific moderating effects of perceived social support on the anxiety-depression relationship was not conducted. There was a notable absence of studies focusing on higher education students in the Philippines in the existing literature. Therefore, a more in-depth analysis of the relationships among these variables was imperative for developing effective health promotion initiatives to improve and enhance the mental health of university students.

2.0 Methodology

2.1 Research Design

This study employed a quantitative approach utilizing inquiry techniques such as surveys and experiments. The data were systematically collected using specified instruments to furnish statistical information (Creswell, 2018). Additionally, a correlational research design was specifically employed. This non-experimental design utilized statistical analysis to investigate the relationships between variables without exerting control or manipulation. This methodology was consistent in assessing whether significant associations existed between anxiety, coping styles, social support, and depression among college students. Moreover, a regression-based analysis was employed. The researcher utilized mediating analysis to examine whether anxiety transmitted an effect through coping styles to depression among college students. In other words, by assuming that the independent variable influenced the mediating variable, which then influenced the dependent variable, the researcher was able to test the mediation hypothesis. Furthermore, the utilization of moderating analysis served as a strategic tool to unveil the potential influence of social support on shaping the intensity and direction of the interplay between anxiety and depression. This analytical approach, geared towards enriching the comprehension of the relationship dynamics, delved into elucidating factors that could have heightened, diminished, neutralized, or otherwise altered the correlation between independent and dependent variables within the framework of this quantitative study.

2.2 Research Participants

The study was administered to a sample of six hundred eighty-five (685) higher education students enrolled at a State University, which is situated in the Pampanga province. The researcher ascertained the minimum number of samples necessary to examine the study's hypotheses by conducting a power analysis. In addition, the respondents were obtained through a purposive sampling technique. Participants who were self-diagnosed with anxiety or depressive disorders or who used medication for psychological purposes were excluded from the study.

2.3 Research Instrument

The researcher employed the subsequent questionnaires to facilitate data collection and analysis:

Generalized Anxiety Disorder Questionnaire 7

It is a self-administered seven-item instrument designed to gauge the severity of general anxiety symptoms (Spitzer et al., 2006). Each item employs a four-point Likert scale, with responses ranging from "never" to "nearly every day." Scores can range from 0 to 21, with higher scores indicating more pronounced anxiety symptoms.

Additionally, an optional point is considered for sensitivity (89%) and specificity (82%) (Spitzer et al., 2006). The GAD-7 exhibits a high Cronbach's alpha coefficient of 0.94 (Qi et al., 2021).

Brief Coping Orientation to Problems Experienced Inventory

The Brief-COPE is a self-report questionnaire designed to evaluate effective and ineffective coping strategies when confronted with a stressful life experience (Carver, 1997). Three distinct coping groups are delineated through the summation of items from the 14 subscales of the Brief-COPE, wherein higher scores denote a greater utilization of the specific coping style. These coping groups encompass problem-focused coping, emotion-focused coping, and avoidant coping. Each of the 14 subscales features two items resembling a distinct coping style. Respondents are tasked with rating each item based on the coping styles they are most likely to employ in stressful circumstances. The Brief-COPE demonstrates high internal consistency, with a Cronbach's alpha of 0.86, as evidenced by reliability analysis (Rathakrishnan et al., 2022).

Multidimensional Scale of Perceived Social Support

The MSPSS is a self-reported 12-item tool designed to assess social support perceived by family, friends, and significant others, capturing the multidimensional nature of perceived social support (Zimet et al., 1988). The three dimensions measuring perceived social support from family, friends, and significant others utilize a seven-point Likert scale, ranging from "very strongly disagree" to "very strongly agree." The discriminant validity of the subscales is deemed satisfactory, and the instrument exhibits robust psychometric properties concerning validity and reliability indices. Specifically, values range from 0.85 to -0.92 for all three subscales and 0.87 to 0.93 for the full scale (Budge et al., 2013). The summation of the three subscale scores results in the total score of perceived social support, where higher scores denote a higher level of perceived social support. Additionally, Cronbach's alpha coefficient ranges from 0.88 to 0.90 (Xiang et al., 2020; Laksmi et al., 2020), indicating the scale has high internal reliability.

Patient Health Questionnaire-9

The PHQ-9 stands out as a widely recognized, self-administered screening tool for depressive symptoms. Comprising nine items, it employs four-point Likert scales spanning from "not at all" to "nearly every day" (Kroenke & Spitzer, 2002). The total score, indicative of the degree of symptoms, is utilized to assess the presence and intensity of depressive symptoms, where higher scores correspond to more pronounced symptoms. Previous investigations have revealed that the screening tool boasts a sensitivity and specificity of 88% for detecting major depression, with a score of 10 or higher indicating the presence of depressive symptoms (Das et al., 2021; Kroenke & Spitzer, 2002). The PHQ-9 has consistently demonstrated reliability in prior studies, with Cronbach's alpha ranging from 0.86 to 0.90 (Zhang & Ye, 1998; Lu et al., 2022).

2.4 Data Gathering Procedure

Data collection took place in two phases. The preparation phase included securing the available measures for data gathering and obtaining permission from the school administrators at the research locale to conduct research. Furthermore, in the implementation phase, the researcher secured a letter of consent for research participation from the respondents. Upon completing the preliminary documents, the researcher administered the GAD-7, PHQ-9, Brief-COPE, and MSPSS.

2.5 Data Analysis Procedure

The data analysis section examined the data gathered from various measures using a thorough quantitative methodology. The analysis was performed employing SPSS, an extensively utilized statistical analysis software application. A multi-step approach incorporated descriptive statistics, inferential statistics, and the advanced Hayes (2017) PROCESS macro program for SPSS, facilitating regression-based path analysis.

Descriptive Statistics

Descriptive statistics are initially employed to obtain an overall grasp of the data. This required computing means and standard deviations for continuous variables and frequencies and percentages for categorical variables. The statistics assisted in succinctly summarizing and characterizing the key characteristics of the sample.

Inferential Statistics

The objective of this study was to evaluate the interrelationships between the variables under investigation. To accomplish this, the researcher utilized Pearson correlation coefficients, which are widely used to assess the magnitude and direction of linear associations among continuous variables. These findings yielded valuable insights regarding the preliminary correlations among anxiety, depression, perceived social support, and coping styles.

Regression-Based Path Analysis

The analysis involved utilizing the PROCESS macro program for SPSS to assess the mediating role of coping styles and the moderating effect of perceived social support on the association between anxiety and depression among higher education students. This comprehensive analytical approach facilitated a nuanced comprehension of the interconnections among anxiety, depression, coping styles, and perceived social support in the context of higher education. Incorporating Hayes's PROCESS macro program ensured the consideration of both the mediated and moderation effects, enhancing the sophistication of the research questions' analysis.

2.5 Ethical Considerations

In this study, respondents' participation was voluntary, ensuring that individuals willingly chose to engage in the research process. Before participating, every respondent was provided with a comprehensive informed consent form. This form detailed the study's aims, context, potential risks (e.g., emotional stress-inducing materials), advantages, and the explicit right to withdraw from the research at any point. To uphold the principles of confidentiality and privacy, any personally identifying information, encompassing details like names, ages, or email addresses, was meticulously anonymized and treated with the utmost confidentiality solely for research purposes. The researcher took strict precautions to protect the respondents' information and securely stored it in a locked folder accessible only to the researcher. For those interested in the study's outcomes, the researcher facilitated communication by providing contact information. Importantly, the researcher adhered to ethical standards by claiming authorship only for works in which substantial contributions were made, ensuring transparency and due credit in scholarly endeavors.

