

**Examining the Moderating Effect of Social Support on the Relationship Between  
Academic Stress and Burnout among University Students after the Covid-19 Pandemic**

Alexa Schulze

s2533332

University of Twente

Faculty of Behavioural, Management and Social Sciences

Positive Clinical Psychology and Technology (PCPT)

First Supervisor: Dr Erik Taal

Second Supervisor: Luisa Reiter

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## Abstract

### Background

Academic stress is a widespread issue among students, and it raises the risk of burnout and mental health problems. Student's stress level is dependent on many factors, such as social support which functions as a buffer against stress. Gaining more insights into the influence of social support on the academic stress-burnout relationship can be beneficial to create interventions to support students within an academic context. Thus, this study aims to examine the moderating effect of social support on the relationship between academic stress and burnout among university students. By examining this in the post-pandemic period, the study aims to address a gap in the literature.

### Methods

The study's target group is university students since they are vulnerable to high stress and burnout. The University of Twente's SONA system and online social media channels were used to distribute a one-time online survey. To measure the factors of academic stress, burnout, and social support, the survey included the Student Life-Challenges Scale (SLCS), the Maslach Burnout Inventory - Student Survey (MBI-SS), and the Social Provision Scale - 10 items (SPS-10). RStudio was used to analyze the collected data from 134 participants by conducting descriptive statistics, Pearson correlation and multiple linear regression analysis.

### Results

The results indicated that participants' academic stress levels were close to the middle score. Moreover, it was found that the participants scored average on exhaustion and below average on cynicism and professional inefficacy. Furthermore, there was a positive correlation between stress and the burnout variables, exhaustion, cynicism and professional inefficacy. However, social support had no moderation effect on the relationship between academic stress and the burnout variables, exhaustion, cynicism and professional inefficacy.

### Conclusion

The findings emphasize the importance of conducting further studies to enhance our understanding of stress and burnout in students and to provide more insights into the influence of different dimensions of social support on the relationship between stress and burnout. This can help in developing focused treatments to support their mental health and academic achievement.

*Keywords:* academic stress, burnout, social support, moderation, university students, Covid-19 pandemic

### **Examining the Moderating Effect of Social Support on the Relationship Between Academic Stress and Burnout among University Students after the Covid-19 Pandemic**

The link between students' stress levels and the risk of burnout is examined in this research while investigating whether social support has a moderating effect on this relationship. University students will be the study's target population since they are subject to a lot of stressors, particularly with the appearance of the Covid-19 pandemic.

#### **Stress among students**

In the course of our life, almost all individuals experience some kind of stress which often affects the individual's mental health as well. Lazarus and Folkman (1986), defined stress as "a particular relationship between the individual and his surroundings which is judged by him to be threatening or to overwhelm his resources and which puts his well-being at risk" (Lazarus & Folkman, 1986, as cited in Pozos-Radillo et al., 2014, p. 47). Porru et al. (2022) agree with this definition that individuals perceive stress when they are facing life challenges including demands and threats. Furthermore, according to Porru et al. (2022), the actual stress results from a mismatch between the nature of the challenges, such as their source, intensity, and duration and the personal resources required to overcome them, for example, the individual's coping mechanisms, resilience, values, and beliefs.

Recent studies have shown that the prevalence of stress and mental health problems is higher in younger generations, especially university students (Porru et al., 2022). University students commonly suffer stress as they encounter a variety of new problems. Some of the most prevalent sources of stress among university students include the academic pressure to succeed in their studies, which is also linked to the fear of not gaining the information required for a future job or the general lack of interest (Porru et al., 2022). The high academic pressure on the students can also be a cause of the expectations and pressure created by parents and teachers (Bedewy & Gabriel, 2015). Also balancing a high workload can be difficult, resulting in stress (Porru et al., 2022). Furthermore, many university students face financial difficulties as well as a change toward increased independence as they move out of their parent's house for the first time (Ramachandiran & Dhanapal, 2018).

The internal and external factors, which contribute to the high level of stress, have various consequences on the student's mental health and well-being. Some physical consequences of stress include "fatigue, tension, dizziness, sleeplessness, tachycardia, gastrointestinal symptoms, irritability, anxiety and cynicism" (Ramachandiran & Dhanapal,

2018, p. 2116). Also, stress can result in decreased academic performance (Porru et al., 2022) as well as mental issues such as depression, anger, anxiety, irritability, and reduced self-esteem (Bedewy & Gabriel, 2015).

Although students already experience high levels of stress, the current Covid-19 pandemic had a substantial negative impact on student's physical and mental health. In addition to the fact that the virus infected millions of people, it also resulted in pandemic anxieties, depression, significant changes in routines, and physical and social isolation (Imran et al., 2020; Chunyi et al., 2021).

Concludingly, stress is a dominant problem in student's life. To reduce student stress and so enhance their mental health, it is important to study stress among students.

### **Burnout in students**

Events that are favourable, neutral, or negative can all cause stress. A person needs some stress in their life to keep from becoming bored or frustrated. But when someone is under too much stress at work for a prolonged period can result in the syndrome of burnout (Bruce, 2009).

In the study of burnout caused by work stress, one of the first researchers in this field was Maslach (Nikodijević et al., 2012). There is a variety of causes and triggers which increase the risk of burnout. Some of the main causes of burnout are work overload, a lack of control, a lack of independence, a lack of rewards and support, a lack of community and unfair conditions (Schaufeli et al., 2009). According to Maslach and Jackson (1981), the syndrome of burnout includes emotional exhaustion, depersonalization, or cynicism, and reduced professional efficacy. Here, emotional exhaustion is defined as a sensation that one has run out of emotional reserves and describes the stress aspect of the syndrome (Nikodijević et al., 2012). The interpersonal aspect of burnout is characterized by depersonalization or cynicism, which refers to unfavourable reactions to the workplace and the people at work in a cold and detached manner. Reduced professional efficacy is the self-evaluation component of burnout, and it relates to emotions of reduction in competence and productivity as well as a reduced sense of efficacy (Nikodijević et al., 2012).

The original assumption behind Maslach's burnout model was that only people working in human services are vulnerable to burnout. But further research revealed that burnout has been extended to almost every career and is also experienced by students (Rahmati, 2015). Similar to the definition of work-related burnout, Lin and Huang, (2014) explain that "student burnout can lead to higher absenteeism, lower motivation to do required

work, a higher percentage of dropout” (p.78).

For studying burnout outside of human services, the survey that is being used is called the MBI–Student Survey which has been modified for use among students and consists of three aspects, exhaustion, cynicism, and professional efficacy (Schaufeli et al., 2002). While studying students' burnout levels with this survey, students were classified in the middle to upper ranges of the burnout scale, according to several research studies (Lin & Huang, 2014; Rahmati, 2015). In another study by Galán et al. (2011), the results indicated a moderate prevalence of burnout among medical students with 22.6% of the total sample being at risk of burnout. The majority of participants reported experiencing high levels of emotional exhaustion (17.8%), high levels of cynicism (10%) and low levels of academic efficacy (17.8%), indicating symptoms of burnout. Moreover, another study emphasised that students' mental health has been significantly impacted by the COVID-19 pandemic and its related constraints, especially concerning stress and burnout. According to a survey of more than 1,000 college students in the United States, the pandemic caused increased stress levels in 71% of the respondents, with academic strain, health worries, and social isolation being the most prominent causes of stress (Wang et al., 2020).

