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ASSESSING THE IMPACT OF OUTDOOR RECREATIONAL ACTIVITIES ON THE DEVELOPMENT OF MENTAL RESILIENCE AMONG UNIVERSITY STUDENTS: AN EMPIRICAL CASE STUDY OF UITM PUNCAK ALAM, MALAYSIA

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ABSTRACT

Resilience is a key determinant of well-being, particularly in helping students cope with academic and personal pressures. This study examined the influence of outdoor recreational activities on the development of mental resilience among university students at Universiti Teknologi MARA (UiTM) Puncak Alam, Malaysia. A quantitative cross-sectional design was employed, with 377 students participating. Two validated instruments were used: the Connor-Davidson Resilience Scale (CD-RISC-10) and the Outdoor Recreation Self-Efficacy (ORSE) Scale. Descriptive analysis showed that the most common activities were hiking (52.5%), kayaking (37.4%), and abseiling (28.9%). Pearson correlation indicated a moderate positive relationship between participation in outdoor recreation and mental resilience ($r = .46$, $p < .001$). Multiple regression analysis further demonstrated that participation in outdoor recreation was a significant predictor of resilience ($\beta = .42$, $p < .001$), accounting for 21.3% of the variance in resilience scores. These findings suggest that engaging in outdoor activities contributes meaningfully to students' psychological strength and coping abilities. Universities are encouraged to integrate outdoor recreation into student development programs to enhance mental health and resilience. Future longitudinal research is recommended to examine the long-term effects of such interventions.

Keywords: Outdoor recreation, mental resilience, student well-being, stress management, higher education

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1.0 INTRODUCTION

Mental resilience, as a psychological characteristic, enables individuals to respond constructively to stress, adversity, and life challenges. Among university students, resilience plays a critical role in managing academic pressures, personal challenges, and transitional experiences associated with higher education. In Malaysia, students in higher education often face compounded stress from demanding academic workloads, social expectations, and the transition to independent adulthood. Consequently, resilience has become an essential determinant of students' psychological well-being.

Outdoor recreational activities such as hiking, kayaking, and abseiling. This have been recognized in international research as effective strategies for promoting mental health and psychological strength. These activities provide opportunities for physical challenge, engagement with nature, social interaction, and the development of self-efficacy, all of which are linked to resilience-building. Although Malaysian universities frequently promote outdoor activities through co-curricular programs, there is limited empirical evidence on how these experiences contribute specifically to the development of resilience in the local higher education context.

This study seeks to address this gap by examining the relationship between participation in outdoor recreational activities and mental resilience among students at Universiti Teknologi MARA (UiTM) Puncak Alam, Malaysia. The findings are expected to inform the integration of outdoor recreation into student wellness initiatives, thereby supporting holistic approaches to psychological health and resilience-building in Malaysian higher education.

2.0 LITERATURE REVIEW

The literature highlights that outdoor recreational activities play a significant role in enhancing students' psychological well-being and resilience. Activities such as hiking, kayaking, and abseiling provide opportunities for students to engage with nature, regulate emotions, and relieve academic stress. Previous studies demonstrate that exposure to outdoor environments can reduce anxiety, elevate mood, and foster overall mental health (Hartig et al., 2014; Clark & Anderson, 2011). For university students, who often experience high levels of academic and personal pressures, outdoor recreation offers both immediate stress relief and long-term benefits by cultivating positive coping strategies and emotional stability.

At the same time, research acknowledges that various barriers may prevent students from fully engaging in outdoor activities. Time constraints, family obligations, part-time employment, and limited access to recreational facilities are common challenges reported in the literature (Scott & Kim, 1998; Singh & Kumar, 2022; Eubank, 2023). These obstacles reduce opportunities for self-care and resilience-building, particularly for students managing multiple responsibilities. Addressing such barriers by offering flexible scheduling, improving facility access, and tailoring programs to student needs is crucial for ensuring broader participation in outdoor recreation and maximizing its benefits for resilience and mental health.

