

Gender, Physical Activity, and Psychological Well-being among Academic White-Collar Employees: A Cross-Sectional Study

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ABSTRACT

Regular physical activity is widely recognized as a vital non-pharmacological intervention for reducing the risk of psychological disorders, including anxiety and stress. However, modern occupational environments often necessitate prolonged sedentary behaviour. White-collar workers, particularly those in academic and administrative roles, are highly susceptible to occupational stress and physical inactivity due to the intense cognitive demands and desk-bound nature of their professions. This quantitative cross-sectional study aims to differentiate physical activity levels and anxiety scores between male and female white-collar workers, while also examining the overarching relationship between these variables within this demographic. A purposive sample of 159 academic white-collar workers at Universiti Teknologi MARA (UiTM) Arau participated in the research. Data collection utilized digital survey instruments adapted from the validated General Practice Physical Activity Questionnaire (GPPAQ) to measure activity levels, and the Beck Anxiety Inventory (BAI) to assess cognitive and somatic anxiety symptoms. The collected data was evaluated using Chi-Square tests, Independent Sample T-Tests, and Point-Biserial Correlation. The statistical analysis revealed no significant gender differences in either physical activity levels or anxiety scores ($p > 0.05$). Additionally, the correlation analysis indicated no statistically significant inverse relationship between physical activity participation and anxiety reduction among the sampled employees ($p > 0.05$). These findings suggest that the structural constraints and psychosocial stressors of sedentary academic workplaces affect male and female employees equally, potentially neutralizing the anticipated psychological benefits of baseline physical movement. In conclusion, while this specific cohort did not yield significant correlations, the results underscore the necessity for organizations to move beyond basic fitness initiatives. Busy white-collar workers require holistic, multi-dimensional workplace wellness programs incorporating ergonomic, nutritional, and psychological interventions to effectively manage occupational stress, prioritize work-life balance, and sustain comprehensive health.

Keywords: Anxiety; Mental health; Physical activity; White-collar workers

INTRODUCTION

Anxiety is a common psychological disorder characterized by persistent nervousness and worry that can negatively impact an individual's social and occupational functioning. If left unmanaged, the continuous tension associated with anxiety can escalate into chronic, depleting conditions that severely affect overall well-being. Engaging in regular physical activity is widely recognized as an effective, non-pharmacological strategy that improves physical health and reduces psychological distress (Goodarzi et al., 2026; Huang et al., 2024).

Despite the well-documented benefits of physical movement, modern occupational environments often discourage active lifestyles. White-collar workers, including academic and administrative professionals, are especially susceptible to extensive sedentary behaviour because their daily tasks require prolonged sitting and intense mental, rather than physical, exertion.

Due to prolonged occupational sitting combined with high cognitive demands can trigger significant psychological stressors, there is growing interest in understanding how the workplace environment dictates employee health (Clinchamps et al., 2024). Furthermore, studies suggest that vulnerability to anxiety and participation in physical activity may differ significantly between genders. Given that physical activity and psychological health are highly interconnected, it is vital to explore how sedentary professional environments impact male and female employees differently.

LITERATURE REVIEW

Efficacy of Physical Activity on Mental Health

Physical movement of any intensity is vital for energy expenditure and the maintenance of holistic well-being. A robust body of recent literature continues to validate that physical activity interventions yield significant, medium-to-large effects in reducing anxiety, depression, and general psychological distress (Huang et al., 2024; Singh et al., 2023). Across diverse populations, structured exercise programs are identified as highly acceptable and effective therapeutic interventions for mitigating anxiety symptoms and preventing cognitive decline (Goodarzi et al., 2025). The psychological benefits of physical activity are frequently attributed to both physiological mechanisms such as the regulation of cortisol levels and the stimulation of neuroplasticity and psychological mechanisms, including distraction from environmental stressors and enhanced self-efficacy (Singh et al., 2023). Consequently, global health directives increasingly position physical activity as a primary, non-pharmacological treatment for managing occupational and generalized anxiety.

