Multidimensional Stress Analysis Among Software Engineering Undergraduates in Sri Lanka: A Gender-Based and Academic Progression Perspective

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Abstract

This study focus on identifying the most dominant stress factors among Software Engineering undergraduates in Sri Lanka. Study uses a questionnaire and quantitative data analysis among 216 students. Results indicated that most prominent stress factors are academic workload and personal attributes. Moreover, female students perceive more stress comparatively, year 1 students perceive more stress during their transition, social behavior and personal attributes related stress varies over years, and UGC approved programs has less stress comparatively. Correlation analysis showed a strong relationship between stress and academic workload, a moderate correlation with personal attributes, weak or no significant correlation with social behavior and resource allocation. Regression analysis confirmed that academic workload is the strongest predictor of stress with personal attributes has some influence while social behavior and resource allocation had no influence. Recommendations include curriculum reforms, gender-specific support programs, stress management interventions, and improved resource accessibility to enhance student well-being.

Key Words : Stress, Software Engineering, Undergraduates

1. Introduction

Stress is one of the global phenomena faced by most of the tertiary level students in the world, regardless of the level and scope of study. Academic stress is especially high among students who study complex, and rapidly changing advanced technological programs (Global Organization for Stress, 2023). Software Engineering is one such dynamic field which requires rapid technological changes and higher customer satisfaction. Due to high demanding nature of its industry, Software Engineering curriculums are developed in a way that students must go through demanding deadlines and projects during their academic journey. This results in high academic pressure especially when working in projects (Grab, Fraser, Trieflinger, & Kuhrmann, 2023).

Therefore, stress can be seen as an inevitable phenomenon among Software Engineering undergraduates. Moreover, if students face stress related issues during the study period, they tend to differ or dropout from the study program which will negatively impact the organization. Therefore, it is essential to identify respective stress factors and address them at the early stages of the study program. On the other hand, Ostberg et al.(2020) states that the software engineering body of knowledge on stress is very limited. They further state that there is no proper understanding of the actual phenomenon.

To address these issues, this study investigates main stress factors that affects student's stress in SE domain while providing attention to gender and academic progression. A quantitative research design is employed in the study. Data collection instrument of the study is a structured questionnaire administered to students which consists of a pilot study and a main study. Data were collected from 216 students studying in higher educational institutes in Sri Lanka. Data were analyzed using IBM SPSS version 27.

This study contributes to the theoretical understanding of stress factors in SE education. The developed regression model including academic workload and personal attributes, can be used to predict and understand the stress level of SE students. Findings and recommendations of the study provides actionable insights to students, educators, institutes, and policy makers.

2. Literature Review

2.1 Stress

WHO (World Health Organization, 2023) defines stress as a state of concern or mental tension caused by challenging circumstances which is natural. George (2017) in his book states that Hans, who is declared as the father of stress defines stress as a non-specific response of the body to any demand. George (2017) further states in behavioral science stress can be defined as apperception of a hazard, which can cause anxiety, worry, emotional strain and difficulty in adapting. Therefore, stress can be generalized as the tension caused by a certain incident or a situation. Even though it is a natural phenomenon, if it is not properly managed it can cause severe repercussions.

2.2 Theories related to stress.

According to Selye (1976) (Selye H. , 1976) stress is defined as a "a state manifested by a syndrome which consists of all the nonspecifically induced changes in a biologic system." This syndrome is mentioned as the general adaptation syndrome (GAS) and was presented as a model. This model declares 3 concepts such as, stress is a defensive mechanism, a stress scenario follows 3 stages (alarm, resistance, and exhaustion) and if the stress is severe it could result in health consequences or even death (Cummings & Lee , 2019). Holmes and Rahe's Theory state that an important life event or a change in life which calls for a response, adjustment, or adaptation generates stress. Holmes and Rahe (1967) by using the Social Readjustment Rating Scale (SRRS) rationalized that stress is an independent variable which can arise because of an experience. In other terms it states that stress is s stimuli generated because of a certain response. Lazarus's, transactional theory of stress and coping (TTSC) visualizes stress as a product of a transaction among a person and

