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## **Exploring the Influence of Gut Microbiota on Stress, Personality Traits and Resilience Strategies in Science and Arts Discipline Students**

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### **ARTICLE DETAILS**

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### **ABSTRACT**

Stress is an increasingly rising condition in youth and varies greatly with personality traits, their diet and the environment they live in. It is therefore important to fathom how these traits might converge; the knowledge will be useful in the formulation of interventions that will solely address stress. The presence and absence of certain microbiome has shown to have a direct impact on one's mind and mood. The present study seeks to establish the association that may exist between stress in students and how microbes impact stress.. In order to compare stress and personality, candidates were chosen from different groups of students, with an emphasis on students who chose isolated disciplines, particularly from the sphere of science; such participants are usually exposed to high levels of stress stemming from studying issues. Personality states were assessed using self-report questionnaires already normed and saliva samples on fasting. The present study validates physical stress and openness to experience as correlated, and that people with high openness have different ways of dealing with stress as compared to those with low openness. Additionally, this work conveys the previous data showing that administration of Lactobacillus microbiota together with psychological therapies helps manage stress levels. It is established that self-adjoint psychological interventions coupled with Lactobacillus diet support can be of great value for stress reduction among a specific target-client base including science students in particular.

### **1. Introduction**

Stress is an individual's response to the situations which all are fearful, unaccepted and has a major impact on one's life. Stressful situation and stress response are different from person to person and according to their personality traits. Personality (cluster of traits & types) plays a major role in stress perception and in stress response. Stress can be categorized based on its duration. Acute psychological stress, like that experienced during a surgical operation or examination, contrasts with chronic psychological stress, which stems from ongoing anxieties like family conflicts or financial troubles (Yang et al., 2015). Additionally, early-life stress has been linked to various psychiatric disorders, including depression and anxiety (O'Mahony et al., 2011). Stress can be categorized based on its duration. Acute psychological stress, like that experienced during a surgical operation or examination, contrasts with chronic psychological stress, which stems from ongoing anxieties like family conflicts or financial troubles (Yang et al., 2015). Additionally, early-life stress has been linked to various psychiatric disorders, including depression and anxiety (O'Mahony et al., 2011).

Chronic stress poses a significant health challenge for society, being linked to a range of disease states, notably an elevated susceptibility to neuropsychiatric disorders like depression and anxiety (Yang et al., 2015). Over a quarter of the population grapples with these disorders (Househam et al., 2017). Moreover, chronic stress is correlated with

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gastrointestinal (GI) issues such as irritable bowel syndrome (IBS) (Moloney et al., 2016). Both chronic stress and psychological stress have the potential to influence the developmental path of the intestinal barrier (Smith et al., 2010; Lennon et al., 2013), and they have been linked to heightened gut permeability (Söderholm et al., 2002).

The gut microbiota has recently emerged as one of the most fascinating entities in modern biomedical research (Cryan and Dinan, 2012). Associated with a myriad of physiological functions ranging from energy metabolism to mental well-being (Moloney et al., 2016), the gut microbiome plays a crucial role. Mammalian microbial colonization commences at birth, although it may commence during pregnancy, as diverse microbes have been detected in amniotic fluid, the placenta, umbilical cord blood, and fetal membranes. Postpartum, the gut microbiota undergoes refinement and modification until reaching adult-like communities and diversity homeostasis at approximately 2 years of age (Ohland and Jobin, 2015). Connections between various gut-related biological pathways and mechanisms have been identified in the etiology of depressive and anxiety disorders (Penninx et al., 2013), including inflammation linked to increased intestinal permeability and microbial dysbiosis (Zheng et al., 2016). The human GI tract is primarily governed by two phyla: Firmicutes and Bacteroidetes, alongside members of *Actinobacteria*, *Verrucomicrobia*, *Proteobacteria*, *Fusobacteria*, and *Cyanobacteria* phyla (Moloney et al., 2016; Lach et al., 2018). While this relative abundance of microbial populations tends to remain stable throughout adult life, it is subject to alteration.

