Effectiveness of Mindfulness Meditation on Bio-Psychological Parameters Among Adolescence in Selected Nursing Colleges at Madurai

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Abstract---Background: There is a correlation between self-esteem in adolescents and depression, Anxiety and stress and Mindfulness meditation is effective to reduce these factors and gives relaxation among adolescents. The study was conducted to determine the effectiveness of mindfulness meditation on low self-esteem, depression, anxiety and stress among Students from selected Nursing colleges at Madurai, Tamilnadu, India. Methods: An Experimental design was employed for this study with participation of 300 students in Madurai in Tamilnadu. A structured DASS scale applied to ask about depression, anxiety and stress, and Rosenberg scale was administer to find the level of Self-esteem before and after Administration mindfulness meditation. Results: Students with low self-esteem were revealed that there is significance different in mean score of depression among experimental group that 15.2 in pre test and post test 8.6 where as in control group there is no significance difference subsequently Anxiety, stress, self esteem pre test score was 15.0, 17.8, 22.1 and post test score was 9.9, 12.7, 28.3. This shows significant change after administration of mindfulness meditation. Conclusions: Self-esteem is associated with anxiety, depression, and stress, which significantly affect students' quality of life. Te mindfulness meditation was effective to reduce Depression anxiety and stress and this would directly decrease the level of cortisol in the body. These results therefore suggested the need for a school-based or web-based provision aimed to administer Mindfulness meditation and other relaxation method for dealing with academic stress.

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Introduction

Adolescence (from Latin: to mature) is stage from childhood to adult. In this stage there is transitional change from both physical and psychological health. The stage of adolescence are early adolescence aged between 10-13, middle adolescence aged between 12-17 and later adolescence aged between 18-21. During adolescents period the self esteem takes hit during the traditionally awkward early teenage years possibly because of pubertal changes and increased emphasis on social comparison. (Jamie Ducharme, TIME mental health August22, 2018)
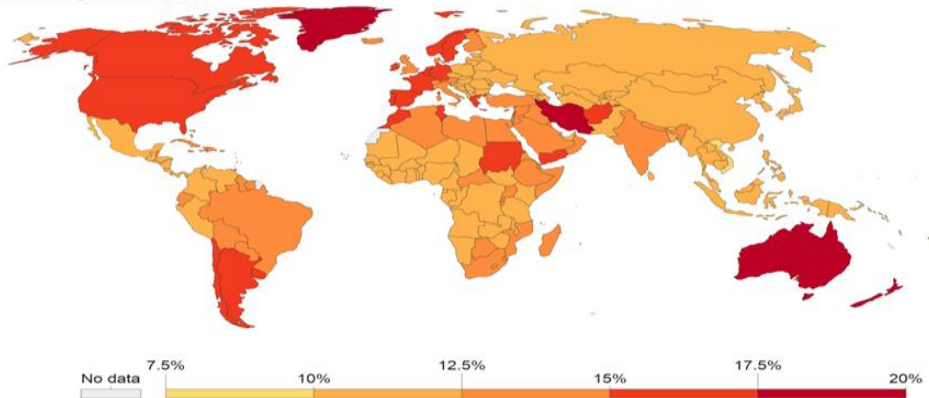
Self esteem is an individual subjective evaluation of their self and their worth. This is the essential motivation to an individual to fulfill their life. According to Carl Rogers (1902-1987) an advocate of humanistic psychology he stated that many people's problem is arising from poor worth of self and they have string idea about themselves. They are not capable to be loved by other even themselves. This is the crucial period to habituate their mental and emotional habits for their healthy life style.

A healthy self esteem has positive behaviors characteristic such as acting independence, mature, taking pride in their accomplishment accepting frustration so on. When a person is having unhealthy esteem they cannot overcome the frustration. In short span low self might withdraw living with low self esteem can harm the mental health of the people and lead to depression and anxiety. (nhs.uk.mental health-self help tips) low self esteem contributed toward high risk f anxiety depression, stress and suicidal ideation.

Majority of adolescence undergo stress, Researcher Orth.O Robin stated that low self esteem produced depression and anxiety under stressful life events. If we have study about stress and stressors among adolescents we might know about their mental health problems elaborately. The current youngsters are facing more problems in their life time such as from physical, mental, social and cultural sources. Most of the youngsters are reluctant to share their problems with their parents and this leads to depression and anxiety.