his/her environment (Lazarus R. , 1999). The theory was further enriched with the introduction of the concepts of appraisal and coping. Stress appraisal contains of primary appraisal, secondary appraisal, and reappraisal (Cummings & Lee, 2019). Primary appraisal requires understanding whether a stressor poses a threat. Secondary appraisal includes ones' individual assessment of the coping strategies he can use to cope with the identified threats. Reappraisal means continuous re-evaluation of the nature of treat and threat coping systems to respond the stressor. Conservation of Resources theory describes a framework to understand the processes involved in facing, managing, and becoming resistant to chronic and traumatic stress (Holmgreen, Tirone, Gerhart, & Hobfoll, 2017). Theory suggests that people feel stressed when they do not think they have the required resources to fight stress. COR theory states that people are motivated to protect and acquire resources, which are considered valuable to them. It states that stress is occurred as a response when they come across a situation that reduce or remove their resources.

2.3 Stress and Tertiary Education

Praveeni and Herath's (2020) study on investigating the levels of Perceived Academic Stress (PAS) among undergraduate students in Sri Lanka revealed that undergraduate students reported higher academic stress levels which negatively related with the Academic Performance (AP). Campbell-Phillips and Halder (2020) have conducted a study among tertiary level students in Bangladesh to investigate whether there is a relationship between academic stress and tertiary level institutional arrangements. Results indicated that students suffer from stresses in personal inadequacy, fear of failure, interpersonal difficulties with teachers and inadequate lab and library facilities. According to Alsulami, et al., (2018) study on perception of academic stress among Health Science undergraduates in Saudi Arabia, it is proclaimed that students have a high stress factor compared to other students. Mahees's (2020) study on investigating stress factors among university students proclaims that most students in University of Colombo suffers from academic stress. As proved by Adrian et al. (2021), computer science students struggle due to the social-emotional /social-cognitive, structural and/or personal factors. Luciano and Salvatierra (2022)'s study on stresses and stress coping mechanisms in tertiary students claimed that stresses are highly correlated with the family income. Another study conducted by Ross, Niebling, & Heckett, (1999) declared that academic workload is one of the most prominent stress factors. Yorke (2006) found that the heavy academic workload, regular assessments, and academic pressure are major factors for stress among undergraduate students. Clinciu's (2013) study examined the issues and challenges faced by new students during the transition for a new high school or a new university.

3. Methodology

A quantitative study design is used in the research. First, an initial investigation and a systematic literature review was conducted to define the research gap, the problem, study objectives and research questions. Next a comprehensive theoretical framework was created, and hypothesis were drawn by analyzing the findings of the literature review. Afterword's quantitative study is designed including sampling and data collection instruments. Data collection instrument is a 5-point Likert

scale questionnaire which was designed to administer to students. Consent was taken from all students as a part of the questionnaire. They were explained on their right to withdraw from the study at any point of time.

Questionnaire consists of demographic information section and stress factors section. Demographic information capture participant background information such as the degree program (3 year/4 year/UGC approved/UGC not approved), gender, and year of study. Stress factors section uses questions to measure the perceived stress level of students. There are five variables related in the theoretical framework and each variable is represented by a group of questions. Authors did not use any scale since existing scales do not have direct correspondence to the software engineering domain. An ethical approval was obtained from the ethical review committee of the respective universities before administrating the questionnaire. Quantitative data were analyzed using SPSS version 27. Frequency and demographic analysis, Pearson correlation and regression analysis were used as the statistical analysis. Then the analyzed results are presented systematically. Finally, the research provides suitable recommendations for proper stress management.

