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Journal of Computing Research and Innovation 9(2) 2024

Journal of Computing Research and Innovation

Gender-based Analysis of Stress Factor among Universiti Teknologi Mara (UiTM) Students

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ARTICLE INFO

Article history:
Received 30 June 2024
Revised 13 August 2024
Accepted 13 August 2024
Online first
Published 1 September 2024

Keywords:
DASS
Mental Health
Post Covid19
Stress
Tertiary Level

DOI:
10.24191/jcrinn.v9i2.469

ABSTRACT

Today, stress often becomes a significant problem in the daily life. Various factors contribute to this mental health issue, including a busy lifestyle, work pressure, financial issues, health concerns, tense interpersonal relationships, technological advancements, and social changes. In the tertiary education especially, stress can significantly affect students' mental health and this can impact their performance in academic study. The stress level may impact differently between gender, this is due to some factor that are unique to female students' experiences such as social pressure, hormonal factor or safety concern. This research is focus during the post covid19 where students are studying in hybrid mode which is online and also face to face for certain subjects they learn in university. This research aims to see the differences in the mean stress score by gender and also the relationship between level of stress and gender by using Depression Anxiety Stress Test (DASS) questionnaire. The data of the questionnaire are collected during online webinar and analyzed based on the objective of this research. The results from this research study indicate that there is a difference in the mean score by gender, and the relationship between stress level and gender is significant.

1. INTRODUCTION

Stress can be defined as a physiological and psychological response to a perceived threat or demand, whether real or imagined, that disturbs the body's equilibrium (Ogazi et al., 2022). It's a genuine reaction that helps individuals cope with challenging situations. Stress activate the body's "fight or flight" response, releasing hormones like adrenaline and cortisol, which prepare the body to confront or flee from the perceived danger (Sharma & Pal, 2021). While short-term stress can be beneficial, chronic or excessive

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https://doi.org/10.24191/jcrinn.v9i2.469

stress can have negative effects on physical health, mental well-being, and overall quality of life (Egede et al., 2022).

Stress today often becomes a significant problem. A busy lifestyle, work pressure, financial issues, health concerns, tense interpersonal relationships, technological advancement and social changes bring additional pressure, such as the pressure to succeed professionally, maintain a healthy lifestyle and meet social expectations (Tran et al., 2020). Various other factors can also lead to prolonged stress. Society must recognize this stressful problem and came up with the necessary support and measure to help individuals manage and get through with stress in their daily lives. Insightful communities can be vital in creating a supportive environment and building resilience to face stress challenges effectively.

In schools or university environments, stress is a common issue among students, which can significantly impact their academic performance and affect their mental health. Specifically, different genders reported different stress experiences (Reddy et al., 2018; Kamardeen et al., 2018). Everyone is unique, and each of them responds to stress differently, and studies have found gender-based differences in stress responses. For example, studies by Varghese et al. (2015) and Pourrajab et al. (2014) reported that female students have slightly higher levels of stress compared to male students due to several factors unique to female students' experiences such as academic pressure, social pressure, hormonal factors and safety concerns. Similarly, a global review on perceived stress and self-efficacy among college students found that female students generally have greater levels of stress and more health problems compared to their male counterparts (Varghese et al., 2015).

Stress levels and sources of stress among university students have significant implications for developing targeted interventions to support students' academic performance, personal growth, and social well-being. However, the specific stress factors experienced by university students, particularly in relation to gender differences, remain understudied. Ayesha (2024) emphasized the need for a more detailed analysis of specific stressors affecting university students, building upon earlier research by Edjah et al. (2020) and Kumari et al. (2020) that identified some key stressors. This gap in knowledge emphasizes the need for further investigation to understand better and address the unique challenges faced by students of different genders in higher education settings (Ayesha, 2024, Birech, 2023).

This paper investigates stress-related issues among students in higher education institutions, focusing on gender differences to manage and reduce stress. The study aims to analyse the mean stress scores of male and female students and explore the relationship between stress levels and gender. Understanding these differences can help develop targeted interventions and support systems to address student stress more effectively. Below are the following research questions (RQ) addressed by this study:

RQ1: Is there a significant difference in average stress scores by genders?

RQ2: Is there an association between stress levels and gender?

