

# Perceived Stress and Its Association with Body Fat Percentage among Academic and Administrative Employees in Universiti Teknologi MARA Pahang

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## ABSTRACT

Stress has been identified as a risk factor for high blood pressure, cardiovascular disease, and cancer. Recent research has suggested that body composition is essential in determining health and disease. However, the influence of stress on body composition among higher institutional staff remains to be determined. This study aimed to compare perceived stress and body fat percentage levels between two categorical groups. Furthermore, this study investigated the correlation between stress and body composition among academicians and administrators in Universiti Teknologi MARA Pahang, Malaysia. One hundred and forty (N=140) participants were involved in this study. They were divided into two categorical groups, which were referred to as "academicians" and "administrators." A demographic profile, the Perceived Stress Scale-10, and body fat percentage were obtained to assess the stress level and participants' body composition. Independent t-test results suggested that academicians more stressed than the administrators. In terms of body fat percentage, neither group demonstrated a statistically significant difference in results. Additionally, pairwise correlation demonstrated a statistically significant positive relationship between fat percentage and stress level ( $p < 0.05$ ,  $r = 0.235$ ). Tracking body composition and perceived stress can provide valuable insights into the health and well-being of higher education staff. This is to facilitate the implementation and facilitation of future initiatives involving the staff and act as an aid to regulate their performance aim.

## 1. INTRODUCTION

In the era of globalisation, social competition is so strong that it leads to depression and stress (Fu et al., 2021). In today's highly competitive and fast-paced world, the pressure to perform has become an increasingly common source of stress and emotional strain. This is especially true in higher education

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institutions, where both academic and administrative staff often face heavy workloads, tight deadlines, and complex responsibilities. Academic staff reported higher perceived stress attributed to additional pressures such as research productivity, teaching loads, and institutional expectations. These findings are consistent with the literature, which suggests that workplace stress not only undermines mental health but also exerts measurable effects on physical health outcomes (Föhr et al., 2015; Pant et al., 2024).

It is not unexpected that the increasing levels of stress people encounter in contemporary society have an impact on their eating habits (Vidal et al., 2018). According to a recent study, people who were depressed tended to eat more hedonistic, high-fat, sweet foods, while people who were happy tended to eat more dried fruit (Thurn et al., 2025). Stress causes the release of more glucocorticoids and insulin, which leads to a greater desire for "comfort foods" that are high in fat and sugar (Barrington et al., 2014). The root causes of this behaviour, along with other factors that contribute to obesity, are slowly coming to light.

Obesity has been at epidemic levels for decades, and its prevalence is still significantly increasing. Obesity is associated with several lifestyle-related conditions that can hinder daily functioning and diminish work capacity, including diabetes (Zhou et al., 2023), heart disease (Lira et al., 2022), stroke (Miguel et al., 2023), and hypertension (Brinkmann et al., 2023). Men between the ages of 30 and 60, who are primarily full-time workers, are more likely to be obese (Campisi et al., 2015). Stress at work may be a factor in obesity. Like other public service professionals (like first responders), higher institutional workers frequently lead extremely stressful lives and have to deal with stressors unique to their jobs, like physically taxing duties. These stressors have a detrimental effect on health through behavioural, physiological, and psychological effects (Ablanedo-Rosas et al., 2011).

There is growing recognition of the impact workplace stress can have on physical health, including body composition. Previous research has suggested that job stress can influence behaviours related to physical activity and diet (Rizvi et al., 2015), yet few studies have focused on staff at educational institutions. This study seeks to address this gap by examining the relationship between perceived stress and body fat percentage among academic and administrative employees at Universiti Teknologi MARA Cawangan Pahang, Malaysia.

