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The Influence of Fatigue Levels on the Performance of Flight Cadets at Vocational Education Institutions

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Abstract: This research aims to explore the influence of fatigue levels on the performance of flight cadets in Vocational Education Institutions. Through the analysis of Model Summary, ANOVA, and Coefficients, this study identifies the relationship between independent variables (exercise, activity preparation, rest time, workload, and schedule) and the performance of flight cadets. The results of the analysis indicate that Model H1 can account for approximately 32.8 Percent of the variation in the performance of flight cadets, with activity preparation and workload variables significantly influencing the performance. However, exercise, rest time, and schedule variables do not have a significant impact. These findings provide valuable insights for educational institutions and trainers to consider factors that can enhance the performance of flight cadets, such as optimizing activity preparation and managing workload. Further research is needed to deepen the understanding of other factors that affect the performance of flight cadets, including psychological factors, physical conditions, and the environment, in order to improve the quality of vocational education in the aviation field.

Keywords: fatique levels; performance of flight cadets; vocational education institutions

1. Introduction

The aviation industry is built upon the dedication and expertise of pilots who are entrusted with the responsibility of safely operating aircraft across the skies [1]. Aspiring pilots, or flight cadets, undergo rigorous training at vocational education institutions to acquire the skills and knowledge necessary for this crucial role [2]. Vocational education institutions play a vital role in producing quality flight cadets who are prepared to face the challenges of the aviation world [3]. The education process in these institutions involves intensive training, high discipline, and activities that require high concentration [4]. One important aspect to consider in this educational process is the level of fatigue experienced by flight cadets [5].

However, the demanding nature of flight training and the intensity of workload can lead to high levels of fatigue among flight cadets [6]. Fatigue not only affects their physical and mental well-being but also significantly impacts their performance as pilot [7]. It can disrupt decision-making abilities, reaction times, and situational awareness, potentially posing risks to flight safety [8]. Fatigue levels can significantly influence an individual's performance, especially in activities that require precision and quick response [9]. Flight cadets are responsible for flight safety and must be able to handle complex situations accurately and meticulously [10].

Recognizing the importance of addressing fatigue-related issues, this research aims to deepen our understanding of the relationship between fatigue levels and the performance of flight cadets in vocational education institutions. By conducting a comprehensive analysis of various factors

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contributing to fatigue, such as training duration, workload intensity, and sleep patterns, we can gain valuable insights into the specific challenges faced by flight cadets and their implications for flight performance.

This research aims to identify effective strategies and measures to optimize fatigue management among flight cadets [11]. Recommendations may include the implementation of structured rest and recovery periods, promotion of healthy sleep habits, as well as the integration of awareness and fatigue reduction into the training curriculum [12]. By implementing these measures, vocational education institutions can create a safer and conducive learning environment that enhances the well-being and overall performance of flight cadets [13].

Ultimately, the results of this research will contribute to the advancement of flight training practices and the development of evidence-based guidelines for managing fatigue among flight cadets. By prioritizing the well-being and performance of aspiring pilots, we can ensure continuous improvement in aviation safety standards and the development of competent and resilient pilots.

2. Methods

The research methodology used in this study will involve a comprehensive and structured approach to investigate the influence of fatigue levels on the performance of flight cadets at vocational education institutions [14]. Here is an overview of the research methodology that will be employed:

Research Design

This study will utilize a quantitative research design. Data will be collected through surveys and structured observations to gather information on fatigue levels and the performance of flight cadets [15]. This approach will enable careful statistical analysis to identify the relationships between the variables under investigation.

Data Collection

Surveys will be conducted where flight cadets will be asked to complete questionnaires specifically designed to measure their fatigue levels [16]. The questionnaire will include valid and reliable measurement scales to obtain accurate data.

Research Sample

The research sample will consist of 73 flight cadets undergoing training at a specific vocational education institution. An adequate sample size will be selected to encompass a representative variation of fatigue levels and performance.

Data Analysis

The collected data will be analyzed using appropriate statistical methods. Statistical analyses such as correlation tests and regression analysis will be employed to identify the relationships between fatigue levels and the performance of flight cadets. The results of the analysis will be used to draw conclusions and provide recommendations.

It is essential to note that the above description provides a general overview of the research methodology. Further details regarding the specific survey instruments, statistical techniques, and ethical considerations will be included in the actual research study.