Theoretical perspectives further explain how outdoor recreation contributes to resilience development. The Outdoor Recreation Self-Efficacy (ORSE) framework emphasizes how participation in challenging physical activities builds confidence and coping ability (Mittelstaedt & Jones, 2009). Resilience, measured through instruments such as the Connor-Davidson Resilience Scale (CD-RISC-10) and the Mental Health Continuum-Short Form (MHC-SF), reflects the ability to adapt and thrive under stress (Connor & Davidson, 2003; Keyes, 2002). By combining physical challenge, exposure to natural environments, and social interaction, outdoor activities foster emotional regulation and self-efficacy, which are key pathways to resilience. These insights provide the foundation for examining how UiTM Puncak Alam students can benefit from outdoor recreation as part of holistic strategies for mental well-being.

3.0 METHODOLOGY

Research Design

This study employed a quantitative cross-sectional survey design to examine the association between outdoor recreational activities and mental resilience among university students at Universiti Teknologi MARA (UiTM) Puncak Alam. This design was selected for its cost-effectiveness, efficiency in collecting data from a large sample within a limited timeframe, and suitability for exploring relationships at a single point in time. As a cross-sectional approach, it allows for identifying associations but does not establish causal relationships.

Population and Sampling

The study population comprised undergraduate students enrolled at UiTM Puncak Alam. Using stratified random sampling, 377 participants were selected to ensure balanced representation across the seven main faculties on campus. Strata were defined according to faculty, and participants from each faculty were randomly chosen in proportion to enrollment size. This sampling method was adopted to reduce bias and capture the diversity of academic backgrounds and recreational participation. A priori sample size calculation using G*Power confirmed that a minimum of 300 participants was required to achieve sufficient statistical power ($\beta = .80$, $\alpha = .05$), making the final sample size of 377 adequate for the analyses.

Research Instrument

Data were collected using a structured questionnaire consisting of two validated instruments. Mental resilience was assessed using the Connor-Davidson Resilience Scale (CD-RISC-10), which has demonstrated strong reliability in prior studies (Cronbach's $\alpha = .85–.90$). Outdoor recreational self-efficacy was measured using the Outdoor Recreation Self-Efficacy (ORSE) Scale, which evaluates confidence in performing outdoor activities across domains such as skill performance, coping with challenges, and social interaction (Cronbach's $\alpha = .82–.88$). Both instruments were administered in English, with minor contextual adaptations for the Malaysian setting. Reliability testing in this study yielded Cronbach's α values of .87 for CD-RISC-10 and .85 for ORSE, indicating high internal consistency.

Data Collection Procedures

Data collection was conducted over a four-week period using both online (via university email invitations and Google Forms) and face-to-face distribution (during classroom visits). Approximately 60% of responses were collected online and 40% in person. Inclusion criteria required participants to be full-time undergraduate students aged 18–25 years, while students on leave or enrolled in part-time programs were excluded. Prior to participation, informed consent was obtained, and respondents were assured of confidentiality and voluntary participation.

Data analysis

Data were analyzed using SPSS Version 27. Descriptive statistics were used to summarize demographic characteristics and activity participation levels. Pearson product–moment correlation was employed to examine associations between outdoor recreation and mental resilience, while multiple regression analysis tested the predictive strength of outdoor recreation participation. Assumptions of normality, linearity, homoscedasticity, and multicollinearity were checked prior to analysis. Statistical significance was set at $p < .05$. In addition to p-values, effect sizes (Cohen's r and f^2) were calculated to provide greater insight into the magnitude of observed relationships.

4.0 RESULT AND DISCUSSION

4.1 RESULT

The study examined demographic characteristics, participation in outdoor recreational activities, mental resilience scores, and the associations between outdoor recreation and resilience indicators. Descriptive and inferential statistics were conducted to address the research questions.

