

Factors Influencing Stress Management Among TVET MARA Students During Practical Training

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Abstract

Students in Technical and Vocational Education and Training (TVET) institutions are often exposed to significant levels of stress during their practical training due to heavy workloads, complex technical tasks, and demanding industrial expectations. If unmanaged, this stress may negatively impact their mental well-being, academic performance, and competency development. Therefore, this study aims to identify the level of stress and the stress management strategies among students in TVET MARA institutions in Batu Pahat during their practical and hands-on training. The study focuses on stress factors related to skills-based training, including workload, time constraints, pressure to achieve specific competencies, and the requirement to train in real industrial environments. A quantitative research design was employed using survey questionnaires distributed to first- and second-year students. The data were analyzed using descriptive and inferential statistics, including t-tests, Pearson correlation, and Mann-Whitney tests. The findings revealed that students experienced a moderate level of stress, which is $m=2.93$, $SD=0.89$. The most dominant stress management strategies were emotion-focused approaches, such as rest, spiritual practices, and seeking social support. The study also found a significant relationship between stress levels and the strategies used, as well as differences in stress and management strategies based on gender and year of study. This study highlights the importance of effective mental health support and early intervention to ensure student well-being and the effectiveness of the teaching and learning process. The implementation of a holistic institutional-level stress management programmed is recommended as a proactive measure to support students in navigating the challenges of practical training.

1. Introduction

Technical and Vocational Education and Training (TVET) under the Ministry of Education Malaysia (KPM) is an educational stream that emphasizes technical and vocational skills, with the aim of producing skilled, professional, and job-ready graduates. TVET equips students not only with technical knowledge but also with practical skills that are relevant to the real demands of the workforce. It is a critical national agenda, contributing significantly to the country's development efforts (Hassan et al., 2020). In line with the Dasar TVET Negara and the government's

ongoing TVET Transformation initiatives, Malaysia aims to strengthen the quality of training, enhance student readiness for Industry 4.0, and increase national TVET participation rates through structured and industry-aligned pathways. These policy directions reinforce the urgency of ensuring that students are not only technically competent but also psychologically prepared for the challenges of intensive practical training.

According to the official portal of Majlis Amanah Rakyat (MARA), several institutions fall under the MARA TVET umbrella, including UniKL, German-Malaysian Institute (GMI), MARA Japan Industrial Institute (MJII), Kolej Kemahiran Tinggi MARA (KKTm), Institut Kemahiran MARA (IKM), and GIATMARA. These institutions offer a range of programs that cater to students from diverse social backgrounds and economic levels, reflecting MARA's mission to provide equitable access to technical education nationwide.

In line with 21st-century learning principles, TVET emphasizes core elements such as communication skills, critical and creative thinking, collaboration, and values-based education. While these competencies are crucial for producing holistic graduates, they may also contribute to increased pressure and psychological strain for students (Vijayakumaran et al., 2023). Depression and stress tend to arise when students are unable to cope with the demands and burdens in their lives (Mazizi & Hamjah, 2023). For many students, balancing academic expectations with the need to master hands-on, technically demanding tasks can create significant emotional pressure, particularly during industrial training.

To better understand these challenges, this study is theoretically guided by Lazarus and Folkman's (1984) Transactional Model of Stress and Coping, which views stress as a dynamic interaction between an individual and the demands of their environment. According to this model, stress arises when students perceive training demands as exceeding their available resources, making coping strategies essential for maintaining emotional balance and performance. Introducing this theoretical perspective early helps frame the relevance of examining both stress factors and coping mechanisms among MARA TVET trainees.

Although previous studies have explored stress among higher education students, evidence focusing specifically on MARA TVET institutions during industrial training remains limited. Hence, a holistic study is needed to identify the specific stress factors faced by TVET students, especially in relation to skills-based, competency-driven training environments. Understanding these stressors can inform targeted stress management strategies tailored to their unique context. Such efforts align with the Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education) and SDG 3 (Good Health and Well-Being) (Sachs et al., 2023). By exploring this issue comprehensively, the mental health and well-being challenges faced by TVET students can be identified, addressed, and transformed into opportunities for producing well-rounded, competent, and resilient graduates.

