A Multiple Linear Regression Analysis on the Perception of Secondary School Students in Tangkak, Johor towards Absenteeism

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Abstract: While school attendance has been one of the determinants of students' success, absenteeism has increased in 2020. This research was conducted to investigate the factors influencing the perception of students towards absenteeism. Additionally, this research aims to compare the perception towards absenteeism between gender as well as between school areas. Factors such as school environment, family problems, student's attitude and health problems were considered in the study. The study involved a total of 580 students who came from two different schools, one represented the urban area and the other represented the rural area. The data were gathered through a questionnaire adapted from a previous study. A multiple linear regression analysis was employed to answer the first objective. The results revealed that the most significant factor that influenced the perception of students towards absenteeism was school environment. For the second objective, an independent z test was employed to compare the perception scores between gender as well as between school area (urban and rural). It was found that the perception of students towards absenteeism differs by gender but did not differ by school area.

Keywords: Absenteeism, regression, school, z test

1   Introduction

Absenteeism can be defined as the percentage of students who are not in class on any given day [1]. Absenteeism without justification is a disciplinary issue [2]. Students' engagement is vital to ensure that they understand what they are learning. This can also help them to achieve better academic performance. Not only academic performance, the participation of students in school is important for their economic and social development in all aspects [3] and predicts large risk indicators for the future of education [4].

Research shows that attendance is one of the important determinants of a students' academic performance [5-7]. Unfortunately, absenteeism has been described as one of the biggest problems in Malaysia [8]. The frequency of students not entering schools has been increasing day by day. For instance, the officer in Pejabat Pendidikan Daerah Tangkak stated that student attendance in Tangkak, Johor has declined from 92% to 85% in 2020. The pattern of student absenteeism changes rapidly over time. This problem affects not only the teachers in Malaysia, but primarily the students' academic performance. Moreover, the enthusiasm and academic success of other students may also be affected [9].

Education officials and academics have been seriously concerned about student absenteeism in recent years [10]. Research has been conducted to identity the factors causing absenteeism among students.

According to Sethi [1], the cause of absenteeism falls into three large categories, namely behavioural problems, negative environment and family issues. Another aspect that might cause absenteeism among students is school setting and environment [11]. Pehlivan [12] identified that "not liking the school" was one of the factors contributing to absenteeism.

More complicated factors such as emotional, family and social problems might also lead to absenteeism among school students [13]. According to Clark [15], guardians of the students have a big influence on school attendance. In other studies such as Demir and Karabeyoglu [4], William [14], Clark [15] and Gentle-Gennity [16], student's attitude was believed to have significant effect on absenteeism. Other than that, health condition of the students was also found to be the main cause of absenteeism [17]. Bhattarai [18] reported that, in Nepal, fever was the most common cause for student absenteeism. He added that students with problematic absenteeism appear to have greater incidences of anxiety, disruptive disorders and drug abuse compared to students without problematic absences.

Absenteeism was also reported to differ by gender and school area in the previous studies. Malcolm, Wilson, Davidson and Kirk [19] found that absenteeism was more common among female students while Guare and Cooper [20] found that school absenteeism rates were the same for male and female students. This finding was further confirmed by GarcCa and Weiss [21] who later found that male students were not more likely than females to develop serious frequent absenteeism. Teachers generally believe that male students seemed to involve more in absenteeism than females [22]. AlSayyari and AlBuhairan [23] also reported that the occurrence of low absences was better in females than male students and the possibility of females reporting low absences was 1.57 higher than for male students. In terms of school area, school absenteeism seemed to be more common among students from low-income families living in rural areas [24]. In contrast, Ananthakrishnan and Nalini [25] and Bouck [26] reported that absenteeism was not a big problem for school children in rural areas.

In this study, the aim was to identify the factors influencing the perception of students towards absenteeism. Based on the literature, four factors were considered in this study which were school environment, family problems, student's attitude and health problems. Additionally, the perception of students towards absenteeism was compared between gender and school area.

2   Methodology

This section describes the methodoly involved in the study which includes the design of the study, research instrument and statistical analysis employed to answer the objectives.

