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Modeling Health-Related Quality of Life: Insights from Higher Education Students in Kelantan

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Abstract: Prioritising the quality of life among students is essential, as it directly impacts their academic performance, mental health, and overall well-being, laying the foundation for lifelong success and fulfilment. This study aims to determine the relationships between physical activity, sleep quality, lifestyle, and quality of life among university students. Another objective is examining potential differences in life quality according to gender. The study employed stratified random sampling to choose 80 participants from a prominent higher education institution in Kelantan. Data was gathered via self-administered questionnaires. Multiple linear regressions and the independent t-test were used in data analysis. Significant relationships between lifestyle and quality of life are shown by the study's findings. The findings also revealed that physical activity and sleep quality did not significantly influence quality of life. Notably, no discernible differences in quality of life levels were observed between male and female students. The study provides valuable insights for higher education administrators and policymakers to enhance positive health-related quality of life among students.

Keywords: Quality of life, Physical activity, Sleep quality, Lifestyle

1 Introduction

University students confront myriad challenges regarding their quality of life, primarily stemming from a need for more understanding about how physical activity, lifestyle choices, and sleep quality intertwine to impact overall well-being. While research suggest that regular exercise can mitigate chronic diseases and boost fitness levels, there is still a gap in understanding how these factors collectively influence quality of life, especially among diverse student groups. Furthermore, poor sleep quality significantly correlates with a decline in quality of life, affecting physical and psychological well-being [1–4].

The subjective perceptions of health and happiness that university students have about their lives result from various factors, including their level of physical activity, sleep habits, and lifestyle choices. Sedentary behaviours resulting from academic demands contribute to diminished quality of life, with lifestyle factors accounting for a substantial portion of related issues [1]. Understanding these interconnected factors is crucial for effectively addressing the well-being of university students.

Quality of life encompasses multiple dimensions, including physical, psychological, social, and environmental aspects, all of which contribute to an individual's overall well-being. Regular physical activity is essential for maintaining physical health, while adequate sleep quality is crucial for cognitive function and overall wellness [5–9]. Lifestyle encompasses an individual's behaviour, habits, and choices, which collectively shape their identity and well-being. By consciously shaping their lifestyle, individuals can enhance their overall well-being and lead more fulfilling lives [10–12].

The relationship between quality of life and physical activity is bi-directional and positive, with exercising contributing to both physical and mental health. Similarly, quality of life and sleep quality interact, with healthy habits positively influencing one another. Intentionally shaping one's lifestyle can also enhance quality of life across various dimensions, underscoring the importance of considering individual circumstances and variations [1–4].

While there has been considerable research on this topic, more studies are needed to understand the factors affecting the quality of life of higher education students. Hence, the purpose of this study is to determine whether physical activity, sleep quality, and lifestyle significantly impact the quality of life of university students. This research is deemed important in creating a supportive environment to develop students' overall well-being.

2 Methodology

A Study Design, Sample and Instrumentation

This research employs a cross-sectional design and utilises a quantitative approach to assess the impact of independent variables, such as physical activity, sleep quality, and lifestyle, on a dependent variable, quality of life. The data collection method involves the use of primary data through a self-administered questionnaire. The population for this study comprises all 358 students enrolled in the Diploma in Mathematical Science at UiTM Kelantan Branch, Machang Campus. A total of 80 samples were chosen using a simple random sampling technique with a 95% confidence level and a 10% margin of sampling error. The questionnaire comprises two sections: Part A, which focuses on the demographic profile, and Part B, which contains questions related to physical activity, sleep quality, lifestyle, and quality of life. Response options include Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), and Strongly Disagree (SD). Table 1 provides a summary of the number of items and sources of instrumentation employed in the study.

Table 1: Instrumentation

Variable	Number of Items	Source
Physical Activity	5	Abrantes et al., (2022)
Sleep Quality	6	Nishra (2023)
Lifestyle	6	Abrantes et al., (2022)
Quality of Life	5	WHO, Quality of Life (2016)

B Study Framework

The study framework is illustrated in Figure 1, with quality of life as the dependent variable and physical activity, sleep quality, and lifestyle as the independent variables.