2. Methodology

This study employed a quantitative survey design to examine stress levels and stress management strategies among students undergoing practical and industrial training in MARA TVET institutions. The target population consisted of 161 first- and second-year students, with a minimum sample size of 113 determined based on Krejcie and Morgan's (1970) table. Simple random sampling was used to enhance generalizability and minimize sampling bias (Wahyudi, 2018).

The study focused specifically on MARA training centres in Batu Pahat because these centres recorded the highest industrial training participation rate in the region and offered consistent programme structures. Their accessibility also enabled systematic data collection within the study timeframe. Although the sample was limited to Batu Pahat, the centres share standardized MARA curricula and training requirements, allowing the findings to reasonably represent similar TVET environments (Ministry of Education Malaysia, 2019).

Data were collected using a structured questionnaire consisting of three sections: respondent demographics, stress levels during industrial training, and coping strategies. Sections B and C contained 30 items measured on a six-point Likert scale (1 = Strongly Disagree to 6 = Strongly Agree) to reduce neutral responding. A pilot study confirmed strong internal consistency, with a Cronbach's alpha of 0.876.

Data were analysed using SPSS Version 27. Descriptive statistics (mean, standard deviation, frequencies, percentages) were used to identify major stressors and coping patterns. Inferential analyses—including Independent Samples t-tests, Mann-Whitney U tests, and Pearson or Spearman correlations—were conducted to examine group differences and variable relationships. The choice between parametric and non-parametric tests was guided by skewness-based normality checks. All tests were conducted at a significance level of $p < 0.05$ to ensure statistical validity.

3. Results and Discussion

The data analysis in this study is structured into three core segments: the demographic profiles of the respondents, the identification of stress factors experienced by students during practical training, and the coping strategies employed to manage those stressors. The subsequent inferential analysis investigates the relationship between

these stress factors and the effectiveness of stress management strategies among TVET MARA students, including differences based on gender and year of study.

3.1 Respondent Profile

A total of 148 respondents participated in this study, consisting of 91 males (61.5%) and 57 females (38.5%). The majority were enrolled in Automotive Technology (21%), followed by Electrical Wiring (13%), Fashion and Dressmaking (12%), Confectionery and Bakery (12%), Computer Systems (11%), and Motorcycle Technology (10%). The remaining were from Makeup and Beauty Therapy (8%), Refrigeration and Air Conditioning (7%), and Industrial Electronics (6%). Most respondents were first-year students (86%) compared to second-year students (14%). Data were collected from five GIATMARA centers, with the highest number from Parit Sulong (26%) and the lowest from Parit Raja (12%).

Table 1: Respondent demographic profile

Demographic Characteristic	Frequency	Percentage (%)
Gender	Male	61.5
	Female	38.5
Program of Study	Automotive Technology	21
	Motorcycle Technology	10
	Computer Systems Technology	11
	Industrial Electronics	6
	Fashion and Dressmaking	12
	Confectionary and Bakery	12
	Electrical Wiring (PW2)	13
	Refrigeration and Air Conditioning Technology (Phase One)	7
	Makeup and Beauty Therapy	8
Year of Study	Year 1	86
	Year 2	14
Educational Institution	GIATMARA Parit Sulong	26
	GIATMARA Ayer Hitam	20
	GIATMARA Batu Pahat	24
	GIATMARA Sri Gading	18
	GIATMARA Parit Raja Branch	12

3.2 Identification of Stress Factors Among MARA TVET Students During Industrial Training

The analysis of stress factors in Table 2 shows that MARA TVET students experienced moderate overall stress ($M = 2.93, SD = 0.89$), with several items standing out as dominant contributors. The highest stressors emerged from the category Achieving Certain Skill Levels, particularly students’ concerns about not meeting competency requirements (B9, $M = 3.72$). This suggests that expectations related to technical mastery and assessment standards place strong pressure on students, consistent with Siegrist’s (1996) Effort–Reward Imbalance Theory, where high effort accompanied by uncertainty or self-doubt amplifies stress.