A   Study Design

This study involved 580 sample students from two schools in Tangkak, Johor, namely school A and school B. Stratified sampling technique was applied to select the sample in which the students were grouped according to their school. School A represents the urban area while school B represents the rural area. A total of 292 students were randomly taken from school A, of which 144 of them were males and 148 were females. Students from School B made up the rest of the sample with 148 males and 140 males.

B   Research Instrument

A questionnaire from Kirkwood and Rintoul [27] was adopted for data collection purpose. The questionnaire consists of two sections. Section A gathers the demographic profile of the respondents whereas section B measures the perception towards absenteeism and five factors influencing absenteeism which include school environment, family problems, student's attitude and health

problems. The perception towards absenteeism was measured through a five-point likert scale where 1 represents strongly disagree and 5 represents strongly agree. The questionnaire was converted to online form before it was distributed to the students.

C Statisical Analysis

A multiple linear regression analysis was employed to answer the first objective which was to identify the factors influencing absenteeism from student's prespective. Next, an independent t-test was performed to answer the second objective which was to compare the perception towards absenteeism between gender as well as between school area. Prior to that, descriptive analysis, specifically the frequency table was used to describe the demographic profile of the students.

i. Multiple Linear Regression Analysis

A multiple linear regression model can be used to explain the relationship between the dependent variable and independent variables [28]. Hence, factors causing the variation in the dependent variable can be identified from the model. In this study, the following regression model was estimated to identify the factors influencing the perception of students towards absenteeism.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 \tag{1}$$

where

Y = perception towards absenteeism
X_1 = school environment
X_2 = family problems
X_3 = students' attitude
X_4 = health problems

ii. Model Assumptions

The linear regression model assumes that the errors are independent and normally distributed with zero mean and constant variance. In addition, there should be no multicollinearity problem in the data [29]. The scatter plot matrix was used to check if the errors were linear. Next, a plot of residuals versus predicted values was investigated to check whether the errors were independent and have constant variance. For normality assumption, Shapiro-Wilk and Kolmogorov-Smirnov test were performed to check if the errors were normally distributed. Finally, the presence of multicollinearity problem was identified by observing the Variance Inflation Factor (VIF) and Tolerance values.

iii. Independent Z Test

According to Pandis [30], the independent z test can be used to compare the means between two independent groups if the sample size is large enough (n > 30). The null hypothesis is $H_0 : \mu_1 = \mu_2$. Rejecting this null hypothesis indicates that there is a significant difference between the two population means. The test statistic can be calculated using the following formula:

$$Z = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\dfrac{\sigma_1^2}{n_1} + \dfrac{\sigma_2^2}{n_2}}} \tag{2}$$

where $\bar{x}_1$, $\bar{x}_2$ are the sample means, μ_1, μ_2 are the population means, σ_1^2, σ_2^2 are the population variances and n_1, n_2 are the sample sizes for group 1 and group 2, respectively. In most cases, the population variances are unknown and they are estimated by the sample variances.

3　Results and Discussions

i.　Demographic Profile of the Respondents

The frequencies of students based on their demographic profile were tabulated in Table 1 below. Based on Table 1, there are 288 male students who participated in the study. Malay students surpass other races with a total of 445 (76.7%) students. Referring to Table 1, the students are approximately equally distributed by their level of education with a frequency of 75 to 112 students in each group.

Table 1: Distribution of Students Based on Demographic Variables

Variables	Frequency (%)
Gender	
Male	288 (49.6)
Female	292 (50.4)
Race	
Malay	445 (76.7)
Chinese	99 (17.1)
Indian	32 (5.5)
Others	4 (0.7)
Current Level of Education	
Form 1	92 (15.9)
Form 2	95 (16.4)
Form 3	97 (16.7)
Form 4	112 (19.3)
Form 5	109 (18.7)
Form 6	75 (13.0)

ii.　Identification of Significant Factors Influencing Perception Towards Absenteeism

The linear regression model was estimated to identify the significant factors influencing the perception of students towards absenteeism. All assumptions of the model are fulfilled in which the errors are independently normally distributed with zero mean and constant variance. Table 2 presents the results of the multiple linear regression analysis. The tolerance values are more than 0.1 and VIF values are less than 10 for all factors. This indicates that multicollinearity problem does not exist in the data.