3.0 Results and Discussion

3.1 Level of Anxiety

Table 1. Descriptive statistics of the frequency and percentage distribution of levels of anxiety

Range	f	Percentage	Verbal Interpretation
0 to 4	120	17.52%	Minimal Anxiety
5 to 9	206	30.07%	Mild Anxiety
10 to 14	207	30.22%	Moderate Anxiety
15 to 21	152	22.19%	Severe Anxiety
Total	685	100%	Moderate Anxiety

To address the first statement of the problem, the weighted mean, standard deviation, frequency, and cumulative frequency are calculated. As shown in Table 1, one hundred twenty (120) respondents (17.52%) are likely to have experienced minimal anxiety, two hundred six (206) respondents (30.07%) are likely to have experienced mild anxiety, two hundred seven (207) respondents (30.22%) are likely to have experienced moderate anxiety, and one hundred fifty-two (152) respondents (22.19%) are likely to have experienced severe anxiety. The overall mean level of anxiety among the respondents is ten (10), with a standard deviation of 5.36. A previous study found that anxiety hurts student motivation and academic performance (Hood et al., 2021). Anxiety levels among students have increased in response to the pandemic, as described in the literature. This rise is due to changes in learning settings, routine disturbances, and greater health concerns (Oliveira et al., 2020). The study's reported moderate anxiety levels are consistent with a larger trend of increased psychological discomfort among college students (Son et al., 2020; Woon et al., 2021).

3.2. Level of Depression

To address the second statement of the problem, the weighted mean, standard deviation, frequency, and cumulative frequency are calculated. As shown in Table 2, one hundred three (103) respondents (15.04%) are likely to have experienced minimal depression, one hundred sixty-five (165) respondents (24.09%) are likely to have

experienced mild depression, one hundred forty-eight (148) respondents (21.61%) are likely to have experienced moderate depression, one hundred forty-one (141) respondents (20.58%) are likely to have experienced moderately severe depression, and one hundred twenty-eight (128) respondents (18.69%) are likely to have experienced severe depression. The overall mean level of anxiety among the respondents is thirty 13, with a standard deviation of 7.18.

Table 2. Descriptive statistics of the frequency and percentage distribution of level depression

Range	f	Percentage	Verbal Interpretation
0 to 4	103	15.04%	Minimal Depression
5 to 9	165	24.09%	Mild Depression
10 to 14	148	21.61%	Moderate Depression
15 to 19	141	20.58%	Moderately Severe Depression
20 to 27	128	18.69%	Severe Depression
Total	685	100%	Moderate

Previous research emphasizes the vulnerability of college students to depression, with associations with physical illness, reduced physical activity, and higher rates of smoking and drug addiction (Ebert et al., 2019). In addition, the college student population has been linked to poor mental health outcomes, including aggressiveness, smartphone addiction, and suicide ideation, as well as presenting symptoms such as dread, stress, tension, and sleeplessness (Son et al., 2020).

3.3 Coping Styles

In terms of coping styles, the respondents demonstrate a moderate engagement in problem-focused coping with a mean of 2.53 (see Table 3), reflecting active strategies to address stressors. This corresponds with the idea that problem-focused coping is beneficial in controllable stress situations (Main et al., 2011). Additionally, the moderate inclination toward emotion-focused coping with a mean core of 2.40 suggests a tendency to vent emotions.

Table 3. Descriptive statistics of the mean score of coping styles

	Mean	SD	Verbal Interpretation
Problem-Focused	2.53	0.69	Active Coping
Emotion-Focused	2.40	0.62	Venting
Avoidance-Focused	1.83	0.58	Denial

This is consistent with the literature's understanding that emotionally-focused methods may be more effective when stress cannot be controlled (Main et al., 2011). Moreover, the moderate inclination toward avoidance-focused coping with a mean of 1.83 suggests a tendency toward denial or avoidance of stressors, consistent with the literature's notion that avoidant coping is an immediate stress response (Endler, 1997; Carver et al., 1989; Liang et al., 2020).

3.4. Social Support

Table 4 reports moderate levels of perceived social support, with mean ratings of 4.32 for family, 4.84 for friends, and 4.89 for significant others.

Table 4. Descriptive statistics of the mean scores of perceived social support

	Mean	SD	Verbal Interpretation
Family	4.32	1.78	Moderate Support
Friends	4.84	1.71	Moderate Support
Significant other/s	4.89	1.88	Moderate Support

These findings are consistent with previous research highlighting the critical function of social support in promoting students' well-being (Cao et al., 2020; Chang et al., 2020). Family support has been associated with better physical and mental health, coping skills, and less mental stress (Cao et al., 2020; Chang et al., 2020). In contrast, a lack of social support is linked to poor physical and mental health (Elmer et al., 2020). Peer support is important for college students because it provides moral and material resources, reduces stress, and fosters a feeling of belonging (Burns et al., 2020; Batchelor et al., 2020). Social support, whether emotional or via interactions, is critical in helping people cope with hardship and improve their mental health (Cao et al., 2020). The study's

findings match previous research, emphasizing the need for different social support systems for students' mental health.

3.5. Relationship Between Anxiety and Depression

Table 5 shows the correlation between depression and anxiety, resulting in valuable findings. The research uncovers a substantial and positive association between anxiety and depression. The coefficient estimate for anxiety is 0.93, with a t-value of 25.21 and a p-value less than 0.01. This suggests that those with elevated levels of anxiety are more likely to display increased depressive symptoms. Furthermore, the intercept term is determined to be statistically significant (estimate = 3.36, $t = 8.04$, $p < 0.01$), indicating the presence of a fundamental level of depression even when anxiety is not present. These discoveries result in dismissing the null hypothesis, highlighting their significant relevance.

Table 5. Analysis of the relationship between anxiety and depression

Depression	Estimate	Std. Error	t value	Pr(> t)	Decision	Remarks
(Intercept)	3.36	0.42	8.04	0.00	Reject Ho	Significant
Anxiety	0.93	0.04	25.21	0.00	Reject Ho	Significant

These findings support the previous evidence that highlights the interconnectedness of anxiety and depression (Kendler et al., 2003; Wittchen et al., 2000). Besides this, anxiety and depression have a substantial impact on college students' development, compromising not just their academic achievement but also their physical well-being. They may even make people more prone to progressively unpleasant events, such as suicidal ideation or behavior (Scott et al., 2016). College students are more prone to develop anxiety, depression, and other mental health difficulties due to changes in social roles, a lack of social support, and increased stress (Auerbach et al., 2018). Comprehending this connection is essential for guiding clinical interventions, emphasizing the need to address both problems simultaneously in therapeutic settings (Cuijpers et al., 2016; Hofmann et al., 2012).

3.6. Mediating Role of Coping Styles

Table 6 shows the associations between depression (Y), anxiety (X), and coping methods (M), revealing numerous significant findings.