According to above stated research, Emotional disorders are common among adolescents. WHO news letter about adolescents it states that anxiety disorders are more common among adolescents and estimated that 3.6% of 10-14 years old and 4.6% of 15-19 year olds. In the same news letter it mentioned that 1.1 % adolescents aged 10-14 years have depression in later adolescent's state aged between 15-19 year olds suffering from 2.8%.

Figure 1. Prevalence of mental disorder in World

In the world wide mental health disorder estimates by Institute for Health Metrics and Evaluation has presented in their flagship Global Burden of disease study is 792 million people lived with a mental health disorder. This is approximately reveals that 10.7% people affected with mental health disorder that means one in ten people globally. In that from India 15% of people suffering from Mental Health disorder and substance use disorder.

WHO sates that globally one in seven 10-19 years old experiences of mental disorders, accounting for 13% global burden of disease in their age group. (WHO News room 17th Nov 2021) Further its states that depression, anxiety and behavioral disorder among the leading causes of illness and disability among adolescences.
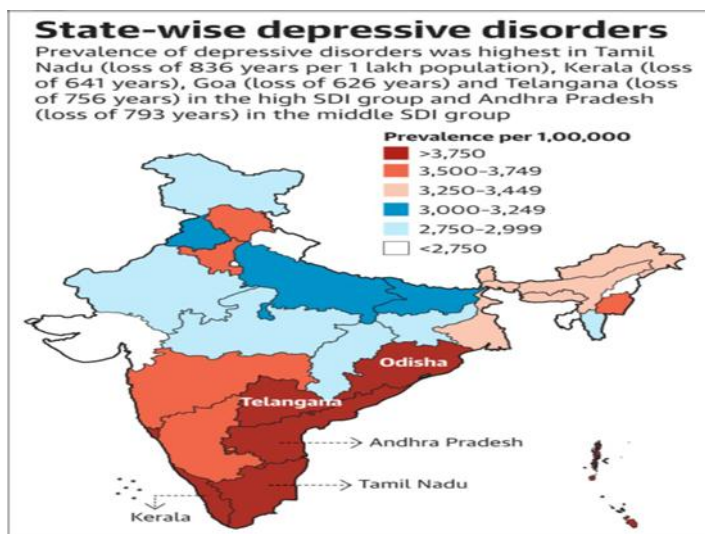

Figure 2. Prevalence of depression in India

Figure 2 says that prevalence of depression among south region is highest. Out of all Tamilnadu sate shows 836 per 1 Lakh population has lost their life. Another research from Indian council of medical research reveals exact scenario of mental health disorder prevalence among India. WHO responses 2021, states that have to develop scales to identify the psychological problem among adolescents. Furthermore it states that school should implement the strategies to promote, protect and restore the mental health among their students. The main triggers of depression are stress and anxiety. Meditation helps alter those feelings and thoughts by training your brain to focus on one thing. When negative thoughts come knocking, the brain returns to that focus point, allowing the negative emotions and physical sensations to pass. Meditation may not make all the symptoms of depression disappear but will help you manage them. It works by changing how your brain reacts to stress and anxiety. When you meditate, you can override the triggers stimulated from the prefrontal cortex and the amygdala. Mindfulness has also been shown to contribute directly to the development of cognitive and performance skills in the young. When children and young people learn to be more 'present' and less anxious, they often find they can pay attention better and improve the quality of their performance, in the classroom, on the sports field, and in the performing arts for example. They often become more focused, more able to approach situations from a fresh perspective, use existing knowledge more effectively, and pay attention.

Above stated researches show that need of Adolescents mental health care is mandatory to implement in every country and state and specially from Tamilnadu Adolescents' data shows high prevalence. This prevalence are push the researcher to investigate the prevalence of depression anxiety and stress among adolescents and to administer mindfulness meditation among them. Based on the review of Literature the statement and objective has formed by the researcher as follows,

Statement of the problem

"Effectiveness of Mindfulness Meditation on Bio-Psychological Parameters among adolescence in selected Nursing colleges at Madurai".

