



Exploring the Relationship between Physical Activity and Mental Well-Being among Office Employees in Saudi Arabia: A Cross-Sectional Study

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Abstract:

Background: Workplace physical inactivity, together with poor mental well-being, has become a significant issue affecting office-based employees. Understanding the relationship between physical activity and mental health is essential to developing effective strategies to promote workplace health.

Objective: This study investigated how physical activity relates to mental health outcomes among Saudi Arabian office workers with the goal of developing targeted intervention strategies.

Methods: A cross-sectional survey was conducted among 526 participants at the Saudi Workforce Inclusion Conference in Riyadh in October 2024, using a convenience sampling approach. Physical activity was assessed using the Global Physical Activity Questionnaire (GPAQ) and categorized as *low*, *moderate*, or *high*. Mental well-being was measured using the Mental Health Continuum Short Form (MHC-SF) and classified as *languishing*, *moderate*, or *flourishing*. Descriptive statistics and multiple regression analyses were conducted to identify predictors of mental well-being.

Results: The survey showed that 52.3% of participants had low physical activity levels, while only 10.5% reached high levels. The mental well-being assessment revealed that *languishing* was present in 38.4% of participants, *moderate* well-being in 52.1%, and *flourishing* in only 9.5%. A regression analysis revealed that physical activity emerged as the strongest predictor of mental well-being ($\beta = 0.534$, $p < .001$), explaining 27.8% of the total variance.

Conclusion: Higher physical activity levels are associated with better mental well-being among office employees. Our findings suggest that workplace policies promoting physical activity may be beneficial for enhancing employee mental well-being.

Keywords: Exercise, Mental well-being, Physical activity, Office employees, Workplace health promotion, Saudi Arabia.

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1. INTRODUCTION

Physical activity refers to body movements that involve skeletal muscles and require energy [1]. The scientific community defines physical activity as an adjustable lifestyle habit that promotes physical health and psychological well-being. Various studies indicated that

leisure and occupational activities with moderate-to-vigorous levels of physical exercise reduce depression, anxiety, and the risk of burnout [2-4]. These protective effects have been observed not only in medical settings but also among healthy working adults, who are often exposed to prolonged sitting, high-performance demands,

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and limited opportunities for physical movement during the workday [5, 6]. Physical activity is a recognized public health intervention to reduce mental health threats among working adults; office environments are characterized by high sedentary behavior and minimal health-promoting activities [7, 8].

Mental well-being is a combination of emotional and psychological aspects, together with social functioning, which goes beyond the absence of psychological disorders to include life satisfaction, personal resilience, and meaningful social engagement [9]. According to the dual-continua model, mental illness exists on a different spectrum than well-being, yet these concepts remain connected [7, 9]. Research indicates that people who report better mental well-being experience superior physical health, improved interpersonal relationships, and enhanced workplace performance [10, 11]. Evidence demonstrates that poor well-being increases the chance of cardiovascular diseases, diabetes, and cognitive decline, thus making it a significant challenge in future healthcare [12]. Research has demonstrated that mental well-being is a fundamental driver of motivation and organizational commitment, while it is inversely related to burnout symptoms, employee absenteeism, and turnover rates [13, 14]. Employers, together with healthcare professionals, prioritize mental well-being as they develop strategies to reduce workplace stress while building employee resilience.

Although research has explored the relationship between physical activity and mental well-being across various populations, understanding these connections in Saudi Arabian office environments remains limited. Furthermore, while the general link between physical activity and mental health is well established, quantitative data examining the strength of this association and identifying demographic predictors among non-health office employees in Saudi Arabia remain scarce. Workplace employees in the public and private sectors spend most of their workdays in sedentary positions with limited movement. Furthermore, psychosocial stressors include stressful workplace expectations and digital fatigue [15, 16]. Physical activity has been broadly associated with overall health status across populations, underscoring its importance as a determinant of health [17]. Multiple studies in Saudi Arabia have shown rising stress and burnout, along with emotional exhaustion, among healthcare and academic professionals; these fields face ongoing concerns about workforce maintenance and institutional health [18-20]. These obstacles continue to intensify due to urban development, the transition to digital administrative settings, and shifting cultural beliefs about productivity and well-being. The national emphasis on workplace mental health in Saudi Arabia, through Vision 2030's workforce transformation, requires studies on lifestyle factors, including physical activity, to develop targeted preventive measures against burnout and build organizational resilience.