Occupational Sedentary Behavior Among White-Collar Workers

Despite the known benefits of exercise, modern professional environments often necessitate prolonged physical inactivity. White-collar professionals typically spend most of their workday in relatively immobile, desk-bound positions, a trend exacerbated by the digital transformation of the workplace. The relationship between this occupational sedentary behaviour and mental health is a critical focal point in organizational psychology. Utilizing the Job-Demand-Control model, recent studies demonstrate that high levels of sedentary behaviour in work settings are directly

associated with increased occupational stress, job strain, and deteriorating overall mental health (Clinchamps et al., 2024). Furthermore, excessive sedentary time even outside of work hours negatively affects systemic physical health, which can subsequently amplify mental health issues like perceived stress and emotional exhaustion (Li & Zeng, 2025). Ultimately, the specific conditions of the work environment heavily dictate an employee's baseline health status, making it difficult for workers to independently overcome occupational fatigue (Javanmardi et al., 2025).

Workplace Anxiety and Gender Differences

Anxiety in the modern workplace frequently stems from intense psychological demands, competitive pressure, and challenging working conditions. Recent studies emphasize that biological and social determinants, including gender, heavily influence how individuals experience, internalize, and manage these occupational stressors (Peris-Ramos et al., 2024). For instance, research among teaching and academic populations has revealed that female workers often report higher levels of perceived stress and exhibit different physical activity and nutritional habits compared to their male counterparts (Peris-Ramos et al., 2024). This disparity is often linked to compounding psychosocial factors, such as work-family conflict and differing societal expectations regarding emotional labour. Understanding these gender-based differences is crucial for organizations aiming to design tailored workplace wellness programs that successfully encourage physical activity and improve employees' mental health equitably.

Summary and Research Gap

While the inverse relationship between physical activity and psychological distress is well-documented in general populations, its specific manifestation within university administrative and academic staff remains underexplored. Existing literature often treats white-collar workers as a monolith, failing to account for the unique gender dynamics and specific occupational hazards present in higher education institutions. This study bridges that gap by empirically evaluating whether the recognized benefits of physical activity hold true for both male and female academic staff facing localized occupational pressures.

METHODOLOGY

Research Design

This study is defined as a quantitative, cross-sectional survey design. This framework was specifically selected to effectively examine the numerical relationship between physical activity scores and anxiety levels among the target demographic at a single point in time.

Population and Sampling of the Study

The study population comprised academic white-collar workers at Universiti Teknologi MARA (UiTM) Arau. Purposive sampling was used to select participants based on specific inclusion criteria: respondents had to be academic staff who had been employed at the university for at least six months. Non-academic staff and those who refused participation were excluded. Out of a total population of 340 white-collar workers, 200 met the inclusion criteria. To ensure statistical

validity and account for potential non-responses or dropout rates, the target sample size was set to 159 respondents, aiming for a relatively equal gender distribution.

Research Instruments

The survey instrument was divided into three distinct sections:

Section A (Demographics): Collected baseline data including the respondent's age, gender, specific faculty, and employment duration at UiTM Arau.

Section B (Physical Activity): Utilized the General Practice Physical Activity Questionnaire (GPPAQ). The GPPAQ is a validated, short self-report measure commonly used in research to categorize adult physical activity into four simple levels: Active, Moderately Active, Moderately Inactive, and Inactive. Recent large-scale clinical trials continue to utilize the GPPAQ to reliably classify baseline activity levels and assess behavioural interventions (Smith et al., 2022).

Section C (Anxiety Levels): Employed the Beck Anxiety Inventory (BAI) to evaluate common somatic and cognitive symptoms of anxiety experienced over the past week. The 21-item questionnaire uses a 4-point Likert scale ranging from 0 ("not at all") to 3 ("severely"). Total scores range from 0 to 63, where scores of 0–21 indicate low anxiety, 22–35 indicate moderate anxiety, and 36 or above signify concerning levels of anxiety. The BAI remains a highly robust and internally consistent psychometric tool for evaluating generalized anxiety in contemporary psychological research (Mazhak & Sudyn, 2025).

