

FACTORS ASSOCIATED WITH STUDENTS' PERCEPTIONS OF CAMPUS SAFETY AND SECURITY AT UiTM KOTA BHARU

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Abstract: *Campus safety affects students' well-being, participation, and confidence in higher education. This study examined gender differences and factors associated with students' perceptions of campus safety and security at Universiti Teknologi MARA (UiTM) Kota Bharu. A cross-sectional study was conducted among 309 undergraduate students selected proportionately by gender from a population of 1,037 students. Data were collected through a bilingual self-administered questionnaire using 10-point Likert scales. Internal consistency was assessed with Cronbach's alpha, gender differences with an independent samples t-test, bivariate relationship with Pearson correlation, and associated factors with stepwise multiple linear regression. Female students reported a slightly higher in mean safety and security perception than male students, but the difference was not statistically significant ($t = -0.799$, $p = .425$). Perception safety and security correlated positively with students' sense of community ($r = .663$), campus environment ($r = .813$), campus lighting ($r = .765$), attitudes and behaviours of campus security ($r = .736$), and campus crime concern ($r = .159$). The final model retained campus environment and campus lighting, explaining 71.1% of the variance in perception safety and security (adjusted $R^2 = .709$), $F(2,306) = 376.603$, $p < .001$. The findings support environmental maintenance and adequate lighting as practical priorities for campus safety and security.*

Keywords: *campus environment; campus lighting; campus safety; multiple linear regression; security; university students*

Introduction

Universities are expected to provide learning environments in which students can participate in academic and social activities without unreasonable fear of harm. Campus safety includes protection against crime and accidents, but it also involves students' psychological assurance that facilities, access controls, communication systems, and security services are dependable. Poorly maintained spaces, weak surveillance, limited communication, and negative interactions with security personnel may reduce confidence even when recorded crime is low (Ekpoh et al., 2020; Savolainen, 2023).

Perception safety may shape movement across campus, participation after normal teaching hours, willingness to report incidents, and trust in university management. Students evaluate safety through visible environmental cues, lighting, community attachment, perception vulnerability, and security personnel's conduct (Azevedo et al., 2022; Braaten et al., 2022). Although safety perceptions may differ by gender, findings are not uniform across institutions. Evidence specific to UiTM Kota Bharu is therefore needed to guide locally appropriate action.

This study provides clear evidence on campus safety and security by examining demographic backgrounds, social factors, environmental, lighting, security personnel and crime concern in one statistical framework.

Problem Context and Study Objectives

Most studies on campus safety and security focus on institutions outside Malaysia, although campus configuration, student composition, transport patterns, and security practices vary across settings. Research from African and European universities indicates concern about theft, harassment, assault, poorly monitored spaces, and safety after dark despite formal security arrangements (Azevedo et al., 2022; Lekganyane et al., 2023; Owusu et al., 2016). Directly transferring those findings to UiTM Kota Bharu could overlook its Malaysian campus context and institutional arrangements. Instead of assuming safety and security rules automatically make students feel safe, this study focused on perceptions of students own safety in campus.

The objectives were to: (a) test whether mean perception campus safety and security differ between male and female students; (b) examine relationship between perception of campus safety and security with sense of community, campus environment, campus lighting, attitudes and behaviours of campus security, and campus crime; lastly (c) identify significant factors affect perception safety and security.

Literature Review

Perceptions of safety and security are multidimensional evaluations of risk, protection, comfort, and institutional responsiveness. Empirical research underscores that subjective safety evaluations do not directly mirror crime statistics, students frequently report feeling unsafe in low crime environments if spaces appear neglected or assistance feels inaccessible. In assessing perception insecurity, Azevedo et al. (2022) demonstrate that individual safety judgments are tied to crime related concerns and personal demographic characteristics while, Braaten et al. (2022) showed that vulnerability and signs of disorder shape campus safety judgements.