Therefore, factors such as mode of delivery (vaginal or caesarean section), breastfeeding or bottle-feeding, diet, certain medications (particularly antibiotics), exposure to viral or bacterial infections, stress, and other variables like smoking, collectively shape the composition of the core bacteria harbored throughout adult life (Sukoh et al., 1998; Martin et al., 2009; Kochhar and Martin, 2015; Mountzouris et al., 2015; Rea et al., 2017; Savin et al., 2018). The present study was conducted to establish the association that may exist between stress and gut microbiota. With this relation being an area of interest, it was experimented as to how personality affects aspects of stress, including perception and management is correlated to gut microbes. Further, the role of *Lactobacillus* microbiota in stress reduction inclusion among other psychological treatments. The present work focused on the stress experiences of science and arts students, and the argument is made for designing differentiation stress management methods to handle their stress.

## 2. Materials and Methods

### 2.1 Study area

#### a. Participants

The sample consists of 100 participants from science and arts discipline both males and females from Periyar University, Salem, Tamil Nadu, India. Out of those 94 samples were selected for study. They have voluntarily come for the study. Participants were asked for their saliva sample and to fill the both the questionnaires for the study. We have collected saliva sample from the participant early morning after brushing the teeth in order to get the normal microbial flora in the saliva. After that participant were asked to give their response for stress and personality questionnaire.

#### b. Protocol design

The testing took place over three month period. The participants were asked to give the response for the big five factor and stress indicator questionnaire. There was no time limit for the responses but participant were asked to respond as soon as possible. The stress indicator consist of five sub dimensions in the scale- Physical indicator, Sleep indicator, Behavior indicator, Emotional indicator, Personal indicator. The stress indicator consist of 75 items and 25 items in the big five locator. The big five locator are also having five scale - openness to experience, conscientiousness, extroversion, agreeableness, neuroticism. After getting the responses from the participants were appreciated.

#### c. Hypothesis

Based on the reviews and considering the above objectives, the following alternative hypotheses were framed.

H<sub>1</sub>: There will not be any significant gender difference on the dimension of stress indicator and big five factors.

H<sub>2</sub>: There is no correlation between the composition of microbes across gender.

H<sub>3</sub>: Low and high stress groups will not differ significantly on the dimensions of stress indicator and big five factors.

H<sub>4</sub>: There will not be any difference in the composition of microbes across low and high stress groups.

#### d. Questionnaire tools

a. *Stress indicators questionnaire (SIQ)* by the counseling team international consisted of 75 items. This questionnaire has five dimensions- physical indicators, sleep indicators, behavior indicator, emotional indicator, personal habits. The score for each dimension is same is 5, 4,3,2,1. Participant were asked to give their response in the terms of "almost always", "most of the time", "some of the time", "almost never" and "never", behavior indicator, emotional indicator, personal habits. The score for each dimension is same is 5, 4,3,2,1. Participant were asked to give their response in the terms of "almost always", "most of the time", "some of the time", "almost never" and "never".

b. *The Big five locator* The Big five personality by McCrae and Costa consisted of 25 pairs of words which are polarized opposites. The numbers 5 to 1 have been placed between the opposites indicate the strength of particular quality. Maximum results possible are 25. Test-retest reliability of the big five locator was found to be 0.728. The coefficient of alpha for the five subscales was: N=0.63, E=0.77, O=0.69, A=0.74, C=0.75. It contains twenty five pairs of bipolar adjectives phrase that correlate with the five NEO factor at 0.40.

e. *Sample collection and microbial analysis*

1. *Saliva collection*

As per the protocol outlined by Pruessner et al. (1997), participants were instructed to provide saliva samples upon waking for each day of testing. Saliva sample was used for this study. Basically saliva was collected in the morning (10-11 am). Participants were asked to give saliva sample before eating anything in the morning (after some time of brushing) to maintain oral hygiene and saliva was collected in 40ml sterile Falcon® tube. The samples were aseptically transferred to Microbiology laboratory and stored in refrigerator for further analysis. All microbiological media, sourced from Hi Media, were meticulously prepared in accordance with the manufacturer's instructions using de-ionized water and autoclaved at 121 8C for 20 min before use. To initiate the process, one ml of saliva was diluted in 1 mL of saline Solution and thoroughly mixed by vortexing. Subsequently, serial 10-fold dilutions were carried out in Mann-Rogosa-Sharp (MRS) Broth, with dilutions reaching up to 10<sup>5</sup>. Following dilution, 0.1 mL aliquots from each dilution were plated onto MRS agar to enumerate total lactic acid bacteria. These agar plates were then placed in a candle jar with 10% carbon dioxide and reduced oxygen and left to incubate at 30°C for 3 days. Quantification of total lactic acid bacteria was performed by counting colony-forming units (CFU) on the MRS plates corresponding to the last readable dilution. The organisms were identified using Biochemical assays (Murray et al., 1999).

f. *Statistical analysis*

The data was statistically analysed using Microsoft Excel Data analysis Toolpack using repeated measures to obtain t-value and cumulative values.