## 2. LITERATURE REVIEW

### 2.1 *Stress and its association to body composition*

Stress is a normal and essential aspect of human experience. It pertains to the way our bodies and thoughts react to external demands or self-imposed pressures. In certain quantities, stress can be beneficial. It aids in maintaining alertness, concentration, and motivation to confront obstacles. However, when stress becomes chronic or excessive, it can impair coping mechanisms, ultimately impacting our physical health, mental stability, and behaviour (Yaribeygi et al., 2023).

Stress has long been recognised as a double-edged factor in human functioning. Earlier research suggested that while short-term stress could enhance concentration and performance, prolonged exposure was strongly associated with fatigue, impaired decision-making, and burnout (Almojali et al., 2020; Miguel et al., 2023). In academic contexts, these effects have been consistently documented. For instance, studies prior to 2020 highlighted that students often experience academic, financial, and social pressures that compromise mental health and academic outcomes (Pascoe et al., 2020). More recent investigations have emphasised that the intensity and persistence of stress in higher education remain critical concerns, with academic staff also demonstrating elevated levels of exhaustion and reduced problem-solving capacity under sustained stress (Khoshaim et al., 2020). This shift reflects a broader recognition that stress affects not only students but also those delivering education.

Beyond psychological outcomes, attention has increasingly turned to the influence of stress on body composition. Earlier studies identified links between chronic stress, poor coping strategies, and greater

adiposity during adolescence (Olive et al., 2017). These findings laid the groundwork for examining stress as a determinant of metabolic health. More recent research between 2020 and 2025 has strengthened this connection, showing that stress is significantly associated with higher body fat percentage, irrespective of body weight (Lopuszańska-Dawid et al., 2022). Such evidence underscores the relevance of body fat percentage, rather than weight alone, as a more precise indicator of health risk (Heymsfield & Wadden, 2021). Importantly, recent studies also highlight that stress interacts with lifestyle factors — such as diet, physical activity and metabolic rate — to influence adiposity in ways not fully captured by BMI (de Sevilla et al., 2021; Brinkmann et al., 2023).

### 3. METHODOLOGY

#### 3.1 Research Design

This study employed a cross-sectional experimental design involving 140 staff members from UiTM Pahang. Participants were randomly selected and evenly split between academic and administrative roles, with equal representation of male and female respondents. Ethical approval was obtained prior to the study.

#### 3.2 Instrumentation

##### 3.2.1 Demographic Questionnaire

The demographic questionnaire included 12 items addressing respondents' personal characteristics. Demographic characteristics such as ethnic origin, gender, age, education, occupation, income level and marital status are frequently used as socio-economic indicators in research. After collecting these data, responses were categorised into relevant groups for analysis. Each survey question was analysed and incorporated into the study.

##### 3.2.2 Perceived Stress Scale (PSS-10)

The Perceived Stress Scale (PSS-10) was developed to determine stressful situations in one's life of the respondent. The PSS-10 is a shorter and refined version of the PSS-14, designed for greater efficiency in data collection. In four trials, the PSS-10's test-retest reliability was determined, and in each case, the test-retest reliability of the PSS-10 consistently exceeded 0.70. All responses were inverted for computing the PSS scores; for example, 0 = 4, 1 = 3, 2 = 2, 3 = 1, and 4 = 0.

##### 3.2.3 Bioelectrical Impedance Analysis (BIA)

Bioelectrical impedance analysis (BIA) was employed to measure body composition. In this study, a hand-held BIA device was used due to its practicality for field data collection. BIA is a valid method for estimating body composition, particularly fat percentage, by detecting the electrical impedance of body tissues. It determines the body's composition by detecting the electrical signals that pass through fat, lean mass, and water.

#### 3.3 Data Analysis

All data analyses were performed using IBM SPSS Statistics, version 26. Descriptive statistics were used to summarise the demographic characteristics of participants. Inferential analyses included Pearson's correlation and independent samples t-tests to examine the relationships between stress level and fat percentage and to compare stress level and fat percentage between two categories of staff.