Female students frequently reported greater concern about sexual victimisation and lower safety in isolated areas, such as parking lots or when navigating campus after dark, whereas male students are more concern about physical assault or property crime (Lane et al., 2009; Lekganyane et al., 2023). Beyond individual demographics, social connectedness and

institutional trust act as vital protective factors against fear of crime. A strong sense of community enhances safety evaluations by fostering belonging, shared responsibility, mutual trust, and informal guardianship among students.

Institutional trust is further reinforced through the presence of security personnel. Effective security depends on personnel who are visible, approachable, adequately trained and responsive. Conversely, inadequate communication, insufficient security resources or unapproachable staff can weaken students' confidence even in environments with active safety patrols (Ekpoh et al., 2020; Owusu et al., 2016). Grounded in Crime Prevention Through Environmental Design (CPTED), institutional safety relies heavily on physical maintenance, territorial reinforcement, clear access control and natural surveillance (Shariati & Guerette, 2019). Among environmental attributes, artificial illumination serves as a primary determinant of nighttime safety. Adequate campus lighting enhances pedestrian visibility, navigational ease and natural surveillance along walkways, entrances and parking facilities (Prihatiningrum et al., 2021; Zeng et al., 2025).

Methodology

Research Design, Population, and Sample

A quantitative, cross-sectional study was conducted during the October 2025–February 2026 academic semester. The target population comprised 1,037 active, full-time undergraduate students enrolled at UiTM Kota Bharu. Distance learning students, part-time students, students undergoing industrial training, and non-UiTM Kota Bharu students were excluded. To establish a clear sampling frame, a comprehensive list of all eligible students was obtained.

The student population was then divided into two distinct strata based on gender (male and female). This stratification is supported by Azevedo et al. (2022), who found that females tend to perceive higher levels of insecurity and report a greater variety of feared crimes than males. Interestingly, women express concern not only about crimes typically linked to female victimization, such as sexual assault and domestic violence, but also about offenses more commonly associated with male victims, including robbery and physical attacks. Stratifying by gender allows for a direct comparison of safety perceptions, highlighting differing concerns and vulnerabilities to ultimately contribute to more inclusive and effective safety strategies.

Based on the population size of $N = 1,037$, the minimum statistical sample size required at a 95% confidence level and a 5% margin of error was calculated at $n = 281$. To account for potential non-response bias and incomplete submissions, a 10% oversampling allowance was applied, establishing a final target sample size of $n = 309$. Proportionate stratified sampling was then utilized to match the population's gender distribution ($N_{\text{male}} = 304$, 29.3%; $N_{\text{female}} = 733$, 70.7%), allocating 91 places to male students and 218 places to female students. Simple random sampling was subsequently applied within each stratum to distribute the self-administered online questionnaire, resulting in 309 fully completed and valid records for analysis.

Research Instrument

The bilingual English–Malay questionnaire consist of three demographic background questions and 32 construct items: perception campus safety and security, students' sense of community, campus environment, campus lighting, attitudes and behaviours of campus security, and campus crime. As outlined in Table 1, responses ranged from 1 (strongly disagree) to 10 (strongly agree), and item scores were averaged within constructs. Construct items were

adapted from several sources as presented in Table 1 and go through a content review for proper translation. A pilot study of 30 students assessed clarity and internal consistency.

Table 1: Research Instrument

Construct	No. of Items	Source
Perception Campus Safety and Security	5	Morrison and Mensah (2021)
Students' Sense of Community	5	Ekpoh et al., (2020)
Campus Environment	6	Ramrakhiani et al., (2021)
Campus Lighting	5	Morrison and Mensah (2021)
Attitudes and Behaviours of Campus Security	5	Ekpoh et al., (2020)
Campus Crime	6	Morrison and Mensah (2021)

For this study, the primary data source was first-hand information. This indicated that the data had been created or generated by the researcher using questionnaire. The questionnaire was sent out through online platforms such as E-mail, WhatsApp, and Telegram. Online questionnaires had made the process of distribution easier. It provided benefits to both parties, which were the researchers and the respondents. The researchers were able to collect the data quickly without incurring additional costs, and the respondents were able to answer the questionnaire at their convenience.