This study investigates the relationship between physical activity group classification and mental well-being

among Saudi Arabian office workers by assessing GPAQ and MHC-SF, validated tools, to provide evidence of actual workplace conditions and insights into lifestyle changes affecting mental health across diverse workplace environments. The results will help professionals in healthcare education, workplace wellness, and organizational leadership develop methods to connect physical activity with enhanced mental wellness. The proposed strategies involve developing customized workplace initiatives that demonstrate evidence-based approaches to meet employee requirements. This study contributes to existing workplace health research while offering an innovative perspective for workplace wellness coordinators seeking to integrate workforce growth with total employee wellness. Despite growing evidence linking physical activity to mental well-being, limited research has examined this relationship among office employees in the Gulf region. This study, therefore, addresses a significant gap by exploring how activity levels relate to psychological well-being among a Saudi working population. It was hypothesized that higher levels of physical activity would be positively associated with better mental well-being among Saudi Arabian office employees.

2. METHODS

2.1. Participants and Procedures

The research design for this study used a cross-sectional approach to collect data from office workers in various sectors across Saudi Arabia. The researchers selected participants through convenience sampling at the Saudi Workforce Inclusion Conference, which took place in Riyadh from October (29th to 31st, 2024). The conference provided an excellent opportunity to collect data because it united many office employees from public and private organizations. This setting was selected because it brought together office employees from various sectors in one venue, enabling convenient access for participants; however, the sample may not fully reflect all office workers in Saudi Arabia. The online survey link via QR code was placed at various locations throughout the conference area to reach potential participants. The invitation guaranteed participant confidentiality while asking for basic demographic details, such as gender, sector, and length of work experience. The researchers did not offer any incentives to encourage participants to take the survey. The inclusion criteria included Saudi nationals who performed administrative or office duties, were at least 25 years old, and maintained employment status. The study excluded participants who were unemployed or had medical conditions that prevented them from engaging in regular physical exercise. All participants were asked to accept electronic informed consent before starting the questionnaire. The online survey received responses from 526 employees. All valid cases were included in the analysis after removing responses that lacked sufficient data for physical activity or mental well-being assessments.

2.2. Physical Activity Measurement

The GPAQ served as a tool to measure physical activity levels through its standardized self-report format required by the World Health Organization (WHO). The GPAQ contains 16 items that measure physical activity during a typical week across three domains: work (including household activities), transportation, and leisure-time activities.

The survey participants documented their participation in vigorous and moderate-intensity activities by reporting the number of days per week and the duration in minutes for each domain; transport activities were measured regardless of intensity. The GPAQ served as a guide for data cleaning and processing to handle missing or invalid responses [21].

The official Arabic version of the GPAQ, which was culturally adapted according to WHO guidelines, was used in this study. The version has shown acceptable psychometric properties among Arabic-speaking populations, with test-retest reliability coefficients (Kappa: 0.68-0.82) and Spearman's rho exceeding 0.70 for continuous variables [22].

Total physical activity volume (MET-minutes per week) was calculated by multiplying the frequency and duration of each activity by its corresponding standardized MET value (8.0 for vigorous activities and 4.0 for moderate and transport activities). This continuous MET min/week score was used as the independent variable in the regression analysis.

Participants were classified into physical activity levels based on their total weekly MET-minutes, in accordance with the GPAQ scoring guidelines [21]. Participants who reported less than 600 MET-min/week were classified as having low activity. The participants who scored between 600 and 3000 MET min/week were classified as having *moderate* activity, and those who scored above 3000 MET min/week were classified as having *high* activity.

2.3. Mental Well-being Measurement

The MHC-SF was used to assess participants' positive mental well-being across emotional, psychological, and social domains. The 14-item scale captures the frequency of well-being experiences over the past month using a 6-point Likert scale ranging from 0 ("never") to 5 ("every day"), with total scores ranging from 0 to 70; higher scores indicate greater well-being [9, 23]. Participants were categorized as *flourishing* if they experienced emotional well-being 'almost every day' or 'every day' (score ≥ 4) on at least one relevant item and reported the same frequency (score ≥ 4) on at least six of the remaining 11 items related to social and psychological well-being.

