

## **Stress, Self-Regulation, and Physical Activity Towards Quality of Life Among Senior Year Health Science Undergraduates**

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### **ABSTRACT**

*Final-year university students experience considerable stress due to academic demands, high expectations, and challenges such as online learning, emotional self-regulation, and physical inactivity. Prolonged stress significantly impacts students' behaviors, influencing their quality of life (QoL), which encompasses physical, mental, and social well-being. Emotion regulation and physical activity are crucial factors for mitigating stress and enhancing overall well-being. This study aimed to explore the relationships between perceived stress, physical activity, emotional self-regulation, and their combined influence on QoL among senior-year Health Sciences students at Universiti Kebangsaan Malaysia (UKM). A cross-sectional study was conducted involving 135 senior-year students from ten Health Sciences programs, selected through stratified random sampling. Data collection employed validated self-administered questionnaires, including the Perceived Stress Scale (PSS), Self-Regulation Questionnaire (SRQ), Global Physical Activity Questionnaire (GPAQ), and WHO QOL-BREF. Descriptive statistics, correlation analysis, and multiple linear regression were conducted using SPSS to examine the relationships and predictive effects of the variables on QoL. Descriptive analysis revealed notable trends in stress, physical activity, and QoL levels. Correlation analysis indicated significant associations between perceived stress, self-regulation, and physical activity, with each factor contributing to students' overall QoL. Multiple regression analysis highlighted self-regulation and physical activity as critical predictors of QoL, while stress negatively impacted well-being. This study underscores the pivotal role of emotional self-regulation and physical activity in enhancing QoL*

*among senior-year students. Strategies to improve self-regulation skills and encourage regular physical activity may effectively reduce stress and promote holistic well-being during critical academic phases.*

**Keywords:** *physical activity, quality of life, self-regulation, stress*

## INTRODUCTION

Of late, university students, particularly those in their senior years, encounter significant stressors stemming from various sources. It is commonly known that university students stress is a pervasive issue with multifaceted origins (Reddy et al. 2018). In addition, its contributing factors include academic challenges, high expectations on grades, adapting to online learning, low self-esteem, living conditions as well as social support (Putra & Ardi 2020, Rozanov et al. 2024, Kassim 2023, Litwic-Kaminska et al., 2023)

The ramifications of prolonged stress extend beyond the academic realm, impacting students' behaviours across domains such as dietary habits, physical activity, social interactions, and emotional self-regulation (Back, 2015). These behavioural shifts consequently influence the overall quality of life (QoL) experienced by students. QoL is a comprehensive state of complete physical, mental and social well-being (Raina 2019). It is a multi-dimensional perspective which includes positive and negative emotions, where positive affect contributes to overall happiness, while negative affect is often treated as a separate construct within the subjective well-being (Nima et al., 2024)

Emotion regulation strategies and abilities are indeed crucial for maintaining a favourable quality of life, as it influences mental health, resilience, and overall well-being. It also encompasses various strategies, such as cognitive reappraisal and expressive suppression, which can significantly impact an individual's emotional experiences and social interactions. In fact, effective emotion regulation is linked to improved subjective well-being and lower rates of psychopathological symptoms, including depression and anxiety (Kim et al. 2024). Evidently, the inability to manage negative emotions may precipitate depression (Beauregard et al., 2006). Findings from a systematic review shows self-regulation strategies and executive functions are significantly associated with various dimensions of students' well-being. This suggests that self-regulation may play a role in overall well-being, which could be related to HRQoL (Rodriguez et al. 2022).

A systematic review and meta-analysis found that physical activity interventions significantly reduced symptoms of depression, anxiety and stress among university students (Huang et al., 2024). Research indicates that engaging in regular physical activity can alleviate psychological distress, enhance mood, and improve overall well-being (Galler et al. 2024). Maintaining physical activity during the transition from high school to university is associated with lower levels of fatigue and higher levels of vigour among students. Research indicates that students who engage in regular physical activity experience enhanced mental and physical energy, while those with sedentary lifestyles report increased fatigue (Frederick et al., 2022; Bray & Kwan, 2006).