Statistical Analysis

The instrument internal consistency was verified using Cronbach's alpha (α). All statistical analyses were executed using SPSS (Version 28.0) with the alpha level set at $\alpha = .05$ for two-tailed tests of significance. Data preparation began with screening for completeness, distributional normality and influential outliers. Since all $n = 309$ records were fully completed, a complete-case analytical framework was adopted (Kang, 2013). To evaluate univariate normality, skewness and kurtosis indices were inspected alongside boxplots and residual diagnostics; given the sample size ($n > 300$), absolute skewness values < 2.0 and absolute kurtosis values < 7.0 were established as criteria for acceptable normality (Kim, 2013).

An independent samples t test was conducted to test for mean differences in perception campus safety and security between male and female students. Pearson correlation coefficients (r) quantified the linear relationships between perception safety and security and the identified factors (students' sense of community, campus environment, campus lighting, attitudes and behaviours of campus security and campus crime). Lastly, stepwise multiple linear regression was applied to identify factors for statistical prediction of perception campus safety and security. Variable selection was governed by probability of F to-enter criteria ($\leq .05$ for inclusion, $\geq .10$ for removal). Regression assumptions were validated by inspecting variance inflation factor (VIF) values and tolerance for multicollinearity, together with standardized residual scatterplots for linearity, homocedasticity and normality. Regression coefficients are interpreted as adjusted associations rather than direct causal effects.

Ethical Considerations

This study was conducted in strict accordance with institutional ethical standards for human subject research. Prior to data collection, the study protocol, sampling procedure and measurement instruments received formal ethical clearance and approval from the UiTM Research Ethics Committee (REC) (BERC/MR/UG/2025/144).

Results

Demographic Profile

The total respondents for this study were 309 students. Table 2 clearly presented that the sample was predominantly by female students (70.6%) with most respondents were aged 21 to 23 years (79.6%), and Semester 3 and Semester 4 students was the largest group (44.3%).

Table 2: Demographic Profile of Respondents

Variable	Category	Frequency (<i>n</i> = 309)	Percentage (%)
Age	18 – 20 years	54	17.5
	21 – 23 years	246	79.6
	24 years and above	9	2.9
Gender	Male	91	29.4
	Female	218	70.6
Semester	Semester 1 – 2	59	19.1
	Semester 3 – 4	137	44.3
	Semester 5 – 6	113	36.6

Reliability and Normality Diagnostics

Scale reliability and distributional normality were evaluated prior to main hypothesis testing. The result presented in Table 3.

Table 3: Reliability and Normality Diagnostics

Construct	Pilot Study (α)	Actual Study (α)	Skewness	Kurtosis
Perception campus safety and security	.858	.906	-0.637	0.398
Students' sense of community	.800	.811	-0.34	-0.413
Campus environment	.888	.918	-0.758	0.877
Campus lighting	.858	.840	-0.713	0.645
Attitudes and Behaviours of Campus Security	.908	.936	-0.835	0.936
Campus Crime	.936	.934	-0.670	0.173

Internal consistency was assessed using Cronbach's alpha (α) for both the pilot and actual study. Across all constructs, Cronbach's alpha values ranged from .800 to .936, exceeding the established threshold of .70 for robust internal consistency (Hair et al., 2019). Univariate normality was inspected using skewness and kurtosis values. For medium to large samples, absolute skewness values < 2.0 and absolute kurtosis values < 7.0 indicate acceptable distributional normality (Kim, 2013). Based on Table 3, skewness values ranged from -0.835 to -0.340 demonstrating mild negative skewness. Kurtosis values ranged from -0.413 to 0.936 indicating a relatively normal without extreme dispersion. Because all values fell well within the established threshold parameters, the distributional properties satisfied the assumptions required for inferential testing.