Conversely, participants were categorized as *languishing* if they responded 'never' or 'once or twice' (score ≤ 1) to at least one emotional item and at least six of the social and psychological items. Those who did not meet either condition were classified as having *moderate* mental health. The MHC-SF consists of three emotional well-being items, six psychological well-being items, and five social

well-being items that measure distinct positive functioning dimensions [24].

The Arabic version of the MHC-SF, which has undergone a cultural adaptation and validation process among Arabic-speaking populations, was used in this study. The MHC-SF demonstrated robust structural validity and satisfactory psychometric properties, including a confirmed three-factor model through confirmatory factor analysis [25].

The scale has demonstrated high internal consistency (Cronbach's $\alpha > 0.80$) and measurement invariance across gender and cultural contexts [23, 24]. The total MHC-SF score was used as a continuous dependent variable in the statistical analyses to examine its relationship with physical activity levels.

2.4. Statistical Analysis

IBM SPSS Statistics (Version 25.0) served as the analytical tool for data analysis. Descriptive statistics displayed participant demographic information along with their GPAQ and MHC-SF assessment results through means, standard deviations, and frequencies. The independent variable consisted of MET minutes per week from GPAQ, while the dependent variable was the total mental well-being score from MHC-SF.

The first step of the analysis used Pearson's correlation coefficient (r) to examine the connection between physical activity levels and mental well-being. Physical activity levels (MET min/week) together with age, years of experience, and sector of employment, were analyzed using multiple linear regression to determine their combined effect on mental well-being scores. Categorical predictors were dummy-coded prior to entry into the regression model using indicator (reference) coding. Specifically, the employment sector variable was coded as Government = 1 and Private = 2, with the private sector serving as the reference category. The β coefficients, together with the R^2 and adjusted R^2 values, showed the strength of the relationship and the explained variance. The analysis used squared semi-partial correlations (sr^2) to establish the individual contribution of each predictor to the explained variance. All statistical tests required a p -value below 0.05 to achieve statistical significance.

Cohen's d effect sizes were also computed to quantify the magnitude of mean differences between relevant subgroups when appropriate, following Cohen's classification, where small effect ≥ 0.20 , medium effect ≥ 0.50 , and large effect ≥ 0.80 [26].

Regression assumptions were evaluated using scatterplots and Q-Q plots, the Shapiro-Wilk test for residual normality, and VIF values to assess potential multicollinearity. The analysis confirmed that all four assumptions of multiple linearity, normality of residuals, homoscedasticity, and independence of errors were met.

The power analysis conducted in G*Power version 3.1.9.7 showed that 395 participants were needed to detect a small effect size ($f^2 = 0.02$) with 80% power at $\alpha = 0.05$ significance level.

2.5. Ethics Statement

This study involved the voluntary participation of adult office employees, with informed consent obtained prior to data collection. Without revealing any personally identifiable information, age, gender, industry, and duration of work experience were all collected anonymously. The study involved no interventions or invasive procedures (At the time it was conducted, the researchers' institution did not require formal ethics approval for anonymous, non-interventional survey research involving adults). The study was conducted in accordance with the ethical principles outlined in the Helsinki Declaration (2013 revision).

3. RESULTS

Table 1 presents the descriptive characteristics of the study participants. Of the 526 office employees surveyed, females accounted for a larger portion ($n = 377$) than males ($n = 149$). The participants' ages ranged from 23 to 56 years, with an overall mean age of 31.7 ± 3.7 years. On average, male participants were older (34.0 ± 6.2 years) than their female counterparts (30.8 ± 1.4 years), showing a large effect size (Cohen's $d = 0.91$). The participants reported an average work experience of 7.2 ± 4.0 years. The workforce experience of males exceeded that of females, with 8.6 ± 6.1 years, compared to 6.7 ± 2.6 years for females, reflecting a medium effect size (Cohen's $d = 0.48$). The employment distribution showed that 90.5% of participants worked in private-sector organizations and 9.5% worked in government agencies. The male participants showed a higher tendency to work in government positions (18.8%) than the female participants (5.8%), indicating a small-to-moderate association between gender and employment sector (Cramer's $V = 0.20$, $p < 0.001$).