In the next section, this paper explores a review of the related work on the stress-related issues among students in higher education institutions followed by a section containing a detailed explanation of the research methodology. Then, the paper presents the analysis and result of the study as well as the discussion of the findings. Finally, conclusions are drawn in the final section

https://doi.org/10.24191/jcrinn.v9i2.469

2. LITERATURE REVIEW

2.1 Gender Based Differences in Stress

As most academic institution's goal is to create inclusive environments for the diverse needs of their students, it is crucial to understand the challenges the students experience in their learning process. To achieve this, it is essential to understand the challenges students face in their learning journey. Research consistently highlights the significant impact of stress on both academic performance and the overall well-being of university students (Reddy et al., 2018; Kamardeen et al., 2018). This issue is severe in places with limited resources, where the pressure for academic excellence is intensified. Female students usually face higher expectations and self-imposed standards, which lead to academic stress. For example, Barbayannis et al. (2020) reported a significant level of academic-related stress among female students among college students. Social expectations that expect women to excel academically can cause internalized stress.

In an early study by Spencer, Steele and Quinn (1999), the stereotype threat in academics escalated the pressure on women, especially their abilities to excel academically. This can lead to anxiety and stress to disprove the negative stereotypes. Besides academic pressure, female students often experience social expectations and pressure (Pourrajab et al., 2014). In a recent study by Pourrajab et al. (2014), female students are reported to be more stressed compared to male students due to social relationships and self-image. Next, biological differences such as menstrual cycle fluctuations can be one of the reasons for stress among female students. Maity et al. (2022) found that female students reported higher stress levels during certain phases of their menstrual cycle, potentially impacting their academic performance.

In a nutshell, past studies showed that female students face a unique set of challenges that contribute to higher levels of stress. The combination of academic pressures, social expectations, stereotype threats, and biological factors creates a complex environment that can significantly impact their well-being and academic performance.

2.2 Stress Factors Among Students

The situation of stress among students today is highly complex and varies depending on factors such as social context, culture, economics, and the academic environment (Misra & Castillo, 2004). However, several trends and issues are commonly observed in studies and reports on student stress. The following Table 1 shows the previous study that found the factors contributing to stress.

Table 1 Summary of the previous study on the factors contributing to the stress

Authors	Factors	Description
Gasteiger et al. (2021); Kinderman et al. (2015); Rahimnia et al. (2013); Taheri-Kharameh et al., 2016)	Anxiety and Mental Well-being	There is an increase in anxiety and mental health issues among students, including social anxiety, depression, and emotional pressures that is related to academic and social environments.
Bedewy & Gabriel (2015); Deb et al. (2015); Lal (2014); Maajida Aafreen et al. (2018)	Academic pressure	Students often face high pressure to succeed academically, including pursuing high achievements, completing assignments within short deadlines, and facing stressful exams and assessments.
Jansen et al. (2022); Khadirnavar et al. (2021); McKerrow et al. (2020); Schwartz et al. (2021)	Physical health	Unhealthy lifestyles, including lack of sleep, exercise, and balanced nutrition, often contribute to stress among students.
Bono et al. (2020); Fitzgerald & Konrad (2021); Guan et al. (2022); Sabri et al. (2020)	Financial concerns	Financial issues, including student debt, rising tuition costs, and high living expenses, are also major sources of stress among students.

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Eganov et al. (2020); Kim (2021); McLean et al. (2023)	Social environment	Tense interpersonal relationships, peer violence, difficulties adjusting to campus life, and household issues can also cause stress among students.
Haddad et al. (2021); Shi et al. (2020); Wolfers & Utz (2022); Zhao & Zhou (2021)	Technology and social media	Excessive use of technology and social media can add additional pressure, including feelings of helplessness, lack of privacy, and pressure to maintain a perfect online image.
Lin et al. (2020); María et al. (2021)	Professional demands	Students may face pressure to plan their professional future, including finding employment after graduation and adapting to a changing job market.

With an understanding of these issues, educational institutions and society as a whole need to provide appropriate support to students to help them manage stress, improve mental well-being, and achieve their academic and personal potential.

2.3 COVID-19 and Academic stress factor

The COVID-19 contagion has shifted the universal education landscape, for rapid transition to online learning has brought many challenges and stressors for students. On top of academic pressure, physical health, and financial constraints, the sudden shift from conventional classroom settings to online learning environments posed a substantial challenge. The students had to go through the teaching and learning transition, and the academic institutions were forced to adapt to the new learning setting, often with or without preparation.