While numerous studies have explored the individual impacts of perceived stress, emotional self-regulation, and physical activity on well-being, limited research investigates their combined influence on quality of life among final-year Health Sciences students. Given that these students are uniquely positioned to face academic, social, and career pressures simultaneously, understanding the interplay of these factors is crucial.

This study addresses this gap by examining the relationships between perceived stress, emotional self-regulation, physical activity, and QoL among final-year Health Sciences students at Universiti

Kebangsaan Malaysia (UKM). By identifying key predictors of QoL, the study aims to provide evidence-based insights that can inform strategies to reduce stress, enhance emotional self-regulation, and encourage physical activity, ultimately improving students' well-being during this pivotal phase.

## **METHODOLOGY**

### **Study Design & Sample Size**

This cross-sectional study was conducted among senior-year students in the Faculty of Health Sciences at Universiti Kebangsaan Malaysia. They are all taking 4 years degree programmes and were in their seventh semester. Participants were drawn from various programs, including Biomedical Science, Environmental Health and Industrial Safety, Nutritional Science, Dietetics, Audiology, Speech Sciences, Physiotherapy, Optometry and Vision Sciences, Diagnostic Imaging, and Radiotherapy and Forensic Science. All these programs are located at the UKM Kuala Lumpur Campus, except for Forensic Science, which is based at the UKM main campus in Bangi, Selangor.

The sample size was determined using the Krejcie & Morgan formula, with parameters set as follows: the Chi-Square ( $\chi^2$ ) value, was 3.84; population size (N), was 207; assumed population proportion (P), was 0.50; and degree of accuracy ( $\Delta$ ), was 0.05. With a significance level of 5% and a degree of accuracy of 5%, the required sample size was calculated to be 135 senior health science students. Stratified random sampling was employed, dividing participants by their respective academic programs. The number of participants from each program was determined in proportion to the total population in that program.

### **Study Tools**

A set of self-administered questionnaires of 5 sections was used in this study. The sections include socio-demographic data (age, gender, race, marital status and course), Perceived Stress Scale (PSS) by Cohen et al. (1983), Self-Regulation Questionnaire (SRQ) by Aubrey et al. (1994), while Global Physical Activity Questionnaire (GPAQ) by Bull et al. (2009) and Quality of Life Questionnaire (WHO QOL-BREF).

### **Statistical Analysis**

All collected data were tabulated and analyzed using SPSS. Descriptive analysis was conducted to identify patterns within each variable. To address the non-normal distribution of physical activity data, a log10 transformation was applied. Comparisons of outcome measures between genders were performed using an independent t-test. Correlation analysis was conducted to examine the strength and direction of the linear relationships between quality of life (dependent variable) and perceived stress, emotional self-regulation, and physical activity (independent variables). Finally, multiple linear regression analysis was performed to evaluate the combined effects of perceived stress, emotional self-regulation, and physical activity on quality of life.

## **RESULTS**

A complete finding of the result on socio-demographic characteristic is presented in Table 1. In brief, this study recruited 135 students as study participants. The female majority (82.2%) reflects the composition of overall students in the faculty. Participants are also heavily dominated by Malay ethnicity in which almost all students (98.5%) are single. As we employed proportionate participants recruitment according to the academic programmes, Biomedical science students contribute the most (n=30) while dietetic and forensic science were the least (n=7).

**Table 1: Socio-demographic characteristics of the final year students**

Characteristic	Frequency
Gender	
Female	111 (82.2)
Male	24 (17.8)
Ethnicity	
Malay	106 (78.5)
Chinese	24 (17.8)
Indian	0 (0)
Others	5 (3.7)
Marital Status	
Single	133 (98.5)
Married	2 (1.5)
Academic Programs	
Biomedical Science	30 (22.2)
Nutritional Science	17 (12.6)
Physiotherapy	13 (9.6)
Environmental Health & Industrial Safety	13 (9.6)
Speech Science	13 (9.6)
Audiology	13 (9.6)
Optometry & Vision Sciences	12 (8.9)
Diagnostic Imaging & Radiotherapy	10 (7.4)
Dietetic	7 (5.2)
Forensic Science	7 (5.2)

