

## **Academic stress and its sources among college students.**

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### **Abstract**

As productivity and efficiency models made their way to the academic environment, increasing levels of stress have become part of the academic life. According to the American Psychological Association (2012), besides undergoing the highest levels of stress, millennials and Gen Xers are also the only generations whose main sources of stress are “work, money and job stability.” Adolescents and young adults are especially vulnerable to high-stress levels as they undergo a hormonal and social transition. According to Jayasankara et al. (2017), effective measures have to be taken in school to assist students to alleviate stress, therefore understanding its sources is essential. This paper researches the impact of perceived stress and its sources in the academic environment. The main goal was to ascertain that academic stress exists and to determine its source. Based on literature reviews and Rajendran & Kaliappan academic stress scale of 1991 (Psychological Resources, 2014), we conducted a quantitative survey design administered across a variety of academic segments (management & economics, engineering, law & politics, medical studies, and humanities). The instrument was given out to (n=92) students studying in diverse geographical locations (France, US, Switzerland, The Netherlands, China, and Canada) from which 70.49% were living in urban areas. Our sample not only revealed that students experience various kinds of academic stress but it additionally suggests that stress-levels are shaped by gender and academic streams.

### **Keywords**

College students, Academic stress, causes of stress, anxiety

### **Introduction**

The pioneering studies of Hans Selye (1956) recognized stress as a response to a threatful situation in the environment. (Jayasankara et al., 2017). Later in 1984, Lazarus and

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Folkman defined stress as an individual's physical and psychological response to an event or object which is appraised as a threat. (Yikealo et al. , 2018). However, no one is spared from stress. For example, stress has become part of students' academic life due to the excessive pressure or other types of demands placed on them. Indeed, every student deals with stress daily and it is multifactorial. On one hand, stress arises from academic factors such as increased class workload, lower grades, many hours of study, language difficulties, examinations, fear of failure, relationship with the teacher, etc. (Essel & Owusu, 2015). Some of the common stressors reported in an academic setting include excessive assignments, poor relationships with peers and teachers, poor time management and social skills, family members' dissatisfaction, inadequate resources to perform academic work, long hours of studying. (Agolla & Ongori, 2009). On the other hand, stress arises from non-academic factors including socio-cultural, environmental, and psychological attributes such as the level of self-esteem. (Essel & Owusu, 2015). Even though the perception and response to stress and way of coping differ individually, Prabu argues that stress can lead to serious injuries if it is not managed over time such as physical or mental illness. (2015). According to Reinberg, college can be so stressful that students consider suicide as an alternative because some stresses are exceeding the capacity of students to cope. Indeed, he surveyed college students and found that 20 percent of all students surveyed thought about suicide. (2018). Moreover, depression, anxiety, behavioral problems, irritability, and other problems are also related to stress. Even though behavior and mood are affected by stress, it can also impact the human's physical aspect. Indeed, according to Mayo Clinic, stress impact human's body and provokes headache, muscle pain, chest pain, fatigue, change in sex drive, stomach upset, sleep problems. (2019). Therefore, recognizing sources of stress would help the students, lecturers, supervisors, and career and counseling centers, to put in place methods that alleviate the effects of stress at University.

### **Method**

The study aims to know if stress exists in universities, determine its sources and understand if there are gender or stream differences in academic stress reported by the participants. Our sample (n=92) is merely comprised of western adults, 45 males, and 47 females, ranging from 18 to 26 years old. Study fields have been regrouped into 5 categories or streams: Humanities, Management & Economics, Law & Politics, Engineering, and Medical studies. While the Humanities streams grouped the following study fields: Psychology, Languages, History, etc., Engineering grouped math, physics and IT study fields. To collect

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the data, we used Google Forms and assessed the survey using the Academic Stress Scale, developed by Rajendran and Kaliappan in 1991. (Psychological Resources, 2014). The academic stress scale evaluates 5 potential stressors and scores them using the Likert scale (0: "No stress", 1: "Slight stress", ..., 4: "Extreme stress"). Each stressor is measured using 8 questions each rated out of 4, for a total of 32 per stressors and total anxiety level of 160. It was hypothesized that the level of stress varies among gender and the different academic streams.