Gender Difference

An independent samples t-test was employed to examine whether a statistically significant difference existed in perception campus safety and security between male and female student at UiTM Kota Bharu. On average, female students reported a slightly higher mean safety and

security perception ($M = 7.89$, $SD = 1.51$) than male students ($M = 7.74$, $SD = 1.51$). Levene's test for equality of variances was non-significant, $F(1,307) = 0.165$, $p = 0.685$, indicating that the assumption of homogeneity of variance was satisfied; thus, equal variances were assumed. Table 4 shows the mean difference of -0.150 was not statistically significant with $t(307) = -0.799$, $p = 0.425$. Additionally, Cohen's d was calculated to assess the magnitude of this difference, yielding an effect size of $d = 0.10$. This indicates a negligible effect size, consequently suggesting that there is no meaningful or statistically significant difference in the perception of campus safety and security between male and female students.

Table 4: Independent Samples t-test for Perception Campus Safety and Security by Gender

Gender	N	M	SD	Levene's $F(p)$	t	df
Male	91	7.74	1.51	0.165 (.685)	-0.799	307
Female	218	7.89	1.51			

Correlation Analysis

Pearson correlation analysis was conducted to evaluate the linear relationships between students' perception campus safety and security with five other variables (Table 5). All relationships were statistically significant ($p < .01$).

Table 5: Pearson Correlation and Strength Association for Perception Campus Safety and Security

Variable	r	p	Magnitude
Students' sense of community	.663	< .001	Moderate
Campus environment	.813	< .001	Strong
Campus lighting	.765	< .001	Strong
Attitudes and Behaviours of Campus Security	.736	< .001	Strong
Campus Crime	.159	.005	Weak

Based on Table 5, campus environment exhibited the strongest positive correlation with perception safety and security ($r = .813$, $p < .001$), closely followed by campus lighting ($r = .765$, $p < .001$) and attitudes and behaviours campus security ($r = .736$, $p < .001$). Students' sense of community demonstrated a moderate positive association ($r = .663$, $p < .001$), whereas campus crime displayed a weak statistically significant positive correlation ($r = .159$, $p = .005$).

Multiple Linear Regression

Stepwise multiple regression was employed as an exploratory approach to identify the most parsimonious set of predictors from the multiple variables assessed. As detailed in Table 6, two statistically significant models emerged from the stepwise selection process. Model 1, retaining only campus environment, was statistically significant, $F(1,307) = 599.47$, $p < 0.001$. Model 2, which added campus lighting, was also significant with $F(2,306) = 376.60$, $p < 0.001$. The remaining variables—students' sense of community, attitudes and behaviors of campus security, and campus crime—were excluded from the final model as they did not account for a statistically significant increment in variance beyond the retained environmental predictors.

Table 6: Significance of the Regression Models

Model	Variables	<i>F</i>	<i>p</i>
1	Campus Environment	599.465	< .001
2	Campus Environment Campus Lighting	376.603	< .001

Model goodness of fit statistics for both models are presented in Table 7. In Model 1, campus environment accounted for 66.1% of the variance in student safety and security perceptions ($R = .813$, $R^2 = .661$, adjusted $R^2 = .660$). The inclusion of campus lighting in Model 2 significantly enhanced model fit ($R = .843$, $R^2 = .711$, adjusted $R^2 = .709$). The addition of campus lighting produced a 5.0% increase in total variance explained. Thus, final model for this study is Model 2 with two environmental predictors.

Table 7: Model Summary and Goodness of Fit Statistics

Model	R	R Square	Adjusted R Square
1	0.813	0.661	0.660
2	0.843	0.711	0.709

The regression coefficients for both models are presented in Table 8. In the final estimated model (Model 2), both campus environment ($\beta = .550$, $t = 11.57$, $p < .001$) and campus lighting ($\beta = .345$, $t = 7.26$, $p < .001$) maintained positive, statistically significant contributions. By comparing standardized coefficient (β) indicates that campus environment exerted a stronger relative predictive influence on perception safety and security than campus lighting.

