Physiological Activity and Well-being Status among Employees of University of Medical Sciences

Zahra Rampisheh1, Mozdeh Ramezani1, Narjes Khalili1, Parissa Massahikhaledi1, Soodabeh Hoveidamanesh2, Susan Darroudi3, Neda SoleimanvandiAzar4, Batool Tayefi1*

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Abstract
Background: Workplace physical activity plays an important role in employees’ health. As university employees are a population at risk for a sedentary working pattern, this study aimed to investigate the physical activity status of employees of Iran University of Medical Sciences (IUMS) and its subsequent effects on their well-being.

Methods: This cross-sectional study included 472 employees from different units of IUMS in Tehran. The participants were selected by a multistage sampling method. Interviews were conducted by using an international physical activity questionnaire, a questionnaire for stages of behavioral change, the World Health Organization Well-being Questionnaire, and a demographic checklist from July to October 2019. Analysis of variance, t test, and logistic regression analysis were used. Data were analyzed using IBM SPSS (Version 21.0).

Results: Total physical activity in the study population was 6216.58 ± 5886.09 MET-minutes/week. The mean score of the well-being index was 54.72 ± 22.4; there was an association between sex and location of work with physical activity in domains (p<0.05). The highest prevalence rates for change of stage of physical activity were found in the maintenance stage for men and the contemplation stage for women. There was a significant difference between men and women's well-being index—men reported being more active and energetic than women (p<0.001). Results also revealed that having vigorous physical activity compared with a moderate level could increase the well-being index.

Conclusion: Physical activity behavior at the workplace was associated with well-being level. It could, therefore, be postulated that enhancing physical activity may be beneficial to improving well-being in an academic environment.

Keywords: Physical Activity, University Workplace, Trans-Theoretical Model, Well-Being

Introduction
It is now widely accepted that physical activity is a key feature of a healthy lifestyle, which positively influences

--- What is “already known” in this topic:
• It is now widely accepted that physical activity is a key feature of a healthy lifestyle.
• Individuals who are physically active have reduced health-care expenditures, burnout, sick days, and feel more energized, satisfied, and active during work hours.

--- What this article adds:
• Total physical activity in employees who worked in the service unit was significantly higher than in other groups.
• Employees with high physical activity level had better well-being feeling than those with low physical activity level.
• Individuals who were in the preparation and maintenance stages of a physical activity behavior had more well-being feeling than the individuals in the contemplation stage.

1. Preventive Medicine and Public Health Research Center, Psychosocial Health Research Institute, Department of Community and Family Medicine, School of Medicine, Iran University of Medical Sciences, Tehran, Iran
2. Burn Research Center, Iran University of Medical Sciences Tehran, Iran
3. Student Research Committee, International UNESCO Center for Health-Related Basic Sciences and Human Nutrition, Mashhad University of Medical Sciences, Mashhad, Iran
4. Preventive Medicine and Public Health Research Center, Psychosocial Health Research Institute, Iran University of Medical Sciences, Tehran, Iran

Corresponding author: Dr Batool Tayefi, tayefi.b@iums.ac.ir

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Physical Activity and Well-being

health conditions across the lifespan (1-3); also, regular physical activity is proven to help prevent and manage non-communicable diseases such as heart disease, stroke, diabetes, and several cancers (4, 5). It also helps prevent hypertension, maintain healthy body weight, and improve mental health, quality of life, and well-being (4, 5). Workplace health promotion programs are designed to improve the physical activity of workers. The World Health Organization and the World Economic Forum have indicated that the workplace is an ideal location to implement improving programs to reduce diabetes, obesity, and cardiovascular disease risk factors in employees (5). Previous researches have evaluated workplace health conditions in terms of nutrition (6), stress management (7), tobacco cessation (8), and physical activity (9-12). Of particular attention, the workplace has the potential of reaching a significant proportion of employed adults, and this group spends the main part of their time at work (13). Hence, the workplace is an ideal objective location to assess, conclude, and promote healthy behaviors of employee populations. Increasing employees’ physical activity can create a healthier workforce, improve productivity, and decrease employees’ risk of developing costly and debilitating chronic diseases (14). Results of studies showed that physically active employees have lower health care costs, show a lower level of burnout, require a lesser amount of sick leave, and feel more vigorous, satisfied, and active during working hours (15-17).