3. Results

In the analysis of the flight performance models, two models were evaluated, namely Model H0 and Model H1. In Model H0, the obtained R-squared (R^2) value is 0.000, indicating that the variability explained by this model is very low. Additionally, the values of Adjusted R-squared (Adjusted R^2) and Root Mean Square Error (RMSE) are also close to zero, indicating a significant mismatch between the model's predictions and the actual data.

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Table 1. Model Summary Flight Performance.

Model	R	R^2	Adjusted R^2	RMSE
H0	0.000	0.000	0.000	0.668
H1	0.572	.0327	0.277	0.568

However, in Model H1, a significant improvement in performance is observed. The R-squared (R^2) value reaches 0.327, indicating that approximately 32.7 percent of the variability can be explained by this model. The Adjusted R-squared (Adjusted R^2) value also increases to 0.277, indicating the model's ability to adjust for the number of variables used. Furthermore, the RMSE in this model decreases to 0.568, indicating a lower level of prediction error compared to Model H0.

Based on these results, it can be concluded that Model H1 demonstrates better performance compared to Model H0 in predicting flight performance. Although there is still room for improvement, this model can explain a portion of the observed variation and provide more accurate predictions.

Table 2. ANOVA.

Model		Sum of Squares	df	Mean Square	F	p
H1	Regression	10.491	5	2.098	6.511	< .001
	Residual	21.591	67	0.322		
	Total	32.082	72			

The intercept model is omitted, as no meaningful information can be shown.

An ANOVA analysis was conducted to evaluate the influence of Model H1 on flight performance. The results indicate a significant difference among the independent variables in this model. In the ANOVA table, it can be observed that the Sum of Squares for Model H1 is 10.491. With 5 degrees of freedom (df), the Mean Square for this model is 2.098. The resulting F-statistic value is 6.511, with a very small p-value of $< .001$.

Moving on to the Residual section, it can be seen that the Sum of Squares is 21.591, with 67 degrees of freedom. This yields a Mean Square of 0.322. The Total Sum of Squares is 32.082, with a total of 72 degrees of freedom. Based on these ANOVA results, it can be concluded that Model H1 has a significant influence on flight performance. The high F-statistic value and low p-value indicate that at least one independent variable in the model has a significant impact on the dependent variable. These findings provide further insight into the importance of the independent variables in predicting flight performance.

Table 3. Coefficients.

Model		Unstandardized	Standard Error	Standardized	t	p
H0	(Intercept)	4.452	0.078		56.984	< .001
H1	(Intercept)	1.209	0.697		1.734	0.088
	Sports	-0.016	0.058	-0.030	-0.280	0.781
	Activity Preparation	0.509	0.180	0.402	2.8210	0.006
	Rest Time	-0.160	0.134	-0.159	-1.195	0.236
	Activity Load	0.336	0.136	0.346	2.461	0.016
	Schedule	0.032	0.089	0.045	0.353	0.725

The Coefficients analysis is used to obtain information about the influence of independent variables in Model H0 and Model H1 on the dependent variable, which is flight performance. In Model H0, the intercept has an unstandardized coefficient value of 4.452, with a standard error of 0.078. This value indicates that when all independent variables are zero, the flight performance is approximately 4.452. This result is highly significant with a t-statistic of 56.984 and a p-value of $< .001$, indicating that the intercept has a strong influence on flight performance in Model H0.

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On the other hand, in Model H1, the intercept has an unstandardized coefficient value of 1.209, with a standard error of 0.697. In this case, the t-statistic is 1.734 with a p-value of 0.088, indicating that the intercept does not significantly affect flight performance in Model H1. Furthermore, there are several independent variables in Model H1. The Sports variable has an unstandardized coefficient of -0.016, a standard error of 0.058, and a standardized coefficient of -0.030. However, the t-statistic (-0.280) and p-value (0.781) indicate that this variable does not have a significant influence on flight performance.

The Preparatory Activities variable shows an unstandardized coefficient of 0.509, a standard error of 0.180, and a standardized coefficient of 0.402. With a t-statistic of 2.821 and a p-value of 0.006, this variable has a significant impact on flight performance in Model H1. The Rest Time variable has an unstandardized coefficient of -0.160, a standard error of 0.134, and a standardized coefficient of -0.159. However, the t-statistic (-1.195) and p-value (0.236) indicate that the influence of this variable is not significant on flight performance.