Consequently, several studies showed that burnout syndrome was a severe problem in student's life, especially also during the Covid-19 pandemic. This raises the question of whether still students perceive high levels of stress and burnout after the end of the pandemic restrictions.

### **Social Support**

The stress and burnout levels in individuals can be explained by many internal and external factors. One important context, which should be considered here is social support. Already many years ago, researchers have seen a beneficial connection between social support and health (Morrison & Bennett, 2016). Furthermore, several studies have revealed that people who believe they have a high amount of support are more likely to rate situations as less stressful. This implies that social support serves as a "buffer" against stress (Morrison & Bennett, 2016).

In general, the assistance and protection provided to others are known as social support (Langford et al., 1997). A more specific definition is that social support is seen as a perception or feeling of being loved, valued, and a member of a social network that supports one another and has positive benefits on one's mental and physical health (Taylor, 2022). Here, romantic partners, close relatives and friends, coworkers, health and social care

professionals, and support groups can all be sources of support (Morrison & Bennett, 2016). Although every person experiences some kind of social support, people's perspectives on the quality of connections within their social networks and their satisfaction with the support vary (Morrison & Bennett, 2016). Moreover, there are also differences in the type of social support. Many studies differentiate here between received social support, reflecting the actual support people receive, and perceived social support, which reflects people's perceptions of the support they can access, whereby according to Haber et al. (2007), these different types are weakly correlated. Individuals benefit in various ways from social support for example it provides them with “personal competence, health maintenance behaviours, effective coping behaviours, perceived control, sense of stability, recognition of self-worth, positive affect, psychological well-being, and decreased anxiety and depression” (Langford et al., 1997, p. 95).

In many types of research, social support is indirectly linked to the relationship between stress and burnout. Numerous studies have shown that social support effectively reduces distress during stressful times. In addition, another way around, a lack of social support during difficult times can be extremely stressful, especially for those with high social support needs. Two well-known models of social support here are the direct effect and buffering effect models. According to the direct effect model, physical and mental health are directly impacted by their social support. The buffering effect model states that social support can buffer the negative effects of stressful situations on people's physical and mental health, including burnout (Morrison & Bennett, 2016). In this context, it has been determined that social support acts as a buffer in the link between life stress and health status (Taylor et al., 2007).

As the pandemic resulted in many changes in social life, such as social isolation and more remote work, the experience of social support was also significantly influenced (Szkody et al., 2021). Therefore, it is interesting to investigate how the pandemic affected the stress and burnout level in people and if the relationship effect of social support on stress and burnout might have changed after the pandemic.

### **Overview of the Study**

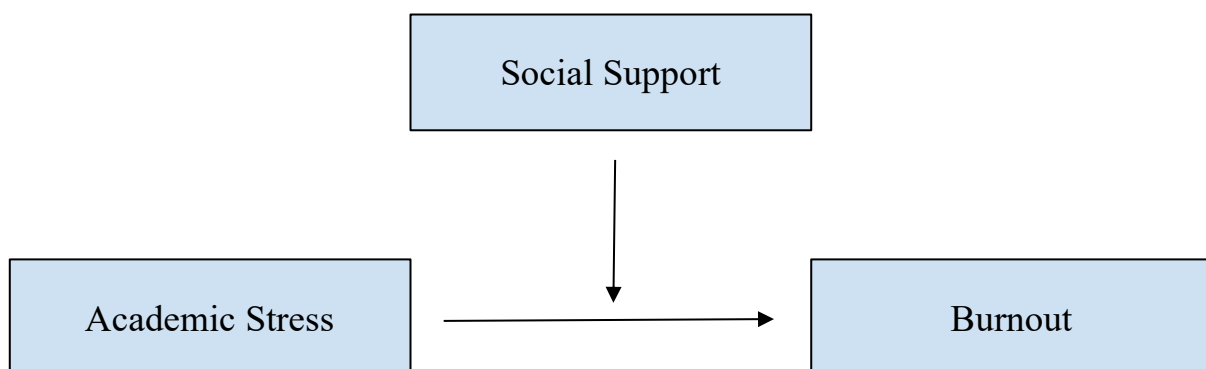
The literature review leads to the conclusion that stress and burnout have a high impact on student's mental health. The target group for this research is students who are currently enrolled at a university in the Netherlands or Germany. Studying this connection can benefit the institutions to better serve students by lowering their stress levels and preventing

the risk of burnout in students. Consequently, it is essential to explore both concepts and look at how the two variables, stress, and burnout, are related.

The literature review also found a link between stress and burnout and social support. Much research has shown that social support acts as a buffer against the effects of stress on mental health, which is referred to as the so-called buffering effect hypothesis of social support. Thus, exploring this social support buffering effect further can benefit the students, as the universities can provide them with the appropriate social support in a study-related context.

The literature review indicates that there is relationship between the three variables, stress, burnout, and social support. However, the majority of studies were conducted before the Covid-19 pandemic, which had a significant influence on students' levels of stress and burnout as well as on the type and extent of social support available to students. Moreover, research on academic stress and burnout solely concentrated on medical students, as medical students are known to face significant levels of academic stress. As a result, the current study aims to determine if social support moderates the relationship between student burnout and academic stress during the Covid-19 pandemic (see Figure 1). By doing this, the gap in the literature may be addressed, and it can also provide valuable insights into the best way to help students in reducing their stress levels and prevent burnout.

**Figure 1.** Moderation Effect of Social Support on Academic Stress and Burnout



In order to answer the research question, “Is social support a moderator of the relationship between academic stress and burnout in university students after the Covid-19 pandemic?”, a one-time research survey will be developed which entails three small questionnaires addressing student’s stress levels, burnout, and social support. The current study addresses several research questions.

1. How much stress do university students perceive? A moderate-to-high level of stress in university students is expected
2. How high is the risk of burnout among university students? The risk of burnout among university students is expected to be moderate.
3. To what extent is academic stress related to feelings of burnout? A positive relationship between stress and burnout is expected, meaning that higher stress is related to higher burnout.
4. Does social support moderate the relationship between stress and burnout? It is expected that social support has a direct influence on the relationship between stress and burnout and that social support functions as a buffer for stress and burnout.

## Methods

### Design

This study aims to evaluate the relationship between students' academic stress and burnout, moderated by social support. Therefore, quantitative data were gathered for this study with a survey at a single point in time. This survey is the result of the collaborative work of five students, who individually examined different research questions. All the research questions address university students' academic stress and burnout.