3.1 Theoretical Framework and Hypothesis

The theoretical framework for stress factors is derived based on the Selye's General Adaptation Syndrome (Selye H. , 1983), Lazarus and Folkman's transactional model of stress and coping (Lazarus & Folkman, 1984), Holmes and Rahe’s SRRS (Holmes & Rahe, 1967) theories, and on the results of past studies on stress factors. It assumes that there are multiple interconnected factors influence stress among SE undergraduate students. The dependent variable stress is directly affected by the independent variables, Academic workload, Social Behavior, Resource Allocation and Personal Attributes and is depicted in the below figure 3.1. The interplay between these variables provides a comprehensive understanding of stress dynamics experienced by the SE undergraduate students.

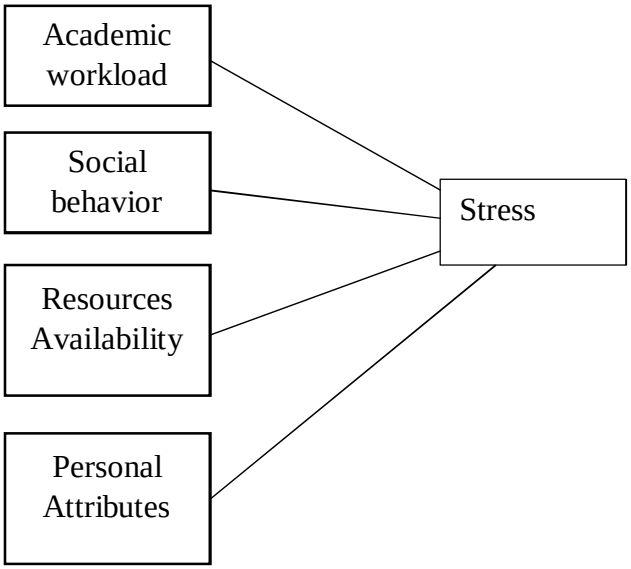

Figure 3-1 : Theoretical Framework for Stress Factors

3.2 Research Hypothesis

Following the research question "what are the factors contributing to undergraduate students' stress in SE degrees programs?" below 4 hypotheses are generated.

- H1 : There is a significant correlation between high curricular workload and stress levels in SE undergraduates in non-state higher education institutes.
- H2 : There is a significant correlation between poor social behavior and stress levels in SE undergraduates non-state higher education institutes.
- H3 : There is a significant correlation between inadequate resource allocation, and stress levels in SE undergraduates non-state higher education institutes.
- H4 : There is a significant correlation between personal attributes and stress levels in SE undergraduates non-state higher education institutes.

4. Results and Discussion

Cronbach's alpha value of the study reported 0.810. This indicated that the data set is reliable. Further Kolmogorov-Smirnov Test and Shapiro-Wilk Test was conducted to test the normality of each variable and the results for all are above 0.05, indicating that data are normally distributed in these variables.

4.1 Sample Demographics

Study sample consists with 216 students following SE degree programs. The sample included 124 (57.4%) male and 92 (42.6%) female students representing a nearly balanced sample. Age of all the students falls between 18 - 25 years. Most of the students were between 21 and 23 years, whereas there were only 2 and 8 students respectively 18 years and 25 years old. The average age of

respondents were 22 years. GPA descriptives of the respondents are between 3.87 and 0.18. This indicates that study consists of students with good performances as well as students with bad performance making it a balanced sample. The sample included participants from different degree types. Most of the students 32.4% are from 3-year private programs, 25% are from 4-year UGC programs, and 21.3% are from the 4-year private programs and the 3-year UGC programs.

4.2 Descriptive Statistics

Below figure 4.1 shows the descriptive statistics of the examined stress factors. According to the results Academic Workload is the highest stress factor with a mean value of 4.39. A low standard deviation of 0.190 and a low variance of 0.36 indicates that responses are tightly clustered around the mean with a little variability in responses. Next highest stress factor is Personal Attributes followed by Social Behavior and Resource allocation.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
Stress	216	3.75	5.00	4.2697	.32154	.103	.117	.166
Academic Workload	216	4.00	4.69	4.3914	.19012	.036	-.191	.166
Resource Allocation	216	1.90	4.30	3.4954	.50179	.252	-1.125	.166
Social Behaviour	216	2.17	4.42	3.6543	.48034	.231	-.786	.166
Personal Attributes	216	3.18	4.45	3.8468	.30642	.094	-.386	.166
Valid N (listwise)	216							