Previous studies revealed that engaging in physical activity could have a positive effect on depression and anxiety (2, 18) and physical activity can improve people’s self-perception and self-esteem, mood, and subjective well-being, reduce stress, and improve sleep quality (19). The trans-theoretical model is used to assess the physical activity behavior of individuals; each stage of this model could be related to the amount of one’s physical activity. Well-being is a comprehensive concept and largely depends on living standards and it is an essential global issue that achieving better well-being is an important challenge for governments and organizations all around the world (19-21). Well-being is an example of a positive construct of mental health that may be promoted by physical activity (19). There was a strong emphasis on documenting physical activity at the international and national levels in the last decade in order to produce clinical guidelines to prevent difficulties (22). In addition, it appears that the advancement of well-being is emerging as a public health priority in several countries globally.

One issue that should be taken into account is that these studies should be conducted in different communities. The academic environment is one of the public communities where individuals with different knowledge levels, economic status, and social norms reside together. On the other hand, the health status of the university’s staff will have an undeniable impact on achieving the goals of this organization. Iran University of Medical Sciences (IUMS) covers a complex of educational environments such as colleges, research centers, and health care provider units such as primary health care centers and hospitals. As university employees are a population at risk for a sedentary working pattern, the purpose of this study was to investigate the physical activity status of employees of IUMS, and its subsequent effects on their well-being.

Methods

Study Sampling and Data Collection

This was a cross-sectional study with a population consisting of all 11,901 employees of IUMS. According to the information obtained from the literature review, by considering 95% confidence interval, (α = 0.05), (σ = 560) and accuracy coefficient (d = 56), the sample size was estimated to be 385 individuals. Considering the design effect of 1.2, the final sample size increased to 480 individual (23).

A total of 480 samples were selected using a multistage sampling method. The first stage was stratified sampling, in which each of the 5 main categories of job units, including university administrative/financial units, faculties, hospitals, health networks, and primary health care centers, research institutes, and research centers, were considered as a stratum.

At the second stage, the sample size assigned to each stratum was proportionally determined based on the number of employees in each included unit. Then, from a complete list of employees, the desired number of samples were selected by systematic random sampling from each of the selected units, and then the data were collected.

All of the individuals were over the age of 18 and had no mobility disorders that limited their physical activity. The ones who did not consent to participate in the study were excluded. There were not any limitations in sex type, work experience duration, and type of employment in the selection of participants.

About 30 minutes of face-to-face interviewing were conducted by using structured questionnaires (physical activity questionnaire, questionnaire for stages of behavioral change, and 5-item WHO Well-being questionnaire) and demographic checklist (including sex, age, educational status, marital status, location of work, and work shift were questioned), by three pre-trained interviewers according to the location of the workplace. To ensure the quality of the interviews, all the interviewers, had received extensive training prior to data collection. Finally, completed questionnaires were carefully checked by quality supervisors at the end of each day.

Respondents were assured that participation in the study was voluntary. All necessary informed consent was self-evidently complemented for each participant.

The study was approved by the Research Ethics Committee of Iran University of Medical Sciences, Tehran, Iran (IR.IUMS.REC.1397.733).

Due to the incompleteness of some questionnaires, 8 questionnaires were excluded from the study and finally the information of 472 employees was entered into statistical analysis. The overall response rate among those eligible was 98.33% yielding a total of 472 participants.

Physical Activity Assessment

Physical activity was evaluated by the standard International Physical Activity Questionnaire (IPAQ) (24). The re-
liability and validity of the Persian version of this question-naire which include 27 questions and 5 sections, confirmed by Vasheghani Farahani et.al (25).

The IPAQ is used to assess habitual PA during the past 7 days. There are two versions, the long form (27 items) and the short form (7 items). The long version of IPAQ was used in the present study which participants were asked to report the intensity, and duration of their work (7 items), domestic and gardening (6 items), leisure time (6 items), and transport-related physical activities (6 items) engaged in the past week. The questionnaire also includes two questions about the time spent on sitting as an indicator of sedentary behavior. The number of days per week and the time spent on walking per day as well as moderate and vigorous activities from all four domains are recorded (25).

Individuals are classified into three categories with low (600), moderate (600-3000), and high physical activity (≥3000) according to their MET scores (MET minutes represent the amount of energy expended carrying out physical activity) (26).