### Participants

Using the University of Twente's SONA system, participants were recruited in return for 0.25 study credits. Moreover, convenience sampling was employed to recruit students from other universities through online social media channels (e.g., Instagram). In this study, 161 individuals participated in the survey. Several exclusion criteria were used to screen the participants. The first exclusion criterion, the failure to complete the questionnaire was checked in the dataset. After this screening process, 134 participants remained. The exclusion criteria age under 18, insufficient understanding of the English language, not consenting to the study, not enrolled in a university, and a pattern in the responses (for example, only selected disagree), were fulfilled in all participants. Therefore, after the screening process, the final participant sample consists of 134 participants. Here, Table 1 displays an overview of the sample characteristics. In the final dataset, most participants are female (75.4%), and most participants have a German nationality (72%). Also, the majority of participants studied at the University of Twente (68.8%), began their studies in 2020 (33.48%) and the most frequent study field was Psychology (45.8%).



**Table 1***Demographics characteristics of 134 university students*

Variable	n (%)	Mean	SD	Range
<b>Age (in years)</b>		21.5	2.3	18-39
<b>Gender</b>				
- Male	32 (23.9)			
- Female	101 (75.4)			
- non-binary/ third gender	1 (0.7)			
<b>Nationality</b>				
- Dutch	43 (32.1)			
- German	72 (53.7)			
- others	19 (14.2)			
<b>Study Phase</b>				
- Bachelor year 1	30 (22.4)			
- Bachelor year 2	32 (23.9)			
- Bachelor year 3	50 (37.3)			
- Master year 1	13 (9.7)			
- Master year 2	3 (2.2)			
- Others	6 (4.5)			
<b>Study Programme</b>				
- Psychology	62 (45.8)			
- Communication Science	19 (14.1)			
- Law	9 (6.7)			
- Others	44 (32.6)			
<b>Start Year</b>				
- 2022	33 (24.63)			
- 2021	30 (22.39)			
- 2020	45 (33.48)			
- 2019	15 (11.20)			
- Others	11 (8.3)			
<b>University</b>				
- University of Twente	93 (68.8)			
- WWU Münster	6 (4.4)			
- Goethe University Frankfurt	4 (2.9)			
- Others	31 (23.9)			

**Materials**

For this study, the questionnaires that measured the variable academic stress, risk of burnout and social support were used to assess the essential constructs. The general questionnaire also included questions about the background characteristics and demographics

of the participants, such as age, gender, nationality, the year the study began, study program, and university.

**Academic Stress.** To evaluate students' level of academic stress, the Student Life-Challenges Scale (SLCS) was used, with 22 items (Porru et al., 2022). This questionnaire is based on the Higher Education Stress Inventory (HESI). It consists of six subscales, faculty shortcomings, worries about future competence, unsupportive climate, high workload, low commitment, and financial concerns (Porru et al., 2022). But, the Low Commitment scale, which includes two items, was eliminated from the SLCS since it was not an accurate measurement of study stress as it had many characteristics in common with the MBI-SS's cynicism measure. The first subscale contains faculty shortcomings and is measured with seven items (e.g., "I am able to influence the studies or curriculum") with a Cronbach's  $\alpha$  of .74 (Cronbach's  $\alpha$  = .61 in this study). The next subscale contains worries about future competence and is measured through three items (e.g., "the long hours and responsibilities of my future career worry me") with Cronbach's  $\alpha$  of .67 (Cronbach's  $\alpha$  = .65 in this study). The subscale of unsupportive climate has a Cronbach's  $\alpha$  of .65 (Cronbach's  $\alpha$  = .70 in this study) and five items (e.g., "studying has created a climate of anonymity and isolation among the students"). The high workload is another subscale of the Student Life-Challenges Scale with three items (e.g., "the pace of study is too high") and has a Cronbach's  $\alpha$  of .68 (Cronbach's  $\alpha$  = .77 in this study). The last subscale contains financial concerns with also two items (e.g., "As a student, my financial situation is worrying") and Spearman's  $R_s$  = .49 (Spearman's  $r_s$  = .64 in this study). A 4-point Likert scale is used with the response categories totally disagree (1), somewhat disagree (2), somewhat agree (3), and totally agree (4). A score was calculated as the mean of the items for each subscale, whereby a higher mean score suggests more academic stress in the students (Porru et al., 2022). Here, the positively formulated items 1, 3, 5, 7, 19, and 20 (e.g., "I am satisfied with my choice of career") needed to be reversed coded as a high score indicates a low level of stress.

**Burnout.** Secondly, the Maslach Burnout Inventory-Student Survey (MBI-SS) was used to measure the risk of burnout in students, consisting of 15 items (Schaufeli et al., 2002). The questionnaire includes three subscales, namely exhaustion with 5 items (e.g., "I feel emotionally drained by my studies"), cynicism with 4 items (e.g., "I have become more cynical about the potential usefulness of my studies") and professional inefficacy with 6 items (e.g., "I believe that I make an effective contribution to the classes that I attend"). The scale's categories are Never (0), A few times per Year (1), Once a Month (2), A few times per Month (3), Once a Week (4), A few times a Week (5), and Every Day (6). A high score on an item

indicated a higher risk of burnout for the exhaustion and cynicism subscale. But for the items of the subscale of professional inefficacy, a low score indicated the risk for burnout, which is why these items were reversed scored (Schaufeli et al., 2002). A score was calculated as the mean of the items for each subscale, whereby a higher mean score suggests a higher risk of burnout. According to Yavuz and Dogan (2014), the subscales have high internal consistency with Cronbach's  $\alpha$  of .84 for exhaustion (Cronbach's  $\alpha = .90$  in this study), Cronbach's  $\alpha$  of .84 for cynicism (Cronbach's  $\alpha = .91$  in this study) and Cronbach's  $\alpha$  of .88 for reduced professional inefficacy (Cronbach's  $\alpha = .79$  in this study).

**Social Support.** Lastly, the Social Provision Scale consists of 10 items (SPS - 10) and is applicable to assess the level of social support (Orpana et al., 2019). The scale SPS-10 assesses five forms: attachment (e.g., “there are people I can depend on to help me if I really need it”), guidance (e.g., “there are people who enjoy the same social activities I do”), social integration (e.g., “I have close relationships that provide me with a sense of emotional security and well-being”), reliable alliance (e.g., “there is someone I could talk to about important decisions in my life”) and reassurance of worth (e.g., “I have relationships where my competence and skill are recognized”). The scale showed a high level of internal consistency, with a Cronbach's alpha of .93 (Orpana et al., 2019) (Cronbach's  $\alpha = .93$  in this study). Items are answered on a 4-point Likert scale and include strongly disagree (1), disagree (2), agree (3), and strongly agree (4). The scale scores, which can be ranging between 10 and 40, are calculated by summing the item scores. Higher scores indicate high social support levels. Participants are classified as having "strong" social support if their SPS-10 score is 30 or above (Orpana et al., 2019).