Figure 4.1 : Descriptive statistics of stress factors

4.3 Variations by Gender

An independent sample t-test is conducted to determine the difference between male and female students on their perception on stress factors. The results of independent sample t-test on stress factors are shown in below figure 4.2.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Academic Workload	Equal variances assumed	1.596	.208	-2.473	214	.014	-.06395	.02585	-.11491	-.01299
	Equal variances not assumed			-2.455	190.587	.015	-.06395	.02605	-.11533	-.01257
Resource Allocation	Equal variances assumed	1.107	.294	2.320	214	.021	.15856	.06835	.02382	.29329
	Equal variances not assumed			2.321	196.783	.021	.15856	.06830	.02386	.29325
Social Behaviour	Equal variances assumed	2.707	.101	-1.090	214	.277	-.07200	.06607	-.20222	.05823
	Equal variances not assumed			-1.081	189.797	.281	-.07200	.06663	-.20343	.05944
Personal Attributes	Equal variances assumed	.301	.584	-1.269	214	.206	-.05342	.04210	-.13641	.02957
	Equal variances not assumed			-1.256	188.465	.211	-.05342	.04253	-.13733	.03048

Figure 4.2 : T-test results for variations by gender

According to the results equal variances can be seen among male and female students. The negative mean difference of -0.06395, indicates that on average female students reported more stress on academic workload compared to male students. A positive mean difference of 0.15856, indicates that male students have reported less stress on resource allocation compared to female students. For both social behavior and personal attributes Levene's Test p values show equal variances and no significant differences between male and female students.

4.4 Variation by Academic Year

One-way ANOVA is used to compare the mean values based on the academic year variable. The results are shown in below figure 4.3.

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Academic Workload	Between Groups	.291	3	.097	2.746	.044
	Within Groups	7.481	212	.035		
	Total	7.771	215			
Resource Allocation	Between Groups	2.329	3	.776	3.177	.025
	Within Groups	51.806	212	.244		
	Total	54.135	215			
Social Behaviour	Between Groups	10.880	3	3.627	19.853	<.001
	Within Groups	38.726	212	.183		
	Total	49.606	215			
Personal Attributes	Between Groups	3.454	3	1.151	14.587	<.001
	Within Groups	16.733	212	.079		
	Total	20.187	215			

Figure 4.3 : ANOVA test results for variations by year

The results indicates that all four variables show high F values and low significance values < 0.05 resulting that there is a statistically significant difference between the study years in all 4 variables. Therefore, Levene's Test is conducted to determine which post-hoc test to use. Levene's Test results showed equal variance in academic workload and Tukey's HSD is used. Other variables reported unequal variance and Games-Howell test is used (Agbangba, Aide, Honfo, & Kakai , 2024).

The results on academic workload indicated that students experience a higher workload when transferring from year 1 to year 2. There are no statistically significant differences observed between other years. This shows that the stress due to workload occurs early in the academic journey and stabilizes over time. The Games-Howell test results indicated a significant difference in resource allocation in year 2 and year 4. Results showed a considerable difference on stressors related to social behavior among study years, indicating a pattern where students depict difference on stressors of social behavior as the progress over study years. Stressors related to personal

attributes showed a trend of change over the academic years with year 1 demonstrating changes most prominently.