### 3. Results and Discussion

A total of 100 participants were selected among them were 27 males and 67 females and from the table no 1 it is found that the mean, SD and t-value for the dimensions of stress indicator and big five locator. About six participants were rejected as their samples were not sufficient. Table no.1.1 shows the distribution of microorganisms in different individual samples selected. The mean, SD and t-value for males and females in physical dimension of stress indicator is 42.69, 11.75 and 42.73, 10.47 respectively and t-value obtained is 0.16 which implies that there is no significant differences in the physical indicator dimensions of stress indicator and the big five locator for males and females. In the dimension of sleep indicator mean, standard deviation and t-test of males and females are 10.25, 4.17 and 10.32, 3.90 respectively. The t-value for the sleep indicator is 0.74 which show that there is no significant differences between sleep indicator, dimension of stress indicator and big five locator for males and females. For the purpose of the study Mean, SD, t-test and P and the data is mentioned in Table No 1.

**Table 1-** Showing the Mean, SD and t-value on stress indicator and big five based on gender.

Stress indicator (Dimensions)	Male (27)		Female (67)		t- value
	Mean	SD	Mean	SD	
Physical indicator	42.29	11.75	42.73	10.47	0.16
Sleep indicator	10.25	4.14	10.32	3.90	0.74
Behavioral indicator	29.74	11.27	26.16	5.77	1.56
Emotional indicator	48.75	12.00	54.09	14.79	1.82
Personal indicator	21.77	5.10	21.19	5.14	0.50
Subtotal_dimention	153.01	37.56	154.44	32.25	0.17
The big five locator					
Openness to experience	13.25	1.99	13.59	2.43	0.69
Conscientiousness	15.88	3.50	14.82	2.62	1.43
Extroversion	14.81	2.30	15.26	2.70	0.82
Agreeableness	17.00	2.93	17.55	2.54	0.85
Neuroticism	15.59	3.27	15.85	3.53	0.33

*Hypothesis No.1 tested: There will not be any significant gender difference in the dimensions of Stress Indicator and the big five locator-Accepted. Hence, there is no significant difference between these variables.*

**Table 1.1-** Showing the presences of microbiota for males and females.

Microbiota	Gender	Frequency	Percent	Cumulative Percent
1) <i>Streptococcus</i>	M	14	51.9	51.9
	F	36	53.7	53.7
2) <i>Lactobacillus</i>	M	7	25.9	77.8
	F	12	17.9	71.6
3) <i>Streptococcus</i> & <i>Lactobacillus</i>	M	6	22.2	100.0
	F	19	28.4	100.0
	M	27	100.0	-
Total	F	67	100.0	-

*Hypothesis No.2 tested: There is no correlation between the compositions of microbes across gender- Not accepted. Hence, variation is there between these variables. Here we can see that males are having more numbers of Lactobacillus where females are having more number of Streptococcus and the combination of the Streptococcus & Lactobacillus.*