Table 2: Results of the Multiple Linear Regression Analysis

Variable	Parameter Estimates	t	p-value	Tolerance	VIF
School Environment	0.10612	3.44	0.006	0.94097	1.06274
Family Problems	0.05545	-1.47	0.1412	0.91184	1.09669
Students' Attitude	0.01091	0.39	0.6968	0.97861	1.02186
Health Problems	0.07137	-1.69	0.0910	0.93035	1.07487
F-statistic = 3.84 (p = 0.0044)					
R^2 = 0.0295					

As indicated by the p-value of the F-statistic (p = 0.0044), the estimated model fits the data very well. R^2 value is quite low in which only 2.95% of the total variation in perception towards

absenteeism is explained by school environment, family problems, students' attitude and health problems. Nevertheless, that was not considered as a serious problem in this study as the objective was merely to identify significant factors rather than making predictions. A high R^2 will be important for studies that aim to make predictions on the dependent variable based on the independent variables [31]. If making predictions is not the aim of the study, then low R^2 is acceptable [32]. Moreover, low value of R^2 does not indicate the absence of relationship between the dependent and independent variables [33].

Based on the results, the estimated model can be written as:

$$Y = 14.29292 + 0.10612X_1 - 0.05545X_2 + 0.01091X_3 - 0.07137X_4 \qquad (3)$$

where Y = perception towards absenteeism, X_1 is school environment, X_2 is family problems, X_3 is students' attitude and X_4 is health problems.

At 5% level of significance, as agreed by previous researchers, school environment was found to be significant (p = 0.006) in this study. The parameter estimate for school environment indicated that school environment was positively related to perception towards absenteeism in which students who were happy with the school environment tend to have higher perception score. Meanwhile, in contrast with Vanneste et al. [13], family problems was found to be insignificant (p = 0.1412) to the perception towards absenteeism. In the previous studies, students' attitude was found to be important by Demir and Karabeyoglu [4], William [14], Clark [15] and Gentle-Gennity [16]. Contrarily, this study found that the factor was insignificant (0.6968). Additionally, while Tronick and Beeghly [17] and Bhattarai [18] stated that health problems influenced absenteeism, that seemed not to be the case in this study (p = 0.0910).

iii. Comparison of Perception Towards Absenteeism between Gender and School Areas

Independent z test was performed to compare the perception towards absenteeism between gender, as well as between school areas. Prior to that, normality test was performed on the perception towards absenteeism and it turned out that the perception towards absenteeism was normally distributed. Therefore, independent z test was chosen. The results of the test were summarized in Table 3.

Table 3: Results of the Independent Z Test

Variable	Z	p-value
Gender	-2.72	0.0067
School Area	0.48	0.6280

As shown in Table 3, there is a significant difference in the mean scores of the perception towards absenteeism between male and female students (p = 0.0067). This supports the findings of Malcolm, Wilson, Davidson and Kirk [19] and AlSayyari and AlBuhairan [23]. Meanwhile, the mean scores of the perception towards absenteeism does not differ by school area (p = 0.6280). This seems to oppose the results found by Prakash et al. [24].

4   Conclusion

School absenteeism is associated with a multitude of life-course issues. For the purpose of the study, the phenomenon of absenteeism among secondary school students in Tangkak, Johor was investigated. It was found that absenteeism rate has been increasing in Tangkak, Johor. Keeping in view the severity of the problem, this study was aimed at exploring the factors that cause absenteeism among secondary school students in Tangkak, Johor. Gender, school environment, family problem, students' attitude and school area were among the factors found to be related to absenteeism. Therefore, these factors were investigated to better understand their effects on absenteeism. A total of 580 students from two schools, one represented the urban area and the other represented the rural

area, took part in the study. A multiple linear regression analysis was employed to identify significant factors for school absenteeism while independent z test was performed to compare the perception towards absenteeism between genders as well as between school areas.

The results of the multiple linear regression analysis revealed that the only factor found to be significant was school environment. The value of R^2 was found to be very low. Although, it was considered tolerable due to the objectives of this study, future research may be necessary. A low value of R^2 may be caused by the negligence of some important factors. Finally, the independent z test suggested that the perception towards absenteeism differs by gender but not by school areas. This study has included all common important factors influencing school absenteeism, to the best of the authors' knowledge. However, future works can be done to improvise the results of this study by considering more important factors. Comparison can also be made between schools from different states in Malaysia.

Acknowledgements

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