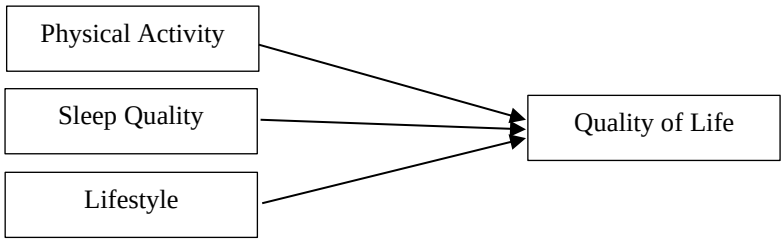

Figure 1: Theoretical Framework

C Method of Analyis

Descriptive statistics were utilised to delineate the demographic profiles of the respondents. Multiple linear regression (MLR) was applied to discern the connections between quality of life and independent variables. The assumptions of linearity, homoscedasticity, normality, and the absence of multicollinearity must all be met for MLR to be effective [13–16]. In addition, an independent t-test was run to investigate gender-based variations in quality of life levels.

3 Findings

A Demographics of Respondents

Table 2 illustrates that most participants were male students, constituting 67.5% of the overall count, as opposed to female students. The respondents were predominantly between the ages of 18 and 20. Additionally, there was a balanced representation of respondents among three different semesters.

Table 2: Descriptive Table of Respondents Demographic

		Percentage	Frequency
Gender	Male	67.5	54
	Female	32.5	26
Age	18 - 20	80	64
	21 - 23	15	12
	24 - 26	5	4
Semester	1	30	24
	3	30	24
	5	40	32

B Model Adequacy Checking

Model adequacy checks include the assumption of linearity between independent and dependent variables, normality of residuals, homoscedasticity, and multicollinearity.

i. Linearity

Table 3 indicates a noteworthy linear association between physical activity ($r = 0.453$, p-value < 0.05), sleep quality ($r = 0.362$, p-value < 0.05), and lifestyle ($r = 0.555$, p-value < 0.05) and lifestyle ($r = 0.555$, p-value < 0.05) with quality of life. All of the independent variables are adequate to be in a linear regression model.

Table 3: Pearson Correlation

Dependent variable	Independent variable	Pearson correlation	p-value
Quality of life	Physical activity	0.453	<0.05
	Sleep quality	0.362	<0.05
	Lifestyle	0.555	<0.05

i. Homoscedasticity

Figure 2 shows that the residuals are randomly dispersed without any discernible pattern, suggesting the fulfilment of homoscedasticity, where residuals exhibit constant variance and lack bias.

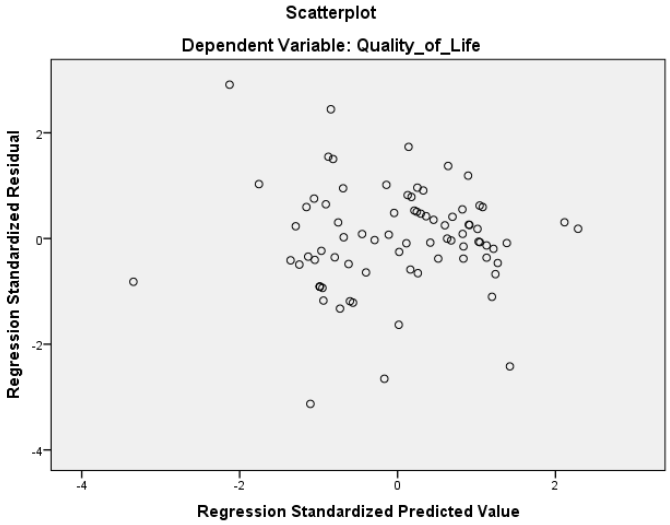

Figure 2: Scatter Plot for residual vs. predicted

iii. Normality

In Figure 3, the plot depicts a histogram with a bell-shaped curve, signifying that the residuals are normally distributed and, consequently, meet the assumption of normality of the residuals.