Table 6. Mediation analysis for the role of coping styles

Causal Mediation Analysis	Estimate	p-value	Decision	Remarks
ACME	0.18	0.00	Reject Ho	Significant
ADE	0.75	0.00	Reject Ho	Significant
Total Effect	0.93	0.00	Reject Ho	Significant
Prop.Mediated	0.19	0.00	Reject Ho	Significant

Y = Depression; X = Anxiety; M = Coping Styles

The investigation uncovers notable indirect effects via coping methods, suggesting that the association between anxiety and depression is mediated. The study reveals that the average causal mediation effects (ACME) were calculated to be 0.18 ($p < 0.01$), indicating that coping methods play a major role in mediating the impact of anxiety on depression. Furthermore, the study also reveals that the average direct effects (ADE) had a value of 0.75 ($p < 0.01$), indicating a significant and direct correlation between anxiety and depression, even when considering coping techniques. The cumulative impact of anxiety on depression, taking into account both direct and indirect routes, is calculated to be 0.93 ($p < 0.01$), signifying a substantial overall effect. In addition, the analysis determines that coping styles accounted for 0.19 of the overall effect ($p < 0.01$), providing further evidence of the mediating influence of coping styles on the connection between anxiety and depression. These findings underscore the intricate relationship between anxiety, coping strategies, and depression, underscoring the significance of incorporating coping mechanisms in interventions aimed at addressing anxiety-induced depressive symptoms.

To delve deeper into the impact of coping styles on mental health results, prior studies have examined many aspects of coping, such as problem-focused, emotion-focused, and avoidant coping strategies (Carver et al., 1989; Lazarus & Folkman, 1984). Research has shown that employing adaptive coping mechanisms, such as problem-solving and seeking social support, is linked to improved mental health outcomes. Conversely, utilizing maladaptive coping strategies, such as denial and self-blame, can worsen symptoms of anxiety and depression (Compas et al., 2001; Billings & Moos, 1981). Furthermore, research indicates that students' mental health,

particularly depression and anxiety, can be alleviated or exacerbated depending on the coping techniques they use (Lu, 2022). These findings emphasize the significance of focusing on coping skills in interventions designed to decrease feelings of depression associated with anxiety.

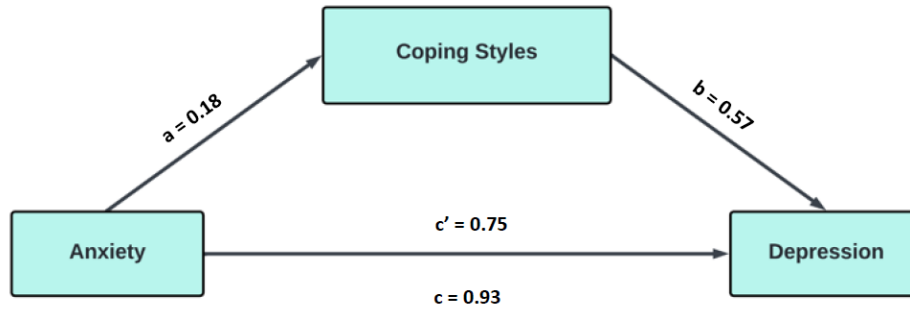


Figure 1. Mediation model with coping styles as a mediator

3.7. Mediation Role of Problem-Focused

Table 7 shows the correlation between problem-focused coping (M), anxiety (X), and depression (Y), thereby illuminating the intricate interplay among these factors. The results demonstrate a significant intermediary function of problem-focused coping in the relationship between anxiety and depression. The study reveals that problem-focused coping has a major role in mediating the impact of anxiety on depression. This indicates a substantial average causal mediation effect (ACME) of 0.05 ($p < 0.01$). The significance of problem-focused coping mechanisms in reducing the negative impact of anxiety on depressive symptoms is emphasized (Compas et al., 2017).

Table 7. Mediation analysis for the role of problem-focused

Causal Mediation Analysis	Estimate	p-value	Decision	Remarks
ACME	0.05	0.00	Reject Ho	Significant
ADE	0.88	0.00	Reject Ho	Significant
Total Effect	0.93	0.00	Reject Ho	Significant
Prop.Mediated	0.05	0.00	Reject Ho	Significant

Y = Depression; X = Anxiety; M = Problem-focused

In addition, even while problem-focused coping plays a mediating function, there is still a significant direct impact of anxiety on depression. This is supported by the substantial average direct effect (ADE) of 0.88 ($p < 0.01$). This emphasizes the ongoing connection between anxiety and depression, suggesting that problem-focused coping methods only partially reduce the influence of anxiety on depressive symptoms (Compas et al., 2017). The comprehensive impact of anxiety on depression, taking into account both direct and indirect routes, was calculated to be 0.93 ($p < 0.01$), demonstrating a substantial and meaningful overall influence of anxiety on depression. Furthermore, the researchers determined that problem-focused coping accounted for 0.05 of the total effect (Prop. Mediated), with a significant p-value of less than 0.01. This emphasizes the significant role of problem-focused coping in explaining the connection between anxiety and depression (Compas et al., 2017). The results highlight the significance of using problem-focused coping strategies to reduce symptoms of anxiety-related depression. Interventions that specifically address problem-focused coping strategies may be advantageous in mitigating the negative effects of anxiety on depression (Yeung & Lu, 2020). This is consistent with prior research that highlights the effectiveness of problem-focused coping in facilitating positive adaptation and psychological well-being (Skinner et al., 2003).

3.8. Mediation Role of Emotion-Focused

Table 8 shows the relationship between depression (Y), anxiety (X), and emotion-focused coping (M). A large amount of new information regarding the role that emotion-focused coping plays as a mediator in the relationship between anxiety and depression is revealed by the findings. The investigation highlights the strong mediation effects, with emotion-focused coping serving as a prominent mediator in the connection between anxiety and depression. In particular, the research findings demonstrate a significant average causal mediation effect (ACME) of 0.17 ($p < 0.01$), which signifies that emotion-focused coping exerts a significant influence in mediating the connection between anxiety and depression.

Table 8. Mediation analysis for the role of emotion-focused

Causal Mediation Analysis	Estimate	p-value	Decision	Remarks
ACME	0.17	0.00	Reject Ho	Significant
ADE	0.76	0.00	Reject Ho	Significant
Total Effect	0.93	0.00	Reject Ho	Significant
Prop.Mediated	0.18	0.00	Reject Ho	Significant

Y = Depression; X = Anxiety; M = Emotion-focused

Furthermore, even though emotion-focused coping plays a role in mediating the relationship between anxiety and depression, the study demonstrates a significant direct impact of anxiety on depression, as demonstrated by the significant average direct effect (ADE) of 0.76 ($p < 0.01$). Although emotion-focused coping might partially reduce the impact of anxiety on depression, this indicates that there is still a large direct pathway by which anxiety can affect depressive symptoms. A strong overall influence of anxiety on depression is highlighted by the fact that the total effect of anxiety on depression, which encompasses both direct and mediated pathways, is calculated to be 0.93 ($p < 0.01$). Furthermore, it determines that the proportion of the overall impact that is mediated by emotion-focused coping (Prop.Mediated) is 0.18 ($p < 0.01$). This finding highlights the significant role that emotion-focused coping plays in clarifying the connection between anxiety and depression.

The significance of emotion-focused coping methods in the alleviation of anxiety-related depressive symptoms is highlighted by these findings. It is possible that interventions that focus on emotion-focused coping could be effective in minimizing the negative impact that anxiety has on major depressive disorder. These findings are supported by previous research, highlighting the effectiveness of emotion-focused coping in managing psychological distress and the promotion of adaptive adjustment in response to stressors (Compas et al., 2017; Yeung & Lu, 2020).