Objectives

- To assess the pretest and posttest level of depression, anxiety Stress , self-esteem and Biological Parameters(Salivary cortisol) among adolescence in the experimental and control group.
- To determine the effectiveness of mindfulness meditation on anxiety, depression, stress, self-esteem and Biological Parameter (Salivary cortisol) between control and experimental group.

Null hypothesis

- NO_1: There is no significant difference between pretest and posttest level of depression, anxiety and self-esteem among the adolescence in the experimental and control group at $p < 0.05$ level.

- N0$_2$: There is no significant correlation between pretest and posttest level of depression, anxiety and self-esteem among the adolescence in the experimental and control group at p<0.05 level.
- N0$_3$: There is no significant association between selected socio-demographic variables of the adolescence with their posttest score on bio-psychological variables at p<0.05 level.

Materials Methods

Research Approach : An Quantitative Approach was adopted in this study.
Research Design: A True Expertimental design was adopted to assess the Effectiveness of Mindfulness on reduction of Depression, Anxiety, stress and improve the self esteem among Adolescents.

Table 1
Pre-Test

PRE-TEST	INTERVENTION	*POST-TEST*
Day-1 1.Socio-demographic data 2.pre- level of self esteem, depression, anxiety and stress with DAS 21 scale and Rosenberg Scale and saliva cortisol	Day-1 to 8 week Administration of mindfulness meditation to improve self esteem. No manipulation to control group	9th week post-test - level of self esteem, depression, anxiety and stress with DAS 21 scale and Rosenberg Scale and saliva cortisol

Variables

- Independent variable: In this study, the independent variable was Mindfulness Meditation.
- Dependent variable: The dependent variable in the study was Level of self esteem, depression, Anxiety, stress and saliva cortisol.

Setting of the study

This study was conducted at C.S.I Jeyaraj Anna PAckiam college of Nursing, Chithirai College of Nursing, Vellammal College of Nursing at Madurai. These setting were chosen by randomized sampling technique
Population The study population from selected Nursing College students at Madurai.
Sample: Sample size for this study was 200 students 100 from Experimental group and 100 from Control group.
Sampling Technique Quota sampling were used to select the colleges and allocated randomly for experimental and control group.

Sampling criteria

Inclusion criteria

- Students who were meet critera in Rosenberg scale and DASS 21 scale.
- Students who were willing to participate in the study.
- Students who were present at the time of data collection

Exclusion criteria

- Those who are not willing to participate in the study.
- Those who are not attending during the study.
- Those who seriously affected with mental and physical disorder.
- Those who were Deaf.
- Those who are recently underwent bereavement.
- Those who are practicing yoga/ Meditation in their daily life.

Development of instrument

DASS-21 : To assess the Depression, Anxiety and Stress
Rosenberg Scale: To assess the level of self esteem
Salaiva cortisol: To assess the level of cortisol in saliva
Applied Mindfulness process scale (AMPS)- To assess the effectiveness of Mindfulness meditation

Data collection

A study has conducted among 20 samples. 10 are from Experimental group and 10 are from control group. Data collection period is from Last week of Oct 2021 to Third week of Dec 2021. Mindfulness Meditation has administered from Nov first week to December last week After 8 weeks post test result has collected from the samples. Researcher found feasibility in samples and reliability from tool.

Plan for data analysis

The data analysis was planned to include descriptive and inferential statistics.

Results

The results were presented according to Objective

Table 2
Analysis of control and experimental groups data

S.No.	Parameter	Groups	Mean	SEM
1	Depression	Con-Pre-Test	13.0	1.9
		Con-Post-Test	14.9	1.9
		Exp-Pre-Test	15.2	1.3
		Exp-Post-Test	8.6	1.9

2	Anxiety	Con-Pre-Test	12.2	2.2	
		Con-Post-Test	14.8	1.8	
		Exp-Pre-Test	15.0	1.6	
		Exp-Post-Test	9.9	1.8	
3	Stress	Con-Pre-Test	12.0	1.2	
		Con-Post-Test	13.8	1.2	
		Exp-Pre-Test	17.8	1.9	
		Exp-Post-Test	12.7	1.9	
4	Self-esteem	Con-Pre-Test	28.3	0.8	
		Con-Post-Test	25.4	0.9	
		Exp-Pre-Test	22.1	0.7	
		Exp-Post-Test	28.3	1.3	
5	Salivary cortisol (units)	Con-Pre-Test	14.749	0.561	
		Con-Post-Test	14.805	0.558	
		Exp-Pre-Test	15.802	0.878	
		Exp-Post-Test	1.323	0.213	

n – Control (Con) = 10; Experimental (Exp) = 10.