The stages of behavioral change (Trans-theoretical model) were used to assess the physical activity behavior of subjects. Participants were classified based on the five stages include pre-contemplation, contemplation, preparation, action, and maintenance (27). In the pre-contemplation stage, the person has no physical activity and does not intend to start in the next 6 months. In the contemplation status, although the person is physically inactive, but have intend to begin physical activity within the following 6 months. At the preparation stage, the subject has physical activity, but less than the recommended level. In the action phase, the person performs a regular physical activity for less than 6 months. However, the maintenance stage includes individuals to maintain regular physical activity for more than 6 months.

Well-being Assessment

Well-being was measured using the 5-item World Health Organization Well-Being Index (WHO-5), which is a widely used questionnaire assessing the psychological well-being of individuals. These items are included: (1) I have felt cheerful and in good spirits; (2) I have felt calm and relaxed; (3) I have felt vigorous and active; (4) I woke up feeling fresh and rested; and (5) My every day has been filled with things that interest me. Each of the 5 items is scored from 5 (all of the time) to 0 (none of the time). Thus, the total score of subjective well-being ranges from 0 to 25. To obtain a percentage score as the index ranging from 0 to 100, the raw score is multiplied by 4. A percentage score of 0 represents the worst, whereas a score of 100 represents the best imaginable well-being. In some studies this index is categorized to ≤50% and >50%; which the index of ≤50% implies the decreased well-being (28).

Statistical Analysis

Data analyses were performed using IBM SPSS (Version 21.0). The normality of data distribution was evaluated using the Kolmogorov-Smirnov test.

Descriptive statistics, including mean, frequency, and standard deviation were defined for all variables and expressed as mean ± standard deviation (29). Differences between the 2 groups were compared using a t test, and analysis of variance was used for comparison between more than 2 groups. A logistic regression analysis was used to evaluate the association between physical activity, physical activity behavior, and the well-being index. P<0.05 was considered statistically significant.

Results

Demographic Characteristics

The data of 472 participants (134 men and 338 women) were entered into the analysis. All participants were at least 18 years old. The mean age of the participants was 37.07 ± 9.48 years old. In our study, 336 (72.1%) were married and 130 (27.9%) unmarried. According to the workplace, 84 (19.1%) of participants worked in the primary health care units, 212 (48.2%) in the hospitals, 95 (21.6%) in the administrative/financial area, 14 (3.2%) in the faculties as academic members, and 35 (8%) in the service units. Among these, 308 (68%) worked at day, 6 (1.3%) at night, and 139 (30.7%) in a rotational situation (Table 1).

Table 1. Demographic Characteristics of Participants

| Variable            | Frequency |
|---------------------|-----------|
| Age (year)          | 37.07 ± 9.48 |
| Sex                 | 134 (28.4%) |
| Educational status  | 338 (71.6%) |
| Employment status   | 100 (21.5%) |
| Marital status      | 130 (27.5%) |
| Location of work    | 84 (19.1%)  |
| Work shifts         | 212 (48.2%) |

Data presented as Mean ± SD for continuous variables or frequency for categorical parameters.
Physical Activity and Well-being

Physical Activity Status and Physical Activity Behavior Stage

As data presented in Table 2, total physical activity in the study population was 6216.58 ± 5886.09 MET-minutes/week, and physical activity in walking, moderate, vigorous, and sitting was 2056.41 ± 2200.25, 2258.13 ± 2374.94, 2062.16 ± 3261.22, and 277.05 ± 169.89 MET-minutes/week, respectively (Table 2).

As shown in Table 2, there were no significant relation with sex for our analyses of walking (p=0.109), sitting status of physical activity (p=0.792), or moderate physical activity level (p=0.312). However, we observed a significant difference between men and women regarding physical activity in a vigorous state (p=0.029) (Table 2). To age parameter, total physical activity in walking and sitting states were not significantly different between participants aged ≤35 years and >35. However, in moderate or vigorous activities, differences between the 2 groups were significant, p=0.069 and p=0.063, respectively.

There was an association between sex and location of work with physical activity in each domain (i.e. work time, transport, domestic, and leisure time). These associations remained statistically significant for the work time, domestic and leisure time domains for men compared with women (p<0.05). Total physical activity in employees who worked at the service unit was significantly higher than in other groups (p<0.05). However, there were no significant differences between primary health care units, hospitals, administrative/financial units, faculties academic members, and service units in physical activity at different day times (p>0.05) (Table 2).