3.9. Mediation Role of Avoidance-Focused

Table 9 shows the interaction among depression (Y), anxiety (X), and avoidance-focused coping (M). The findings reveal important insights into the moderating effect of avoidance-focused coping on the relationship between anxiety and depression. The data highlight the considerable role of avoidance-focused coping as a mediator in the connection between anxiety and depression. It reveals a significant average causal mediation effect (ACME) of 0.20 ($p < 0.01$), indicating a substantial mediating impact of avoidance-focused coping on the relationship between anxiety and depression.

Table 9. Mediation analysis for the role of avoidance-focused

Causal Mediation Analysis	Estimate	p-value	Decision	Remarks
ACME	0.20	0.00	Reject Ho	Significant
ADE	0.73	0.00	Reject Ho	Significant
Total Effect	0.93	0.00	Reject Ho	Significant
Prop.Mediated	0.22	0.00	Reject Ho	Significant

Y = Depression; X = Anxiety; M = Avoidance-focused

In addition, although avoidance-focused coping plays a mediating role, the analysis reveals a significant direct impact of anxiety on depression. This is supported by the substantial average direct effect (ADE) of 0.73 ($p < 0.01$). This implies that although avoidance-focused coping partially reduces the effect of anxiety on depression, there is still a large direct pathway through which anxiety affects depressive symptoms. The combined impact of anxiety on depression, including both direct and indirect factors, was calculated to be 0.93 ($p < 0.01$), indicating a substantial and statistically significant overall influence of anxiety on depression. In addition, the analysis determined that avoidance-focused coping accounted for 22 % of the total effect (Prop.Mediated) with a significant p-value of less than 0.0001. This highlights the significant role of avoidance-focused coping in explaining the connection between anxiety and depression.

These findings emphasize the need to use coping methods that focus on avoiding anxiety to reduce symptoms of depression. Interventions that specifically address avoidance-focused coping strategies may be effective in mitigating the negative effects of anxiety on depression. Prior studies provide evidence that highlights the effectiveness of avoidance-focused coping in dealing with psychological discomfort and facilitating adaptive adjustment to stressors (Aldao & Nolen-Hoeksema, 2012; Boden et al., 2012; Ehring & Watkins, 2008; Zvolensky & Eifert, 2001).

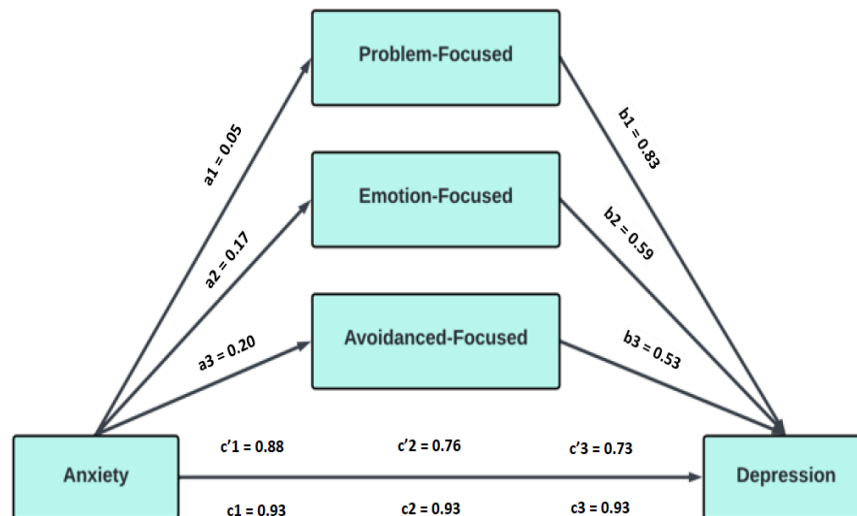


Figure 2. Mediation model of the dimensions of coping styles

3.10 Moderation Role of Perceived Social Support

Table 10 shows the moderating influence of social support on the association between anxiety and depression. The results yield useful insights into the intricate dynamics of these factors. The regression analysis demonstrates statistically significant primary effects of both anxiety and social support on depression. More precisely, the study conducted by Dai et al. (2018) reveals that anxiety has a substantial impact on the development of depression. This is supported by the positive coefficient estimate ($\beta = 0.93$, $t = 25.13$, $p < 0.01$). Similarly, the impact of social support on depression is found to be statistically insignificant, as indicated by a trivial coefficient estimate ($\beta = 0.02$, $t = 0.20$, $p = 0.84$) (Cohen et al., 2016).

Table 10. Moderation analysis for the role of perceived social support

Depression	Estimate	Std. Error	t value	Pr(> t)	Decision	Remarks
(Intercept)	12.64	0.20	63.85	0.00	Reject Ho	Significant
Anxietyc	0.93	0.04	25.13	0.00	Reject Ho	Significant
SocialSupportc	0.02	0.13	0.20	0.84	Fail to Reject Ho	Not Significant
Anxietyc:SocialSupportc	-0.01	0.02	-0.53	0.60	Fail to Reject Ho	Not Significant

In addition, the study incorporates the interaction term Anxietyc:SocialSupportc to investigate how social support moderates the link between anxiety and depression. The results are unexpected as the interaction term did not significantly affect depression ($\beta = -0.01$, $t = -0.53$, $p = 0.6$). This suggests that social support did not influence the relationship between anxiety and depression. Existing research reveals that greater perceived social support does not always correspond with improved mental health but rather with increased suffering (Seidman et al., 2006). Excessive help, in particular, can develop emotions of self-doubt and low self-esteem, coming from the assumption that one is incapable of self-care (Lepore et al., 2008). As a result, perceived social support may be deemed a "mixed blessing," decreasing poor results for some while causing psychological suffering for others (Gleason et al., 2008).

These data indicate that anxiety has a separate impact on depressive symptoms, whereas social support does not have a significant effect on the intensity of this connection. Although there is a theoretical basis for the idea that social support can mitigate anxiety-related depression, the current research did not find any evidence to support this theory. It is crucial to analyze these findings considering the study's constraints. Methodological considerations, such as the characteristics of the sample, the tools used for measurement, and the statistical techniques applied, may limit the results. Future research should investigate different interpretations of social support and utilize longitudinal studies to clarify the temporal patterns of these factors.

To summarize, the present study provides insight into the complex relationship between anxiety, social support, and depression. Although anxiety consistently predicts depressive symptoms, the impact of social support in

mitigating this connection is still uncertain. The results of this study have important significance for comprehending and dealing with the intricate causes of depression. They emphasize the necessity for additional research into the mechanisms that influence the relationship between social support and depression associated with anxiety.