4.5 Variations by Degree Program

One-way ANOVA is used to compare the mean values based on the degree program variable and the results are shown in below figure 4.4. The results indicates that personal attributes variable shows a significance value of 0.234 which is > 0.05 and therefore it indicates that there is no

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Academic Workload	Between Groups	.790	3	.263	8.000	<.001
	Within Groups	6.981	212	.033		
	Total	7.771	215			
Resource Allocation	Between Groups	5.068	3	1.689	7.299	<.001
	Within Groups	49.067	212	.231		
	Total	54.135	215			
Social Behaviour	Between Groups	1.857	3	.619	2.749	.044
	Within Groups	47.749	212	.225		
	Total	49.606	215			
Personal Attributes	Between Groups	.402	3	.134	1.435	.234
	Within Groups	19.785	212	.093		
	Total	20.187	215			

Figure 4.4 : ANOVA test results for variations by degree program

statistically significant difference between the degree program and stressors related to personal attributes. However, academic workload, resource allocation and social behavior, shows high F values and low significance indicating that there is a statistically significant difference. Therefore, Levene's Test is conducted to determine which post-hoc test to use. Results indicated equal variance for academic workload and Tukey's HSD is used. For both resource allocation and social behavior an unequal variance is noted, and Games-Howell method is used.

The Tukey's HSD test results for academic workload indicated that year 4 UGC approved degree programs perceived a higher stress on workload comparatively. Games-Howell results on resource allocation showed that year 4 UGC not approved degree students perceived a higher stress on resource allocation comparatively indicating students following 4-year degree programs faces more stressors on resource allocation. With related to stressors in social behavior students following year 4 UGC approved degree programs experience higher stressors comparatively.

4.6 Correlation analysis

Pearson correlation analysis of stress factors are depicted in the below figure 4.5.

Correlations

		Stress	Academic Workload	Resource Allocation	Social Behaviour	Personal Attributes
Stress	Pearson Correlation	1	.700**	.027	.135*	.261**
	Sig. (2-tailed)		<.001	.698	.048	<.001
	N	216	216	216	216	216
Academic Workload	Pearson Correlation	.700**	1	-.010	.106	.188**
	Sig. (2-tailed)	<.001		.886	.120	.006
	N	216	216	216	216	216
Resource Allocation	Pearson Correlation	.027	-.010	1	.639**	.368**
	Sig. (2-tailed)	.698	.886		<.001	<.001
	N	216	216	216	216	216
Social Behaviour	Pearson Correlation	.135*	.106	.639**	1	.607**
	Sig. (2-tailed)	.048	.120	<.001		<.001
	N	216	216	216	216	216
Personal Attributes	Pearson Correlation	.261**	.188**	.368**	.607**	1
	Sig. (2-tailed)	<.001	.006	<.001	<.001	
	N	216	216	216	216	216

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Figure 4-5 : Correlation analysis of stress factors

Results indicated a strong positive correlation among stress and academic workload with a r of 0.7. This indicates that when the academic workload increases, stress also increases. Therefore, the null hypothesis is rejected supporting H1. Results indicated a weak positive correlation among stress and social behavior with a r of 0.135. Since the r is close to 0 it can be interpreted as some students with higher social behavior may experience high level of stress, but social behavior is not a dominant factor for stress. Therefore, the null hypothesis is rejected supporting H2. Results indicated a very weak positive correlation among stress and resource allocation with a r of 0.027. Since r value is so close to 0 it can be considered that resource allocation has no or very little impact on stress. Therefore, by failing to reject null hypothesis it can be concluded that there is no meaningful relationship between resource allocation and stress. Results indicates a moderate positive correlation among stress and personal attributes with a r of 0.261. This interprets that personal attributes have a meaning full impact on stress. Therefore, the null hypothesis is rejected supporting H4. Additionally, there is a moderate positive correlation among resource allocation and social behavior, a moderate positive correlation among resource allocation and personal attributes, and a strong positive correlation among social behavior and personal attributes.

4.7 Regression Analysis

Multiple linear regression analysis is used to predict the behavior of the dependent variable with respect to independent variables in this study (Sarstedt & Mooi, 214).. Model summary showed a multiple relation coefficient or R value of 0.813 indicating that there is a strong positive correlation between the independent variables and the dependent variable. The coefficient of

determination or the R square value of 0.808 indicates that 80.8% of the of the variability in stress is described by the generated model. This shows a got fit. The ANOVA table generated for the regression model is shown in figure 4.6.