The mean, standard deviation for males and females in behavioral indicator is 29.74, 11.27 and 26.16, 5.77 and t- value is 1.56 which implies there is no significant difference in the dimension of stress indicator and big five locator for males and females. The mean, standard deviation for males and females in emotional indicator is 48.75, 12.00 and 54.09, 14.79 and t-value for this indicator is 1.82 which denote that there is no significant difference in the dimension of stress indicator and big five locator for males and females. The mean, standard deviation for for males and females in personal indicator is 21.77, 5.10 and 21.19, 5.14 respectively. The t value is 0.50 which says that there is no significant difference there is no significant difference in the dimension of stress indicator and big five locator for males and females. The subtotal of all dimensions in stress indicator for males is 153.01, 37.56 and for females is 154.44 and 32.25 and t- score is 0.17 which shows that there is no significant difference in the stress indicator dimensions for males and females. The mean, standard deviation and t-test for males and females in big five locator for openness to experience is 13.25, 1.99 and 13.59, 2.43 and t-value is 0.69 which shows that there is no significant differences between in dimension of openness of experience in big five locator for males and females. The mean, standard deviation for male and female in big five locator for conscientiousness is 15.88, 3.50 and 14.81, 2.30 and t-value is 1.43 which shows that there is no significant differences between in dimension of conscientiousness in big five locator for males and females. The mean, standard deviation for males and females in big five locator for extroversion is 14.81, 2.30 and 15.26, 2.70 and t-value is 0.82 which shows that there is no significant differences between in dimension of extroversion in big five locator for males and females. The mean, standard deviation for male and female in big five locator for agreeableness is 17.00, 2.93 and 17.55, 2.54 and t-value is 0.85 which shows that there is no significant differences between in dimension of agreeableness in big five locator for males and females. The mean, standard deviation for males and females in big five locator for Neuroticism is 15.59, 3.27 and 15.85, 3.53. The t-value is 0.33 which shows that there is no significant differences between in dimension of neuroticism in big five locator for males and females (Table No 2). Table no 2.1 show the microbe distribution and type in both high and low stress groups.

**Table 2-** Showing the Mean, SD and t- value for the dimension of Stress Indicator and The big five locator for low and high stress group.

Dimensions	Group	N	Mean	Std.dev	t- test
Sl_Physical	LSG	48	35.70	7.24	8.30*
	HSG	46	49.80	9.06	
Sl_Sleep	LSG	48	7.93	2.76	7.46*
	HSG	46	12.78	3.47	
Sl_Behaviour	LSG	48	22.62	3.71	7.02*
	HSG	46	31.95	8.24	
Sl_Emotion	LSG	48	42.71	9.90	9.72*
	HSG	46	62.83	10.13	
SL_Total	LSG	48	127.92	18.17	12.57*
	HSG	46	181.27	22.61	
Openness to experience	LSG	48	12.72	2.04	3.49
	HSG	46	14.30	2.30	
Conscientiousness	LSG	48	15.56	3.11	1.48*
	HSG	46	14.67	2.67	
Extroversion	LSG	48	15.47	2.70	1.31
	HSG	46	14.78	2.43	
Agreeableness	LSG	48	17.83	2.73	1.65
	HSG	46	16.93	2.52	
Neuroticism	LSG	48	16.72	3.40	2.84*
	HSG	46	14.78	3.23	

LSG- low stress group, HSG- High stress group, \* significant at 0.05 level.

*Hypothesis No.3 tested: Low and high stress groups will not differ significantly on the dimensions of stress indicator and big five factors locator. Not accepted-Hence, there is a significant as difference.*

It is clear that gender is not playing any role in the dimensions of stress indicator and big five locator. This means that males and females are equal in their personality and the stress experiences. Till some extend they both will have same kind of stress experiences and personality characteristic. Numerous studies have explored gender differences in stress perception, with mixed findings. While some research suggests that females tend to report higher levels of stress

compared to males (Matud, 2004), other studies have found no significant gender differences in stress levels (McLean et al., 2016). While some studies have reported small but statistically significant differences between males and females in certain personality dimensions (Costa et al., 2001), others have found no significant gender disparities (Feingold, 1994). It's important to consider the intersectionality of gender with other factors, such as cultural background, socioeconomic status, and individual differences. These factors may interact with gender to shape stress experiences and personality characteristics in complex ways (Kiecolt-Glaser & Newton, 2001). In summary, while gender may play a role in shaping stress experiences and personality characteristics for some individuals, it may not be a consistent or reliable predictor across diverse populations.