### Results

The sample came from diverse geographical areas, environments (rural/urban) and had different religious and ethnic backgrounds. The sample mean on the total anxiety score was 78.77 out of 160 with a standard deviation of 22.524. The median academic stress level is 79 which is nearly similar to the average stress level, implying that nearly 50% of the sample had above-average stress levels.

**Table 1: Mean and standard deviation on academic stress sample**

<b>N</b>	<b>Mean</b>	<b>SD</b>
92	78.77	22.524

One of our aims is to determine if there exist any significant variances in total stress levels between genders. Our sample comprised 47 females and 45 males, but for the following test, we randomly removed two female participants to have an equal number of female and male participants. Subsequently, we performed a t-test to evaluate the significance of differences between genders. As we were rather confident about the outcome, we used heteroscedastic (different variances, see table 2) one-tailed test. As portrayed in table 2, p-value ( $p=0.048$ ) is inferior to the significance level: alpha ( $\alpha=0.05$ ), thus differences in stress level between gender are significant.

**Table 2: T-test at  $\alpha=0.05$**

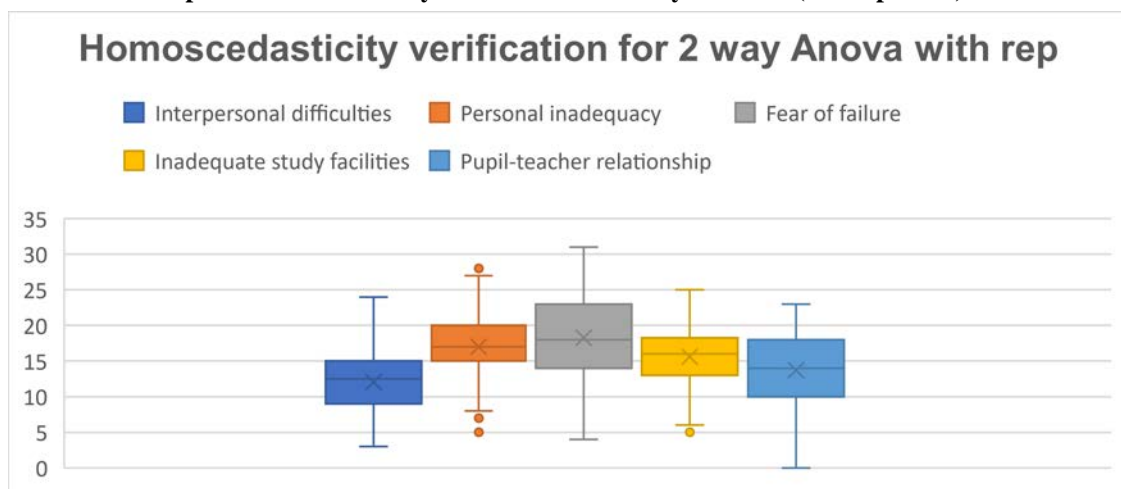
<b>Gender</b>	<b>N</b>	<b>Mean</b>	<b>Variance</b>	<b>Sig</b>
<b>Males</b>	45	73.13	20.75	0.048
<b>Females</b>	45	80.18	40.45	

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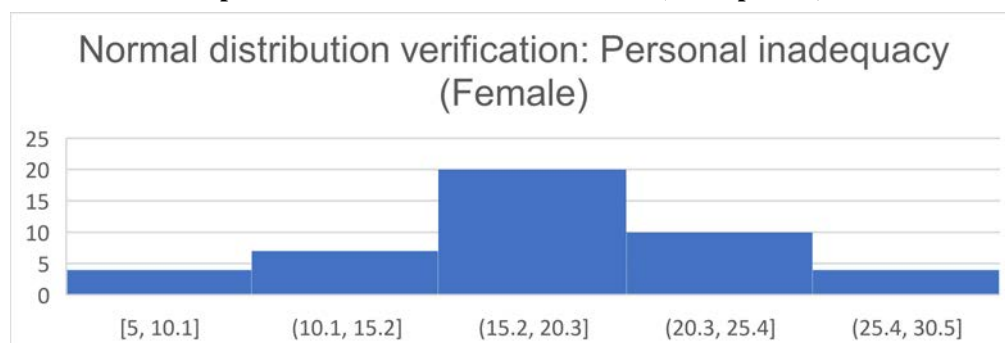
Additionally, we decided to compute a two-way ANOVA to determine whether there is an interaction between gender and levels of stress amongst college students, where gender is the independent variable and stress levels is the dependent variable. Before beginning our ANOVA test, we verified 6 assumptions to ensure the validity of the results.