Table 2 revealed that there is significance different in mean score of depression among experimental group that 15.2 in pre test and post test 8.6 where as in control group there is no significance difference subsequently Anxiety, stress, self esteem pre test score was 15.0, 17.8, 22.1 and post test score was 9.9, 12.7, 28.3. This shows significant change after administration of mindfulness meditation.

Table 3
Difference between pre and post test depression among control and Experimental group - Equal Variance Test (Brown-Forsythe): Passed (P = 0.776)

S.No	Parameter	Group	duration	Mean	SD	SEM	P.value
1	Depression	control	Pre-test	13.000	6.128	1.938	
			Post-test	14.900	5.896	1.865	P=0,776
2		Experimental	Pre-test	15.200	4.237		
						1,340	
			Post-test	8.600			
					5.892	1.863	

Table 3 shows that there is a significance difference in reduction of depression after administration of Mindfulness Meditation from 15.2 to 8.6.

Table 4
Difference between pre and post test Anxiety among control and Experimental group - Equal Variance Test (Brown-Forsythe): Passed 0.795

S.No	Parameter	Group	duration	Mean	SD	SEM	P.value
1	Anxiety	control	Pre-test	12.200	7.084	2.240	
			Post-test	14.800	5.594	1.769	P=0.795
2		Experimental	Pre-test	15.000	4.922		
						1,556	
			Post-test	9.900			
					5.820	1.841	

Table 4 shows that there is a significance difference in reduction of Anxiety after administration of Mindfulness Meditation from 15.0 to 9.9.

Table 5
Difference between pre and post test stress among control and experimental group P= 0.295

S.No	Parameter	Group	duration	Mean	SD	SEM	P.value
1	Stress	control	Pre-test	12.000	3.887	1.229	
			Post-test	13.800	3.706	1.172	P=0.295
2		Experimental	Pre-test	17.800	5.922		
						1,873	
			Post-test	12.700			
					5.926	1.874	

Table 5 shows that there is a significance difference in reduction of stress after administration of Mindfulness Meditation from 17.8 to12.7.

Table 6
Difference between pre and post test Self- Esteem among control and experimental group P= 0.079

S.No	Parameter	Group	duration	Mean	SD	SEM	P.value
1	Self	control	Pre-test	28.300	2.406	0.761	
	Esteem		Post-test	25.400	2.716	0.859	P=0.079
2		Experimental	Pre-test	22.100	2.283		
						0.722	
			Post-test	28.300			
					4.218	1.334	

Table 6 shows that there is a significance difference in Improvement of Self-Esteem after administration of Mindfulness Meditation from 22.1 to28.3.

Table 7
Difference between pre and post test salivary cortisol among control and experimental group P= 0.050

S.No	parameter	Group	duration	Mean	SD	SEM	P.value
1	Salivary	control	Pre-test	14.749	1.774	0.561	
	cortisol		Post-test	14.805	1.766	0.558	P=0.050
2		Experimental	Pre-test	15.802	2.776		
						0.878	
			Post-test	1.323			
					0.673	0.213	

Table 7 shows that there is a Highly significance reduction of Salivary Cortisol after administration of Mindfulness Meditation from 15.8 to1.3.

Two way repeated measures ANOVA (One Factor Repetition)

Dependent Variable: Depression
Normality Test (Shapiro-Wilk): Passed   (P = 0.302)
Equal Variance Test (Brown-Forsythe): Failed   (P < 0.050)

Table 8
Two way ANOVA among depression and mindfulness meditation

Source of Variation	DF	SS	MS	F	P
Group	1	42.025	42.025	0.811	0.380
Subjects(Group)	18	932.250	51.792		
Test	1	55.225	55.225	5.160	0.036
Group x Test	1	180.625	180.625	16.876	<0.001
Residual	18	192.650	10.703		
Total	39	1402.775	35.969		

Table 8 Shows that there is significant difference in Mean Score depression among Experimental and control group. The mean score in experimental group 180.625 in P value of 0.001. It shows the Mindfulness meditation was beneficial according to table 8