Based on the results shown in the Table 2, there were no significant differences between marital status and total physical activity in walking, sitting, moderate, and vigorous states (p>0.05). Moreover, there were no significant differences between marital status and physical activity in each domain (i.e., work time, transport, and domestic and leisure time physical activity) (p>0.05) (Table 3). Also, we did not find any association between work shift and total physical activity in walking, moderate, and vigorous states (p>0.05) (Table 2) and physical activity in each domain (i.e. work time, transport, domestic and leisure time) (p>0.05) (Table 3); but there was an association between shift work and sitting (p<0.05), participants who worked in night shift had more sitting state than others (Table 2).

Overall, 13.4% of the participants were reported in the pre-contemplation stage, 31.5% in the contemplation stage, 18.5% in the preparation phase, 15.2% in the action stage, and 21.4% in the maintenance stage of physical activity behavior. Women were significantly more likely than men to be in the stages of precontemplation, contemplation, preparation, and action (p<0.05), whereas men were significantly more likely to be in the maintenance stage (p<0.05) (Table 3).

Table 2. Descriptive Characteristics of Physical Activity Level by Demographic Variables

|                          | Total physical activity | Walking       | Moderate      | Vigorous      | Sitting   |
|--------------------------|-------------------------|---------------|---------------|---------------|-----------|
| Total                    | 6216.58±5886.09         | 2056.41±2200.25 | 2258.13±2374.94 | 2062.16±3261.22 | 277.05±169.89 |
| Sex                      |                         |               |               |               |           |
| Male                     | 6847.37±6923.82         | 2342.83±2439.86 | 2082.09±2446.32 | 2589.35±3603.82 | 273.65±195.06 |
| Female                   | 5968.95±5416.9          | 1947.5±2095.13 | 2329.52±2345.46 | 1855.39±3097.92 | 278.12±159.74 |
| P-value 1                | 0.023                   | 0.109         | 0.312         | 0.029        | 0.063     |
| Age (year)               |                         |               |               |               |           |
| ≤ 35                     | 6379.25±5569.03         | 2247.25±2125.03 | 2273.27±2336.59 | 1953.2±2949.89 | 396.07±196.35 |
| > 35                     | 5718.13±5822.03         | 1859.13±2210.03 | 2134.08±2262.56 | 1977.82±3398.52 | 265.41±145.53 |
| P-value 1                | 0.245                   | 0.069         | 0.534         | 0.940        | 0.063     |
| Location of work         |                         |               |               |               |           |
| Primary health care centers | 6156.66±6172.53     | 1848.0±2192.82 | 2596.5±2731.53 | 2596.5±2731.53 | 2287.34±1167.03 |
| Hospitals                | 6479.93±5399.84         | 2212.23±2158.59 | 2441.56±2254.99 | 2441.56±2254.99 | 1765.72±1150.65 |
| Administrative/financial unit | 5535.7±1048.55    | 1743.04±2045.29 | 1943.59±2405.07 | 1943.59±2405.07 | 2290.52±1144.92 |
| Academic position (Faculties) | 2949±2732.64    | 1171.5±1171.51 | 728.21±1278.47 | 728.21±1278.47 | 2502.85±1121.12 |
| Service unit             | 10345.78±8728.74       | 3506.25±3065.95 | 2893.71±2539.37 | 2893.71±2539.34 | 931.76±954.05 |
| P-value 2                | <0.001                  | 0.001         | 0.017         | 0.017        | <0.001    |
| Marital status           |                         |               |               |               |           |
| Unmarried                | 6078.86±6089.11         | 2179.91±2302.41 | 2044.37±2459.04 | 2016.05±3176.32 | 280.79±168.58 |
| Married                  | 6146.57±5673.12        | 1990.07±1655.79 | 2303.67±2307.2 | 2016.06±3234.74 | 275.08±170.43 |
| P-value 1                | 0.917                   | 0.43          | 0.925         | 0.743        |           |
| Work shifts              |                         |               |               |               |           |
| Day                      | 6099.94±6058.23         | 1956.8±2126.05 | 2222.21±2148.62 | 2080.2±3268.58 | 291.15±166.56 |
| Night                    | 3103.01±2747.44         | 1457.5±1653.48 | 1322.56±1295.75 | 26.66±65.13 | 486.78±328.9 |
| P-value 2                | 0.393                   | 0.378         | 0.585         | 0.278        | <0.001    |

* Metabolic equivalent minutes (MET)-minutes/week.
1 Student t test.
2 One-way ANOVA.