1. The dependent variable is continuous
2. There are two independent groups (male/female)
3. Observations are independent
4. There are a few outliers and interquartile ranges are low, see graph 1
5. The dependent variables are approximatively normally distributed, see graph 2 for personal inadequacy
6. We performed a Levene's test to guarantee the homogeneity of the variances. The results showed that  $F_{obs} < F_{critical}$  (see table 3), meaning that we have to reject the null hypothesis  $H_0$ : variances were homogenous. However, we continued the two-way ANOVA and violate the assumption that the variances of the independent variables are homogenous as the difference is just above the refuting level.

**Graph 1: Homoscedascity verification for 2 way ANOVA (assumption 4)**



**Graph 2: Normal distribution verification (assumption 5)**



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**Table 3: Levene's test**

<b>Source of Variation</b>	<b>Fobs</b>	<b>F critical</b>
<b>Between Groups</b>	3.319669	3.949321

The ANOVA analysis conveys identical results to the t-test, we reject the null hypothesis, affirming that gender stress levels are significantly different (see table 4). Still, ANOVA gives us additional insight into these gender differences. According to table 4, variations among stressors are significant but the ANOVA analysis does not tell us which stressor has the most influence. To determine and certify which stressors differ we would have to pursue additional research (posthoc test). However, we decided to determine the outliers visually given that we violated one of the ANOVA assumptions and that pursuing further analysis with “incorrect” data is statistically incorrect. As shown in table 4, fear of failure, constituted of the following questions: lack of self-confidence, fear about results, worrying about examinations, etc., is the most important stressors for females with a sum score of 943 and only 2<sup>nd</sup> highest for males with a sum score of 702. Males' most significant stressor is personal inadequacy, constituted of the after-mentioned questions: lack of poor interest in subjects, lack of concentration during class, etc. Consequently, we could say that both “fear of failure” and “personal inadequacy” are the most significant stressors among our sample.

**Table 4**

<b>SUMMARY</b>	<b>Interpersonal difficulties</b>	<b>Personal inadequacy</b>	<b>Fear of failure</b>	<b>Inadequate study facilities</b>	<b>Pupil-teacher relationship</b>	<b>Total</b>
<b>Female</b>						
Sum	528	812	943	692	633	3608
Average	11.73	18.04	20.96	15.38	14.07	16.04
Variance	27.02	27.27	39.82	27.56	32.06	40.45
<b>Male</b>						
Sum	558	720	702	711	600	3291
Average	12.40	16.00	15.60	15.80	13.33	14.63
Variance	12.93	20.18	26.70	18.03	16.73	20.75
<b>Total</b>						
Sum	1086	1532	1645	1403	1233	
Average	12.07	17.02	18.28	15.59	13.70	
Variance	19.86	24.52	40.14	22.58	24.26	
<b>ANOVA</b>						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Sample	223.3088889	1	223.3088889	8.9938	0.0029	3.8627
Columns	2243.364444	4	560.8411111	22.5881	0.0000	2.3922
Interaction	542.1911111	4	135.5477778	5.4592	0.0003	2.3922
Total	13933.66444	449				

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Since Fobs>Fcritical, the ANOVA analysis states that there is a significant interaction between the dependent variables, implying that stressors influence each other. To understand how the academic stressors interact with one another, the data was subjected to multiple correlation analysis and the results are presented in Table 5. As reported by the multiple correlation analysis, all relationships are strong and positive suggestions that the stressors move in the same direction. For example, when “inadequate study facilities” increases by 1, “Pupil-teacher relationship” increases by 0.736 and vice versa. This could infer that schools with lower budgets, thus with inadequate study facilities also have poor quality teachers; Ultimately resulting in higher levels of stress.