The online learning setting has impacted students staying in rural areas. Students from lower socioeconomic backgrounds struggle to access online resources, attend online classes and face other technical issues such as unreliable internet connections and limited access to learning devices such as smartphones or tablets (Pui Yee, 2020; Jaspal & Jagdave, 2021). This creates an unequal learning environment and causes stress levels among students (Abdul et al., 2020). The heavy utilization of technology not only causes technical issues and a digital divide but also causes issues for students to adapt to new online learning platforms quickly. They must proficiently use various digital tools and technologies with minimal guidance. The urgency to learn and become proficient in handling the digital tools for teaching and learning contributed to increased anxiety and stress, especially among those less familiar with technology.

Besides technology challenges, the pandemic has heightened mental health issues among students due to a lack of interaction and engagement (Pui Yee, 2020). The online learning environment often lacks interactivity and engaging elements compared to conventional classrooms. The lack of interaction and face-to-face communication contributed to feelings of isolation and indirectly decreased learning motivation. In 2021, the Ministry of Health Malaysia (MOH) reported that 20% of university students experience anxiety and depression due to various reasons, and the lack of interaction is one of the factors (MOH, 2021). The lack of physical interaction makes students feel disconnected and the sense of isolation is a significant contributor to psychological stress.

Furthermore, the shift to online platforms has led to a rise in cognitive overload and associated stress. Not only do students have to stay focused throughout the online class session, but they also must learn and adapt to the new learning tools quickly. The lack of tools for effective online learning has negatively impacted students, causing stress and anxiety (Chan et al., 2020). On the same note, prolonged exposure to computer screens or tablet screens led to digital fatigue among students (Sarangal & Nargotra, 2022). They will experience physical and mental exhaustion from excessive digital device use. This causes headaches, eye strain and reduced concentration, all of which contribute to overall stress levels.

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3. METHODOLOGY

This study, surveyed the factors contributing to stress among students using the Depression Anxiety Stress Scales (DASS) questionnaire. The DASS is a psychological measurement method used to assess the levels of depression, anxiety, and stress in individuals (Akin & Çetin, 2007). This scale is commonly employed in scientific research and clinical assessments to evaluate a person's emotional state. Studies utilizing DASS often yield valuable information about the mental health status of specific populations, enabling researchers and healthcare professionals to design appropriate and effective interventions for individuals experiencing emotional distress. In the following Table 2 shows the three distinct subscales of DASS.

Table 2 The subscales of DASS

Subscale	Descriptions
Depression	Measures the level of feelings of sadness, hopelessness, and loss of interest or pleasure in life.
Anxiety	Measures the level of excessive worry, fear, and tension.
Stress	Measures the level of excessive anxiety, fear, and tension stemming from specific situations or circumstances.

Each subscale contains several statements that individuals rate based on how well they reflect their experiences over a certain period. The results from DASS provide an overall picture of a person's emotional state and can be used to identify individuals who may require psychological assistance or further support.

The DASS 21 questionnaire used was validated by Musa and Zain (2007). This questionnaire comprises 21 items with 7 items each for stress, depression, and anxiety. This study focused solely on the issue of stress among undergraduate students. Therefore, DASS stress subscale questionnaire comprises of 7 items related to stress was used to assess and measure the levels of anxiety, fear, and excessive tension arising from specific situations or circumstances. The DASS utilizes a series of statements that evaluate an individual's emotional state over a certain period. Each statement is rated by individuals based on the extent to which they agree with the statement. Each statement is usually assessed using a Likert scale ranging from 0 to 3 or 4 (0: Not at all, 1: A little, 2: Sometimes, 3 or 4: Often). The statements that are included in the DASS stress subscale are shown in the following Table 3.

Table 3: Example of DASS stress subscale statements

Question No. in the DASS Questionnaires	DASS Stress Subscale
1	I found it hard to wind down.
6	I tended to overreact to situations.
8	I felt that I was using a lot of nervous energy.
11	I found myself getting agitated.
12	I found it difficult to relax.
14	I was intolerant of anything that kept me from getting on with what I was doing.
18	I felt that I was rather touchy

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Assessments of these statements are then used to generate an overall score in the stress subscale. This score provides an overview of the extent to which an individual experiences stress over a certain period, with higher scores indicate higher levels of stress.