Workload-related items also recorded consistently moderate means, such as difficulty understanding practical tasks when too many trainings are assigned (B3, $M = 3.11$) and frustration over failure to complete tasks on time (B14, $M = 3.40$). These findings align with the argument that vocational students often encounter intense task loads, requiring sustained physical and cognitive energy (Mesuwini, 2024). Time constraints, reflected in items such as overlapping schedules (B13, $M = 3.01$), further indicate that students struggle to balance multiple training demands within tight industrial-style timelines.

Additionally, Table 2 highlights stress linked to industry-like requirements, such as limited SOP understanding (B19, $M = 2.93$) and emotional strain due to distance from family during training (B20, $M = 2.89$). These patterns align with Ogur (2023), who notes that adaptation to real-world industrial expectations—particularly compliance with SOPs—can initially overwhelm trainees unfamiliar with industry routines.

Table 3 shows that students simultaneously employed strong coping mechanisms, particularly emotional-focused strategies such as spiritual reflection (C3, $M = 4.49$) and cognitive reframing (C4, $M = 4.59$). On the problem-solving end, seeking instructor assistance (C6, $M = 4.88$) and repeating tasks to improve mastery (C7, M

= 4.82) were heavily used. These trends reflect Lazarus and Folkman's (1984) model, where effective coping can neutralise or reduce perceived stress, even when stressors remain moderate.

When interpreted together, the data indicate that although students face meaningful stress from workload, competence expectations, and time pressure, they simultaneously demonstrate high resilience and strong self-regulation. This duality suggests that institutional support especially guidance from instructors plays a stabilising role in helping students navigate the rigorous demands of industrial training.

Table 2: Distribution of Mean Scores, Standard Deviations, and Mean Interpretations for Stress Items

No	Item	Mean Score	Std. Deviation	Interpretation
High Workload				
B1	I easily feel burdened when given a lot of hands-on and practical training by lecturers.	2.75	1.28	Moderate
B2	I quickly feel physically exhausted due to excessive workload.	2.82	1.20	Moderate
B3	I do not have enough time to deeply understand practical tasks when there is too much training.	3.11	1.32	Moderate
B4	Too many tasks cause me to lose focus during industrial training.	2.91	1.26	Moderate
B5	My motivation drops when I receive a high amount of industrial training workload.	2.53	1.20	Low
Achieving Certain Skill Levels				
B6	I feel stressed when I am unable to master certain skills during industrial training.	3.16	1.25	Moderate
B7	I feel stressed when I have to reach the practical skill level set by the institution.	2.67	1.01	Moderate
B8	I lack confidence in my level of mastery over technical skills.	3.03	1.18	Moderate
B9	I worry about not achieving the level of competency required in my field of study.	3.72	1.24	Moderate
B10	I feel stressed when I have to demonstrate skills individually in front of lecturers or assessors.	2.84	1.31	Moderate
Time Constraints in Completing Practical Tasks				
B11	Short submission deadlines cause me to feel stressed.	3.03	1.22	Moderate
B12	A packed industrial training schedule makes it difficult for me to manage my time well.	2.88	1.19	Moderate
B13	Overlapping training sessions cause me to fail to complete tasks within the allocated time.	3.01	1.23	Moderate
B14	Failure to complete tasks within the given timeframe makes me feel disappointed.	3.40	1.36	Moderate
B15	I find it hard to divide my time properly when completing industrial training tasks.	3.19	2.82	Moderate
Learning Needs in Real Industry Requirements				
B16	I have difficulty adapting to training environments that resemble real industry settings.	2.64	1.13	Low
B17	I feel unprepared to enter the real working world.	2.65	1.35	Low