**Table 5: Multiple correlation analysis between stressors**

	<i>Interpersonal difficulties</i>	<i>Personal inadequacy</i>	<i>Fear of failure</i>	<i>Inadequate study facilities</i>	<i>Pupil-teacher relationship</i>
<b>Interpersonal difficulties</b>	1				
<b>Personal inadequacy</b>	0.589071974	1			
<b>Fear of failure</b>	0.550523349	0.703651631	1		
<b>Inadequate study facilities</b>	0.693156207	0.600171931	0.647268298	1	
<b>Pupil-teacher relationship</b>	0.580401055	0.534280094	0.622074917	0.735905995	1

Furtherly, our research explored the differences in stress levels between academic streams. We gathered the following streams: Engineering, Humanities, Law & Politics, Management & Economics, and Medical studies. Since our data consist of unequal sample sizes, we could not go into a deeper analysis without additional software to excel such as SPSS. In consequence, we decided to perform a descriptive statistical analysis (see table 6). On the one hand, Humanities students experienced the highest stress level (mean=86.50), with a relatively low standard deviation (SD=17.77), implying that most students experienced similar to average stress levels. On the other hand, Engineering students undergo low levels of stress with a similar level of variance to Humanities students. According to our data set, Management & Economics students are the most irregular group with a standard deviation of 25.00. Inversely, medical students who scored similar levels of stress have a substantially lower standard deviation of 11.60. Even though the population size is very different (Management & Economics: n=45, Medical: n=11), this evidence could suggest that Management students have more diverse profiles (see **discussion** for further details).

**Table 6: Descriptive Statistics for academic streams**

	<i>Engineering</i>	<i>Humanities</i>	<i>Law &amp; Politics</i>	<i>Management &amp; Economics</i>	<i>Medical</i>
<b>N</b>	12	10	14	45	11
<b>Mean</b>	61.57	86.50	80.50	80.41	73.00
<b>Standard Deviation</b>	18.93	17.77	17.40	25.00	11.60

## Discussion

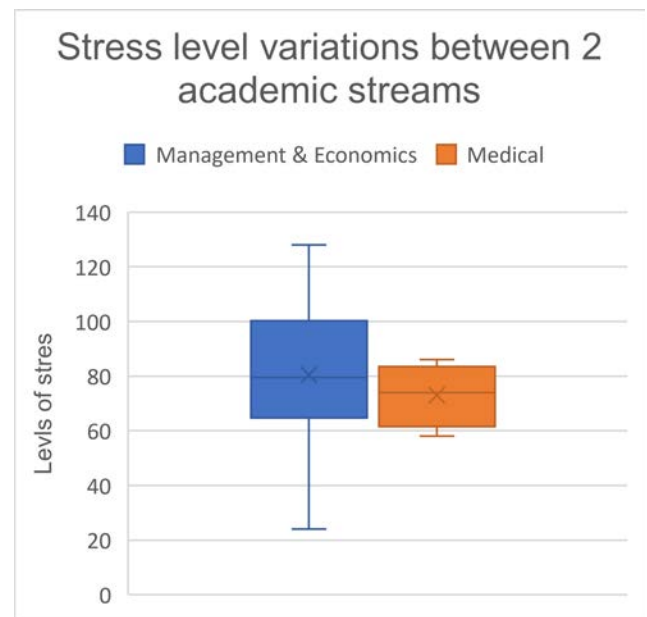
The findings obtained in Table 3 show that the scores obtained on academic stress differ among gender. Indeed, as portrayed in table 2, p-value ( $=0.048$ ) is inferior to the significance level: alpha ( $\alpha=0.005$ ), thus differences in stress level between gender are significant. According to the American Psychological Association, women report higher levels of stress than men. (n.d). Handa & McGivern state that physiological and behavioral stress responses of men and women arise from several factors, including psychosocial influences associated with culturally defined sex roles, menstrual cycle-related fluctuations in sex hormones, and gender differences in neural organization and activation patterns of sex hormones. For example, women demonstrate a higher rise in the release of adrenocorticotrophic hormone (ACTH) than do men, accompanied by a prolonged cortisol response. (2017). Therefore, since the stress stimulates ACTH production and then increases cortisol levels (Yourhormones, 2019), women, therefore, have higher stress levels than men. Moreover, we analyzed that the fear of failure dimension differed with females who reported a higher score (Mean=20.96) than males (Mean=15.60), but yet is the principal stressor in University. Essel and Owusu stated that fear of failure is one of the biggest issues students face each day in their educational life (2017). Fear of failure is alimented by the pressure of deadlines, test results (Agolla & Ongori, 2009), and apprehension of the future, such as not finding a job (Essel & Owusu, 2017). Even though “fear of failure” is an important stressor among males, “personal inadequacy” which includes lack of concentration during class, difficulty in remembering all that is studied, a too-long preparation for the examinations, etc., is the most significant factor of stress. Berings et al. state that females work more conscientiously, have higher study skills, and have greater learning attitudes & strategies. However, those disparities are explained by personality differences between men and women. Berings et al. reported that gender differences regarding the Big Five framework in which women reveal higher scores on agreeableness and