Data was collected during an online mental health webinar, where questionnaires were distributed to all participants. Respondents were selected using simple random sampling, where all students were invited into the webinar, and each participant had a chance to be selected as the respondent. They were asked about difficulty in relaxing, overreacting to situations, feeling agitated, and being intolerant, and each answer was assessed according to its severity, from 0 (not at all) to 4 (often). The summation of the result for each respondent was deliberated and multiplied by two to align with the DASS 42 severity rating, as shown in Table 4, where higher scores indicate greater levels of stress. Scores for each subscale (depression, anxiety, and stress) can be used to interpret an individual's overall emotional state. Specific scores may indicate varying levels, and there are typically cutoff scores used to classify levels of depression, anxiety, and stress.

Table 4: DASS 42 severity ratings (Stress)

DASS(42) Scoring	Severity
0-14	Normal
15 - 18	Mild
1 9- 25	Moderate
26 - 33	Severe
34+	Extremely severe

Source: Lovibond (1995)

Data analysis was performed using IBM SPSS Statistics 25. The research instruments were evaluated with a reliability test, where a Cronbach's alpha value greater than 0.7 indicates that the questionnaire is acceptable and reliable, as suggested by George and Mallery (2003).

This study aims to see the differences in the mean stress score by gender and the relationship between levels of stress and gender. In order to find out if there are differences in average stress scores by gender, an independent sample t-test was utilized. This parametric test compares the means of two independent groups to ascertain whether there is statistical evidence of a significant difference between their population means. The t-test assumes homogeneity of variance, meaning that both groups should have the same variance. Levene's test was used to check for this homogeneity of variance, confirming the appropriateness of the independent sample t-test.

The null hypothesis for Levene's Test states that the population variances of the two groups are equal. If Levene's Test null hypothesis is rejected, it indicates that the variances between the two groups are unequal, thus violating the assumption of homogeneity of variance. The hypotheses for the independent samples t-test are as follows:

H_0: There is no significant difference in average stress scores by gender.

H_1: There is a significant difference in average stress scores by gender.

On the other hand, a Chi-Square test of independence analysis was performed to find the answer about the relationship between levels of stress and gender. The hypotheses are as follows:

H0: There is no association between the level of stress and gender.

H1: There is an association between the level of stress and gender.

4. RESULTS AND DISCUSSION

https://doi.org/10.24191/jcrinn.v9i2.469

The population of interest for this study is all UiTM students. Therefore, 276 students were selected randomly from various UiTM campuses in Malaysia. Most of the respondents are from UiTM Pulau Pinang. However, only 51 male and 103 female students responded.

Table 5 : Cronbach's Alpha

Area	Value
Stress	0.867

To examine the credibility and consistency of the items in the questionnaire, a reliability analysis for the seven items was conducted. The analysis revealed a Cronbach's Alpha value of 0.867, as shown in Table 5. This value exceeds 0.7, indicating that the items have relatively high internal consistency.

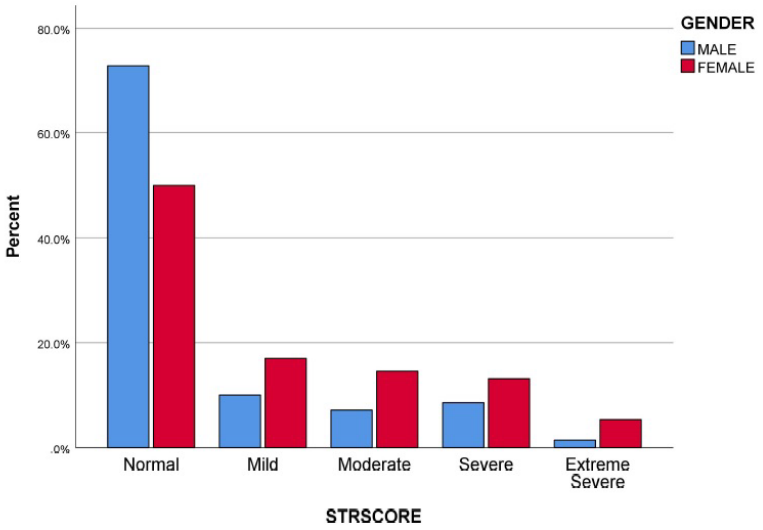

Fig. 1. Level of severity for stress versus gender

When comparing stress levels between genders, a higher percentage of male respondents (72.9%) are in the normal category compared to female respondents (50%). This suggests that females might be experiencing higher levels of stress overall. For both genders, the distribution of respondents across stress categories without considering the normal respondents, reveals that the highest number of those experiencing stress falls into the mild category. This indicates that mild stress is the most common level of stress accustomed among the respondents. The existence of mild stress among both male and female respondents is significant. Mild stress, while not as debilitating as severe stress, can still impact daily functioning and well-being. It is important for institutions to recognize and address even mild stress to prevent it from escalating to more severe levels.