Dependent Variable: Anxiety
Normality Test (Shapiro-Wilk): Passed (P = 0.960)
Equal Variance Test (Brown-Forsythe):   Passed   (P = 0.407)

Table 9
Two way ANOVA among anxiety and mindfulness meditation

Source of Variation	DF	SS	MS	F	P
Group	1	11.025	11.025	0.188	0.670
Subjects(Group)	18	1055.450	58.636		
Test	1	15.625	15.625	1.402	0.252
Group x Test	1	148.225	148.225	13.297	0.002
Residual	18	200.650	11.147		
Total	39	1430.975	36.692		

Table 9 Shows that there is significant difference in Mean Score Anxiety among Experimental and control group. The mean score in experimental group 148.225 in P value of 0.002. It shows the Mindfulness meditation was beneficial according to table 9

Dependent Variable: Stress
Normality Test (Shapiro-Wilk): Failed (P < 0.050)
Equal Variance Test (Brown-Forsythe): Failed (P < 0.050)

Table 10
Two way ANOVA among stress and mindfulness meditation

Source of Variation	DF	SS	MS	F	P
Group	1	55.225	55.225	1.481	0.239
Subjects(Group)	18	671.050	37.281		
Test	1	27.225	27.225	2.225	0.153
Group x Test	1	119.025	119.025	9.727	0.006
Residual	18	220.250	12.236		
Total	39	1092.775	28.020		

Table :10 Shows that there is significant difference in Mean Score Stress among Experimental and control group. The mean score in experimental group 119.025 in P value of 0.006. It shows the Mindfulness meditation was beneficial according to table 10

Dependent Variable: Self esteem
Normality Test (Shapiro-Wilk): Passed (P = 0.888)
Equal Variance Test (Brown-Forsythe): Failed (P < 0.050)

Table 11
Two way ANOVA among self-esteem and mindfulness meditation

Source of Variation	DF	SS	MS	F	P
Group	1	27.225	27.225	2.749	0.115
Subjects(Group)	18	178.250	9.903		
Test	1	27.225	27.225	3.328	0.085
Group x Test	1	207.025	207.025	25.307	<0.001
Residual	18	147.250	8.181		
Total	39	586.975	15.051		

Table 11 Shows that there is significant difference in Mean Score Self-esteem among Experimental and control group. The mean score in experimental group 207.025 in P value of 0.001. It shows the Mindfulness meditation was beneficial according to table 11

Dependent Variable: Saliva cortisol
Normality Test (Shapiro-Wilk): Passed(P = 0.142)
Equal Variance Test (Brown-Forsythe):Failed(P < 0.050)

Table 12
Two way ANOVA among salivary cortisol and mindfulness meditation

Source of Variation	DF	SS	MS	F	P
Group	1	386.200	386.200	75.059	<0.001
Subjects(Group)	18	92.616	5.145		
Test	1	520.057	520.057	251.614	<0.001
Group x Test	1	528.166	528.166	255.537	<0.001
Residual	18	37.204	2.067		
Total	39	1564.242	40.109		

Table 12 Shows that there is significant difference in Mean Score Salivary cortisol among Experimental and control group. The mean score in experimental group 528.166 in P value of 0.001. It shows the Mindfulness meditation was beneficial according to table 12

Discussion

In this chapter the study discussion was discussed according to objective of the study. The First objective was

- To assess the pretest and posttest level of depression, anxiety Stress , self-esteem and Biological Parameters(Salivary cortisol) among adolescence in the experimental and control group.

In this study Nursing students were from both the Experimental and control group have   assessed their level of depression, Anxiety, Stress, Self-Esteem and salivary cortisol The results were shocked to see that from conrol group pre test level of depression , Anxiety, Stress, Self-Esteem and salivary cortisol were 13.0, 8.6, 12.0, 28.3, 14.749. It shows that There is a significant level of depression anxiety and stress among Nursing students. Whereas from Experimental group revealed that there is significance difference in mean score of depression among experimental group that 15.2 in pre test subsequently Anxiety, stress, self esteem pre test score was 15.0, 17.8, 22.1 A Similar study has conducted by Dat tan Nguyen , E. Pamela Wright Conduced study in 27 sep 2016 Canto , city in Vietnam on low self-esteem and it's association with Anxiety Depression and suicidal ideation in Vietnamese secondary school students. A cross -sectional study was including 1149 participation of students. Questionnaire was applied to ask about self-esteem, Depression, anxiety, educational stress and suicidal ideation. Students with low self-esteem were detected at prevalence of 19.4% High educational stress and physical and emotional abuse by parents or other adults in the household were major risk factors.