**Table 2: Gender-specific outcomes measures**

Outcomes	Total N=135	Female n=111	Male n=24	p
Perceived Stress	28.6 ± 5.85	29.03 ± 0.557	26.38 ± 1.105	0.04
Self-Regulation	212.5 ± 19.30	213.65 ± 3.07	206.67 ± 3.07	> 0.05
Physical Activity Level (METs)	1500.0 (4050.0)	3108.11 ± 333.11	3392.50 ± 715.14	> 0.05
Low, n (%)		53 (39.3%)		
Medium, n (%)		39 (28.9%)		
High n, (%)		43 (31.9%)		
<b>Health-Related Quality of Life</b>				
Physical health	51.7 ± 11.55	52.35 ± 1.134	48.46 ± 1.833	> 0.05
Psychological	62.7 ± 11.03	63.21 ± 1.013	60.29 ± 2.556	> 0.05
Social relationships	66.0 ± 12.14	66.71 ± 1.620	62.83 ± 2.326	> 0.05
Environment	68.0 ± 13.34	68.09 ± 1.317	67.58 ± 2.189	> 0.05

p < 0.05 indicates significant different between genders

Perceived stress score among the respondents was  $28.6 \pm 5.85$ , self-regulation was  $212.5 \pm 19.30$ . For the physical activity 53 (39.3%) students showed low physical activity, while nearly another half 43 (31.9%) students showed high physical activity levels. The mean score for the general quality of life and general health were  $3.7 \pm 0.69$  and  $3.7 \pm 0.78$  respectively.

Female students had a significantly higher ( $29.03 \pm 0.557$ ) perceived stress than male ( $26.38 \pm 1.105$ ) student counterparts,  $t(133) = 2.030$ ,  $p = 0.044$  ( $p < 0.05$ ). Both self-regulation and physical activity level did not significantly differ between genders. Similarly, all domains in quality of life were not significantly different between genders.

Correlation analysis showed that there were weak negative correlations between QoL domains with perceived stress and weak positive correlations between QoL domains and self-regulation. These weak

correlations were significant. On the contrary, there were very weak non-significant correlations between QoL domains and physical activity level. Correlation analysis results are presented in Table 3.

**Table 3: Correlation coefficients between perceived stress, self-regulation and physical activity**

QoL	Perceived Stress	Self-regulation	Physical Activity
Physical Health	-0.359***	0.300***	-0.029
Psychological	-0.211*	0.289**	0.033
Social Relationship	-0.241**	0.221*	0.069
Environment	-0.295**	0.316***	0.020

\*\*\* Significant correlation at  $p < 0.001$ ; \*\* Significant correlation at  $p < 0.01$ ; \*Significant correlation at  $p < 0.05$

The multiple linear regression analysis was performed to further explain the relationship between perceived stress, self-regulation and physical activity towards quality of life. Physical health, psychological, social relationships and environment domains of QoL accounted for a non-significant 6.6%, 1.0%, 3.0% and 3.4% respectively of the variability of perceived stress.

Similar QoL domains accounted for non-significant 2.7%, 4.7%, 1.5% and 4.3% respectively for the variability of self-regulations, while physical activity accounted for a very minimal non-significant towards QoL. All these relationships are presented in Table 4.

In combination, perceived stress, self-regulation and total physical activity accounted for a significant 15% of the variability in Physical Health, 9.5% in Psychological, 8.9% in Social Relationships and 13.9% in Environment with quality of life. Table 5 depicts this result.

Each domain in the quality of life can be predicted based on the following equation:

**Physical health** = -0.557 (perceived stress) + 0.108 (self-regulation) - 0.009 (physical activity) + 44.624

**Psychological** = -0.213 (perceived stress) + 0.136 (self-regulation) + 0.930 (physical activity) + 36.831

**Social relationships** = -0.396 (perceived stress) + 0.085 (self-regulation) + 2.693 (physical activity) + 50.559

**Environment** = -0.463 (perceived stress) + 0.158 (self-regulation) + 1.964 (physical activity) + 41.394

**Table 4: Regression analysis between QoL domains with perceived stress, self-regulation and physical activity.**

QoL Domains	B [95% CI]	$\beta$	sr <sup>2</sup>
<b>Perceived Stress</b>			
Physical health	-0.557 [-0.903, -0.211]	-0.283	-0.066
Psychological	-0.213 [-0.555, 0.129]	-0.113	0.010
Social relationships	-0.396 [-0.774, 0.018]	-0.191	-0.03
Environment	-0.463 [-0.866, -0.059]	-0.203	-0.034
<b>Self-regulation</b>			
Physical health	0.108 [0.004, 0.213]	0.182	0.027
Psychological	0.136 [0.033, 0.240]	0.24	0.047
Social relationships	0.085 [-0.029, 0.199]	0.136	0.015
Environment	0.158 [0.036, 0.280]	0.229	0.043
<b>Physical Activity</b>			
Physical health	-0.009 [-3.492, 3.474]	0	0.000
Psychological	0.930 [-2.514, 4.373]	0.045	0.001
Social relationships	2.693 [-1.112, 6.499]	0.117	0.015
Environment	1.964 [-2.101, 6.029]	0.078	0.001

**Table 5: The Model Summary Table**

HRQoL	R <sup>2</sup>	Adjusted R <sup>2</sup>	F	P-value
Physical health	0.156	0.137	(3, 131) = 8.077	0.000 <sup>b</sup>
Psychological	0.095	0.075	(3, 131) = 4.605	0.004 <sup>b</sup>
Social relationships	0.089	0.068	(3, 131) = 4.275	0.006 <sup>b</sup>
Environment	0.139	0.119	(3, 131) = 7.028	0.000 <sup>b</sup>

a. Predictors: (Constant), Total physical activity, Self-regulation, Perceived stress scale

b. Dependent Variable: HRQoL (Physical health, Psychological, Social relationships, Environment)

## DISCUSSION

Our study showed that female students have higher perceived stress levels compared to their male counterparts. According to the American Psychological Association (2012), women are more likely than men to acknowledge their increased stress levels. Across various studies, female students consistently showed higher total stress scores compared to male students. Findings from both high school and college settings support this trend (Mishra et al., 2023). Notably, female students have reported higher stress levels during both distance learning and traditional academic settings (Liaquat et al., 2023).

Furthermore, studies have shown that female students generally score higher on emotional self-regulation scales compared to males. For instance, Noor et al. (2024) found significant differences, with females scoring an average of 119.35 compared to 116.47 for males, suggesting better emotional regulation among females. Neuroimaging studies indicate that males may regulate emotions more efficiently, with less prefrontal cortex activity for similar amygdala activity compared to females. However, females exhibit higher resting heart rate variability, reflecting better physiological control of emotions (Min et al., 2023).

The descriptive results from our study revealed low levels of physical activity among final-year students, likely due to time constraints caused by academic commitments. This result aligns with Brown et al. (2003), which showed that males engage in more moderate or vigorous physical activity than females. Recent studies also support this, indicating that male college students consistently report higher physical activity levels, including moderate, intense, and walking activities (Dikmen et al., 2020). Espada et al. (2023) similarly found that while less than half of both male and female university students are physically active, males tend to engage more in physical activities than females.

Interestingly, our study found no significant difference in health-related quality of life (HRQoL) between genders. Similar findings have been reported in a study conducted in China, where no significant difference in overall quality of life was observed between male and female college students, despite females reporting higher positive emotions (Hu et al., 2023). This suggests that while emotional experiences may vary by gender, they do not necessarily lead to differences in HRQoL. However, contrasting findings have been reported by Kobayashi et al. (2022), where female medical students had lower QoL scores. Similarly, in a study among Mexican university students, men reported higher self-perceptions of physical activity and emotional wellness, contributing to better QoL outcomes compared to women (García et al., 2016).

Additionally, our study highlights a negative correlation between perceived stress and quality of life, showing that as stress levels increase, QoL decreases. This finding supports previous research indicating that stress significantly impacts QoL among college students through various psychological and physical symptoms. Academic pressures, financial dependence, and social isolation contribute to stress, leading to anxiety, depression, and decreased QoL (Singh et al., 2024; Naiyar et al., 2023).