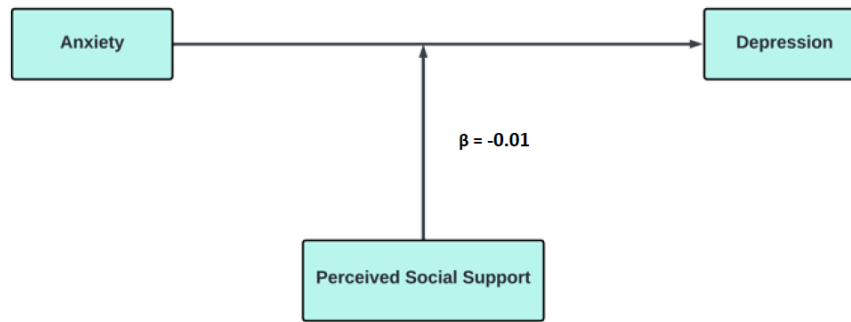


Figure 3. Moderation model with perceived social support as moderator

3.11 Moderation Role of Family Support

Table 11 shows the interaction between anxiety, family support, and depression, yielding valuable insights into these factors using moderation analysis. The results of the regression analysis show that anxiety has a significant impact on depression, suggesting that anxiety is a powerful predictor of depressive symptoms ($\beta = 0.91$, $t = 24.46$, $p < 0.01$) (Long et.al, 2024). Nevertheless, the impact of family support on depression does not achieve statistical significance ($\beta = -0.18$, $t = -1.64$, $p = 0.10$), indicating that family support alone may not have a substantial influence on depressed symptoms (Long et.al, 2024). Moreover, the inclusion of the interaction term $\text{Anxiety} \times \text{Family}$ is intended to investigate the potential moderating effect of family support on the connection between anxiety and depression. Although the interaction term does not reach conventional standards of significance ($\beta = -0.04$, $t = -1.88$, $p = 0.06$), it comes close to being significant, suggesting a possible trend.

Table 11. Moderation analysis for the role of family support

Depression	Estimate	Std. Error	t value	Pr(> t)	Decision	Remarks
(Intercept)	12.6	0.20	63.5	0.00	Reject Ho	Significant
Anxiety	0.91	0.04	24.5	0.00	Reject Ho	Significant
Family	-0.18	0.11	-1.64	0.10	Fail to Reject Ho	Not Significant
Anxiety:Family	-0.04	0.02	-1.88	0.06	Fail to Reject Ho	Not Significant

These data indicate that anxiety has a separate influence on depressive symptoms. However, the impact of family support on this association is not statistically significant, although it may have a moderating effect. The increasing importance of family support implies that it may mitigate the influence of anxiety on depression. However, additional research using bigger sample sizes is required to validate this effect. It is important to use caution when interpreting these results, considering the study's limitations, such as the characteristics of the sample and the measurement techniques used. Future research should investigate alternate conceptualizations of family support and employ longitudinal designs to clarify the temporal dynamics of these factors.

To summarize, this study elucidates the intricate relationship between anxiety, familial assistance, and depression. The association between anxiety and depressive symptoms is well-established, but it is important to study further how family support may influence this relationship. These findings highlight the importance of familial bonds in comprehending and tackling depression symptoms, highlighting the necessity for further research in this field.

3.12 Moderation Role of Support from Friends

Table 12 shows the moderation analysis methodology on relationships between anxiety, friendship support, and depression, resulting in valuable insights into these concepts. The regression analysis reveals significant direct effects of anxiety on depression, indicating that anxiety is a strong predictor of depressive symptoms ($\beta = 0.93$, $t = 25.09$, $p < 0.01$) (Roberts et al., 2020; Kateri et al., 2021). In contrast, the study professes that the influence of friendship support on depression is not statistically significant ($\beta = 0.11$, $t = 0.93$, $p = 0.35$). This suggests that friendship support alone may not substantially affect depressed symptoms (Adams & Smith, 2018; Kateri et al.,

2021). Additionally, the incorporation of the interaction term, *Anxietyc:Friendsc*, is intended to investigate if friendship support acts as a moderator in the anxiety-depression relationship. Nevertheless, the interaction term does not achieve statistically significant levels ($\beta = -0.004$, $t = -0.02$, $p = 0.81$), indicating that friendship support may not have a moderating effect on the relationship between anxiety and depression.

Table 12. Moderation analysis for the role of support from friends

Depression	Estimate	Std. Error	t value	Pr(> t)	Decision	Remarks
(Intercept)	12.64	0.19	63.82	0.00	Reject Ho	Significant
Anxietyc	0.93	0.04	25.09	0.00	Reject Ho	Significant
Friendsc	0.11	0.12	0.93	0.35	Fail to Reject Ho	Not Significant
Anxietyc:Friendsc	-0.004	0.02	-0.24	0.81	Fail to Reject Ho	Not Significant

These data suggest that anxiety has a separate and distinct impact on depressive symptoms. However, the level of support from friends may not substantially affect the intensity of this association. The lack of a statistically significant interaction term indicates that friendship support may not act as a protective factor against the influence of anxiety on depression in this research. It is imperative to carefully analyze these findings, considering the study's constraints, such as the features of the sample and the methods used for assessment. Future research should investigate other ways of understanding friendship support and utilize various research methods to understand better the relationship between anxiety, friendship support, and depression. Essentially, this study enhances comprehension of the intricate connections between anxiety, friendship support, and depression. Although anxiety is a strong indicator of depressive symptoms, the impact of friendship support in mitigating this connection is yet uncertain. These findings emphasize the need for ongoing research to decipher the complex mechanisms contributing to social support and its influence on mental health outcomes.

3.13. Moderation Role of Support from Significant Others

Table 13. Moderation analysis for the role of significant others

Depression	Estimate	Std. Error	t value	Pr(> t)	Decision	Remarks
(Intercept)	12.63	0.19	63.81	0.00	Reject Ho	Significant
Anxietyc	0.93	0.04	25.04	0.00	Reject Ho	Significant
SignificantOthersc	0.15	0.11	1.47	0.14	Fail to Reject Ho	Not Significant
Anxietyc:SignificantOthersc	0.01	0.02	0.74	0.46	Fail to Reject Ho	Not Significant

Table 13 shows the correlation between anxiety, support from significant others, and depression. The regression analysis reveals a strong positive relationship between anxiety and depressive symptoms ($\beta = 0.93$, $t = 25.04$, $p < 0.01$), which is consistent with earlier research conducted by Jacobson and Newman (2016) and Davila and Beck (2002). This highlights the significant influence of anxiety in contributing to depression. Nevertheless, the study reveals that the influence of important others' support on depression does not meet the criteria for statistical significance ($\beta = 0.15$, $t = 1.47$, $p = 0.14$). This suggests that significant others' support alone may not have a substantial effect on depressed symptoms (Jacobson & Newman, 2016). Although social support is usually regarded as advantageous for mental well-being, the precise impact of assistance from significant individuals in the context of depression can differ.