The supportive study has revealed that students are having higher level of Depression Anxiety stress during their Academics and it is highly correlated with low self esteem and that is highly supported with result of this study that those who are having Low self Esteem they are having Significant high level of Depression ,Anxiety and stress. Out of all stress reached peak among students. Regarding level of saliary cortisol Mean score is 14.749 and it was high level among normal students and it is correlated with salivary cortisol. A similar supportive study has done among depressive pateient that correlation between depression ans salivary cortisol done by Matias Brodsgaard Gryderup Conducted study in april 2015 in Denmark on a two year follow up study of salivary cortisol concentration and risk of depression. The study was focused on whether a high level of salivary cortisol is a risk factor of depression. Total 4467participants were participated in this study. Participants were reporting high level of depression, assessed by questionnaire were assigned to a psychiatric interview. By interview 98 participants were diagnosed with depression after 2 years ,2920 participants who had provided saliva cortisol measurement , participated at follow-up. The result shows that risk of depression decreased by increasing daily mean cortisol concentration, while

morning and evening cortisol concentration were not significantly associated with depression.

This depression anxiety and stress among the students may be due academic pressure. Nursing course has a toughest syllabus to complete and real life experience with patient may increase their anxiety and unsuccessful completion of their task may produce depression among them. The Nursing authority and council should take care of their student's mental health during their course and make a effective curriculum plan to reduce their stress.

- To determine the effectiveness of mindfulness meditation on anxiety, depression, stress, self-esteem and Biological Parameter (Salivary cortisol) between control and experimental group.

This study revealed that there is significance different in mean score of depression among experimental group that 15.2 in pre test and post test score is 8.6 where as in control group there is no significance difference subsequently Anxiety, stress, self esteem pre test score was 15.0, 17.8, 22.1 and post test score was 9.9, 12.7, 28.3. This shows significant change after administration of mindfulness meditation. A similar study has conducted by Chloe Randal, Daniel Pratt, Sandra Bucci 2015, Newyork USA has conducted study on Mindfulness and self esteem A systemic review was conducted using electronic data basis resulting in 32 studies meeting the inclusion criteria. 15 studies explore the association between dispositional mindfulness and self esteem and 17 studies investigated changes in self esteem following MBI cross sectional studies found significant positive correlation between dispositional mindfulness and self esteem while the majority of MBI studies resulted in significant increase in self esteem.

Another study has conducted by Yu- Feng Li and Wen-xin sun has conducted study at china in march 2020 on effects of mindfulness meditation on anxiety,depression,stress and mindfulness among nursing student :a meta-analysis and trial sequential analysis of randomized controlled trials.For the data collection 257 nursing student were included .A comprehensive search and screening procedures were conducted to look at all my mindfulness meditation interventions implemented with nursing students .The result shows that, comparing with the control group , mindfulness meditation could significantly improve anxiety and stress .It could also improve depression level of nursing students after 8 weeks intervention duration .Conclusions the results indicated that MM could effectively reduced level of anxiety and stress of nursing students. Revealed that the Mindfulness Meditation was effective in reducing Depression Anxiety stress and improve the level of Self-Esteem. The above supportive study strongly agreed the effectiveness of Mindfulness Meditation among the students to alleviate the stress. When the stress has reduced significantly salivary cortisol level also drop down from the higher level. So the study has accepted the Research hypothesis that mindfulness Meditation is effective to reduce the Depression Anxiety Stress and improve the self esteem. In the Nursing College students should have extra-curricular time to practice yoga mindfulness mediation to relax their stress would help them to increase their academic performance

Conclusions

Self-esteem is associated with anxiety, depression, and stress, which significantly affect students' quality of life. Te mindfulness meditation was effective to reduce Depression anxiety and stress and this would directly decrease the level of cortisol in the body. These results therefore suggested the need for a school-based or web-based provision aimed to administer Mindfulness meditation and other relaxation method for dealing with academic stress.

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