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neuroticism. Further study also demonstrates that female students obtained higher scores on attentiveness, perseverance, and orderliness. (2013).

**Graph 3**

As displayed in graph 3 and table 6, even though Management and Medical students experience on average similar levels of stress, respectively 80.41 and 73, variations amongst each group are distinct. Graph 3 is a representation of the mean and range of each group, it shows that Management levels of stress a more disperse. Although the population size is very different (Management & Economics: n=45, Medical: n=11), this evidence could suggest that Management students have more diverse profiles: personality traits and sensation-seeking which are



major factors in an individual's stress tolerance (Childs et al., 2014). In their paper “Personality traits modulate emotional and physiological responses to stress,” Childs et al. found that an individual's personality traits “explained a significant proportion (11%) of the variance in emotional responses to stress. Personality also explained 8% of the variance in blood pressure responses to stress, and 4% of the variance in heart rate and cortisol responses to stress.” According to Khan and Dhabe (2018), in their research covering the association of personality traits with academic streams, they found significant evidence on the relationship between academic streams and personality. In their sample of MBA students, the engineering streams “produced the majority of extroverts, the majority of high conscientious and also the majority of high openness individuals.” While Khan’s and Dhabe’s study reveals that an association between personality traits and academic streams exists, it does mean that the difference in stress levels between academic streams are the result of different personality traits.

### **Group experience**

The overall experience was positive, even if we struggled to contact Mariana H. by mail and messages on the Messenger platform, and replied three days before the deadline. Working on a project with other students is not an easy task, but definitely a worthy experience; a key point is to agree with how to share the different parts, and to be available to talk about it despite time zone differences. Concertation can sometimes be difficult when people have different



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working habits. For instance, some people begin their work early while others wait for the last minute. It is about different modes of organization, and maybe talents and interests also: some might consider the work to do to be harder than others. Because of the current Covid-19 situation, we have also needed time to adjust, go back home for some, and be organized to continue the semester. At first, we have all suggested different topics we were interested in to finally select the subject matter we were all familiar with: “academic Stress and its source among college students”. However, after sending the survey to students, the participants’ major gender was female. We then tried to look for more male participants since we wanted a certain homogeneity in the results, and we have managed to balance our panel. Explicitly, all the members managed to do their tasks on time, and there was no disagreement with any of the members. Paul-ary S. and Célia P. designed the survey on Google Forms after having discussed it with Julie A. and Paul T. Hence, Paul-ary S. processed the data and wrote the abstract, the results part and discussed the limitations. Julie A. has written the group experience part with Célia P. Moreover, Célia P. wrote the introduction, the discussion, the group experience parts, and the directions for future research parts. Mariana H. wrote the conclusion which was completed by Célia P. and Paul-ary S. Thenceforth, we decided that Julie André and Paul Tempterton will design the PowerPoint and all group members will help them to write scripts and to record voiceovers.

### **Conclusion**

The main goal of our project was to determine the existence of academic stress and define its sources. According to Rajendran & Kaliappan academic stress scale, all students experienced stress. Our study depicted the following 5 sources of stress: personal inadequacy, fear of failure, pupil-teacher relationship, inadequate study facilities, and interpersonal difficulties. We hypothesized that the level of stress varies among gender and the different academic streams. First, our survey shows that differences in stress levels between gender are statistically significant. Additionally, literature reviews show that physiological and behavioral stress responses of men and women arise from several factors, including psychosocial influences associated with culturally defined sex roles, menstrual cycle-related fluctuations in sex hormones, and gender differences in neural organization and activation patterns of sex hormones. On the one hand, female students’ main stressor is the fear of failure. On the other hand, male students display a higher response to personal inadequacy which is explained by personality theories where women reveal higher scores on agreeableness and neuroticism,

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concentration, perseverance, and orderliness. We outlined noteworthy variations between academic streams but not we're unable to precisely determine the underlying factors influencing these differences in anxiety levels.