B18	I feel stressed when training requires strict compliance with standard operating procedures (SOP).	2.47	1.17	Low
B19	I have limited understanding of standard operating procedures (SOP) for industrial practical training.	2.93	1.27	Moderate
B20	Industrial training far from family causes me emotional stress.	2.89	1.51	Moderate

Table 3: Distribution of Mean Scores, Standard Deviations, and Interpretations for Items Related Stress Management Strategies

No	Item	Mean Score	Std. Deviation	Interpretation
Emotional Management Strategies				
C1	I receive emotional support from family members.	4.48	1.55	High
C2	I share my problems and receive encouragement from peers.	4.31	1.31	Moderate
C3	I calm myself by engaging in spiritual activities when feeling stressed.	4.49	1.28	High
C4	I try to change my thinking patterns to avoid overthinking about stress.	4.59	1.24	High
C5	I maintain a healthy eating pattern to help control my emotions.	4.10	1.43	Moderate
Problem-Solving Strategies				
C6	I seek assistance from instructors when facing difficulties during practical training.	4.88	1.26	High
C7	I repeat the training to improve my skills in practical tasks.	4.82	1.09	High
C8	I organize my study schedule more systematically to complete practical tasks.	4.31	1.24	Moderate
C9	I break down complex tasks into smaller parts for easier management.	4.45	1.21	High
C10	I receive feedback from instructors or peers to improve my weaknesses during practical training.	4.86	1.21	High

Table 4 presents a summary of the distribution of mean scores, standard deviations, and their interpretations for both student stress factors and stress management strategies. The findings indicate that the mean score for student stress factors is 2.93 with a standard deviation of 0.89, which falls within the moderate interpretation range. This suggests that while students do experience stress during their training, the intensity remains at a manageable level. On the other hand, the mean score for student stress management strategies is 4.63 with a standard deviation of 0.81, indicating a high level of application. This reflects that students are actively employing effective methods to cope with stress, such as emotional regulation and problem-solving approaches. These results highlight a positive trend where; despite encountering moderate stress, students demonstrate a high capacity to manage their stress through constructive strategies.

Table 4: Summary Distribution of Mean Scores, Standard Deviations, and Mean Interpretations for Student Stress Factors and Stress Management Strategies

Item	Mean Score	Std. Deviation	Interpretation
Student Stress Factors	2.93	.89	Moderate
Student Stress Management Strategies	4.63	.81	High

3.3 Gender-Based Differences in Stress Factors at MARA TVET Institutions

The gender-based analysis conducted in this study aimed to determine whether male and female students experienced different levels of stress during industrial training. As shown in Table 5, the skewness values for both stress factors (.89) and gender (.49) fell within the acceptable range of -1.00 to $+1.00$, confirming that the data were normally distributed and appropriate for parametric testing. Levene's Test in Table 6 showed a non-significant p-value (.51), indicating equal variances between groups and validating the use of the "equal variances assumed" t-test output.

Table 7 shows that although female students recorded a slightly higher stress mean ($M = 2.99$, $SD = 0.90$) compared to male students ($M = 2.89$, $SD = 0.90$), the independent t-test result, $t(146) = -0.66$, $p = .51$, indicates no statistically significant difference between the two groups. Furthermore, the effect size was extremely small (Cohen's $d = -0.10$), demonstrating a negligible practical difference. In real TVET training environments, this negligible effect means that male and female students encounter similar stressors, and gender does not meaningfully influence how stress is experienced.

These findings correspond with prior TVET research, which has shown that vocational stress is primarily shaped by situational demands—such as workload, time pressure, competency expectations, and industrial readiness rather than demographic characteristics such as gender (Buthelezi & Hlalele, 2024). The uniform nature of MARA's curriculum and practical training design, where male and female students undergo the same hands-on tasks and assessment requirements, likely contributes to the absence of gender-based variation.