From the above Table No.2 it is found that in the comparison of male and females are having more number of *Streptococcus* with the percentage of 53.7 and 36 number of frequency and males are having percentage of 51.9 and 14 number of frequency. For the *Lactobacillus* microbiota males are having more number, with the percentage of 25.9 and 7 number of frequency whereas females are having percentage of 17.9 with 12 number of frequency (Table No 1.1). The finding that males have a higher frequency of *Lactobacillus* microbiota compared to females aligns with some prior studies. Research has suggested that *Lactobacillus* colonization patterns can differ between genders due to factors such as hormonal fluctuations, vaginal pH levels, and reproductive health status (Ravel et al., 2011; Brotman et al., 2014). For the combination of microbiota *Streptococcus* & *Lactobacillus* females are having more percentage of 28.4 and 19 number of frequency and male are having percentage of 22.2 and 6 number of frequency. Studies have explored the interplay between different microbial species in the gut and reproductive tract, highlighting the potential implications for host health and disease susceptibility (Srinivasan et al., 2012; Petrova et al., 2018). Previous research has shown variations in the prevalence and abundance of *Streptococcus* species between males and females. For instance, studies have reported higher levels of *Streptococcus* colonization in females compared to males, which may be attributed to hormonal influences, anatomical differences, and behavioral factors (Drell et al., 2013; de Vries et al., 2016).

**Table 2.1-** Showing the type of microbes and the percentage present among low and high stress group.

Group	Microbes	Frequency	Percent	Valid Percent	Cumulative Percent
Low stress Group	<i>Streptococcus</i>	22	45.8	45.8	45.8
	<i>Lactobacillus</i>	10	20.8	20.8	66.7
	<i>Streptococcus</i> & <i>Lactobacillus</i>	16	33.3	33.3	100.0
	Total	48	100.0	100.0	
High stress Group	<i>Streptococcus</i>	28	60.9	60.9	60.9
	<i>Lactobacillus</i>	9	19.6	19.6	80.4
	<i>Streptococcus</i> & <i>Lactobacillus</i>	9	19.6	19.6	100.0
	Total	46	100.0	100.0	

*Hypothesis No.4 tested: There will not be any difference in the composition of microbes across low and high stress groups. Not verified- Hence, there is variation in the composition of microbes across low and high stress group. Here we can see that low stress group is having more number of Lactobacillus and Streptococcus & Lactobacillus. This can be interpreted that they have a positive role in stress reeducation and stress management. In high stress group Streptococcus was more.*

From above Table No.2.1 it is clear that there are 48 participants in low stress group and 46 participants as high stress group. The mean, standard deviation for low and high stress group for physical dimension are 35.70, 7.24, 49.80, 9.06 and t-value is 8.30 which indicate that there is a significant difference in the physical dimensions of low and high stress group. That means there will be visible physical changes in the person's personality when they experienced stress in their life. The mean, standard deviation for low and high stress group for sleep dimension are 7.93, 2.76, 12.78, 3.47 and t-value is 7.46 which indicate that there is a significant difference in the sleep dimensions of low and high stress group. That means there will be visible changes in the sleep patterns when they experienced stress in their life. The mean, standard deviation for low and high stress group for behavioral dimensions are 22.62, 3.71, 31.95, 8.24 and t-value is 7.20 which indicate that there is a significant difference in the behavioral dimensions of low and high stress group. This means that behavioral changes will be there in the person's personality when they experienced stress in their life. The mean, standard deviation for low and high stress group for emotional dimension are 42.71, 9.90, 62.83, 10.13 and t-value is 9.72 which indicate that there is a significant difference in the emotional dimensions of low and high stress group. That means there will be changes in the emotional patterns of person's personality when they experienced stress in their life. The mean, standard deviation for low and high stress group in the total dimension of stress indicator are 127.92, 18.17, 181.27, 22.61 and t-value is 12.57 which indicate that there is a significant difference in the all dimension of stress indicator for low and high stress group. That means all the dimension of stress indicator will definitely have the impact on person and their personality when they experienced high or low stress in their life. The mean, standard deviation for low and high stress group for the dimension openness to experience are 12.72, 2.04 and 14.30, 2.30 and t-value is 3.49 which indicate that there is no significant difference in the dimensions of openness to experience for low and high stress group. The mean, standard deviation for the dimension of conscientiousness are 15.56, 3.11 and 14.67, 2.67 and t-value is 1.48 which indicates that there is significant difference in the dimensions of conscientiousness for low and high stress group. There mean, standard deviations for low and high group in the dimensions of extroversion are 15.47, 2.70, 14.78, 2.43 and t-value 1.31 which indicates that there is significant difference in the dimensions of agreeableness for low and high stress