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.299	4	2.825	54.532	<.001[b]
	Residual	10.930	211	.052		
	Total	22.229	215			

a. Dependent Variable: Stress

b. Predictors: (Constant), Personal Attributes , Academic Workload , Resource Allocation , Social Behaviour

Figure 4.6: ANOVA Table for the Regression Model

According to the significant value of $p < 0.001$, it can be concluded that the model is statistically significant meaning that at least one of the four independent variables are significantly contributing to predict stress. The F value of 54.532 states that the model explains a significant of variance of Stress. The results of multiple regression analysis are shown in the below figure 4.7.

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.276	.390		-3.273	.001
	Academic Workload	1.140	.084	.674	13.650	<.001
	Resource Allocation	-.005	.040	-.007	-.111	.911
	Social Behaviour	-.017	.049	-.025	-.341	.734
	Personal Attributes	.160	.065	.153	2.484	.014

a. Dependent Variable: Stress

Figure 4.7 : Multiple Regression Analysis Results of Stress Factors

This indicates that increase of a single unit in academic workload will increase stress by 1.14 unites, increase of a single unit in resource allocation will increase stress by -0.005 unites, increase of a single unit in social behavior will increase stress by -0.017 unites, and increase of a single unit in personal attributes will increase stress by 0.16 unites, keeping other variables constant. This indicates that changes occur due to resource allocation and social behavior are negligible. Accordingly, when multiple linear regression model is applied for the study, it generates the following model.

Predicted Stress = −1.276 + 1.140 (Academic Workload) − 0.005 (Resource Allocation) − 0.017 (Social Behavior) + 0.160 (Personal Attributes)

This defines that academic workload and personal attributes are the significant stress predictors of stress whereas resource allocation and social behavior do not have significant effect on stress.

5. Discussion

Results indicated that on average female students reported more stress on academic workload compared to male students. This finding aligns with previous research of Misra & McKean (2000) that states female students experience higher stress than male students due to higher expectations. This can occur due to the perfectionism of female students and trying to balance household and other relationships with academic workload more compared to male students. With related to resource allocation, results indicated that male students have reported less stress compared to female students. This finding aligns with past research on gender-based differences in accessing academic resources (Moss-Racusin, et al., Science faculty's subtle gender biases favor male students, 2012). Moreover, since software engineering is a rapidly evolving stream, male students may find resources online efficiently compared to female students. In terms of academic workload, students experience a higher workload when transferring from year 1 to year 2. This finding aligns with past studies of Clinciu (2013) and Mudhovozi (2012). This shows that the stress due to workload occurs early in the academic journey and stabilizes over time. Stabilization of stress over years denotes that students may have developed stress coping strategies over time (Gustafsson, et al., 2010). A pattern where students depict difference on stressors of social behavior as the progress over study years is noted. Tinto (1993) states that most critical year for social interaction is year 1 and students who cannot establish proper social interaction during year 1 tend to face more stress. This exactly align with the study findings. ANOVA results indicated that there is no statistically significant difference between the degree program and stressors related to personal attributes. This agrees with the findings of Pancer, et al., (2000) which states that personal attributes are more influenced by individual factors rather than institutional factors. Results indicates that students perceive a significant difference among different degree programs on stressors in academic workload. UGC approved degree program has a higher stress in workload and resource allocation compared to UCG not approved degree programs. As stated by York (2006) this may be due to UGC approved degree programs having better curriculum design, proper workload distributions, a detailed plan and external support due to certain accreditations that help students come up with stress.

The high positive correlation between stress and academic workload with academic workload being the prominent factor in the regression model indicates that when academic demands of software engineering students are high, stress levels also become high. This finding strongly aligns with studies conducted by Mahees (2020) , Misra & McKean (2000) and Ross, Niebling, & Heckett (1999) where they observed that academic workload is one of the prominent stress factors. This strong correlation between academic workload and stress aligns with Selye's theory where increased workload can act as a trigger for biological stress response. Transactional model of stress coping (Lazarus & Folkman, 1984) aligns and support this finding because when the academic workload is high, it exceeds student's normal capacity in managing stress. This is due to academic workload becoming a threat to their mental and physical wellbeing. Tailoring support and preventive measures can be taken to reduce these issues.