The final estimated regression equation is expressed as:

Perception Campus Safety and Security = 0.960 + 0.560 (Campus Environment) + 0.319 (Campus Lighting)

Table 8: Regression Coefficients Predicting Perception Campus Safety and Security

Model		Unstandardized Coefficients	Standardized Coefficients	<i>t</i>	<i>p</i>
		β	β		
1	(Constant)	1.220		4.433	< .001
	Campus Environment	0.828	0.813	24.484	< .001
2	(Constant)	0.960		3.732	< .001
	Campus Environment	0.560	0.550	11.565	< .001
	Campus Lighting	0.319	0.345	7.262	< .001

Model Adequacy Checking

Multiple linear regression assumes a linear relationship between each predictor variable and the dependent variable. The easiest way to determine if this assumption is met is to create a scatter plot of each predictor variable and the dependent variable.

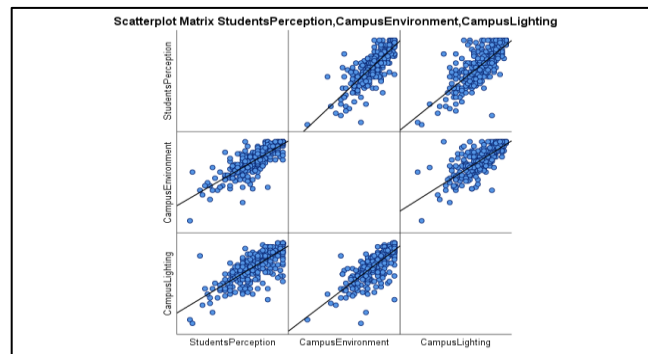


Figure 1: Scatterplot matrix

Figure 1 showed the clear positive linear relationships between Students' Perception of Campus Safety and Security, and both retained independent variables (Campus Environment and Campus Lighting), with data points distributed closely around an upward-sloping straight line and no evidence of curvilinear patterns. This indicates that the relationship between the dependent variable and both predictors is approximately linear. Therefore, the assumption of linearity for multiple linear regression is satisfied.

Multicollinearity occurs when independent variables are highly inter-correlated, inflating standard errors and yielding unstable regression estimates. Diagnostic indicators were evaluated using Tolerance and the Variance Inflation Factor (VIF). As presented in Table 9, both retained predictors (Campus Environment and Campus Lighting) yielded Tolerance values of .418 and VIF values of 2.394. Since the VIF value well below the conservative threshold of 10.0, and Tolerance value exceeded 0.20 (Hair et al., 2019), excessive multicollinearity was ruled out.

Table 9: Collinearity Diagnostics for Final Regression Model

Predictor Variable	Tolerance	VIF
Campus Environment	0.418	2.394
Campus Lighting	0.418	2.394

The assumption of homocedasticity requires that the variance of regression residuals remains uniform across all levels of the predicted values. A scatter plot of standardized residuals against standardized predicted values was generated to assess error distribution. Figure 2 shows the absence of a systematic pattern, confirmed that the assumption of homocedasticity was fulfilled.