group. That means that there will be changes in the level of agreeableness on a person's personality when they experienced high or low stress in their life. The mean, standard deviation for low and high stress group for the dimension of neuroticism are 16.72, 3.40, 14.78, 3.23 and t- value is 2.84 which indicate that there is a significant difference in the dimension of neuroticism for low and high stress group. The distribution of participants into low and high stress groups aligns with previous research that has utilized similar stress categorizations based on validated stress assessment tools (e.g., questionnaires, physiological measures). Studies have shown associations between stress levels and various health outcomes, including gut microbiota composition (Kelly et al., 2015; Moloney et al., 2016). In low stress group *Lactobacillus* and *Streptococcus* & *Lactobacillus* are in higher side. In high stress group *Streptococcus* are in higher side which shows that *Lactobacillus* microbiota is helpful in stress reeducation. According to Savignac (2014) has reported that *Lactobacillus* species have the ability to reduce anxiety like behavior, emotional processing, depression like behavior. *Lactobacillus* species can have the effect in the context of stress, neuro -physiology, and behavior as well as mental outlook (Bested et.al 2013). *Lactobacillus* can have beneficial effects in anxiety in rodents and humans and their strains exist at a neurobehavioral level (Savignac et.al 2014). Hence, we can say that *Lactobacillus* is helpful in reducing the stress. Research has demonstrated that specific strains of *Lactobacillus* can exert beneficial effects on neurobehavioral function, including modulation of stress responses and improvement of mental outlook (Savignac et al., 2014). These effects may involve complex mechanisms such as the gut-brain axis communication and the production of neurotransmitters by gut bacteria (Foster & McVey Neufeld, 2013; Dinan & Cryan, 2017).

### 3.1 Demographic variable

**Table.3-** Showing the number of males and females in high & low stress group.

Group	Gender	Frequency	Percent	Cumulative percent
Low stress Group	Males	15	31	31
	Females	33	68	100
	Total	48	100	-
High stress Group	Males	12	26	26
	Females	34	73	100
	Total	46	100	-

From the above table no 3 we can see the comparison of male and female in low stress group as well as high stress group. In comparison to male, females are more likely to have stress than males. But when it comes to high stress group, more females tend to have less stress. This shows that females are more vulnerable in handling the stress better than males. Previous studies have indeed indicated that females are more likely to report experiencing stress compared to males (Matud, 2004; McLean et al., 2016). While males may be more likely to use problem-focused coping (e.g., seeking solutions, taking action), females often employ emotion-focused coping (e.g., seeking social support, expressing emotions) (Tamres et al., 2002). Studies have shown that females tend to exhibit higher levels of emotional intelligence, social support seeking, and interpersonal skills, which may contribute to their ability to manage stress more effectively (Matud, 2004; Zysberg et al., 2012). From table no.4 it is found that academic discipline across high & low stress group arts discipline students are coming under low stress. Science discipline students are more in high stress. It shows that students in science discipline are likely to experience stress. It could be due to academic pressure and the competition in the field. Research consistently indicates that students in science, technology, engineering, and mathematics (STEM) disciplines tend to report higher levels of stress compared to those in humanities or arts disciplines (Bhagat & Brown, 2018; Levecque et al., 2017). This difference in stress levels may be attributed to factors such as heavy workloads, rigorous coursework, and the competitive nature of STEM fields. Recognizing the challenges faced by students in science disciplines, universities and educational institutions have implemented various support services and coping strategies to help students manage academic stress. These may include counseling services, stress management workshops, academic advising, and peer support networks (Hamaideh, 2011; Regehr et al., 2013).

**Table. 4-** Showing the division in academic discipline across high & low stress group.

Group	Discipline	Frequency	Percent	Cumulative percent
Low stress Group	Arts	14	29.2	29.2
	Science	34	70.8	100.0
	Total	48	100.0	-
High stress Group	Arts	10	21.7	21.7
	Science	36	78.3	100.0
	Total	46	100.0	-

From the table no. 5 shows the significant relationship between the dimensions of stress indicator and big five locator. Furthermore, Brown and Williams (2020) conducted a longitudinal study exploring the correlation between stress indicators and personality dimensions over time. Their results corroborate the significant relationship observed between stress indicators and personality traits, highlighting the importance of considering individual differences in stress perception and coping strategies. There are findings from previous studies utilizing Carl Pearson correlation values to support the observed relationship between stress indicators and personality factors, providing valuable insights into the complex dynamics underlying stress perception and individual differences in coping strategies (Brown and Williams,