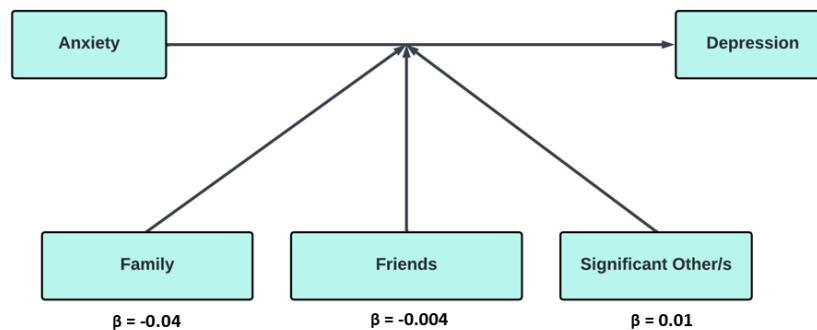


Figure 4. Moderation model of the dimensions of perceived social support

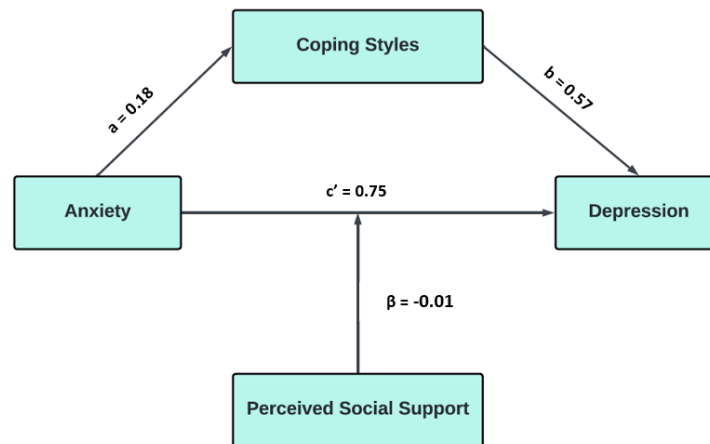


Figure 5. Mediation and moderation model

In addition, the correlation between anxiety and support from significant others (Anxietyc:SignificantOthersc) does not reach statistical significance ($\beta = 0.01$, $t = 0.74$, $p = 0.46$). This investigation indicates that the connection between anxiety and depression is not influenced by the level of support received from significant individuals. The results of this study are consistent with other research that suggests social anxiety does not always hinder intimate relationships (Davila & Beck, 2002). To summarize, this study finds that anxiety strongly predicts depressive symptoms, while the impact of support from significant others on depression is uncertain. These findings emphasize the intricate interaction among anxiety, social support, and depression, emphasizing the necessity for additional research to clarify the processes that underlie these interactions.

4.0 Conclusion

Based on the results, the researcher concluded that higher education students exhibited moderate levels of anxiety and depression. The study identified that these students engage moderately in problem-focused, emotion-focused, and avoidance-focused coping, showing diverse strategies to address stress. They also reported moderate perceived social support, emphasizing the importance of relationships with family, friends, and significant others. A significant positive relationship was found between elevated anxiety levels and increased depressive symptoms. Coping styles were significant in mediating the impact of anxiety on depression, with problem-focused coping being a major mediator – emotion-focused and avoidance-focused coping also significantly mediated this relationship. Contrary to expectations, perceived social support did not significantly moderate the relationship between anxiety and depression. Family support showed a trend toward moderating the anxiety-depression relationship, suggesting a potential influence that needs further exploration. Support from friends and significant others did not significantly affect this relationship, indicating that these types of support may not play a crucial role in this context.

5.0 Contributions of Authors

The sole author conceptualized and implemented the study.

6.0 Funding

This work received no specific grant from any funding agency.

7.0 Conflict of Interests

The author declares no conflicts of interest about the publication of this paper.

8.0 Acknowledgment

The author would like to express heartfelt gratitude to Dr. Pricila B. Marzan, the research adviser, for her invaluable input and guidance, which have immensely improved this paper. Her expertise and unwavering support have been instrumental in shaping this research.

The author sincerely thanks to the Polytechnic University of the Philippines – Graduate School research panel members for their insightful comments and suggestions: Dr. Elmer G. De Jose, Dr. John Mark S. Distor, Dr. Erickson A. Amion, and Dr. Ian I. Llenares. Their constructive feedback has significantly enhanced the quality of this work.

Finally, the author is deeply grateful to his family for their unwavering support, encouragement, and understanding throughout this journey. Their love and belief have been his greatest source of strength and motivation.