The Activity Load variable has an unstandardized coefficient of 0.336, a standard error of 0.136, and a standardized coefficient of 0.346. With a t-statistic of 2.461 and a p-value of 0.016, this variable has a significant impact on flight performance in Model H1. Finally, the Schedule variable has an unstandardized coefficient of 0.032, a standard error of 0.089, and a standardized coefficient of 0.045. However, the t-statistic (0.353) and p-value (0.725) indicate that this variable does not have a significant influence on flight performance. Based on these Coefficients results, it can be concluded that in Model H1, the Preparatory Activities and Activity Load variables have a significant influence on flight performance. On the other hand, the Sports, Rest Time, and Schedule variables do not have a significant influence in predicting flight performance.

Table 4. Model Summary Reaction Rate.

Model	R	R^2	Adjusted R^2	RMSE
H0	0.000	0.000	0.000	0.716
H1	0.573	0.328	0.278	0.609

In the reaction rate analysis, two models were evaluated, namely Model H0 and Model H1. In Model H0, the R-squared (R^2) value obtained is 0.000, indicating that the variability explained by the model is very low. Additionally, the Adjusted R-squared (Adjusted R^2) and Root Mean Square Error (RMSE) values are also close to zero, indicating significant mismatch between the model's predictions and the actual data.

However, in Model H1, a significant improvement in performance is observed. The R-squared (R^2) value reaches 0.328, indicating that approximately 32.8 percent of the variability can be explained by the model. The Adjusted R-squared (Adjusted R^2) value also increases to 0.278, indicating the model's ability to adjust for the number of variables used. Furthermore, the RMSE in this model decreases to 0.609, indicating a lower level of prediction error compared to Model H0.

Based on these results, it can be concluded that Model H1 exhibits better performance compared to Model H0 in predicting reaction rate. Although there is still room for improvement, this model is capable of explaining a portion of the observed variability and providing more accurate predictions.

Table 5. ANOVA.

Model		Sum of Squares	df	Mean Square	F	p
H1	Regression	12.130	5	2.426	6.546	< .001
	Residual	24.829	67	0.371		
	Total	36.959	72			

The intercept model is omitted, as no meaningful information can be shown.

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In the ANOVA table, it can be observed that the Sum of Squares for Model H1 is 12.130. With 5 degrees of freedom (df), the Mean Square for this model is 2.426. The resulting F-statistic is 6.546, with a very small p-value of < .001. Furthermore, in the Residual section, it can be seen that the Sum of Squares is 24.829, with 67 degrees of freedom. This yields a Mean Square of 0.371. The Total Sum of Squares is 36.959 with a total of 72 degrees of freedom.

Based on these ANOVA results, it can be concluded that Model H1 has a significant impact on the reaction rate. The high F-statistic value and low p-value indicate that at least one independent variable in the model has a significant influence on the dependent variable. These results provide further insight into the importance of independent variables in predicting the reaction rate.

Table 6. Coefficients.

Model		Unstandardized	Standard Error	Standardized	t	p
H0	(Intercept)	4.288	0.084		51.132	< .001
H1	(Intercept)	0.320	0.748		0.428	0.670
	Sports	0.024	0.062	0.041	0.381	0.705
	Activity Preparation	0.472	0.193	0.348	2.441	0.017
	Rest Time	0.114	0.114	0.106	0.795	0.430
	Activity Load	0.133	0.146	0.127	0.909	0.367
	Schedule	0.133	0.096	0.177	1.387	0.170

In Model H0, the intercept has an unstandardized coefficient of 4.288, with a standard error of 0.084. This value indicates that when all independent variables are zero, the reaction rate has a value of approximately 4.288. This result is highly significant, with a t-statistic of 51.132 and a p-value < .001, indicating that the intercept has a strong influence on the reaction rate in Model H0. On the other hand, in Model H1, the intercept has an unstandardized coefficient of 0.320, with a standard error of 0.748. In this case, the t-statistic value is 0.428 with a p-value of 0.670, indicating that the intercept does not significantly affect the reaction rate in Model H1.

Next, there are several independent variables in Model H1. The variable "Sports" has an unstandardized coefficient of 0.024, a standard error of 0.062, and a standardized coefficient of 0.041. However, the t-statistic value (0.381) and p-value (0.705) indicate that this variable does not have a significant influence on the reaction rate. The variable "Activity Preparation" shows an unstandardized coefficient of 0.472, a standard error of 0.193, and a standardized coefficient of 0.348. With a t-statistic of 2.441 and a p-value of 0.017, this variable has a significant impact on the reaction rate in Model H1.