Procedures

Prior to data collection, formal ethical approval was obtained from the UiTM Research Ethical Committee. The questionnaire was digitized and distributed to the target academic staff via Google Forms, email, and WhatsApp using a Quick Response (QR) code to facilitate easy access.

All participants were fully informed regarding the study's purpose, the confidentiality of their responses, and their right to voluntary participation or withdrawal at any time without penalty. The digital survey was left open for one week to allow respondents sufficient time to complete the self-administered questionnaire without direct researcher supervision. Following the data collection phase, the responses were compiled and analyzed using IBM SPSS Statistics (Version 26) to conduct Chi-Square tests, Independent Sample T-Tests, and Point-Biserial Correlations.

FINDINGS

The study gathered responses from 159 academic white-collar workers at UiTM Arau. The respondents had a mean age of 40.19 ± 6.588 years and an average employment duration at the university of 9.57 ± 5.623 years. The gender distribution was relatively balanced, consisting of 82 males (51.6%) and 77 females (48.4%).

Based on table 1 and 2, a Chi-Square Test was conducted to evaluate the differences in physical activity scores between male and female white-collar workers. The analysis revealed no statistically significant difference across the activity categories (Inactive, Moderately Inactive, Moderately Active, Active) between the genders ($X^2 = 6.508$, $df = 3$, $p = 0.089$). Consequently,

the null hypothesis was accepted, indicating that both male and female academic staff exhibit equivalent levels of physical activity.

Table 1. Descriptive Analysis for Category of Physical Activity between Gender (Cross-tabulation)

		Gender		
		Male	Female	Total
Category Physical Activity	Inactive	29	21	50
	Moderately Inactive	13	26	39
	Moderately Active	12	11	24
	Active	26	20	46
Total		81	78	159

Table 2. Chi-Square Test for Physical Activity among Males and Females of White-Collar Workers

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	6.508 ^a	3	.089
Likelihood Ratio	6.598	3	.086
Linear-by-Linear Association	.097	1	.755
N	Of Valid Cases	159	
a. 0 cells (.0%) have an expected count less than 5. The minimum expected count is 11.77			

An Independent Sample T-Test was utilized to compare the mean anxiety scores between genders. According to table 3, male respondents reported a mean anxiety score of 13.54 ± 10.552 , while female respondents reported a mean of 12.45 ± 9.824 . The results indicated no significant difference in anxiety levels between males and females ($F = 0.006$, $t = 0.676$, $p = 0.500$) (Table 4). Therefore, the null hypothesis was accepted.

Table 3: Descriptive Analysis for Anxiety Scores Between Males and Females of White-Collar Workers

Gender	N	Mean	Std. Deviation	Std. Error Mean
Male	81	13.54	10.552	1.172

Female	78	12.45	9.824	1.112
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Table 4: Independent Sample T-Test for Anxiety Scores between Males and Females of White-Collar Workers

	F	Sig.	t	df	Sig. (2-tailed)
Equal variances assumed	.006	.941	.676	157	.500
Equal variances not assumed			.677	156.824	.499

To examine the correlation between physical activity and anxiety among the respondents, a correlation analysis was performed. Based on table 5, the resulting coefficient ($r = 0.093$, $p = 0.242$) demonstrated that there is no statistically significant relationship between the level of physical activity and anxiety scores among the white-collar workers sampled in this study.

Table 5: Correlations between Physical Activity and Anxiety among White-Collar Workers

		Category Anxiety	Category Physical Activity
Category Anxiety	Pearson Correlation	1	.093
	Sig. (2-tailed)		.242
	N	159	159
Category Physical Activity	Pearson Correlation	.093	1
	Sig. (2-tailed)	.242	
	N	159	159

DISCUSSION

Physical Activity Scores among Genders

The finding that male and female white-collar workers engage in similar levels of physical activity aligns with recent shifts in occupational health research. While older literature occasionally suggested men were more active, current studies emphasize that the structural design of white-collar environments acts as a "great equalizer" for sedentary behaviour. Prolonged sedentary behaviour on weekdays is dictated primarily by occupational demands such as continuous desk work and computer usage rather than demographic variables (Fukushima et al., 2021).