## Procedure

A survey was created on the Qualtrics survey platform, which fits and complies with all laws and norms governing the collection and storage of sensitive data (*Qualtrics | BMS - DataLab*, n.d.). Furthermore, this survey was also integrated with the SONA platform. Thus, the University of Twente students were able to access the study and get credit points, which ensured that enough participants took part in the study. Participants completed the survey, which was reported to take around 53 minutes to complete ( $SD = 250$  minutes), either through the SONA website or via a Qualtrics link. Before the questionnaire could be filled out, participants had to read and consent to an informed consent form (Appendix A). The survey has 3 parts, where the first part included questions about the participant's demographics (Appendix B). Then, the participants were asked to fill out two questionnaires, concerning the

students' stress and burnout levels, the Student Life-Challenges Scale (SLCS) and the Maslach Burnout Inventory-Student Survey (MBI-SS) (Appendix C). Afterwards, five different questionnaires related to different factors (including coping style, perfectionism, self-regulation, social support, and personality traits), which were presented in a random order, needed to be answered by the participants. Since I conducted the study together with four other fellow students, only the Social Provision Scale - 10 items (SPS -10) (Canuel, 2019) is relevant to this research (Appendix C). After answering the questions, the final section of the study included a few clarification questions to assess the quality of the study and a debriefing sheet with details on the purpose of the study and resources that could assist the students if the study had any unfavourable outcomes (Appendix C).

### **Data Analysis**

RStudio is used to analyze the data. Cleaning the dataset involved eliminating information from it that was not necessary for the research, including the start date, finish date, user language, response id, status, and a few other items. Before analyzing the data, participants were removed who did not fulfil the inclusion and exclusion criteria. After screening the data set, 134 participants remained which represents the final sample. Furthermore, Cronbach's Alpha was determined for each scale to assess its internal consistency.

The next step was the data analysis. Firstly, descriptive statistics were specifically used to get a summary of the participants' characteristics (e.g., age, gender, nationalities, educational program, study program, and universities). Therefore, the mean and standard deviation or frequencies were calculated.

After that, before conducting an explanatory factor analysis, Bartlett's sphericity test and Kaiser-Meyer-Olkin-measure were used to test if scale scores for life challenges and scale scores for burnout can be combined. For the SLCS and MBI-SS, exploratory factor analysis was performed on the mean subscale scores to determine if scales can be combined based on factor loadings. After calculating new combined scores, the mean scores and standard deviations were calculated and reported for the final stress, burnout, and social support scores. Furthermore, Pearson correlations were calculated between these variables. Then, it was assessed whether the conditions for the linear model were satisfied by checking the statistical assumption of normality. To determine if the assumption is violated, the residuals were shown in a histogram.

Afterwards, to acquire a broad picture of the responses, descriptive statistics of each variable (academic stress, exhaustion, cynicism and professional inefficacy, social support) were run to answer the research questions: “How much stress do university students perceive?” and “How high is the risk of burnout among university students?”. Minimum, maximum, mean, and standard deviation were computed in that regard. Also, this was calculated to look for data that could be deceptive, such as floor or ceiling impact.

After that, the research question “To what extent is academic stress related to feelings of burnout?” was analysed with Pearson’s correlation coefficient for the variable academic stress with the variables, exhaustion, cynicism and professional inefficacy, to determine if a high level of stress substantially predicts a high level of burnout. A significance threshold of  $p < .05$  was applied to all analyses. To see the relationship, the variables were also shown in a scatterplot.

For the last research question, “Does social support moderate the relationship between stress and burnout?”, a multiple linear regression analysis was used to determine if student social support moderates the relationship between their degree of stress and burnout. Here, the academic stress variable and social support and its interaction term were included as independent variables. To prevent multicollinearity between the interaction term and the original variables, before doing the regression analysis, the independent variables and moderator variables were centred.

## Results

### Descriptive Statistics and Reliability Analysis

While conducting a factor analysis on the SLCS, the Kaiser-Meyer-Olkin score that was found indicates good sampling adequacy (.75), and Bartlett's sphericity test was significant ( $\chi^2(10) = 150.42, p < .001$ ), indicating that the variables are correlated. The data could be explained by one component, according to the scree plot and eigenvalues. All items significantly loaded on the factor, which explained 38.8% of the variation in the data (see Table D1). This factor was then labelled as "Academic Stress" and was calculated by calculating the mean of the subscale scores leading to a score ranging from 1 to 4. Cronbach's alpha for the scale was .70, indicating moderate internal consistency reliability.

While conducting a factor analysis on MBI-SS, Cronbach's alpha of .52 for the subscales, exhaustion, cynicism and professional inefficacy indicate poor reliability of the scale. The Bartlett’s sphericity test was significant ( $p .05$ ), and the Kaiser-Meyer-Olkin measure was below the cut-off point (.51) suggesting low sampling adequacy. Furthermore,

low correlations between the items were evident in the correlation matrix. Also, the one-factor analysis was found non-significant. Thus, the three variables exhaustion, cynicism and professional inefficacy were analyzed as separate variables.

Histograms of the data were visually inspected to check the normality assumption. The resulting histograms (see Appendix E) revealed that the assumption of normality was not met for the variables of academic stress, exhaustion, cynicism and professional inefficacy and social support.

### **Means of Academic Stress, the Burnout Variables and Social Support**

In the next step, the first research questions were answered (see Table 2). Regarding the first research question, it was found that participants scored just below the middle score of the scale ( $M = 2.4$ ) on academic stress in a range from 1 to 4 with a middle score of 2.5. The scores of the participants ranged from 1.6 to 3.3, thus none of the participants achieved the definite minimum or maximum of the scale.

Furthermore, while answering the second research question, the burnout variable scores could range between 0 and 6 with a mean score of 3. Therefore, participants scored around the middle of the scale on exhaustion as the observed mean ( $M = 3.1$ ) was close to the mean score of the scale. Here, the participants' scores varied from 0.2 to 6. Thus, the lowest score on the scale was not reached, but the highest was. Additionally, participants' cynicism scores ( $M = 1.6$ ) were below the middle of the score, with the mean score of the scale being 3. Moreover, the range of the participants' scores was identical to the scale range (0 to 6), meaning that some participants had the highest and lowest score possible. Moreover, the participants also scored below the middle of the score on professional inefficacy ( $M = 1.9$ ) with a range from 0 to 4.8. This indicates that some participants achieved the absolute minimum, but no participant scored on the maximum of the scale.

Lastly, looking at the descriptive statistic, it is noticeable that the participants scored high on the variable social support as the observed mean ( $M = 34.8$ ) was close to the highest value of 40. Participants obtained the highest score on the scale, which ranges from 10 to 40, but not the minimum with a range of 15 to 40.