The variable "Rest Time" has an unstandardized coefficient of 0.114, a standard error of 0.144, and a standardized coefficient of 0.106. However, the t-statistic (0.795) and p-value (0.430) indicate that this variable does not have a significant influence on the reaction rate. The variable "Activity Load" has an unstandardized coefficient of 0.133, a standard error of 0.146, and a standardized coefficient of 0.127. With a t-statistic of 0.909 and a p-value of 0.367, this variable does not have a significant impact on the reaction rate in Model H1.

Lastly, the variable "Schedule" has an unstandardized coefficient of 0.133, a standard error of 0.096, and a standardized coefficient of 0.177. However, the t-statistic value (1.387) and p-value (0.170) indicate that this variable does not have a significant influence on the reaction rate. Based on these Coefficients results, it can be concluded that in Model H1, the "Activity Preparation" variable has a significant impact on the reaction rate. On the other hand, the variables "Sports," "Rest Time," "Activity Load," and "Schedule" do not have a significant influence in predicting the reaction rate.

Table 7. Model Summary Task Execution Accuracy.

Model	R	R^2	Adjusted R^2	RMSE
H0	0.000	0.000	0.000	0.928
H1	0.540	0.291	0.238	0.810

Model H1. In Model H0, the R-squared (R^2) value obtained is 0.000, indicating that the model is unable to explain the variation that occurs in task performance accuracy. Additionally, the Adjusted R-squared (Adjusted R^2) and Root Mean Square Error (RMSE) values are also close to zero, indicating a significant mismatch between the model's predictions and the actual data.

However, in Model H1, a significant improvement in performance is observed. The R-squared (R^2) value reaches 0.291, indicating that approximately 29.1 percent of the variation in task performance accuracy can be explained by the model. The Adjusted R-squared (Adjusted R^2) value also increases to 0.238, demonstrating the model's ability to adjust for the number of variables used. Furthermore, the RMSE in this model decreases to 0.810, indicating a lower level of prediction error compared to Model H0.

Based on these results, it can be concluded that Model H1 shows better performance compared to Model H0 in predicting task performance accuracy. Although there is still room for improvement, this model is capable of explaining some of the variation that occurs and providing more accurate predictions.

Table 8. ANOVA.

Model		Sum of Squares	df	Mean Square	F	p
H1	Regression	18.067	5	3.613	5.507	< .001
	Residual	43.961	67	0.656		
	Total	62.027	72			

The intercept model is omitted, as no meaningful information can be shown.

The results indicate a significant difference between the independent variables in the model. In the ANOVA table, it can be observed that the Sum of Squares for Model H1 is 18.067. With 5 degrees of freedom (df), the Mean Square for this model is 3.613. The resulting F-statistic is 5.507, with a very small p-value, i.e., < .001.

Furthermore, in the Residual section, it can be seen that the Sum of Squares is 43.961, with 67 degrees of freedom. This yields a Mean Square of 0.656. The Total Sum of Squares is 62.027 with a total of 72 degrees of freedom. By examining these ANOVA results, it can be concluded that Model H1 has a significant influence on task performance accuracy. The high F-statistic value and low p-value indicate that at least one independent variable in the model has a significant impact on the dependent variable. These findings provide further understanding of the importance of independent variables in predicting task performance accuracy.

Table 9. Coefficients.

Model		Unstandardized	Standard Error	Standardized	t	p
H0	(Intercept)	4.164	0.109		38.334	< .001
H1	(Intercept)	0.168	0.995		0.169	0.866
	Sports	-0.003	0.083	-0.004	-0.033	0.974
	Activity Preparation	0.349	0.257	0.199	1.357	0.179
	Rest Time	0.560	0.191	0.401	2.932	0.005
	Activity Load	-0.244	0.195	-0.181	-1.255	0.214
	Schedule	0.196	0.127	0.202	1.535	0.129

The results of the Coefficients analysis demonstrate the influence of independent variables in Model H0 and Model H1 on task performance accuracy. In Model H0, the intercept (constant) has an unstandardized coefficient value of 4.164, with a standard error of 0.109. This indicates that when all independent variables are zero, the task performance accuracy is approximately 4.164. This finding is highly significant with a t-statistic of 38.334 and a p-value of < .001, indicating that the intercept has a strong impact on task performance accuracy in Model H0.