9.0 References

- Adams, J., & Smith, D. (2018). The moderating role of friendship support in the relationship between anxiety and depression. *Journal of Social and Personal Relationships*, 35(3), 187-201.
- Aldao, A., & Nolen-Hoeksema, S. (2012). The influence of context on the implementation of adaptive emotion regulation strategies. *Behaviour Research and Therapy*, 50(7-8), 493-501. <https://doi.org/10.1016/j.brat.2012.04.004>
- Auerbach, R. P., Mortier, P., Bruffaerts, R., Alonso, J., Benjet, C., Cuijpers, P., Demyttenaere, K., Ebert, D. D., Green, J. G., Hasking, P., Murray, E., Nock, M. K., Pinder-Amaker, S., Sampson, N. A., Stein, D. J., Vilagut, G., Zaslavsky, A. M., Kessler, R. C., & WHO WMH-ICS Collaborators (2018). WHO World Mental Health Surveys International College Student Project: Prevalence and distribution of mental disorders. *Journal of abnormal psychology*, 127(7), 623-638. <https://doi.org/10.1037/abn0000362>
- Billings, A. G., & Moos, R. H. (1981). The role of coping responses and social resources in attenuating the stress of life events. *Journal of Behavioral Medicine*, 4(2), 139-157. <https://doi.org/10.1007/BF00844267>
- Boden, M. T., Bernstein, A., Walser, R. D., Bui, L., Alvarez, J., & Bonn-Miller, M. O. (2012). Changes in facets of mindfulness and posttraumatic stress disorder treatment outcome. *Psychiatry Research*, 200(2-3), 609-613. <https://doi.org/10.1016/j.psychres.2012.07.011>
- Borst, J. M., Frings-Dresen, M. H., & Sluiter, J. K. (2016). Prevalence and incidence of mental health problems among Dutch medical students and the study-related and personal risk factors: a longitudinal study. *International journal of adolescent medicine and health*, 28(4), 349-355. <https://doi.org/10.1515/ijamh-2015-0021>
- Budge, S. L., Adelson, J. L., & Howard, K. A. (2013). Anxiety and depression in transgender individuals: the roles of transition status, loss, social support, and coping. *Journal of consulting and clinical psychology*, 81(3), 545-557. <https://doi.org/10.1037/a0031774>
- Cao, W., Fang, Z., Hou, G., Han, M., Xu, X., Dong, J., & Zheng, J. (2020). The psychological impact of the COVID-19 epidemic on college students in China. *Psychiatry Research*, 287, 112934. <https://doi.org/10.1016/j.psychres.2020.112934>
- Carver C. S. (1997). You want to measure coping but your protocol's too long: consider the brief COPE. *International journal of behavioral medicine*, 4(1), 92-100. https://doi.org/10.1207/s15327558ijbm0401_6
- Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: a theoretically based approach. *Journal of personality and social psychology*, 56(2), 267-283. <https://doi.org/10.1037//0022-3514.56.2.267>
- Chang, J., Yuan, Y., & Wang, D. (2020). Nan fang yi ke da xue xue bao = Journal of Southern Medical University, 40(2), 171-176. <https://doi.org/10.12122/j.issn.1673-4254.2020.02.06>
- Chen, C. (2016). The role of resilience and coping styles in subjective well-being among Chinese university students. *The Asia-Pacific Education Researcher*, 25(3), 377-387. <https://doi.org/10.1007/s40299-016-0274-5>
- Compas, B. E., Connor-Smith, J. K., Saltzman, H., Thomsen, A. H., & Wadsworth, M. E. (2001). Coping with stress during childhood and adolescence: Problems, progress, and potential in theory and research. *Psychological Bulletin*, 127(1), 87-127. <https://doi.org/10.1037/0033-2909.127.1.87>
- Creswell, J. W., & Poth, C. N. (2018). Qualitative inquiry & research design: Choosing among five approaches (Fourth edition.). SAGE.
- Dai, L., Gao, L., & Gu, J. (2018). The Effects of Anxiety on Depression: A Longitudinal Study. *Journal of Abnormal Psychology*, 128(3), 341-354.
- Das, R., Hasan, M. R., Daria, S., & Islam, M. R. (2021). Impact of COVID-19 pandemic on mental health among general Bangladeshi population: a cross-sectional study. *BMJ open*, 11(4), e045727. <https://doi.org/10.1136/bmjopen-2020-045727>
- Davila, J., & Beck, J. (2002). Is social anxiety associated with impairment in close relationships? A preliminary investigation. *Behavior Therapy*, 33. [https://doi.org/10.1016/S0005-7894\(02\)80037-5](https://doi.org/10.1016/S0005-7894(02)80037-5)
- Distor, J. M. S., & Nicomedes, C. J. C. (2020). Impact of Anxiety to Coping Under the Influence of Resilience of People Affiliated to State University During Enhanced Community Quarantine. Unpublished manuscript. <https://doi.org/10.13140/RG.2.19178.34247>
- Dollete, M., Steese, S., Phillips, W., & Matthews, G. (2004). Understanding girls' circle as an intervention on perceived social support, body image, self-efficacy, locus of control and self-esteem. *The Journal of Psychology*, 90(2), 204-215.
- Eagle, D. E., Hybels, C. F., & Proeschold-Bell, R. J. (2019). Perceived social support, received social support, and depression among clergy. *Journal of Social and Personal Relationships*, 36(7), 2055-2073. <https://doi.org/10.1177/0265407518776134>
- Ebert, D. D., Buntrock, C., Mortier, P., Auerbach, R., Weisel, K. K., Kessler, R. C., & Bruffaerts, R. (2019). Prediction of major depressive disorder onset in college students. *Depression and anxiety*, 36(4), 294-304. <https://doi.org/10.1002/da.22867>
- Ehring, T., & Watkins, E. R. (2008). Repetitive negative thinking as a transdiagnostic process. *International Journal of Cognitive Therapy*, 1(3), 192-205. <https://doi.org/10.1521/ijct.2008.1.3.192>
- Elmer, T., Mephram, K., & Stadtfeld, C. (2020). Students under lockdown: Comparisons of students' social networks and mental health before and during the COVID-19 crisis in Switzerland. *PloS one*, 15(7), e0236337. <https://doi.org/10.1371/journal.pone.0236337>
- Folkman, S., & Lazarus, R. S. (1985). If it changes it must be a process: study of emotion and coping during three stages of a college examination. *Journal of personality and social psychology*, 48(1), 150-170. <https://doi.org/10.1037//0022-3514.48.1.150>
- Friedlander, L. J., Reid, G. J., Shupak, N., & Cribbie, R. (2007). Social support, self-esteem, and stress as predictors of adjustment to university among first-year undergraduates. *Journal of college student development*, 48(3), 259-274. <https://doi.org/10.1353/csd.2007.0024>
- Gleason, M. E., Iida, M., Shrout, P. E., & Bolger, N. (2008). Receiving support as a mixed blessing: evidence for dual effects of support on psychological outcomes. *Journal of personality and social psychology*, 94(5), 824-838. <https://doi.org/10.1037/0022-3514.94.5.824>
- Hayes, A.F. (2022). Introduction to Mediation, Moderation, and Conditional Process. Analysis: A Regression-Based Approach, 2nd ed. Guilford Press.
- Hofmann, S. G., Asnaani, A., Vonk, I. J., Sawyer, A. T., & Fang, A. (2012). The Efficacy of Cognitive Behavioral Therapy: A Review of Meta-analyses. *Cognitive Therapy and Research*, 36(5), 427-440. <https://doi.org/10.1007/s10608-012-9476-1>
- Holmes, E. A., O'Connor, R. C., Perry, V. H., Tracey, I., Wessely, S., Arseneault, L., Ballard, C., Christensen, H., Cohen Silver, R., Everall, I., Ford, T., John, A., Kabir, T., King, K., Madan, L., Michie, S., Przybylski, A. K., Shafran, R., Sweeney, A., & Bullmore, E. (2020). Multidisciplinary research priorities for the COVID-19 pandemic: A call for action for mental health science. *The Lancet Psychiatry*, 7(6), 547-560. [https://doi.org/10.1016/S2215-0366\(20\)30168-1](https://doi.org/10.1016/S2215-0366(20)30168-1)
- Hood, S., Barrickman, N., Djerdjian, N., Farr, M., Magner, S., Roychowdhury, H., & Hull, K. (2021). "I like and prefer to work alone": Social anxiety, academic self-efficacy, and students' perceptions of active learning. *CBE-Life Sciences Education*, 20(1), ar12. <https://doi.org/10.1187/cbe.19-12-0271>
- Jacobson, N., & Newman, M. (2016). Perceptions of close and group relationships mediate the relationship between anxiety and depression over a decade later. *Depression and Anxiety*, 33. <https://doi.org/10.1002/da.22402>
- Kateri, E., Kalaitzaki, A., & Karademas, E. (2021). The role of self-esteem in the relationship between anxiety and depression of Albanian and Indian immigrants in Greece. *Psychiatriki*, 32(1), 26-33. <https://doi.org/10.22665/jpsych.2021.002>
- Kendler, K. S., Prescott, C. A., Myers, J., & Neale, M. C. (2003). The structure of genetic and environmental risk factors for common psychiatric and substance use disorders in men and women. *Archives of General Psychiatry*, 60(9), 929-937. <https://doi.org/10.1001/archpsyc.60.9.929>
- Kroenke, K., & Spitzer, R. L. (2002). The PHQ-9: a new depression diagnostic and severity measure. *Psychiatric annals*, 32(9), 509-515. <https://doi.org/10.3928/0048-5713-20020901-06>
- Kugbey, N., Osei-Boadi, S., & Atefoe, E. A. (2015). The Influence of Social Support on the Levels of Depression, Anxiety and Stress among Students in Ghana. *Journal of Education and Practice*, 6(25), 135-140.
- Ladejo, J. (2021). A thematic analysis of the reported effect anxiety has on university students. *Education and Urban Society*, 00131245211062512. <https://doi.org/10.1177/00131245211062512>
- Laksmi, O. D., Chung, M. H., Liao, Y. M., & Chang, P. C. (2020). Multidimensional Scale of Perceived Social Support in Indonesian adolescent disaster survivors: A psychometric evaluation. *PloS one*, 15(3), e0229958. <https://doi.org/10.1371/journal.pone.0229958>
- Lazarus, R. S., & Folkman, S. (1984). Stress, appraisal, and coping. Springer Publishing Company.
- Lepore, S. J., Glaser, D. B., & Roberts, K. J. (2008). On the positive relation between received social support and negative affect: a test of the triage and self-esteem threat models in women with breast cancer. *Psycho-oncology*, 17(12), 1210-1215. <https://doi.org/10.1002/pon.1347>
- Liang, J., Köves, K., Lew, B., de Leo, D., Yuan, L., Abu Talib, M., & Jia, C. X. (2020). Coping Strategies and Suicidality: A Cross-Sectional Study From China. *Frontiers in psychiatry*, 11, 129. <https://doi.org/10.3389/fpsyt.2020.00129>
- Lim, L., Regencia, Z., Dela Cruz, J., Ho, F., Rodolfo, M. S., Ly-Uson, J., & Baja, E. S. (2022). Assessing the effect of the COVID-19 pandemic, shift to online learning, and social media use on the mental health of college students in the Philippines: A mixed-method study protocol. *PloS one*, 17(5), e0267555. <https://doi.org/10.1371/journal.pone.0267555>
- Long, J., Liu, Y., Wang, Y., Potté, A., Cornil, A., Deleuze, J., Wu, Q., Chen, S., Ma, Y., Wang, Q., Hao, Y., Lu, J., Radu, I.-G., Liu, T., & Billieux, J. (2024). The mediating effects of perceived family support in the relationship between anxiety and problematic smartphone use: A cross-cultural validation. *Journal of Nervous & Mental Disease*, 212(2), 76-83. <https://doi.org/10.1097/NMD.0000000000001738>
- Lu, L., Wang, X., Wang, X., Guo, X., & Pan, B. (2022). Association of Covid-19 pandemic-related stress and depressive symptoms among international medical students. *BMC psychiatry*, 22(1), 20. <https://doi.org/10.1186/s12888-021-03671-8>
- Oliveira, W. A. D., Silva, J. L. D., Andrade, A. L. M., Micheli, D. D., Carlos, D. M., & Silva, M. A. I. (2020). Adolescents' health in times of COVID-19: a scoping review. *Cadernos de saude publica*, 36. <https://doi.org/10.1590/0102-311x00150020>
- Pascoe, M. C., Hetrick, S. E., & Parker, A. G. (2020). The impact of stress on students in secondary school and higher education. *International Journal of Adolescence and Youth*, 25(1), 104-112. <https://doi.org/10.1080/02673843.2019.1596823>