Table 1: Demographic Profile of Respondents

No.	Demographic	Frequency	Percentage (%)
	Gender		
1	Male	175	46.4
	Female	202	53.6
	Age (year)		
	18–20	165	43.8
2	21–23	179	47.5
	24–26	26	6.9
	27+	7	1.8
	Year of Study		
	Year 1	147	39.0
3	Year 2	113	30.0
	Year 3	82	21.7
	Year 4+	35	9.3
	Faculty		
	Accountancy	54	14.3
	Pharmacy	61	16.2
	Business & Management	54	14.3
4	Health Sciences	54	14.3
	Education	58	15.4
	Hotel & Tourism	48	12.7
	Built Environment	48	12.7

The results indicate that female students (53.6%) slightly outnumbered male students (46.4%). Most participants were aged 21–23 years (47.5%). Pharmacy students were the largest group (16.2%), with other faculties well represented. The sample was broadly distributed across study years, with first-year students forming the largest proportion (39.0%). The overrepresentation of certain faculties, such as Pharmacy, should be considered when interpreting participation trends.

Table 2: Participation in Outdoor Recreational Activities

No.	Variable	Frequency	Percentage (%)
	Participation Frequency		
1	Once a month	176	46.7
	2–3 times a month	147	39.0
	Weekly	54	14.3
	Most Common Activity		
2	Hiking	75	19.9%
	Camping	60	15.9%
	Kayaking	85	17.8%
	Abseiling	67	22.5%
	Zipline	90	23.9%
	Time Spent per Session		
	< 1 hour	48	12.7%
3	1–2 hours	56	14.9%
	2–4 hours	135	35.8%
	> 4 hours	138	36.6%

Students typically engaged in outdoor activities once or 2–3 times per month (85.7%), with only 14.3% participating weekly. Zipline (23.9%) and abseiling (22.5%) were the most frequently reported activities. Most sessions lasted between 2–4 hours (35.8%) or more than 4 hours (36.6%), suggesting that when students participated, their engagement was substantial. Based on prior studies, this frequency can be considered moderate participation.

Table 3: Mean Scores of Mental Resilience

No	Instrument	Mean	Standard Deviation
1.	CD-RISC-10	4.72	0.69
2.	MHC-SF	4.73	0.64
3.	PSS-10	3.34	0.53

Students demonstrated generally positive resilience scores on CD-RISC-10 (M = 4.72, SD = 0.69) and MHC-SF (M = 4.73, SD = 0.64). The PSS-10 score (M = 3.34, SD = 0.53) reflects moderate perceived stress, consistent with normative undergraduate ranges. Notably, higher PSS-10 scores indicate greater stress; thus, while resilience levels were favorable, students still reported moderate stressors in academic and personal contexts.

Table 4: Correlation Between Outdoor Recreation and Mental Resilience

No	Measure	r	p
1.	CD-RISC-10	.835	< .001
2.	MHC-SF	.836	< .001
3.	PSS-10	.849	< .001

Outdoor recreation participation showed strong, positive, and statistically significant correlations with resilience indicators ($r = .835$ to $.849$, $p < .001$). The unusually high correlations suggest potential multicollinearity among the measures. Additionally, the positive correlation with PSS-10 requires cautious interpretation since higher PSS scores represent greater stress; this may reflect measurement overlap or a need to examine scoring direction. These findings indicate associations but cannot confirm causality.

Table 5: Regression Analysis: Mental Resilience Predicting Outdoor Recreation Participation

No	Measure	B	SE	β	t	p
1.	CD-RISC-10	2.492	1.688	–	1.476	.141
2.	MHC-SF	0.003	0.020	.003	0.141	.949
3.	PSS-10	0.022	0.023	.022	0.949	.343

Model summary: $R = .309$, $R^2 = .096$, Adjusted $R^2 = .088$, $F(3, 373) = 13.14$, $p < .001$

The regression model explained 9.6% of variance in outdoor recreation participation ($R^2 = .096$, $p < .001$). While the overall model was statistically significant, none of the individual predictors were significant (all $p > .05$). This suggests that resilience factors alone may not directly predict participation, and other variables (e.g., environmental or social factors) may play stronger roles. The combination of significant model F but non-significant predictors may reflect multicollinearity; further diagnostics such as Variance Inflation Factor (VIF) testing are warranted.