To have a better view for the explanation above, the bar chart in Figure 1 presented the percentage of stress severity according to gender. The percentage of students with normal conditions seems higher for male rather than female. Other categories mild, moderate, severe and extreme severe showed a higher percentage in female compared to male. This implies that more female students are at risk of having stress. The data suggests a notable difference in stress levels between male and female respondents.

https://doi.org/10.24191/jcrinn.v9i2.469

Previous research has indicated that females are more likely to report higher levels of stress due to various factors, including social, psychological, and biological differences. The sources of stress differ between genders, with females being more stressed about personal and family-related issues, while males are more concerned about academic challenges and self-confidence (Tuncay et al., 2020). Matud et al. (2020) found that women had higher scores than men in several areas, including psychological distress, chronic stress, minor daily hassles, emotional coping styles, and social support. However, most of these differences had small effect sizes. Conversely, Gao (2020) found that female students experienced significantly higher levels of anxiety than male students during their first two years of college, but there were no significant gender differences in depression and stress levels.

Table 6: Total score of stress

Mean	1.94
Standard Deviation	1.25
Median (Min, Max)	1 (1, 5)

Table 6 shows the total score for stress. This table describe more on the severity of stress level among the students. The mean score for stress for all respondents is 1.94. Noted that a scale of 1 for stress already falls to a normal level. Meanwhile, the median value for stress is 1 which means that more than 50% of the respondents are still in the normal of stress. Similar to findings from Hassan et al (2023) which revealed that the majority of the respondents have normal level of stress.

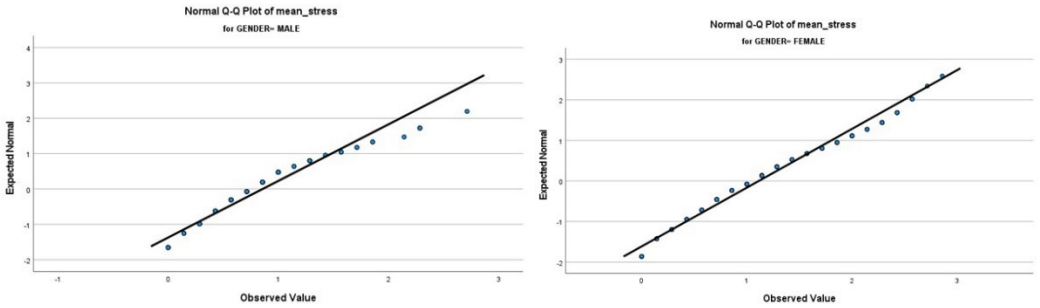

Fig 2. Q-Q Plot for gender

Further test was conducted to investigate the differences of mean score by gender. Before conducting the independent t-test, the normality assumption of the data was assessed using quartile-quartile (Q-Q) plots. The Q-Q plots for males in Figure 2 showed that the data points mostly followed the straight line, indicating approximate normality in the central portion of the distribution, despite some deviations in the tails. A similar pattern was observed for females, reinforcing that the central tendency of the data aligns well with a normal distribution, although minor deviations at the ends suggest slight non-normality. Given the approximate normality and the large sample size n = 70 for male and n=206 for female, the Central Limit Theorem justifies the use of the independent t-test despite these slight deviations.

	Levene's Test for Equality of Variances	**t-test for Equality of Means**

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		Significant Value	Significant (2 tailed)	Mean Difference	Standard Error Difference
Stress score	Equal variances assumed	.003	.003	-.51082	.17012
	Equal variances not assumed		.001	-.51082	.15366

Table 7: T-test for equality of means

The result from Levene's test is significant with p-value = 0.003 (<0.05), which indicates that the independent-t-test must hold the assumption for unequal variances for the two groups of samples. The independent t-test for equality of means is also significant with p-value = 0.001(<0.05) and these results support the hypothesis that the mean score of stress is not equal for male and female. Similarly, to our findings, Mustafa (2022), used an independent t-test and concludes that there is a significant gender difference in perceived stress levels, with females reporting higher levels of perceived stress compared to males.