The moderate positive correlation between stress and personal attributes indicates with personal attributes being the somewhat affecting factor in the regression models that individual

attributes such as personality traits, resilience, and coping mechanisms have a significant impact on stress. Students that exhibit effective personal attributes may experience stressors less. This finding directly aligns with study by Vollrath (2001) which states that stress is directly interconnected with personal attributes. Moreover, Pancer, et al., (2000) observed that personal attributes such as self-doubt and fear of failure increases stress. This finding also aligns with Lazarus' Theory (1999) which states that students with better personality traits, perceive stress differently.

The weak positive correlation between stress and social behavior indicates that social interactions and peer connections contributes to stress in a lesser amount. This is different with the study findings of Alsulami, et al., (2018) which states that stress is highly correlated with social and health problems. Transactional model of stress coping (Lazarus & Folkman, 1984) aligns with this finding which states that stressors arise form individual's appraisal of his/her environment. Hence social behavior affects students on stress. Especially SE students may perceive social stress due to group work, group assignments, hackathons, and competitions. The reason for this relationship to be weak may be due to SE students mostly use online platforms for their learning and tasks limiting social interactions. Moreover, social interactions such as maintaining relationships and peer competitions may increase stress. Universities can provide interventions such as strong counselling services, policies to support effective social interactions and awareness of social overload.

Insignificant correlation between stress and resource allocation indicates that availability or unavailability of resources does not influence stress levels. This finding contradicts the findings of Yorke (2006) and Tight (2019), which states that resource availability significantly impacts academic stress. This may be due to students in Software Engineering discipline may tend to use help from online sources and use self-study where they may get solutions efficiently.

6. Recommendations

Main recommendations from the study are provided below in summary.

1. Addressing Academic Workload Stress
   This includes implementing curriculum reforms to distribute coursework more evenly across semesters, introducing flexible deadlines for assignments and projects to reduce academic pressure, providing time management and study skill workshops to help students cope with workload demands and encouraging the use of peer support groups and academic mentorship programs.
2. Gender-Specific Stress Management Strategies
   This includes organizing stress management workshops and counseling sessions specifically for female students, providing mentorship and career guidance programs to boost female students' confidence in accessing resources and offering flexible scheduling options for female students to balance academic and personal responsibilities.

3. Supporting Students in Early Academic Years
   This includes developing transition programs for first-year students to help them adapt to university life, offering academic resilience training to help students cope with increased

academic demands in year 2 and introducing peer mentoring programs where senior students guide first-year students.

4. Managing Stress in Final-Year Students
   This includes providing career counseling and job placement support to ease the transition from academics to employment, implementing wellness programs focused on handling final-year workload stress, including capstone projects and research work and encouraging networking and collaboration with industry professionals to reduce uncertainty about future careers.

5. Improving Social Behavior & Personal Development
   This includes conducting teamwork training to help students handle conflicts in group projects, organizing social integration programs, especially for first-year students, to promote inclusivity and provide psychological counseling services to support students struggling with self-confidence and stress.

7. Conclusion

This study mainly focused on investigating stress elements related to SE undergraduate students in Sri Lanka. Quantitative data was collected from 216 students studying in higher educational institutes and were analyzed using IBM SPSS version 27. Results indicated that most prominent stress factors among SE undergraduate students are academic workload and personal attributes. Social behavior and resource allocation places a negligible role in increasing stress. A regression model is created from this finding and presented. Key recommendations include addressing academic workload stress, gender-specific stress management strategies, supporting students in early academic years, managing stress in final-year students, and improving social behavior & personal development. This study contributes to the theoretical understanding of stress factors in SE education. Study developed a regression model including academic workload and personal attributes, that can be used to predict and understand the stress level of SE students. Findings and recommendations of the study provides actionable insights to educators, institutes, and policy makers. First curriculum definers and educators can integrate the recommendations provided into SE curriculums.

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