### **Limitations**

This study has several limitations. First, the sample size was too small since only 92 students took the survey. Therefore we would recommend that further study should involve more participants to specifically carry more interdisciplinary research. For example, for this research, we violated one of the assumptions of the ANOVA analysis because of the low sample size and as a result, we could not continue our research. Additionally, we used self-reported data that cannot be independently verified. Self-reported data can contain sources of biases such as selective memory, attribution bias, telescoping or exaggeration. Our data is also subject to different types of cultural biases as it was mainly distributed to non-fluent English students. Finally, further research is needed to determine if personality traits are truthfully the cause of the stress levels variations between academic streams and to determine effective methods and strategies to alleviate it as it can harmful consequences.

### **Directions for future research.**

The findings would help the students, lecturers, supervisors, and career and counseling centers, to put in place methods that alleviate the effects of stress in University. Specifically, future studies can be carried out to determine the effect of stress on health. First, stress hormones affect respiratory and cardiovascular systems since during stress response, your breath hastens to rapidly spread oxygen-rich blood to the body. Therefore, persons who already have breathing problems, such as asthma or emphysema could intensify. Moreover, stress affects sexuality and reproductive system. Even though short-term stress may cause men to produce more testosterone, this effect does not last. Indeed, long-term stress decreases testosterone levels which interfere with sperm production and cause erectile dysfunction or impotence. Chronic stress may also increase the risk of infection for male reproductive organs such as the prostate and testes. Furthermore, stress affects the menstrual cycle of women, leading to irregular, heavier, or more painful periods. Chronic stress may also magnify the physical symptoms of menopause. Finally, stress stimulates the immune system and helps to avoid infections. However, chronic stress weakens the immune system and decrease the body's response to danger and increase the risk of chronic illness and infections. (The American

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Institute of Stress, n.d.). Repeated and prolonged stress also leads to various signs of physical deterioration and premature aging because stress provokes a decline of new neurons produced, neural circuits in the brain break down, and DNA telomeres shorten. (Emotion, Stress & Health, 2020).

### References

- Agolla, J., Ongori H. (2009). An assessment of academic stress among undergraduate students: The case of University of Botswana. *Educational Research and Review*. Retrieved from [https://www.researchgate.net/publication/209835751\\_An\\_assessment\\_of\\_academic\\_stress\\_among\\_undergraduate\\_students\\_The\\_case\\_of\\_University\\_of\\_Botswana](https://www.researchgate.net/publication/209835751_An_assessment_of_academic_stress_among_undergraduate_students_The_case_of_University_of_Botswana)
- American Psychological Association. (2012). Stress by Generations. Retrieved from <https://www.apa.org/news/press/releases/stress/2012/generations>
- American Psychological Association. (n.d.) Stress and Gender. Retrieved from <https://www.apa.org/news/press/releases/stress/2011/gender>
- Berings, D., De Feyter, T., Brebels, L., Van den Broeck, A., Proost, K. (2013). Gender, Personality and Academic Performance: Self-Determination Theory and Regulatory Focus Theory as Levers to Open the Black Box between Gender, Personality, Academic Effort and Performance. Retrieved from: [https://www.researchgate.net/publication/287253911\\_Gender\\_personality\\_and\\_academic\\_performance\\_Self-determination\\_theory\\_and\\_regulatory\\_focus\\_theory\\_as\\_levers\\_to\\_open\\_the\\_black\\_box\\_between\\_gender\\_personality\\_academic\\_effort\\_and\\_performance](https://www.researchgate.net/publication/287253911_Gender_personality_and_academic_performance_Self-determination_theory_and_regulatory_focus_theory_as_levers_to_open_the_black_box_between_gender_personality_academic_effort_and_performance)
- Childs, E. White, T. Wit, H. (2014). Personality traits modulate emotional and physiological responses to stress. *NBCI*. Retrived from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4119514/>
- Emotion, Stress & Health. (2020). K2. Retrieved from: [https://k2.skema.edu/pluginfile.php/1108263/mod\\_resource/content/0/Emotion%20Stress%20%20Health.Spring%202020.2.pdf](https://k2.skema.edu/pluginfile.php/1108263/mod_resource/content/0/Emotion%20Stress%20%20Health.Spring%202020.2.pdf)
- Essel, G., Owusu, P. (2017). Causes of students' stress, its effects on their academic success, and stress management by students. Retrieved from: <https://www.theseus.fi/bitstream/handle/10024/124792/Thesis%20Document.pdf;jsessionid=A4683E83BA3B1B3B29B2F5CC7AE41DD2?sequence=1>
- Handa, RJ., McGivern, RF. (2017). Stress Response: Sex Differences. Retrieved from: [https://www.researchgate.net/publication/312610896\\_Sex\\_Differences\\_Stress\\_Response](https://www.researchgate.net/publication/312610896_Sex_Differences_Stress_Response)
- Ibironke Opeyemi, S. (2016). Hardiness, Sensation Seeking, Optimism and Social Support as Predictors of Stress Tolerance among Private Secondary Schools Teachers in Lagos