Contrary to expectations, relationship between physical activity and quality of life in our study showed only a very weak correlation. This contrasts with previous findings, which reported a moderate to strong positive correlation between physical activity and HRQoL. For instance, Viviers & Derman (2023) found a positive correlation between PA intensity and HRQoL among South African college students, with higher levels of physical activity predicting better QoL outcomes. Similarly, during the COVID-19 pandemic, physical and mental health issues emerged as significant moderators in the PA-HRQoL relationship, particularly among female college students, emphasizing the need for targeted interventions (Mortada et al., 2024).

The findings of this study provide valuable insights into the complex relationships between perceived stress, emotional self-regulation, physical activity, and quality of life among final-year university students. By highlighting that stress negatively impacts QoL, while self-regulation plays a critical role in emotional well-being, this study underscores the importance of developing effective stress management programs tailored to university students. Additionally, promoting regular physical activity despite its weak correlation in this study remains essential for improving students' physical and mental health.

Universities and policymakers can utilize these findings to implement targeted interventions and wellness programs, such as stress reduction workshops, emotional self-regulation training, and structured physical activity initiatives, to enhance students' overall quality of life. Future studies could further explore these relationships over time to determine causal effects and the long-term impact of such interventions. By addressing these key areas, institutions can foster a healthier and more resilient student population, particularly during critical academic phases.

## **LIMITATION**

There are several limitations of this study that should be considered while findings are being interpreted. First, there was an imbalance in gender distribution, with female participants comprising the majority of the sample. This gender skew may limit the generalizability of the results, particularly for insights into male students' experiences and outcomes. Future studies should have more balanced gender representation as it would provide a more comprehensive understanding of these dynamics across genders. Secondly, the data were collected from a single centre at the Faculty of Health Sciences at Universiti Kebangsaan Malaysia. As a result, the findings may not be generalizable to health science students in other universities or educational settings, as institutional factors and learning environments can vary widely. Lastly, there was an imbalance in ethnic representation among participants, which could influence the study's findings. Cultural backgrounds can impact variables like stress perception, self-regulation, and quality of life. Additionally, the lack of ethnic diversity in the sample may limit the applicability of results to a broader population. It is suggested that future studies should aim to recruit a more ethnically diverse sample to enhance the generalizability of findings across different cultural groups.

## **CONCLUSION**

In summary, this study establishes that there is a significant relationship between stress, self-regulation, and physical activity with quality of life among final-year health science students. The findings indicate that many students lack confidence in managing their personal challenges parallel to their high level of stress experience. While a small proportion of students reported being able to manage stress effectively, the majority felt overwhelmed, perceiving their difficulties as insurmountable. These insights highlight

the need for targeted interventions to support students so they are able to develop better coping mechanisms and self-regulation strategies to enhance their overall quality of life.

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## AUTHORS' CONTRIBUTION

Mat Ludin, A.F., Tahir, A.R., Ishak, I., conceived and designed the study. Ahmad, F.M., Zin, N.S., Ahmad, N., Ismail, N.M., Mustafa, N.H. Ahmad Najdi, S.A collected, tabulated and performed initial statistical analysis. Ishak, I. Mat Ludin, A.F. confirmed and interpreted the statistical results. Mat Ludin, A.F, Ibrahim F.W., Abd Warif, N.M supervised the overall execution of the study. Ahmad, F.M., Zin, N.S., Ahmad, N., Ismail, N.M., Mustafa, N.H. Ahmad Najdi, S.A prepared initial manuscript draft and Mat Ludin A.F revised it. Tahir, A.R., Ishak, I, Ibrahim F.W., Abd Warif, N.M checked the revised draft. Mat Ludin, A.F., Tahir, A.R., Ishak, I, Ibrahim F.W., Abd Warif, N.M confirmed the final version.

## CONFLICT OF INTEREST DECLARATION

We certify that the article is the Authors' and Co-Authors' original work. The article has not received prior publication and is not under consideration for publication elsewhere. This research/manuscript has not been submitted for publication nor has it been published in whole or in part elsewhere. We testify to the fact that all Authors have contributed significantly to the work, validity and legitimacy of the data and its interpretation for submission to Jurnal Intelek.

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