**Table 2**

*Means (M), Standard Deviation (SD), Minimum, Maximum and Pearson Correlations for the stress, burnout, and social support variables*

Variable	<i>M</i>	<i>SD</i>	Min	Max	1	2	3	4	5
1. Academic Stress	2.4	0.3	1.6	3.3	—				
2. Exhaustion	3.1	1.5	0.2	6	.62***	—			
3. Cynicism	1.6	1.6	0	6	.53***	-.49***	—		
4. Professional Inefficacy	1.9	1.0	0	4.8	.41***	.30***	.48***	—	
5. Social Support	34.8	5.0	15	40	-.24**	-.16*	-.23**	-.35***	—

\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

### **Correlational Analysis on Academic Stress and Burnout**

The Pearson correlations between academic stress with the three burnout variables, exhaustion, cynicism, and professional inefficacy, were calculated to assess research question 3, as shown in Table 2. A significant and strong positive correlation was found between the variables of academic stress and exhaustion ( $r = .62$ ,  $p < .001$ ) and the variables of academic stress and cynicism ( $r = .53$ ,  $p < .001$ ) and for the variables of academic stress and professional inefficacy, there was a positive moderate correlation ( $r = .41$ ,  $p < .001$ ). Concludingly, these results are in line with the expected results for research question 3, stating that burnout increases in direct proportion to the amount of academic stress.

Furthermore, the results showed weak negative correlations of social support with the stress and burnout variables, indicating an inverse weak relationship between these variables. In particular, this shows that with a high level of social support, the academic stress variables and burnout variables tend to decrease.

### **Moderation of Social Support on Academic Stress and Burnout**

In the first multiple regression analysis on exhaustion (Table 3), the results revealed a significant overall model, which suggests that the model account for around 39% of the variance in the outcome variable, exhaustion. Examining the main effects, a significant positive effect of academic stress was found on exhaustion scores, indicating that higher levels of exhaustion were linked to higher levels of academic stress. In contrast, social support did not have a significant main effect on exhaustion scores, suggesting that social support was

not a predictor of exhaustion. Also, the results showed that the interaction effect between academic stress and social support on exhaustion scores was not statistically significant, indicating that social support did not moderate the relationship between academic stress and exhaustion.

**Table 3***Moderator Analysis on Exhaustion*

Effect	Estimate	SE	95% CI		t	p
			LL	UL		
Intercept	3.06	0.11	2.85	3.28	28.50	< .001
Academic Stress	1.94	0.22	1.51	2.37	8.82	< .001
Social Support	-0.002	0.02	-0.04	0.04	-0.08	.94
Academic Stress: Social Support	-0.003	0.04	-0.08	0.08	-0.08	.94

Note. *LL* = lower limit; *UL* = upper limit,  $R^2 = .39$ ,  $F(3,130) = 27.68$ ,  $p < .001$

For the second multiple regression analysis on cynicism (Table 4), there was found a significant overall model, which showed an explained variance of the dependent variable of 29%. The main effect of academic stress was found to be statistically significant and positive, indicating that higher levels of academic stress were associated with higher levels of cynicism. In contrast, the main effect of social support and the interaction effect between academic stress and social support were not significant, suggesting that social support did not have a direct significant impact on cynicism and that social support did not moderate the relationship between academic stress and cynicism.



**Table 4***Moderator Analysis of Cynicism*

Effect	Estimate	SE	95% CI		t	p
			LL	UL		
Intercept	1.56	0.12	1.32	1.80	12.75	< .001
Academic Stress	1.69	0.25	1.20	2.18	6.73	< .001
Social Support	-0.03	0.03	-0.09	0.03	-1.05	.30
Academic Stress: Social Support	-0.03	0.05	-0.13	0.07	-0.59	.56

Note. *LL* = lower limit; *UL* = upper limit,  $R^2 = .29$ ,  $F(3,130) = 18.36$ ,  $p < .001$

In the third multiple regression analysis on professional inefficacy (Table 5), the overall model was significant, which shows that the model explains approximately 29% of the dependent variable, professional inefficacy. Furthermore, the main effect of Academic Stress was significant, demonstrating that academic stress may be a reliable predictor of professional inefficacy. Similarly, the main effect of social support was also significant. However, the interaction effect between academic stress and social support was also not significant, suggesting that there is no moderation of social support on the relationship between academic stress and professional inefficacy.

**Table 5***Moderator Analysis on Professional Inefficacy*

Effect	Estimate	SE	95% CI		t	p
			LL	UL		
Intercept	1.97	0.08	1.81	2.13	24.49	< .001
Academic Stress	0.72	0.17	0.39	1.05	4.36	< .001
Social Support	-0.06	0.02	-0.10	-0.02	-3.30	.001
Academic Stress: Social Support	-0.02	0.03	-0.08	0.004	0.52	.61

Note. *LL* = lower limit; *UL* = upper limit,  $R^2 = .23$ ,  $F(3,130) = 13.28$ ,  $p < .001$

## Discussion

### Summary of main findings

The purpose of this study was to determine if social support moderates the relationship between academic stress and burnout in students after the Covid-19 pandemic. Four different research questions were developed to answer the general research question. Although the study did not find a strong influence of social support that changes the relationship between academic stress and burnout, the analysis supports that academic stress is positively correlated with the three burnout factors, exhaustion, cynicism, and professional inefficacy. Furthermore, it was shown that social support has a beneficial association with the stress and burnout variables.

### Discussion of the main findings

The first research question focused on the level of stress in university students. Based on the findings, the scores on academic stress were below the middle score of the scale. Similarly, the study conducted by Porru et al. (2022) also found a moderate level of exposure to students' life challenges, which was associated with poorer mental and self-rated health. However, because these studies do not indicate whether these stress levels are considered moderate or high from a clinical perspective, no inferences can be made about the severity of students' stress levels. Nevertheless, regardless of whether these levels of academic stress are considered moderate or high, it is evident that difficulties in student life have a detrimental impact on the well-being of university students (Porru et al., 2022). This emphasizes the importance of further studying stress in students. Furthermore, these findings should be taken into account when considering how universities and educational institutions should prioritize their students' well-being by implementing effective stress management strategies.

The second research question aimed to investigate the risk of burnout among university students, and it was expected to find a moderate level of burnout. Based on the scores of exhaustion, cynicism and professional inefficacy, the expected outcome of finding a moderate level of burnout was partially confirmed, when comparing the means with the scores of the study of Galán et al. (2011). According to the study of Galán et al. (2011) on medical students, it appears that the scores of exhaustion, cynicism and professional inefficacy are moderate, ranging between the 25th and 75th percentiles in the middle quartile (Galán et al., 2011). In this study, the scores on exhaustion, cynicism and professional inefficacy were also found to range between the 25th and 75th percentiles, indicating moderate scores. These findings can be compared to the scores of medical students, as past

research has mostly focused on medical students when examining students' burnout. Although similar to the academic stress levels, no norm scores are available to interpret the scores as high or low, this still suggests that the participants appear to have some level of tiredness and detachment from their studies or a lack of confidence in their efficacy. This is also in line with other studies, as they also found that university students frequently experience moderate to high levels of exhaustion, cynicism and professional inefficacy as symptoms of burnout (Lin & Huang, 2014; Rahmati, 2015). Therefore, this moderate level of burnout in students shows that it is crucial to acknowledge the prevalence of burnout among university students in order to address their well-being and develop measures that reduce the risk of burnout.