## 4. FINDINGS AND DISCUSSION

### 4.1 Analysis of body composition, measured through body fat percentage, and stress levels between academicians and administrators

This section presents the findings of the study conducted among 140 staff members of UiTM Pahang, consisting of both academicians and administrators. The analysis focused on two main aspects: body composition, measured through body fat percentage, and stress levels between the two groups. The results indicated that demographic factors such as gender, marital status, and educational attainment were significant predictors of body composition, while differences in stress levels were also identified, with academicians experiencing comparatively higher stress than administrators. These findings underscore the importance of demographic and occupational factors in shaping both physical and psychological outcomes. The detailed results are presented in the following sections, supported by descriptive and inferential analyses.

**Table 1.** Factors Influencing Body Composition among Administrator and Academicians

|                | F     | Sig. | t     | df  | Sig.<br>(2-tailed) |
|----------------|-------|------|-------|-----|--------------------|
| Gender         | 15.30 | 0    | 2.47  | 138 | 0.015              |
| Marital Status | 17.68 | 0    | -2.96 | 138 | 0.004              |
| Education      | 48.00 | 0    | 17.32 | 138 | 0                  |

\*  $p < 0.05$

An analysis was conducted to examine the factors influencing body composition (measured by fat percentage) among administrators and academicians. The results, as summarised in Table 1, indicated that gender, marital status, and education level were all statistically significant factors affecting body composition. Specifically, gender was found to significantly influence body composition,  $F(1, 138) = 15.30$ ,  $p = 0.015$ , with a corresponding  $t$ -value of 2.47. Marital status also had a significant effect,  $F(1, 138) = 17.68$ ,  $p = 0.004$ ,  $t = -2.96$ . Education level showed the most substantial effect,  $F(1, 138) = 48.00$ ,  $p < .001$ ,  $t = 17.32$ . These findings suggest that demographic variables, particularly education, are strongly associated with differences in body composition between the two groups.

**Table 2.** Stress level by Job Categories

|              | Job categories | N  | Mean  | Std.<br>Deviation |
|--------------|----------------|----|-------|-------------------|
| Stress Level | Administrator  | 70 | 16.27 | 5.29              |
|              | Academician    | 70 | 18.8  | 4.28              |

The current analysis examined the difference in stress levels between two professional groups: administrators and academicians. Descriptive statistics are presented in Table 2. Each group consisted of 70 participants. Administrators reported a mean stress level of 16.27 ( $SD = 5.29$ ), whereas academicians reported a higher mean stress level of 18.80 ( $SD = 4.28$ ). These preliminary results suggest that academicians may experience higher levels of stress compared to administrators. These findings may reflect differences in job roles and responsibilities, with academic staff potentially facing greater pressures related to research output, teaching loads, and academic performance expectations.

**Table 3.** Body Composition by Job Categories

|                   | Job categories | N  | Mean  | Std.<br>Deviation |
|-------------------|----------------|----|-------|-------------------|
| Fat<br>Percentage | Administrator  | 70 | 33.15 | 6.61              |
|                   | Academician    | 70 | 31.7  | 7.55              |

This study aimed to examine differences in body composition, specifically body fat percentage, between two professional groups: administrators and academicians. Descriptive statistics for each group are presented in Table 3. Each group consisted of 70 participants. The results show that administrators had a slightly higher mean body fat percentage ( $M = 33.15$ ,  $SD = 6.61$ ) compared to academicians ( $M = 31.70$ ,  $SD = 7.55$ ). Although the mean fat percentage is greater among administrators, the difference is relatively modest. The standard deviation is slightly larger among academicians, indicating greater variability in fat percentage within that group. These findings may reflect variations in occupational physical activity, job-related routines, or access to health resources. Administrators may have more sedentary roles or different work schedules that impact body composition compared to academicians. Future research should consider incorporating physical activity levels, dietary patterns, and lifestyle behaviours to better understand these differences.