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- State. *Clinical Depression*. Retrieved from <https://www.omicsonline.org/open-access/hardiness-sensation-seeking-optimism-and-social-support-as-predictorsof-stress-tolerance-among-private-secondary-schools-teachers-.php?aid=79333>
- Jayasankara, R., Karishma, M., Anjana, T. (2017). Understanding Academic Stress among Adolescents. *Artha-Journal of Social Sciences*. Retrieved from: <https://biomedpharmajournal.org/vol11no1/academic-stress-and-its-sources-among-university-students/>
- Khan, D., Dhabe, S. (2018). Study on Association of Personality Traits with Graduation Stream and Specialization Choice of Management Students. *Research Gate*. Retrieved from [https://www.researchgate.net/publication/327594705\\_A\\_Study\\_on\\_Association\\_of\\_Personality\\_Traits\\_with\\_Graduation\\_Stream\\_and\\_Specialization\\_Choice\\_of\\_Management\\_Students](https://www.researchgate.net/publication/327594705_A_Study_on_Association_of_Personality_Traits_with_Graduation_Stream_and_Specialization_Choice_of_Management_Students).
- Mayoclinic. (n.d.). Stress management. Retrieved from: <https://www.mayoclinic.org/healthy-lifestyle/stress-management/in-depth/stress-symptoms/art-20050987>
- Prabu, S. (2015). A Study on Academic Stress among Higher Secondary Students. *International Journal of Humanities and Social Science Invention*. Retrieved from: [http://www.ijhssi.org/papers/v4\(10\)/Version-2/I04102063068.pdf](http://www.ijhssi.org/papers/v4(10)/Version-2/I04102063068.pdf)
- Psychological Resources. (2014). Academic Stress Scale. Retrieved from: <http://psychologicalresources.blogspot.com/2014/12/academic-stress-scale.html>
- Reinberg, S. (2018). 1 in 5 college students so stressed they consider suicide. *CBS News*. Retrieved from <https://www.cbsnews.com/news/1-in-5-college-students-so-stressed-they-consider-suicide/>
- The American Institute of Stress. (n.d.) Stress Effects. Retrieved from: <https://www.stress.org/stress-effects>
- Yikealo, D., Tareke, W., Karvinen, I. (2018). The Level of Stress among College Students: A Case in the College of Education, Eritrea Institute of Technology. *Open Science Journal*. Retrieved from: [https://www.researchgate.net/publication/329043569\\_The\\_Level\\_of\\_Stress\\_among\\_College\\_Students\\_A\\_Case\\_in\\_the\\_College\\_of\\_Education\\_Eritrea\\_Institute\\_of\\_Technology](https://www.researchgate.net/publication/329043569_The_Level_of_Stress_among_College_Students_A_Case_in_the_College_of_Education_Eritrea_Institute_of_Technology)
- You and Your Hormones. (2019). Adrenocorticotrophic hormone. Retrieved from: <https://www.yourhormones.info/hormones/adrenocorticotrophic-hormone/>