Table 8: Chi Square test

	Value	**Degree of Freedom**	**Asymptotic Significance (2 sided)**
Pearson Chi-Square	11.575[a]	4	.021
Likelihood Ratio	12.273	4	.015
Linear-by-Linear Association	8.760	1	.003
Number of Valid Cases	276		

a. 1 cells (10.0%) have expected count less than 5. The minimum expected count is 3.04

A statistical procedure for determining the difference between observe data and expected data is the Chi-Square test. This test also used to determine whether it correlates to the categorical variable in the data, which in this case helps us figure out two things which is to investigate the relationship between the stress level and gender.

Table 8 indicates that 1 cell (10.0%) has an expected count less than 5, with the minimum expected count being 3.04. While this is not ideal, it is relatively close to 5 and involves a small proportion of the cells. It suggests that the assumption is not perfectly met, but the Chi-Square test can still be considered fairly robust in this scenario, especially since it involves only one cell out of several.

Table 9: Result of Chi Square Test for Gender and Stress Score

Stress Level		**Normal**		**Mild**		**Moderate**		**Severe**		**Extreme**		**p-value**
		Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%	
Gender	Male	51	72.9	7	10	5	7.1	6	8.6	1	1.4	0.021
	Female	103	50	35	17	30	14.6	27	13.1	11	5.3	

Table 9 descriptively shows that out of 70 male respondents, 51 are in the normal category, while the remaining are in the mild to extreme severe stress categories. In contrast, out of 206 female respondents, 103 are in the normal category, with the rest falling into the mild to extreme severe stress categories. the normal stress level is the highest for both gender male and female which is 72.9 % and 50%. It is also shown that gender was statistically significant at 95% confidence level for stress level (p-value = 0.021 < 0.05). Therefore, there is a relationship between level of stress and gender. This is supported by the findings that male and female students are different in important ways particularly concerning their experience of psychological stress and general psychological well-being (Mohd Suhaimi et al., 2018).

5. CONCLUSION

https://doi.org/10.24191/jcrinn.v9i2.469

In this study, it appears that most students experienced normal levels of stress symptoms as the total score for stress is at the normal stages, which is 1.9384. Moreover, the frequency of stress levels from normal to mild stages for the male gender is 61%, and for females is 67%. This analysis, however, found the necessity of focused stress management programs that cater to the unique requirements of both genders, with an emphasis on preventing mild stress from getting worse. From the result, there were significant differences in mean scores between males and females. From the analysis it can be concluded that the hypothesis for the mean score of stress is not equal for males and females, and there is a significant gender difference in perceived stress levels, with females reporting higher levels of perceived stress compared to males. Based on the Chi-Square independent analysis, the relationship between levels of stress and gender is significant. Therefore, there is a relationship between the level of stress and gender.This research provides to the existing literature by shedding light on the perceived stress levels and varied coping strategies employed by male and female students. Consequently, educational interventions may be necessary for students to cultivate enduring, healthy coping mechanisms. Faculty and other university officials are encouraged to prioritize and comprehend these factors to safeguard students' well being within their courses. Future research should explore the underlying causes of these gender differences in stress levels to inform more effective intervention strategies.

6. ACKNOWLEDGEMENTS/FUNDING

The authors would like to acknowledge the support of Universiti Teknologi Mara (UiTM), Cawangan Negeri Pulau Pinang, Malaysia for providing the facilities and support on this research.

7. CONFLICT OF INTEREST STATEMENT

The authors agree that this research was conducted in the absence of any self-benefits, commercial or financial conflicts and declare the absence of conflicting interests with the funders.

8. AUTHORS' CONTRIBUTIONS

Syarul Heiry Yahaya: Conceptualisation, methodology, formal analysis, investigation, editing, and validation; **Norazah Umar**: Conceptualisation, methodology, and formal analysis and editing; **Rozita Kadar**: Conceptualisation, writing- review and editing, and validation; **Nursakirah Ab Rahman Muton**: Conceptualisation, supervision, writing- review and editing.

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