The third research question examined the relationship between academic stress and burnout with the hypothesis that there would be a positive association between the two variables. The results showed that there are strong positive correlations between academic stress and the burnout variables, exhaustion and cynicism. Moreover, the correlation between academic stress and professional inefficacy was found to be a moderate positive correlation. Thus, these findings support the expectations of a direct correlation between academic stress and the three burnout variables, exhaustion, cynicism, and professional inefficacy, among university students. This is in line with previous research (Bruce, 2009), which emphasizes how academic stress can negatively affect students' overall feeling of exhaustion, their sense of detachment as well as their decline in their academic abilities and perceived effectiveness in their future professional roles. Furthermore, this result is also consistent with other studies that showed how stress harms both mental health and academic performance (Porru et al., 2022; Bedewy & Gabriel, 2015). This outcome contributes to a clearer understanding of the relationship between stress and the three burnout factors, and it highlights the need for academic institutions to provide extensive support systems that deal with the underlying causes of stress and burnout, offer tools for stress management, and encourage a good work-life balance. In addition, it was found that social support had a significantly weak negative correlation with academic stress, exhaustion, cynicism and professional inefficacy. This is a striking finding when considering that the participants scored high on the overall social support scores. As previous research highlighted, social support has a highly positive influence on mental health in individuals and is beneficial in reducing people's stress and burnout levels (Morrison & Bennett, 2016). Thus, these findings are not in line with previous literature. As an explanation, despite strong overall social support scores among participants, there may be additional factors influencing burnout, which might account for the weak

negative association between social support and burnout. The protective benefits of social support may have been overpowered by these variables. Thus, it is crucial to understand that stress and burnout are multifaced concepts impacted by many different factors.

The last research question investigated if social support moderates the relationship between stress and burnout. It was expected that social support would work as a buffer for stress and burnout. However, this expectation needs to be rejected due to the results. While there were significant main effects between academic stress and all three burnout factors, the results did not indicate a significant moderation effect of social support on the three factors of burnout, exhaustion, cynicism, and professional inefficacy. This suggests that social support has no strong influence, changing the relationship between academic stress and exhaustion, cynicism, and professional inefficacy. On the one hand, an explanation for this could be that academic stress and social support are not the only factors that contribute to university students' burnout. As previous research suggests, it may also be influenced by other elements such as coping mechanisms or individual expectations (Schaufeli et al., 2009). On the other hand, another possible reason for this finding is that the direct relationship between academic stress and burnout is so strong that social support is not strong enough to buffer the effects of academic stress on burnout.

Further, it was found in the multiple regression analysis of this study that social support had a direct influence on professional inefficacy but no direct effect on exhaustion or cynicism. This is an interesting pattern, meaning that social support may have an impact on how people perceive their own efficacy and ability, but social support does not improve the negative impacts of academic stress on the levels of exhaustion and cynicism. An explanation here could be the difference in the perceived and received level of social support. As previous literature already found, the two types of social support, received social support and perceived social support need to be differentiated and are only weakly correlated (Haber et al., 2007). In this study, participants may have believed they had strong social support which increased their level of perceived efficacy. However, the quality or efficacy of that perceived support may not have been adequate for reducing their feelings of exhaustion and cynicism. Although, the lack of a direct relationship between social support and exhaustion or cynicism does not rule out the possibility of other aspects, such as the received social support levels having a direct impact. Consequently, as social support does not moderate the relationship between academic stress and burnout in this study, it is crucial to take into account both how it is perceived and how it is received when analysing social support's effects on burnout.

### **Limitations and Strengths**

Although the present study is in line with some of the expected outcomes, this research also has a few limitations to be aware of. The results of this study are limited in their generalisability and validity. Firstly, the study's recruitment of participants has certain limitations. For instance, in this study, data was gathered through a convenience sample technique, which implies that the researcher did not randomly select the participants from the population of university students. Furthermore, it is apparent that most of the students studied psychology or communications science at the University of Twente. As this study aimed to study university students in general, this population was not representative.

The second limitation of this study is that the SPS-10 for measuring the level of social support may not be an appropriate measure, which might have prevented the detection of a significant moderation effect. For instance, the SPS-10 was rather short, which saved time, but it missed assessing different elements and dimensions of social support as it was only assessed in one overall factor. Moreover, the literature also suggests that the participants' scores of the social support variable may be inaccurate since the questionnaire could potentially have a response bias since it only includes positively formulated items, which can lead to automatic answers (Orpana et al., 2019).

Furthermore, no norm scores were established for the SLCS or the MBI-SS, which is another limitation of this study (Porru et al., 2022; Schaufeli et al., 2002). In order to compare individual scores to a standard reference group and acquire a better understanding of the output in comparison to others, norm scores are important (Crawford & Howell, 1998). Therefore, since there is no standardized reference group to determine the severity of the participant's stress and burnout score relative to others, the results on what is considered to be high or low levels of the academic stress variable and the three burnout variables can only be interpreted based on subjective criteria.

The fact that this study only used a single measurement within a correlational design is a further limitation. As a result, the research can offer information on a specific point in time, such as here the post-pandemic period but cannot identify changes or patterns across time. In addition, this study design is challenging in establishing the causation of the relationship between academic stress, burnout and social support. In specific, the variables investigated in this study cannot be linked through a cause-and-effect relationship, which means that the study does not show that changes in social support are caused by burnout or that burnout directly affects social support. Moreover, this study design also implies that inference can be

drawn on the specific relationship between the variables, but it offers no details about any underlying phenomena or evidence for other factors influencing this relationship.

Despite these limitations, this study also has some strengths. The first strength of this study is its contribution to the literature in that it looks particularly at the relationship between stress and burnout among students without limiting its scope to the medical study field. Here, it is also noteworthy that this study used the Maslach Burnout Inventory-Student Survey (MBI-SS) as an assessment method. The MBI-SS has received widespread validation, especially in research involving medical students. Utilizing this survey across different subject disciplines, which showed high internal consistency in the burnout subscales of this study, the study is able to gain a more in-depth knowledge of the relationship between academic stress, burnout and social support.

The study's timing, which took place a few years after the COVID-19 pandemic, is another notable strength. Especially students experienced extensive stress and burnout throughout the pandemic due to changes in their social life, more remote work, and the lack of social support in person (Imran et al., 2020; Chunyi et al., 2021). Nevertheless, research on stress and burnout among university students, particularly after the pandemic's peak, is limited. Conducting the study during this period provides valuable insights into the post-pandemic experiences of university students. This brings attention to an important topic that has not been widely discussed in the literature.