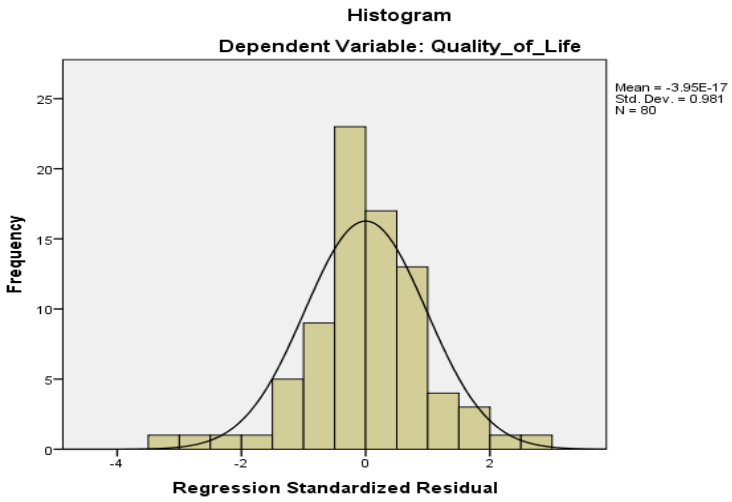

Figure 3: Distribution of Residual for Satisfaction

iv. Multicollinearity

The multicollinearity test aims to ascertain the degree of interrelation among the independent variables in the model. Table 4 reveals no indication of multicollinearity for all variables, given that the tolerance values for physical activity (0.640), sleep quality (0.837), and lifestyle (0.605) surpassed the threshold of 0.1. The variance inflation factor (VIF) values were also below 10, specifically 1.563, 1.195, and 1.654. Consequently, this model does not exhibit multicollinearity issues.

Table 4: Coefficients form multicollinearity assumption

Variables	Collinearity Statistics		Findings
	TOL	VIF	
Physical activity	0.640	1.563	
Sleep quality	0.837	1.195	No Multicollinearity
Lifestyle	0.605	1.654	

C Significance of Model

The model's significance is assessed to determine its suitability for the data in linear regression. Subsequently, the R2 value gauges how much of the variance in the dependent variable is accounted for by the independent variables. A higher R2 value, approaching 1, indicates a better fit for the model. In Table 5, the F-statistic holds a significant value ($F = 13.741$, p-value < 0.05), signifying the existence of a noteworthy regression model. The R2 value (0.352) indicates that 35.2% of the total variation in quality of life can be explained by the independent variables. The low R2 value is due to insignificant predictors of physical activity and sleep quality variables.

Table 5: Analysis of Variance for MLR test

Model	ANOVA	F	Sig	R Square
1	Regression	13.741	0.000	0.352

D Significance of Independent Variable

Based on the findings in Table 6, it can be inferred that only lifestyle ($\beta = 0.395$, p-value < 0.05) significantly influences students' quality of life. With 95% confidence, when the lifestyle measurement increases by 1 unit, the quality of life increases between 0.157 and 0.633 units. The variables of physical activity ($\beta = 0.159$, p-value = 0.142) and sleep quality ($\beta = 0.129$, p-value < 0.129) did not exhibit a statistically significant impact on the quality of life.

Table 6: Coefficient for MLR test

Variable	Unstandardised coefficient	t-statistic	p-value	95% confidence interval	
				Lower	Upper
Constant	2.056	3.820	0.000	0.984	3.127
Physical Activity	0.159	1.484	0.142	-0.055	0.373
Sleep Quality	0.129	1.533	0.129	-0.039	0.296
Lifestyle	0.395	3.308	0.001	0.157	0.633

E Independent T-test (Gender)

In assessing whether a statistically significant difference exists between the means of two unrelated groups, the independent t-test, an inferential statistical test, is employed. The findings, presented in Table 7, reveal that the F-value for Levene's test ($F = 0.648$, p-value = 0.423) indicates homogeneity of variance. Furthermore, the independent t-test suggests no significant difference in psychological health between male and female students (t-statistic = 0.597, p-value = 0.552).

Table 7: Independent T-test Result

Levene's Test		T-test for Equality Means		Quality of life Mean
F	P-value	T	P-value	
0.648	0.423	0.597	0.552	Male = 5.2692 Female = 5.4741

F Summary of The Findings

The results of the entire study are summarised in Table 8.

Table 8: Summary of The Findings

Relationships	Findings
• There is a relationship between physical activity and quality of life	Not Supported
• There is a relationship between sleep quality and quality of life	Not Supported
• There is a relationship between lifestyle and quality of life	Supported
• There is a significant difference in quality of life between genders	Not Supported

4 Conclusion

The MLR findings indicate that lifestyle significantly influences students' quality of life. Subsequently, an independent t-test was employed to address the second objective, revealing no significant difference in quality of life between genders. These results are anticipated to aid the management team in formulating effective strategies for delivering high-quality education and fostering a supportive academic environment conducive to students' quality of life. To replicate this study and delve into the various factors influencing quality of life, a longitudinal design is recommended for its ability to yield more pertinent information. Furthermore, it is proposed that future investigations incorporate additional independent variables, considering the potential influence of various factors on quality of life.

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