The distribution of participants by mental health category and physical activity is presented in Table 2. Overall, 52.3% of the population had low activity levels, with a slightly higher percentage among females (53.3%) than among males (49.7%). Just 10.5% of participants were in the *high-activity* group, whereas 37.3% reported *moderate* physical activity. Interestingly, males (15.4%) were more likely than females (8.5%) to exhibit *high* levels of activity.

Over half of the participants (52.1%) were categorized by the MHC-SF as having *moderate* mental well-being. The prevalence of *languishing* well-being was 38.4% among participants, with a significantly higher rate among females (42.2%) compared to males (29.0%). Although only 9.5% of the entire sample was categorized as *flourishing*, the

percentages for males and females were nearly equal (8.7% and 9.8%, respectively).

As shown in Table 3, the multiple linear regression analysis identifies the MHC-SF total score as a significant predictor of positive mental well-being. The model was statistically significant ($F = 59.231$, $p < 0.001$), indicating that the predictors collectively explained a significant portion of the variance in mental well-being ($R^2 = 0.313$, adjusted $R^2 = 0.307$).

The analysis revealed that weekly physical activity (MET min/week score) was the most significant predictor of mental well-being ($\beta = 0.534$, $p < 0.001$), uniquely accounting for 27.8% of the variance ($sr^2 = 0.278$), with a 95% confidence interval (CI) for the unstandardized coefficient (B) ranging from 0.007 to 0.009. The study found that age ($\beta = 0.103$, $p = 0.007$) was a significant predictor of well-being scores, with older participants reporting slightly higher well-being scores (95% CI for B: 0.18-0.75). However, it accounted for only 1.0% of the variance ($sr^2 = 0.010$), indicating a small effect size and a minimal practical contribution compared with the stronger effect of physical activity.

Table 1. Descriptive characteristics of the study participants (N = 526).

Variable	Males (n = 149)	Females (n = 377)	Total (n = 526)
Age (years)	34.0 ± 6.2 (25-56)	30.8 ± 1.4 (23-34)	31.7 ± 3.7 (23-56)
Years of Experience (years)	8.6 ± 6.1 (1-41)	6.7 ± 2.6 (1-20)	7.2 ± 4.0 (1-41)
Government Sector (n/%)	28 (18.8%)	22 (5.8%)	50 (9.5%)
Private Sector (n/%)	121 (81.2%)	355 (94.2%)	476 (90.5%)

Table 2. Distribution of participants by physical activity and mental well-being categories (N = 526).

Variable	Males (n = 149)	Females (n = 377)	Total (n = 526)
Physical activity classification (n/%)	Low	74 (49.7%)	201 (53.3%)
	Moderate	52 (35.0%)	144 (38.2%)
	High	23 (15.4%)	32 (8.5%)
MHC-SF Categories (n/%)	Languishing	43 (29.0%)	159 (42.2%)
	Moderate	93 (62.4%)	181 (48.0%)
	Flourishing	13 (8.7%)	37 (9.8%)

Table 3. Multiple linear regression analysis predicting mental well-being from physical activity, age, experience, and sector (N = 526).

Predictor	B	SE	β	t	p	CI for B 95%	sr^2
Constant	18.495	6.040	-	3.062	0.002	6.33-30.36	-
MET min/week score	0.008	0.001	0.534	14.517	0.000	0.07-0.09	0.278
Age	0.435	0.161	0.103	2.696	0.007	0.18-0.75	0.010
Years of experience	-0.22	0.152	-0.05	-1.45	0.148	-0.51-0.78	0.003
Sector	-4.51	2.017	-0.082	-2.24	0.026	-0.55-8.47	0.007

Note: Model summary: $R = .559$, $R^2 = .313$, Adjusted $R^2 = .307$, $F(4, 521) = 59.231$, $p < .001$, sr^2 = squared semi-partial correlation.