4.2 DISCUSSION

The findings of this study suggest a positive association between participation in outdoor recreational activities and mental resilience among UiTM Puncak Alam students. Students who reported greater involvement in activities such as hiking, kayaking, abseiling, and ziplining also reported higher resilience scores on the CD-RISC-10 and MHC-SF scales. These results align with prior studies indicating that outdoor activities can foster coping skills, psychological well-being, and stress management (Chen & Xu, 2018; Hwang & Chang, 2019). However, given the cross-sectional design, these findings cannot establish causality. The results should therefore be interpreted as associations rather than definitive proof of resilience enhancement through outdoor activity.

The high correlations observed ($r = .835$–$.849$) are unusual for social science research and may indicate overlap between resilience measures, potential multicollinearity, or measurement redundancy. This issue underscores the importance of carefully selecting instruments and may explain why regression results did not identify significant individual predictors despite the overall model reaching statistical significance. The regression model

accounted for only 9.6% of the variance in outdoor recreation participation ($R^2 = .096$), suggesting that resilience explains only a small portion of participation behavior, while other factors such as prior athletic experience, socioeconomic status, or personality traits likely play a greater role.

Potential mechanisms that may underlie the observed associations include enhanced self-efficacy, social bonding with peers, and exposure to restorative natural environments, all of which have been highlighted in previous literature as contributors to resilience development (Álvarez & Gómez, 2020; Wu & Xie, 2021). Interestingly, most students reported participating only monthly, yet often engaged for extended periods per session. This pattern suggests that the quality and depth of engagement, rather than frequency alone, may influence resilience outcomes.

Several limitations must be acknowledged. First, reliance on self-reported data introduces risks of recall bias and social desirability bias. Second, the cross-sectional design restricts causal inference, preventing conclusions about whether outdoor recreation leads to resilience or vice versa. Third, the study was limited to a single campus, reducing generalizability to other student populations. Fourth, the strong intercorrelations between resilience measures raise concerns of multicollinearity, which may have influenced regression outcomes. Future research should address these limitations through longitudinal or experimental designs, multi-campus sampling, and careful selection of distinct measurement tools.

Despite these limitations, the findings highlight valuable implications for higher education institutions. Outdoor recreation should be considered a complementary strategy alongside traditional mental health services. Universities could integrate structured outdoor programs into co-curricular credits, collaborate with community organizations to expand activity options, and design initiatives tailored to different student demographics. Such programs may provide low-cost, preventive approaches to enhancing student well-being and resilience, particularly when combined with professional counseling and support services.

5.0 CONCLUSION

This study found significant associations between outdoor recreational activities and mental resilience among UiTM Puncak Alam students. While the strength of correlations suggests meaningful links, the modest explanatory power of regression models indicates that resilience is only one of many factors influencing outdoor recreation participation. The results point to the potential value of outdoor programs as part of a holistic approach to supporting student well-being, though causal relationships remain unconfirmed.

For universities, the key implication is that structured and inclusive outdoor initiatives could complement existing mental health services by offering students opportunities to build coping skills, self-efficacy, and social connections. However, further longitudinal and intervention-based research is needed to establish causal effects and explore how different types and intensities of activities contribute to resilience development.

AUTHORS' CONTRIBUTION

Fiqrul Izzat Bin Faidrul Iqmar is the author and main researcher of this research, Zaharul Azwan bin Abdul Razak contributes as a supervisor and corresponding author. Mohamad Nadzlee bin Alim contributes to conducting the analysis in this research and act as second author.

CONFLICT OF INTEREST

The authors declare that there are no financial, personal, or professional conflicts of interest that could have influenced the research, analysis, or reporting of this study.

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