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However, in Model H1, the intercept has an unstandardized coefficient value of 0.168, with a standard error of 0.995. In this case, the t-statistic value is 0.169 with a p-value of 0.866, indicating that the intercept does not have a significant influence on task performance accuracy in Model H1. Furthermore, there are several independent variables in Model H1. The variable "Sports" has an unstandardized coefficient of -0.003, a standard error of 0.083, and a standardized coefficient of -0.004. However, the t-statistic value (-0.033) and the p-value (0.974) indicate that this variable does not have a significant impact on task performance accuracy.

The variable "Activity Preparation" has an unstandardized coefficient of 0.349, a standard error of 0.257, and a standardized coefficient of 0.199. With a t-statistic of 1.357 and a p-value of 0.179, this variable does not have a significant influence on task performance accuracy in Model H1. The variable "Rest Time" has an unstandardized coefficient of 0.560, a standard error of 0.191, and a standardized coefficient of 0.401. With a t-statistic of 2.932 and a p-value of 0.005, this variable has a significant impact on task performance accuracy in Model H1.

The variable "Activity Load" has an unstandardized coefficient of -0.244, a standard error of 0.195, and a standardized coefficient of -0.181. However, the t-statistic (-1.255) and the p-value (0.214) indicate that the influence of this variable is not significant on task performance accuracy. The variable "Schedule" has an unstandardized coefficient of 0.196, a standard error of 0.127, and a standardized coefficient of 0.202. However, the t-statistic value (1.535) and the p-value (0.129) indicate that this variable does not have a significant influence on task performance accuracy.

Based on these Coefficients results, it can be concluded that in Model H1, the variable "Rest Time" has a significant impact on task performance accuracy. On the other hand, the variables "Sports," "Activity Preparation," "Activity Load," and "Schedule" do not have a significant influence in predicting task performance accuracy.

Table 10. Model Summary Decision Making.

Model	R	R^2	Adjusted R^2	RMSE
H0	0.000	0.000	0.000	0.874
H1	0.432	0.186	0.126	0.817

In decision-making analysis, two models were evaluated, namely Model H0 and Model H1. In Model H0, the R-squared (R^2) and Adjusted R-squared (Adjusted R^2) values are 0.000, indicating that the model is unable to explain the variability in decision-making. Additionally, the Root Mean Square Error (RMSE) value is 0.874, indicating a high level of prediction error.

However, in Model H1, there is an improvement in model performance. The R-squared (R^2) value is 0.186, indicating that approximately 18.6 percent of the variability in decision-making can be explained by this model. The Adjusted R-squared (Adjusted R^2) value is 0.126, indicating the model's ability to adjust for the number of variables used. Furthermore, the RMSE in this model decreases to 0.817, indicating a lower level of prediction error compared to Model H0.

Table 11. ANOVA.

Model		Sum of Squares	df	Mean Square	F	p
H1	Regression	10.241	5	2.048	3.067	0.015
	Residual	44.746	67	0.668		
	Total	54.986	72			

The intercept model is omitted, as no meaningful information can be shown.

ANOVA analysis was used to evaluate the impact of Model H1 on decision-making. The results indicate a significant difference between the independent variables in this model. In the ANOVA table, it can be observed that the Sum of Squares for Model H1 is 10.241. With 5 degrees of freedom (df), the Mean Square for this model is 2.048. The resulting F-statistic value is 3.067, with a p-value of 0.015.

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In the Residual section, it can be seen that the Sum of Squares is 44.746, with 67 degrees of freedom. This yields a Mean Square of 0.668. The Total Sum of Squares is 54.986 with a total of 72 degrees of freedom. Based on these ANOVA results, it can be concluded that Model H1 has a significant impact on decision-making. The relatively high F-statistic value and low p-value indicate that at least one independent variable in the model has a significant influence on the dependent variable in the context of decision-making. These results provide further understanding of the importance of independent variables in predicting decision-making.

Table 12. Coefficients.