The employment sector was a significant negative predictor ($\beta = -0.082$, $p = 0.026$), with those in the government sector reporting lower mental well-being scores, with a 95% CI for B between -8.47 and -0.55 . Although statistically significant, it explained only 0.7% of the unique variance ($sr^2 = 0.007$), indicating a very small practical contribution relative to physical activity. Years of experience did not significantly predict mental well-being ($p = 0.148$), uniquely accounting for 0.3% of the variance ($sr^2 = 0.003$), with a 95% CI for B ranging from -0.78 to 0.51 .

4. DISCUSSION

In this study, more than half of the employees (52.3%) were classified as having *low* physical activity, with females exhibiting slightly higher inactivity rates (53.3%) than males (49.7%), and only 10.5% achieved *high* activity levels. At the time of the study, 38.4% of the participants were categorized as *languishing*, whereas just 9.5% were *flourishing*. These distributions align closely with prior findings on prevalent inactivity and languishing among working-age adults [9, 27-29]. Such patterns likely stem from a confluence of factors, including sedentary occupational settings characterized by prolonged sitting and limited micro-movements, occupational stress that undermines psychological resilience, and a lack of engagement in leisure-time or self-directed physical activity. These patterns are more closely linked to positive mental health outcomes than activities performed in non-leisure contexts [30, 31].

Weekly physical activity (MET min/week) was identified as the most powerful predictor of positive mental well-being, explaining 27.8% of the variance, indicative of a large effect size. This strong predictive power may be explained by multiple biopsychosocial mechanisms. From a biological perspective, regular physical activity increases endorphin secretion and promotes cardiovascular regulation, mechanisms that collectively attenuate stress reactivity and contribute to greater mood stability. Similarly, psychological benefits of exercise include building self-efficacy and a sense of control, which cultivates resilience and emotional balance. Socially, participation in regular physical activity often involves interpersonal interaction, teamwork, and social support, all of which are known to improve positive affect and mental well-being [32].

Mental well-being was not significantly predicted by years of experience. The sample's relative homogeneity may explain this non-significant result. Most participants held similar office-based roles with comparable job demands, work routines, and organizational structures, limiting between-group variability. Years of experience might therefore not have produced meaningful variation in factors influencing emotional, psychological, and social well-being, or in opportunities for physical activity, which could explain the observed null effect on overall mental well-being.

This supports meta-analytic evidence that structured physical activity interventions can significantly lower

depression and anxiety symptoms while improving the overall quality of life [33]. These findings are consistent with those of a study by Singh *et al.* [34], who reported a significant positive association between moderate-to-vigorous physical activity and mental well-being among office workers. Consistent with Keyes' [9] mental health framework and subsequent research by Gunnell *et al.* [35], even modest increases in moderate-to-vigorous physical activity may facilitate a shift from *languishing* or *moderate* mental well-being toward *flourishing*. Importantly, leisure-time physical activity appears to confer greater psychological benefits than work- or transport-related activity, as it is often associated with autonomous motivation, skill mastery, and positive social interaction. In contrast, work-related activities, typically repetitive and externally controlled, may yield limited mental health gains [36].

These findings are also supported by regional data showing that among healthcare workers in the Middle East and North Africa (MENA) region, low physical activity is associated with a high prevalence of noncommunicable diseases and mental health issues [37]. Such parallels reinforce the regional relevance of promoting workplace wellness programs.

This finding is consistent with occupational health perspectives, which suggest that occupational context variables, such as increased administrative demands, limited organizational support, or reduced flexibility in managing work-life balance, may account for the slight but significant negative correlation between government-sector employment and mental well-being ($\beta = -0.082$) [35]. This pattern may also be explained through organizational psychology perspectives. Government-sector workplaces are typically characterized by bureaucratic rigidity, limited autonomy, and fewer workplace wellness initiatives than those in private organizations. Such structural constraints can heighten perceived administrative burden, reduce intrinsic motivation, and limit opportunities for health-promoting behaviors. These factors contribute to lower reported well-being among public employees. Supporting this interpretation, Kim *et al.* [38] found that staff shortages, high job demands, and constrained resources in local government contexts heightened burnout and frustration despite strong public service motivation. This interpretation also aligns with the Job Demands-Resources framework proposed by Bakker and Demerouti [39], which emphasizes that insufficient job resources and limited autonomy undermine psychological well-being in demanding work environments.