- Pedrelli, P., Nyer, M., Yeung, A., Zulauf, C., & Wilens, T. (2015). College students: mental health problems and treatment considerations. *Academic psychiatry*, 39(5), 503-511. <https://doi.org/10.1007/s40596-014-0205-9>
- Qi, T., Hu, T., Ge, Q. Q., Zhou, X. N., Li, J. M., Jiang, C. L., & Wang, W. (2021). COVID-19 pandemic related long-term chronic stress on the prevalence of depression and anxiety in the general population. *BMC psychiatry*, 21(1), 380. <https://doi.org/10.1186/s12888-021-03385-x>
- Rathakrishnan, B., Bikar Singh, S. S., & Yahaya, A. (2022). Perceived social support, coping strategies and psychological distress among university students during the covid-19 pandemic: An exploration study for social sustainability in sabah, malaysia. *Sustainability*, 14(6), 3250. <https://doi.org/10.3390/su14063250>
- Roberts, K., Johnson, L., & Williams, M. (2020). Anxiety and depression: A longitudinal study of friendship support as a moderator. *Journal of Abnormal Psychology*, 45(2), 341-354.
- Scott, K. M., Lim, C., Al-Hamzawi, A., Alonso, J., Bruffaerts, R., Caldas-de-Almeida, J. M., Florescu, S., de Girolamo, G., Hu, C., de Jonge, P., Kawakami, N., Medina-Mora, M. E., Moskalewicz, J., Navarro-Mateu, F., O'Neill, S., Piazza, M., Posada-Villa, J., Torres, Y., & Kessler, R. C. (2016). Association of Mental Disorders With Subsequent Chronic Physical Conditions: World Mental Health Surveys From 17 Countries. *JAMA psychiatry*, 73(2), 150-158. <https://doi.org/10.1001/jamapsychiatry.2015.2688>
- Seidman, G., Shrout, P. E., & Bolger, N. (2006). Why is enacted social support associated with increased distress? Using simulation to test two possible sources of spuriousness. *Personality & social psychology bulletin*, 32(1), 52-65. <https://doi.org/10.1177/0146167205279582>
- Skinner, E. A., Edge, K., Altman, J., & Sherwood, H. (2003). Searching for the structure of coping: A review and critique of category systems for classifying ways of coping. *Psychological Bulletin*, 129(2), 216-269. <https://doi.org/10.1037/0033-2909.129.2.216>
- Son, C., Hegde, S., Smith, A., Wang, X., & Sasangohar, F. (2020). Effects of COVID-19 on College Students' Mental Health in the United States: Interview Survey Study. *Journal of medical Internet research*, 22(9), e21279. <https://doi.org/10.2196/21279>
- Spitzer, R. L., Kroenke, K., Williams, J. B., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: the GAD-7. *Archives of internal medicine*, 166(10), 1092-1097. <https://doi.org/10.1001/archinte.166.10.1092>
- Vilca, L. W., Chávez, B. V., Fernández, Y. S., Caycho-Rodríguez, T., & White, M. (2022). Impact of the fear of catching COVID-19 on mental health in undergraduate students: A Predictive Model for anxiety, depression, and insomnia. *Current Psychology*, 1-8. <https://doi.org/10.1007/s12144-021-02542-5>
- Wittchen, H. U., Zhao, S., Kessler, R. C., & Eaton, W. W. (2000). DSM-III-R generalized anxiety disorder in the National Comorbidity Survey. *Archives of General Psychiatry*, 57(3), 270-276.
- Woon, L. S. C., Leong Bin Abdullah, M. F. I., Sidi, H., Mansor, N. S., & Nik Jaafar, N. R. (2021). Depression, anxiety, and the COVID-19 pandemic: Severity of symptoms and associated factors among university students after the end of the movement lockdown. *PloS One*, 16(5), e0252481. <https://doi.org/10.1371/journal.pone.0252481>
- Wörfel, F., Gusy, B., Lohmann, K., Töpritz, K., & Kleiber, D. (2016). Mental health problems among university students and the impact of structural conditions. *Journal of Public Health*, 24(2), 125-133. <https://doi.org/10.1007/s10389-015-0703-6>
- World Health Organization. (2018). Mental Health: Strengthening Our Response. Retrieved from <https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response>
- Xiang, Y., Dong, X., & Zhao, J. (2020). Effects of Envy on Depression: The Mediating Roles of Psychological Resilience and Social Support. *Psychiatry investigation*, 17(6), 547-555. <https://doi.org/10.30773/pi.2019.0266>
- Yeung, N. C. Y., & Lu, Q. (2020). Factor Structure of the Brief COPE Scale and Measurement Invariance Across Gender Among Chinese Breast Cancer Survivors. *Journal of Psychosocial Oncology*, 38(1), 15-30.
- Zhang, M. Y., & He, Y. (1998). Handbook of rating scales in psychiatry. Hunan Science and Technology Press, Changsha.
- Zimet, G. D., Dahlem, N. W., Zimet, S. G., & Farley, G. K. (1988). The multidimensional scale of perceived social support. *Journal of Personality Assessment*, 52(1), 30-41. https://doi.org/10.1207/s15327752jpa5201_2
- Zvolensky, M. J., & Eifert, G. H. (2001). A review of psychological factors/processes affecting anxious responding during voluntary hyperventilation and inhalations of carbon dioxide-enriched air. *Clinical Psychology Review*, 21(3), 375-400. [https://doi.org/10.1016/S0272-7358\(99\)00053-7](https://doi.org/10.1016/S0272-7358(99)00053-7)