The use of an online survey to gather data is another benefit of the conducted research since it enables a greater number of participants to be obtained within a short timeframe. Thus, the study collected data from a wider range of participants in a relatively short amount of time by eliminating the limitations of physical place and time. The online survey method also provides some confidentiality and convenience for participants. Since respondents may take the survey at their own time and location, there is less chance of social desirability biases and a higher chance of getting sincere and genuine replies, which also results in more standardized data collection.

### **Future Research Recommendations**

Based on the outcomes of the study, future directions can be made for additional research. Firstly, the study's results indicate the need for conducting longitudinal studies. These studies will better understand the relationship between academic stress, burnout, and social support over time and thus the long-term effects of the pandemic on the student's stress and burnout levels could be investigated. Also, it can be further investigated if daily events or different

periods, such as exam periods in students' academic journey may influence the moderation effect of social support on the relationship between academic stress and burnout. Furthermore, longitudinal research can help identify other or additional factors that contribute to burnout resilience or vulnerability by investigating the relationship between these variables over a longer period.

This study focused on university students' experiences with academic stress, burnout, and social support, while this study mainly consisted of psychology and communication science students with over 70% of students from the University of Twente. However, future research can further investigate these experiences at different educational levels and by looking at the different study fields or different study systems on a larger and more representative population. By comparing various experiences, it is possible to better understand how stress and burnout develop and what elements contribute to it. Concludingly, this knowledge can help in the development of interventions that support the students, which are targeted to certain educational levels or areas of study. Moreover, evaluating factors in the study systems that appear to reduce academic stress could be adopted in other systems, enabling an improvement of the overall educational system.

The use of more precise social support measures that offer distinct scores for the many characteristics or dimensions of social support is advised for future research on social support and its relationship with burnout and academic stress. The current study used the Social Provision Scale - 10 items (SPS-10), which provides a general assessment of perceived social support. Using measures that capture particular dimensions of social support, especially while also separately assessing the received and perceived social support level of the participants can provide a more thorough understanding of how various types of support relate to burnout and academic stress. Moreover, future studies should consider including further variables such as personality characteristics, organizational aspects, and academic variables. Thus, by adopting a thorough study methodology, researchers can better grasp the complex relationships between these variables and how they affect the stress-burnout-social support link in academic or organizational contexts.

### **Conclusion**

In conclusion, the study aimed to investigate the possible moderation effect of social support on the relationship between academic stress and burnout among university students. The initial goal was to fill the literature gap by investigating the moderation effect after the Covid-19 pandemic. Furthermore, the study should contribute to the missing research on the investigation of stress and burnout among university students in general, as most of the

literature focused on studying stress and burnout in medical students. Based on the results, it can be concluded that high levels of academic stress are positively correlated with high levels of burnout. However, no moderation effect of social support was found on the relationship between academic stress and the burnout variables, exhaustion, cynicism, and professional inefficacy. This research can be viewed as a starting point for a more in-depth examination of the area of stress and burnout. Nevertheless, further research is needed to examine the effect over a longer period and thereby identify influential factors and third variables to find additional explanations and effects. To acquire an in-depth understanding of the variables influencing stress and burnout, it is also advised to broaden the research by including other study disciplines and educational systems. Furthermore, using accurate social support measures that account for more characteristics and dimensions of social support, which measures both received and perceived social support levels would offer a more thorough study methodology.

In conclusion, this study emphasizes the main role of academic stress and the risk of burnout in university students. Even if social support did not show a significant moderating effect in this study, it should not be overlooked since it could still be necessary in another context or another population. This highlights the value of additional research to improve our comprehension of stress and burnout in students. Finally, the findings provided new input to improve educational systems and develop interventions in universities that support students in lowering their stress and burnout levels. This underlines the need of giving student well-being first priority and implement strategies that support a healthy learning environment.



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## **Appendix A**

### **Informed Consent**

#### *Purpose and Procedure*

The purpose of this study is to gain further information about the academic stress levels that university students experience, the potential influence of these stress levels on burnout symptoms experienced by students, and related factors. It is important to research these factors as university students have been shown to experience stress which influences their academic performance and well-being.

If you choose to participate in this study, you will be asked to fill out questions with regard to these variables.

#### *Risk, anonymity & confidentiality*

We believe there are no major risks associated with this research study beyond the chance that some items may feel uncomfortable to think about or lead you to recall upsetting situations. We are minimizing the risk of a data breach by anonymizing all of your information and storing it in a secure way. Your answers in this study will be treated confidentially; they will not be shared with other parties than the researchers and their supervisor.

#### *Contact*

If you have any questions or concerns, you can contact the following people:

First Supervisor: Erik Taal (e.taal@utwente.nl)

Second Supervisor: Luisa Reiter (l.c.reiter@utwente.nl)

Alexa Schulze (a.schulze@student.utwente.nl)

Eda Selin Özkan (e.s.ozkan@student.utwente.nl)

Iris Antoinette Ruel (i.a.ruel@student.utwente.nl)

Iris Maria van den Heuvel (i.m.vandenheuvel@student.utwente.nl)

Jonah Justin Shepherd (j.j.shepherd@student.utwente.nl)

#### *Participant rights & consent*

Your participation in this study is entirely voluntary. You are free to decline to participate, omit any question, or you can withdraw from the study at any time without the need to give a reason.

## Appendix B

### Demographic Questions

Firstly, we would like to gather some demographical data from you. Please answer the following questions.

How old are you?

—

How would you describe yourself?

- Male
- Female
- Non-Binary/third gender
- Prefer to self-describe:
- Prefer not to say

What is your Nationality

- Dutch
- German
- Others (please indicate):

In which phase of your study are you right now?

- Bachelor year 1
- Bachelor year 2
- Bachelor year 3
- Master year 1
- Master year 2
- Other:

Which study are you doing?

—

In what year did you start your study?

—

At which university do you study?

—

**Appendix C**  
**Student Life-Challenges Scale**

The following statements refer to challenges that you might encounter in your academic life.

Please read the statements and indicate to what extent you agree with them.

1. I feel that my teachers treat me with respect.
2. The teachers often fail to clarify the aims of the activities
3. The study stimulates my personal development.
4. As a student you are often expected to participate in situations where your role and function is unclear.
5. I am able to influence the studies or curriculum.
6. There is too much focus on passive learning of facts and too little on active seeking of knowledge and time for reflection.
7. I feel that the training is preparing me well for my future profession.
8. I am worried that I will not acquire all the knowledge needed for my future profession.
9. The long hours and responsibilities of my future career worry me.
10. The insight I have had into my future profession has made me worried about the stressful workload.
11. Studying has created a climate of anonymity and isolation among the students.
12. The professional role presented in our course conflicts with my moral viewpoint.
13. There is a competitive attitude among students.
14. I feel that the studies have played a role in creating a cold and impersonal attitude among students.
15. It seems to me to be treated worse on the basis of my sex.
16. My study controls my life, and I don't have a lot of time for other activities.
17. The literature is too difficult and extensive.
18. The pace of study is too high.
19. I am satisfied with my choice of career.
20. I am proud of my future profession.
21. As a student, my financial situation is worrying.
22. I am worried about my future financial situation and my ability to pay off my student loans.