Anxiety Scores Among Genders

The results also demonstrated that both male and female academic staff experience comparable levels of anxiety. This is a departure from classical psychological models that historically reported higher anxiety predispositions in women. However, this finding is strongly supported by

recent empirical data in higher education settings. Hintze et al. (2024) indicate that within university environments, severe job-specific stress, including heavy workloads, role conflict, and post-pandemic performance expectations, predicts psychological distress universally, overriding traditional gender disparities.

The Relationship Between Physical Activity and Anxiety

Perhaps the most notable finding of this study is the lack of a significant relationship between physical activity and anxiety reduction among the academic staff. Although general clinical guidelines strongly advocate for exercise to mitigate stress, the nuances of the modern workplace complicate this relationship. White-collar professionals often face intense occupational stressors, including high psychological demands, long working hours, and poor environmental conditions. Furthermore, negative workplace relationships such as long-term exposure to bullying from superiors, peers, or subordinates can inflict devastating emotional and psychological harm on employees. These severe psychosocial hazards can ultimately neutralize the anticipated psychological benefits of physical movement. Recent cross-sectional research has found similar non-significant correlations in public office workers, suggesting that when occupational stress and organizational dysfunction are exceptionally high, physical activity alone is insufficient to lower clinical anxiety (Tiis et al., 2025).

This implies that workplace anxiety must be treated multi-dimensionally. Employees may need holistic wellness support that looks beyond mere physical exertion. For instance, incorporating organizational-level stress management protocols, psychological support mechanisms, and improved dietary and nutritional interventions may yield more significant mental health improvements than exercise alone (DeSmet et al., 2024).

Limitation of Study

Limitations should be considered when evaluating the results. The cross-sectional survey design measures exposure and outcomes simultaneously, which introduces the possibility of reverse causality (e.g., high anxiety leading to reduced physical activity, rather than vice versa). Next, the reliance on self-reported screening instruments like the GPPAQ is susceptible to reporting bias, as individuals frequently exaggerate their actual physical activity levels. Future research would benefit from direct observational tools or wearable accelerometers to capture more accurate variables. Furthermore, this study omitted critical confounding variables such as individual personality traits, attitudes toward health, and overall nutritional intake, which heavily influence mental health. Finally, data collection occurred at the end of the academic semester, a period when university staff typically experience heightened workloads and consequently engage in less physical activity.

CONCLUSION

This study investigated the intersections of gender, physical activity, and anxiety among academic white-collar workers at UITM Arau. The analyses revealed that male and female staff experience equivalent levels of physical activity and equivalent rates of occupational anxiety. Furthermore, physical activity did not demonstrate a significant inverse relationship with anxiety within this specific cohort

These findings suggest that structural occupational stressors heavily dictate employee well-being, potentially neutralizing the anticipated psychological benefits of physical movement. It is highly recommended that busy white-collar professionals prioritize comprehensive work-life balance. Furthermore, university administrations should design multifaceted workplace wellness programs that address ergonomic, nutritional, and psychological support, rather than focusing solely on physical fitness initiatives.

Conflict of Interest Statement

The authors agree that this research was conducted in the absence of any self-benefits, commercial or financial conflicts, and declare the absence of conflicting interests with the funders.

Authors' Contributions

Yaasmiin Ahmed Tarmizi: Investigation, data curation, formal analysis, and writing – original draft; Masshera Jamaludin: Conceptualization, methodology, supervision, and writing – review and editing; Nurul Farha Zainuddin: Methodology, formal analysis, and writing – review and editing; Zulkifli Ismail: Validation and writing – review and editing.

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