Model		Unstandardized	Standard Error	Standardized	t	p
H0	(Intercept)	4.014	0.109		39.241	< .001
H1	(Intercept)	0.711	1.004		0.709	0.481
	Sports	-0.050	0.084	-0.071	-0.596	0.553
	Activity Preparation	0.507	0.260	0.306	1.954	0.055
	Rest Time	0.037	0.193	0.028	0.190	0.850
	Activity Load	0.095	0.196	0.075	0.483	0.631
	Schedule	0.103	0.128	0.113	0.804	0.424

For Model H1, the intercept has an unstandardized coefficient value of 0.711, with a standard error of 1.004. Its standardized coefficient value is 0.709. The t-test results show that the t-statistic value is 0.709, with a p-value of 0.481. This indicates that the intercept does not have a significant influence on decision-making. Next, the variable "Olahraga" has an unstandardized coefficient of -0.050, with a standard error of 0.084. Its standardized coefficient value is -0.071. The t-test results show that the t-statistic value is -0.596, with a p-value of 0.553. This indicates that the "Olahraga" variable does not have a significant influence on decision-making.

The variable "Persiapan Kegiatan" has an unstandardized coefficient of 0.507, with a standard error of 0.260. Its standardized coefficient value is 0.306. The t-test results show that the t-statistic value is 1.954, with a p-value of 0.055. This suggests an indication that the "Persiapan Kegiatan" variable has a significant influence on decision-making, although the p-value is still relatively high to claim strong statistical significance. The variable "Waktu Istirahat" has an unstandardized coefficient of 0.037, with a standard error of 0.193. Its standardized coefficient value is 0.028. The t-test results show that the t-statistic value is 0.190, with a p-value of 0.850. This indicates that the "Waktu Istirahat" variable does not have a significant influence on decision-making.

The variable "Beban Aktifitas" has an unstandardized coefficient of 0.095, with a standard error of 0.196. Its standardized coefficient value is 0.075. The t-test results show that the t-statistic value is 0.483, with a p-value of 0.631. This indicates that the "Beban Aktifitas" variable does not have a significant influence on decision-making. Lastly, the variable "Jadwal" has an unstandardized coefficient of 0.103, with a standard error of 0.128. Its standardized coefficient value is 0.113. The t-test results show that the t-statistic value is 0.804, with a p-value of 0.424. This indicates that the "Jadwal" variable does not have a significant influence on decision-making.

Based on these results, it can be concluded that in Model H1, only the "Persiapan Kegiatan" variable has a potential influence on decision-making. However, it is important to note that the statistical significance of this variable needs further examination, considering sample size and relevant statistical assumptions.

Table 13. Model Summary – Communication Skills .

Model	R	R^2	Adjusted R^2	RMSE
H0	0.000	0.000	0.000	0.935
H1	0.405	0.164	0.101	0.887

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The results indicate that Model H1 is able to explain a small portion of the variability in communication skills. In the Model Summary, it can be seen that the R-squared (R^2) value for Model H1 is 0.164. This means that approximately 16.4 percent of the variability in communication skills can be explained by the independent variables included in this model. The value of R (correlation coefficient) is 0.405, indicating a positive relationship between the independent variables and communication skills.

The Adjusted R-squared (Adjusted R^2) is 0.101. This is the adjusted version of R-squared that takes into account the number of independent variables and sample size. This value indicates that Model H1 has a relatively low goodness of fit in explaining communication skills. The Root Mean Square Error (RMSE) is 0.887. It measures the average error between the values predicted by Model H1 and the actual values of communication skills. The lower the RMSE value, the more accurate the model is in predicting the dependent variable.

Based on this Model Summary, it can be concluded that Model H1 has limited ability to explain the variability in communication skills. The relatively low R^2 value and lower Adjusted R^2 value indicate that there are other factors that also influence communication skills and have not been included in this model. Additionally, the relatively high RMSE value indicates significant prediction errors. Therefore, further research and the addition of other variables or factors are needed to improve the quality and fit of Model H1 in explaining communication skills.

Table 14. ANOVA.

Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**p**
H1	Regression	10.320	5	2.064	2.626	0.032
	Residual	52.667	67	0.786		
	Total	62.986	72			

The intercept model is omitted, as no meaningful information can be shown.

Analysis of Variance (ANOVA) is used to test the significance of the contribution of independent variables to the variability in communication skills. The results indicate that Model H1 has a significant effect in explaining the variation. In the ANOVA results, it can be observed that the Sum of Squares for Regression in Model H1 is 10.320. This represents the amount of variation explained by the independent variables in this model. The Degree of Freedom for Regression is 5, indicating the number of independent variables included in the model.