Response options:

- 1 = Totally disagree
- 2 = Somewhat disagree
- 3 = Somewhat agree
- 4 = Totally agree

### **Maslach Burnout Inventory-Student Survey**

The next statements are about symptoms that you might experience as a consequence of your studies. Please read the statements and indicate to what extent they apply to you.

1. I feel emotionally drained by my studies.
2. I feel used up at the end of a day at university.
3. I feel tired when I get up in the morning and I have to face another day at the university.
4. Studying or attending a class is really a strain for me.
5. I feel burned out from my studies.
6. I have become less interested in my studies since my enrolment at the university.
7. I have become less enthusiastic about my studies.
8. I have become more cynical about the potential usefulness of my studies.
9. I doubt the significance of my studies.
10. I can effectively solve the problems that arise in my studies.
11. I believe that I make an effective contribution to the classes that I attend.
12. In my opinion, I am a good student.
13. I feel stimulated when I achieve my study goals.
14. I have learned many interesting things during the course of my studies.
15. During class, I feel confident that I am effective in getting things done.

Response options:

- 0 = Never
- 1 = A few times per Year
- 2 = Once a Month
- 3 = A few times per Month
- 4 = Once a Week
- 5 = A few times a Week
- 6 = Every Day



**Social Provision Scale – 10 Items**

The next questions are about your current relationships with friends, family members, co-workers, community members, and so on. Please indicate to what extent each statement describes your current relationships with other people.

1. There are people I can depend on to help me if I really need it.
2. There are people who enjoy the same social activities I do.
3. I have close relationships that provide me with a sense of emotional security and well-being.
4. There is someone I could talk to about important decisions in my life.
5. I have relationships where my competence and skill are recognized.
6. There is a trustworthy person I could turn to for advice if I were having problems.
7. I feel part of a group of people who share my attitudes and beliefs.
8. I feel a strong emotional bond with at least one other person
9. There are people who admire my talents and abilities.
10. There are people I can count on in an emergency.

Response options:

- 1 = Strongly disagree
- 2 = Somewhat disagree
- 3 = Somewhat agree
- 4 = Strongly agree

**Appendix D**  
**Results from the Factor Analysis of the SLCS**

**Table D1**

*Results From a Factor Analysis of the Student Life-Challenges Scale (SLCS)*

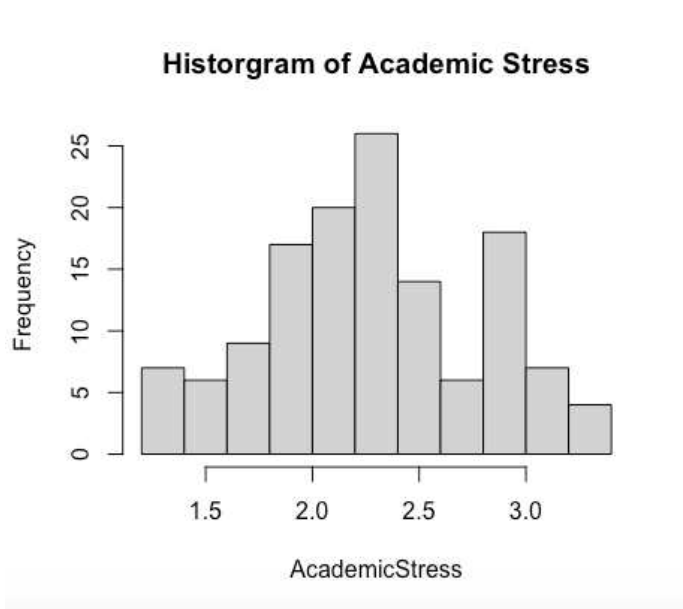
Subscales	Factor loading
Faculty shortcomings	.70
Worries about future competence	.62
Unsupportive climate	.74
High workload	.62
Financial concerns	.37

**Appendix E**

**Histograms of the Assumption Check**

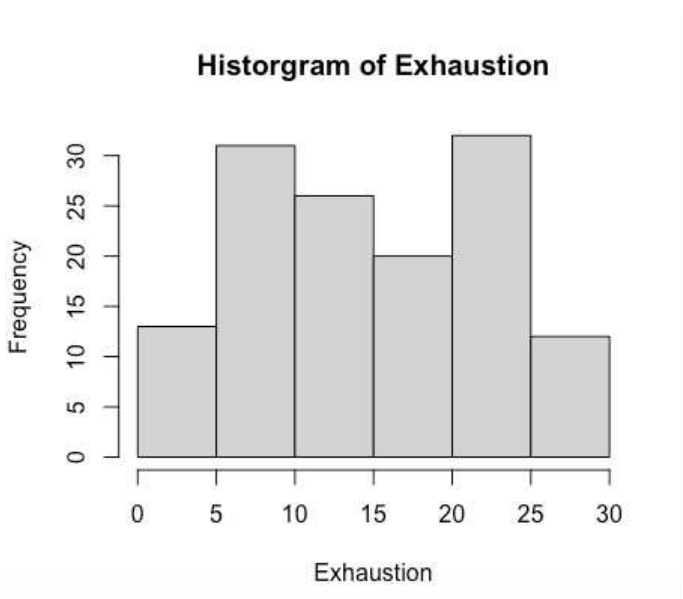
**Figure 2**

A Histogram for Academic Stress



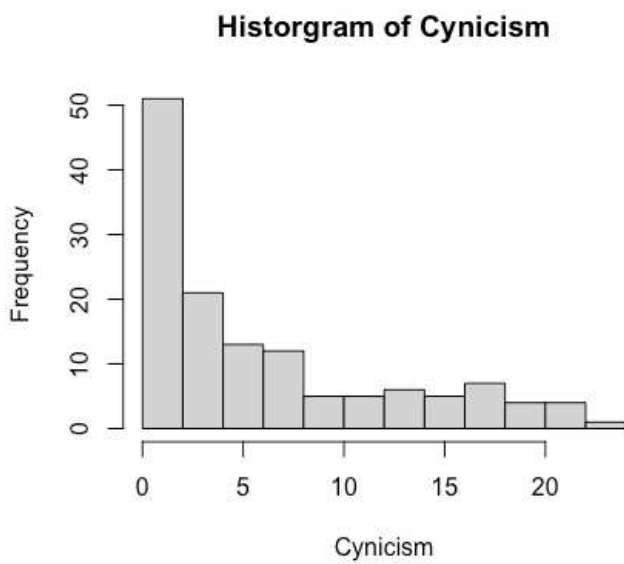
**Figure 3**

A Histogram for Exhaustion



**Figure 4**

A Histogram for Cynicism



**Figure 5**

A Histogram for Professional Inefficacy



**Figure 6**

A Histogram for Social Support