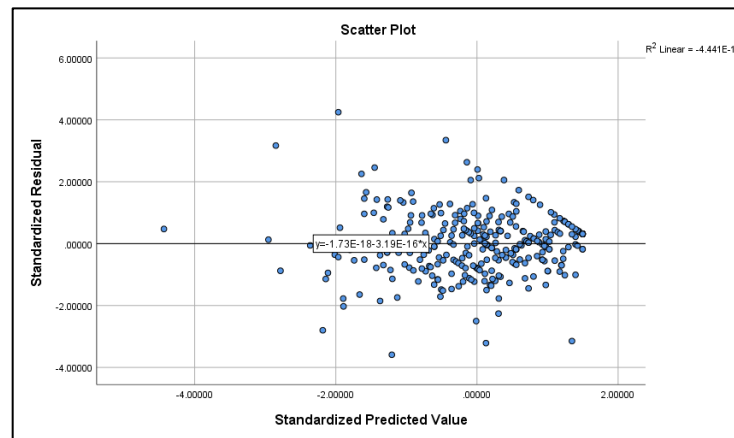


Figure 2: Standardized Residuals Scatter Plot

Discussion

The absence of a statistically significant gender difference contrasts with a substantial body of literature reporting that female students typically experience higher levels of fear and lower perception safety than their male peers (Lane et al., 2009; Lekganyane et al., 2023). Within the specific context of UiTM Kota Bharu, male and female students navigate identical physical facilities, lighting arrangements and institutional security protocols which may account for the comparable overall safety evaluations. The finding does not imply identical fears or experiences; it only indicates that the overall mean scores did not differ meaningfully.

The physical campus environment emerged as the strongest correlation and the primary predictor in the regression model, accounting for 66.1% of the variance in safety and security perceptions. This finding supports Crime Prevention Through Environmental Design (CPTED) principles which posit that physical order, clean facilities, clear lines of sight, and visible institutional upkeep serve as tangible cues of institutional control and safety (Shariati & Guerette, 2019). This aligns closely with empirical work by Morrison and Mensah (2021), who demonstrated that overall physical and social conditions serve as the cornerstone of campus security assessments. Because some environment items referred explicitly to effective safety measures and a sense of safety, part of the strong relationship may reflect conceptual overlap with the outcome.

Campus lighting provided significant, unique explanatory power beyond the general physical environment, establishing the final two predictors model that explained 71.1% of the total variance in perception safety and security. Students may interpret well-lit paths, entrances, lecture areas, and car parks as cues of visibility and institutional care. Lighting also supports pedestrian navigation and natural surveillance after dark (Prihatiningrum et al., 2021; Zeng et al., 2025). Conversely, while students' sense of community and attitudes and behaviours of campus security demonstrated strong positive correlation with perception safety and security, neither was retained in the final regression model.

Practical Implications

The empirical findings provide actionable insights for campus administrative leadership, facilities management and security department at UiTM Kota Bharu. University management

should conduct systematic environmental safety audits across high traffic and isolated zones, including pedestrian pathways, parking facilities, building entrances, stairwells, and lecture halls. These audits must evaluate the fixture functionality. Routine night inspections are essential, as daytime evaluations fail to capture shadowing or nonfunctional lighting.

Environmental maintenance should be paired with user-friendly reporting platforms such as mobile reporting applications to ensure rapid repairs of lighting and infrastructure failures. Although security attitudes not significantly contribute, security staff remain vital to institutional trust. Officers should maintain high visibility during peak and late-night hours and receive continuous training in crisis response, proactive communication, respectful student engagement, and trauma informed support for sexual misconduct reporting.

Limitations and Future Research

While this study offers valuable empirical evidence, several limitations must be considered when interpreting the results. Firstly, data were collected from a single branch campus during a single academic semester, limiting direct generalizability to other UiTM campuses or Malaysian higher education institutions. Because all constructs were evaluated using a single self-administered questionnaire, common method variance and response style bias may inflate inter construct correlations (Podsakoff et al., 2003). Future studies should incorporate multi sources of data collection, objective lighting metrics such as lux-meter measurements, institutional incident records, geospatial safety mapping (GIS), and qualitative inquiry.

Conclusion

Undergraduate male and female students at UiTM Kota Bharu reported comparable overall perceptions of campus safety and security. Multiple regression model identified physical campus environment and campus lighting as the primary predictors of perception safety and security, jointly accounting for 71.1% of the total variance. These outcomes demonstrate that proactive infrastructure maintenance, natural surveillance, and effective night-time illumination serve as fundamental pillars of student safety and security. Given the data driven nature of stepwise regression and potential measurement overlaps, these findings should be treated as exploratory. Continued psychometric scale refinement and multi campus replication will provide a robust and evidence-based foundation for higher education security policy in Malaysia.

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