The Mean Square for Regression is 2.064. The Mean Square is calculated by dividing the Sum of Squares by the Degree of Freedom and reflects the variation explained by each individual independent variable. The F-value is 2.626. The F-value is used to test the statistical significance of the independent variables in the model. The higher the F-value, the more significant the contribution of the independent variables to the variation in communication skills.

The p-value is 0.032, indicating a level of statistical significance lower than the typically used alpha level (e.g., 0.05). This indicates that Model H1 can significantly explain the variation in communication skills. Based on these ANOVA results, it can be concluded that Model H1 has a significant effect in explaining the variability in communication skills. The contribution of the independent variables to the variation has been statistically proven significant, as indicated by the lower p-value compared to the established alpha level. Therefore, it can be concluded that the independent variables in Model H1 have a significant influence on communication skills.

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Table 15. Coefficients.

Model		Unstandardized	Standard Error	Standardized	t	p
H0	(Intercept)	4.014	0.109		36.665	< .001
H1	(Intercept)	0.869	1.089		0.798	0.428
	Sports	-0.052	0.091	-0.069	-0.567	0.573
	Activity Preparation	0.511	0.282	0.288	1.815	0.074
	Rest Time	-0.101	0.209	-0.072	-0.484	0.630
	Activity Load	0.206	0.213	0.151	0.966	0.337
	Schedule	0.099	0.139	0.101	0.707	0.482

Based on these coefficient results, there are no independent variables that significantly influence communication skills in Model H1. All independent variables do not have a significant impact on communication skills, as indicated by the p-values that are greater than the set level of significance (e.g., 0.05).

4. Discussion

Based on the analysis results, it can be concluded that the level of fatigue experienced by flight cadets at the Vocational Education Institution has an influence on their performance. The variables of Activity Preparation and Workload have a significant positive impact on the performance of flight cadets, indicating that higher levels of activity preparation and workload tend to result in better performance. These findings are consistent with the theory that adequate preparation and appropriate workload management can help enhance an individual's performance in complex and demanding tasks, such as in the context of aviation [17].

These research findings have important implications for fatigue management and performance improvement for flight cadets at the Vocational Education Institution [18]. Trainers and managers can pay more attention to the levels of activity preparation and workload experienced by flight cadets. By implementing appropriate strategies to ensure adequate preparation and optimal workload management, it is expected to enhance the performance of flight cadets in facing complex and demanding flight tasks.

However, it should be noted that the variables of Sports, Rest Time, and Schedule do not have a significant influence on the performance of flight cadets. This suggests that other factors may play a more dominant role in influencing the performance of flight cadets, which need to be further investigated to gain a more comprehensive understanding.

This study has several limitations. First, it was conducted in a specific Vocational Education Institution, so the generalization of the research findings is limited to that context. Obtaining a larger and more representative sample from various vocational education institutions could provide more generalizable results. Additionally, other factors such as psychological factors, physical conditions, and environmental factors can also influence the performance of flight cadets. Therefore, further research may involve these factors to gain a more comprehensive understanding of the impact of fatigue on the performance of flight cadets in vocational education institutions [19].

5. Conclusions

This study aimed to investigate the influence of fatigue levels on the performance of flight cadets at a Vocational Education Institution. The analysis included examining the Model Summary, ANOVA, and Coefficients. Based on the Model Summary analysis, it was found that Model H1 could account for approximately 32.8 percent of the variation in flight cadets' performance. These results indicate a significant influence of the independent variables on the performance of flight cadets.

Furthermore, the ANOVA analysis revealed that Model H1 had statistical significance in explaining the variation in flight cadets' performance. The significant F-statistic value indicates a significant impact of the independent variables on the performance of flight cadets. The Coefficients analysis indicated that the variables of Activity Preparation and Workload had a significant positive influence on flight cadets' performance. These findings provide evidence that adequate activity preparation and optimal workload management can enhance the performance of flight cadets [20].

However, the variables of Sports, Rest Time, and Schedule did not have a significant impact on flight cadets' performance. This suggests that other factors may play a more dominant role in influencing the performance of flight cadets. In conclusion, fatigue levels do affect the performance of flight cadets at a Vocational Education Institution. The level of activity preparation and optimal workload management have a significant positive influence on flight cadets' performance. Therefore, it is important for educational institutions and trainers to consider these factors to enhance the performance of flight cadets. However, further research is needed to involve other factors such as psychological factors, physical conditions, and environmental factors to gain a more comprehensive understanding of the impact of fatigue on the performance of flight cadets in vocational education institutions.

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