From a practical standpoint, these results imply that mental health interventions and stress management programmes in MARA TVET institutions do not need to be gender-specific. Instead, institutions should focus on universal stress-support mechanisms, such as technical mentoring, workload structuring, emotional support services, and time-management reinforcement, which will benefit all students equally. The findings reinforce the idea that improving training conditions and institutional support is more impactful than tailoring interventions according to demographic factors.

Table 5: Normality Test for Gender Differences in Student Stress Factors among Male and Female Students at TVET MARA Institution Batu Pahat (n=148)

Item	Skewness
Student Stress Factors	.89
Gender	.49

Table 6: Homogeneity of Variance Test

Test	Test Statistic	p-value
Levene's Test	0.99 (Not Significant)	.51 (Variance is homogeneous / equal variance)
Independent t-test Effect Size (Cohen's d)	$t(146) = -0.66$ $d = .01$	

Table 7: Differences in Student Stress Factors Between Male and Female Students at TVET MARA Institution in Batu Pahat (n=148)

Item	M	SD	t	df	p	d
Student Stress Factors			-0.66	146	.51	-0.10
	Male	2.89	0.90			
	Female	2.99	0.90			

3.4 Year-Based Differences in Stress Coping Strategies Among TVET Students

Year-based comparisons were conducted to determine whether first-year and second-year students differed in their use of stress management strategies during industrial training. As shown in Table 8, the skewness value for stress management strategies (.21) fell within the acceptable normality range; however, the year-of-study variable showed a skewness value of 2.16, indicating a non-normal distribution. Due to this violation of normality assumptions, a Mann-Whitney U test was used instead of a parametric alternative. This ensures that the analysis remains statistically robust for unequal or non-normally distributed groups.

Table 8: Normality Test for Differences in Student Stress Management Strategies Between Year 1 and Year 2 Students at TVET MARA Institution in Batu Pahat (n=148)

Item	Skewness
Stress Management Strategies	.21
Year of Study	2.16

Table 9 reports a statistically significant difference between Year 1 and Year 2 students ($z = -2.60, p = .009$), with Year 2 students demonstrating higher mean ranks (97.65) compared to Year 1 students (70.88). This indicates that second-year students engage in stress management strategies more frequently and effectively. Although the effect size $r = -0.20$ is considered small, it still reflects a meaningful practical implication: as students gain more experience, exposure, and familiarity with the demands of industrial training, they develop better coping capabilities.

This pattern aligns with existing literature stating that coping skills strengthen through repeated practice, technical familiarity, and exposure to real or simulated industry tasks. Hamasaki (2020) emphasised that structured, repeated engagement in demanding activities enhances emotional regulation and physiological resilience. Similarly, Rofa and Ngah (2024) noted that TVET students develop greater confidence, better stress tolerance, and stronger problem-solving habits as they progress into higher levels of training.

In the context of MARA TVET institutions, the findings suggest that Year 2 students benefit from accumulated hands-on experience, increased mastery of industrial procedures, and stronger relationships with instructors and peers all of which contribute to more effective coping. In contrast, Year 1 students are still adapting to new routines, technical demands, and expectations, making them more vulnerable to stress and less consistent in applying coping strategies.

These results highlight the importance of early-stage institutional interventions. By strengthening orientation programmes, offering structured mentoring, and providing targeted skill-preparation sessions for first-year students, institutions can help reduce the coping gap between the two cohorts. Ultimately, supporting students earlier in their training journey can enhance resilience and improve their overall readiness for industry environments.