The study suggests that workplace wellness strategies should focus on increasing physical activity to improve employee mental well-being. For government sector employees, the most effective interventions are likely to include organizational support, flexible scheduling, and opportunities for social engagement, which address sector-specific challenges. Workplace policies should therefore focus on developing accessible and sustainable programs. Consistent with both this study and previous research [9, 30, 31], moderate-to-vigorous physical activity is strongly associated with *flourishing* mental well-being.

Such programs should be tailored to align with employee preferences and motivational drivers, thereby maximizing psychological benefits and improving overall quality of life.

Building on this recommendation, workplace wellness strategies should prioritize tailored interventions. For government-sector employees, introducing structured physical activity sessions during working hours, on-site fitness resources, and leadership-supported wellness initiatives may improve participation and well-being. Future research should employ longitudinal or experimental designs to examine causal pathways between physical activity domains and mental health and explore mediating factors, such as job satisfaction, organizational culture, and perceived autonomy.

5. STUDY LIMITATIONS

The study results should be interpreted with consideration of their specific limitations and contextual boundaries. First, the study's cross-sectional design enables association detection but prevents researchers from establishing cause-and-effect relationships between mental well-being and physical activity. Research designs that follow participants over time or implement interventions are needed to establish directionality.

Second, self-reported physical activity levels were measured using the GPAQ, which has been widely validated but is susceptible to recall bias and may overestimate or underestimate activity levels.

Third, the generalizability of the findings may be limited because the sample was restricted to office employees, who may not represent other occupational groups with different physical activity demands. Moreover, as participants were recruited during a professional conference, potential selection bias should be acknowledged, as such attendees may differ from the general workforce in motivation, education, or awareness of health-related behaviors. In addition, although key demographic and occupational variables were analyzed, other unmeasured confounders, such as dietary habits, sleep quality, and existing chronic conditions, may have influenced the observed associations between physical activity and mental well-being. Future studies should control these variables to strengthen the robustness and precision of the results.

Fourth, to fully capture the subtleties of employee well-being in occupational contexts, the mental well-being measure relied on the MHC-SF, which, despite its validation, could benefit from being supplemented with other qualitative or context-specific assessments.

CONCLUSION

This study offers further evidence that higher levels of physical activity are associated with better mental well-being among office employees. These results point to the value of workplace initiatives that make active lifestyles easier to adopt and maintain while also supporting a sense of purpose and satisfaction at work. Identifying activity patterns alongside workplace-specific challenges enables realistic, flexible interventions that match varying work

environments. The applied knowledge enables policy-makers and employers to create programs that promote physical activity while improving the overall quality of working life.

AUTHOR'S CONTRIBUTIONS

The author declares full responsibility for the study conception and design, data collection, analysis, and interpretation of results, as well as manuscript preparation, review, and approval.

LIST OF ABBREVIATIONS

GPAQ	= Global Physical Activity Questionnaire
MHC-SF	= Mental Health Continuum Short Form
WHO	= World Health Organization
MET	= Metabolic Equivalent of Task
QR	= Quick Response Code

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

At the time of the study, the author's institution did not require formal ethics approval for anonymous, non-interventional survey research involving adults. All procedures adhered to the Declaration of Helsinki (2013 revision).

HUMAN AND ANIMAL RIGHTS

Every procedure involving human participants was conducted in accordance with the ethical standards of the 1975 Declaration of Helsinki, as revised in 2013, and with the institutional and/or research committee guidelines.

CONSENT FOR PUBLICATION

Electronic informed consent was obtained from all participants before data collection.

STANDARDS OF REPORTING

STROBE guidelines were followed

AVAILABILITY OF DATA AND MATERIALS

All data supporting the findings of this study are available from the corresponding author [F.B] upon reasonable request.

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CONFLICT OF INTEREST

The author declares no conflict of interest, financial or otherwise.

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