2020; Smith and Johnson, 2019). There is a significant relationship difference between physical dimensions of stress indicator and openness to experience dimension of big five locator. Whereas there is no significant relationship physical dimensions of stress indicator and between conscientiousness, extroversion, agreeableness, neuroticism. There is a significant difference relationship between sleep dimension of stress indicator and conscientiousness. There is no significant difference relationship between sleep dimension of stress indicator and openness to experience, extroversion, agreeableness as well as neuroticism. This shows that there is a relationship between sleep and conscientiousness. Openness to experience may influence individuals' sleep behaviors and habits, while neuroticism is often associated with sleep disturbances and insomnia (Costa & McCrae, 1987). There is a significant difference between behavioral dimension of sleep indicator and openness to experience to experience. There is a significant strong association between behavioral dimension of sleep indicator and neuroticism. There is no significant association between the behavioral dimensions of sleep indicator and conscientiousness, extroversion and agreeableness. However, extroversion may be associated with seeking social support and coping strategies in response to emotional stressors (Leger & Charles, 2020). There is a significant relationship between emotional dimension of stress indicator and openness to experience. There is a strong significant relationship between emotional dimension of stress indicator and neuroticism. There is no significant relationship between emotional dimension of stress indicator and conscientiousness, extroversion, agreeableness. There is no significant difference between the personal dimension of stress indicator and openness to experience, conscientiousness, extroversion, agreeableness and in neuroticism. Hence, we can say that there is impact of stress in almost all the dimensions of life. Due to stress experience person personality or behavior may differ from one another. The absence of significant differences between the personal dimension of stress indicator and openness to experience, conscientiousness, extroversion, agreeableness, and neuroticism aligns with previous research that has explored the multifaceted nature of stress perception and its interaction with personality (Hampson et al., 2016).

**Table..5-** Showing the Carl Pearson correlation values for stress and personality factors.

Big five Stress indicator	Openness to experience	Conscientious -ess	Extroversion	Agreeablenes s	Neuroticism
SI_Physical	0.21*	-0.15	-0.07	-0.15	-0.12
SI_Sleep	0.18	-0.20*	-0.00	-0.12	-0.19
SI_Behaviour	0.21*	-0.06	-0.18	-0.11	0.23*
SI_Emotional	0.21*	-0.06	-0.18	-0.10	-30**
SI_Personal	-0.09	-0.11	-0.03	-0.14	-0.11

\*significant at 0.05 level, \*\* significant at 0.01 level

Previous studies have shown that there can be a relationship between physical stress indicators and openness to experience. For example, individuals high in openness to experience may perceive and react to physical stressors differently compared to those low in openness. This relationship may be attributed to differences in coping styles and perceptions of stress (McCrae & Costa, 1999). For instance, research has indicated that while personality traits can influence stress perception and coping strategies, the relationship between physical stress and personality may not always be straightforward and can vary depending on individual differences (Matthews & Deary, 1998). The lack of significant relationship between the sleep dimension of stress and openness to experience, extroversion, agreeableness, and neuroticism is in line with some prior research. However, studies have shown that neuroticism can be associated with sleep disturbances and poor sleep quality (Smith et al., 2018).

#### 4. Conclusion

In conclusion, the relationship between stress indicators and personality factors is multifaceted and influenced by various individual differences, including gender. While previous research has shown significant associations between stress dimensions and personality traits, the role of gender in shaping these relationships appears to be complex and nuanced. *Lactobacillus* microbiota was found to reduce the stress with other psychological interventions. This study also highlights the present conditions of the science and arts discipline students in Periyar University. There should be some counseling facility for all the science stream students and we should also provide them a healthy diet which contains more number of *Lactobacillus* to reduce their stress level. This study can be used very well in clinical setup and we can use this *Lactobacillus* microbiota to maintain a healthy stress free life. A rigorous schedule of this study with serious participants can throw more light about the association of the variables. For the better understanding and to find out the particular species we should go for the 16NA whole genome sequencing (DNA sequencing) of the samples.

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#### 5. Conflict of Interest

There is no conflict of interest.

## 6. References

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