Table 9: Differences in Stress Management Methods Between Year 1 and Year 2 Students at TVET MARA Institutions in Batu Pahat (n=148)

Item	Mean Rank	z	Mann-Whitney U	Asymp. Sig. (2-tailed)	r
Stress Management Strategies		-2.60	817.00	.009	-.2
	Year 1	70.88			
	Year 2	97.65			

3.5 Relationship Between Stress Factors and Coping Strategies During Practical Training

The relationship between student stress factors and coping strategies was examined using Pearson’s correlation analysis. Table 10 shows that both variables met normality assumptions, with skewness values of 0.81 for stress factors and 0.89 for coping strategies—falling within the acceptable range of -1.00 to +1.00. This confirms the suitability of a parametric correlation test.

Table 10: Normality Test for the Relationship Between Stress Factors and Stress Management Strategies Among TVET MARA Students in Batu Pahat (n=148)

Item	Skewness
Student Stress Factors	.81
Stress Management Strategies	.89

As presented in Table 11, the analysis revealed a moderate negative correlation between stress factors and coping strategies ($r = -0.319, p < .001$). This indicates that students who applied coping strategies more frequently—such as emotional regulation, cognitive reframing, seeking instructor assistance, and structured problem-solving—tended to experience lower levels of stress during industrial training. The moderate effect size suggests that

coping behaviour is not merely a supplementary response mechanism but functions as a meaningful protective factor in real TVET learning environments.

This finding aligns with Lazarus and Folkman's (1984) transactional stress-coping theory, which posits that effective coping reduces the perceived intensity of stress by altering how individuals interpret and respond to challenges. In the case of MARA TVET students, strategies such as seeking guidance from instructors, breaking complex tasks into simpler parts, and engaging in spiritual or emotional self-calming (as seen in Table 3 high mean scores) likely help them regulate anxiety when facing demanding practical tasks.

Additionally, the negative correlation supports Siegrist's (1996) Effort-Reward Imbalance framework, suggesting that when students feel more in control through effective coping, the imbalance between effort (technical workload and deadlines) and perceived reward (skill mastery and confidence) becomes less psychologically taxing. This means that coping strategies may buffer students from feeling overwhelmed, even when training intensity remains constant.

Practically, this relationship underscores the need for MARA institutions to intentionally strengthen coping skill development among students especially those in their early training stages. Structured interventions, such as coping-skills workshops, time-management coaching, technical rehearsal clinics, and accessible psychosocial support, can enhance students' ability to manage stress before it escalates. When students are equipped with strong coping strategies, they are more likely to maintain emotional stability, stay engaged in hands-on learning, and adapt successfully to industrial expectations.

Table 11: Relationship Between Stress Factors and Stress Management Strategies Among TVET MARA Students in Batu Pahat

		Stress Factor	Stress Management Strategies
Stress Factor	Pearson Correlation	1	-.319**
	Sig. (2-tailed)		<.001
	N		148
Stress Management Strategies	Pearson Correlation	-.319**	1
	Sig. (2-tailed)	<.001	
	N	148	

4. Conclusion

This study has demonstrated that MARA TVET students experience moderate levels of stress during their practical and industrial training, particularly in relation to workload, time constraints, and achieving technical competencies. Despite these stressors, students effectively employ a range of stress management strategies, especially problem-solving approaches such as seeking help from instructors, repeating tasks, and organizing schedules. Emotional coping strategies, such as spiritual practices and family support, also play a significant role.

The findings also indicate no significant gender-based differences in stress levels, suggesting that interventions should be inclusive and not gender-targeted. However, students in their second-year exhibit more mature and effective stress management strategies compared to first-year students, highlighting the importance of experience and adaptation over time. Importantly, a significant negative correlation was found between stress levels and coping strategies, which suggests that the better students manage stress, the lower their stress levels become. This underscores the need for institutions to implement structured, proactive stress management programs that build students' resilience early, particularly through time management training, technical skill reinforcement, and continuous psychological support.

In conclusion, a holistic, institution-wide approach to stress support should be embedded into the TVET learning experience to ensure students are not only technically competent but also mentally prepared for the demands of the real workforce.

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Conflict of Interest

The authors declare that there is no conflict of interest related to the publication of this manuscript.

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