**Table 4.** Relationship between Stress Level and Body Composition among Staff in UiTM Pahang

|                | Stress              | Fat Percentage |
|----------------|---------------------|----------------|
| Stress         | Pearson Correlation | 1              |
|                | Sig. (2-tailed)     | 0.235**        |
|                | N                   | 140            |
| Fat Percentage | Pearson Correlation | 0.235**        |
|                | Sig. (2-tailed)     | 1              |
|                | N                   | 140            |

\*  $p < 0.05$

As summarised in Table 4, the key findings from the data analysis indicate that body composition, measured in terms of fat percentage, was significantly associated with stress levels. Specifically, a significant positive correlation was found between stress levels and body fat percentage. Additionally, a significant difference in stress levels was observed between academic and administrative staff, with academics reporting higher levels of stress. In contrast, no significant difference in body composition was identified between the two groups.

## 4.2 Discussion

Recent studies have consistently reported a significant association between perceived stress and body fat percentage. Aiyegbusi et al. (2016) conducted a study among undergraduate students and found that higher scores on the Perceived Stress Scale (PSS) were positively correlated with increases in both visceral fat and overall body fat percentage, with visceral fat showing the strongest relationship. Similar findings have been observed in adolescent populations, where elevated stress levels were significantly linked to increased adiposity, suggesting that stress-related fat accumulation may begin early in life (Pant et al., 2024).

In the context of higher education institutions, occupational stress is frequently reported among university staff. Contributing factors include organisational demands, resource limitations, and interpersonal challenges (Ablanedo-Rosas et al., 2011). These stressors are particularly pronounced in academic settings, where lecturers and administrative personnel are often subjected to rigid institutional

structures, research output requirements, and high teaching loads (Bowen et al., 2016). Such environments are associated with reduced physical activity and increased sedentary behaviour, both of which are key risk factors for elevated body fat (Zhou et al., 2023).

The effectiveness of workplace interventions aimed at promoting physical activity supports the notion that modifiable behaviours can influence body composition. Evidence indicates that reducing sedentary time and incorporating movement throughout the workday can significantly improve body composition, including reductions in fat mass and waist circumference (de Sevilla et al., 2021; Zhang et al., 2025). Moreover, high levels of perceived stress have been linked to maladaptive coping mechanisms such as emotional eating, increased intake of high-fat or sugary foods, and overall poor dietary habits, all of which further contribute to excess body fat (Vidal et al., 2018; Korlakunta et al., 2022).

Gender also appears to play a moderating role in the stress–adiposity relationship. Studies have shown that women typically report higher levels of perceived stress and also tend to have greater body fat percentages compared to men. These differences may be influenced by both physiological mechanisms and sociocultural expectations related to gender roles (Campisi et al., 2015; Ilias et al., 2021).

## 5. CONCLUSION

The findings indicate that perceived stress is significantly associated with body fat percentage among staff in higher education institutions. While this study focused on staff at one institution, the implications are broader: managing stress may be crucial to promoting overall employee health. Future research should include larger samples and consider other variables such as diet, physical activity, and sleep patterns. Reducing occupational stress through wellness programmes, counselling, and flexible work policies could be key strategies for supporting both the mental and physical well-being of higher education staff.

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## CONFLICT OF INTEREST STATEMENT

The authors declare that this study was conducted without any personal, commercial, or financial interests that could be construed as a potential conflict of interest. This research was conducted without any commercial or financial support that could be construed as a potential conflict of interest.

## AUTHORS' CONTRIBUTIONS

Fatin Aqilah Abdul Razak, Nur Atikah Mohamed Kassim, and Sharifah Raidah Syed Hamzah jointly conceptualised the research idea, led the data collection process, and were primarily responsible for drafting and revising the manuscript. Nurul Nadiyah Shahudin and Rozella Ab Razak provided critical input in the development and refinement of the study design and methodology. Kalam Azad Isa performed the statistical analyses and assisted in interpreting the findings. All authors reviewed and approved the final version of the manuscript.

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