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Well-being Assessment

According to results, the mean score of the well-being index components, including 1, 2, 3, 4, and 5 items, was $12.11 \pm 5.04$, $11.32 \pm 5.24$, $11.58 \pm 5.22$, $10.38 \pm 5.58$, and $9.59 \pm 5.29$, respectively; and the total well-being index was $54.72 \pm 22.4$. The results of the Well-being index showed that most participants had well-being feelings most of the time. There was a significant difference between men (58.34 ± 20.84) and women’s (53.3 ± 22.86) well-being index ($p=0.028$) (Table 4).

Association Between Physical Activity and Well-being

We presented the relationship of physical activity levels, with well-being index and physical activity behavior stages in Table 5. The results showed that 48% of those with well-being >50% had high physical activity level and 36.2% of those with well-being ≤50 had low physical activity level; however, there were no significant differences between physical activity levels and the well-being index ($p=0.114$).

Moreover, the results revealed that persons with high physical activity levels were more in the maintenance phase and those with low physical activity levels were more in the contemplation phase, and there were significant differences between physical activity levels and physical activity behavior stages ($p=0.032$) (Table 5).

To estimate the association between physical activity levels and physical activity behavior stages with the well-being index, a simple binary logistic regression model was used.

The results of the logistic regression showed that individuals with a high level of physical activity were 1.598 times more well-being feelings than the individuals with a low level of physical activity have feelings of well-being (odds ratio [OR], 1.598; 95% CI, 1.02-2.488). After adjustment for sex, marital status, work shifts, location, and the duration of physical activity, this relation remains statistically significant (OR, 1.685; 95% CI, 1.03-2.742).

Moreover, it was found that those who were in the preparation stage of a physical activity behavior (OR, 2.58; 95% CI, 1.30-5.115) and maintenance stage of a physical activity behavior (OR, 3.932; 95% CI, 1.97-7.849) had 2.58 and 3.932 times more well-being feelings than the individuals

Well-being Index scores can be calculated using the following formula:

$$ Well-be ing\ Index = \frac{1}{5} \times \sum_{i=1}^{5} \text{Well-be ing\ Index\ of\ Item\ i }$$

### Table 3. Descriptive Characteristics of Physical Activity Domains in Day Time According to Demographic Variables

| Physical activity in different daytime* | Work time PA | Transport PA | Domestic PA | Leisure time PA |
|----------------------------------------|-------------|-------------|-------------|----------------|
| Total                                  | 3153.79±4071.7 | 4299.68±3625.56 | 1458.67±2091.35 | 1005.17±1948.1 |
| Sex                                    | Male        | Female      |             |                |
| P-value1                                |             |             |             |                |
| Location of work                        | Primary health care centers | Hospitals |             |                |
| P-value2                                |             |             |             |                |
| P-value3                                |             |             |             |                |
| Marital status                          | Unmarried   | Married     |             |                |
| P-value4                                |             |             |             |                |
| Work shifts                             | Day         | Night       | Rotational  |                |
| P-value5                                |             |             |             |                |

*MET-minutes/week.

1 Student t test.

5 One-way ANOVA.

### Table 4. Stages of Behavior Change (physical activity) Based on Trans-theoretical Model and Well-being Index of Participants According to 5-Item World Health Organization

| Stages of behavior change (PA) | Total (PA) | Male | Female | P-value |
|--------------------------------|------------|------|--------|---------|
| Pre-contemplation              | 61 (13.4%) | 11 (8.7%) | 50 (15.3%) | 0.001   |
| Contemplation                  | 143 (31.5%) | 33 (26%) | 110 (33.6%) |       |
| Preparation                    | 84 (18.5%) | 23 (18.1%) | 61 (18.7%) |       |
| Action                         | 69 (15.2%) | 17 (13.4%) | 52 (15.9%) |       |
| Maintenance                    | 97 (21.4%) | 43 (33.9%) | 54 (16.5%) |       |
| Well-being index               | Total      | Male | Female |        |
| Well-being index score         | 54.72±22.4 | 58.34±20.84 | 53.3±22.86 | 0.028   |

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who were in the contemplation stage. When the regression formula was adjusted for the demographic and worksite variables, the same statistically significant relations were observed between the behavior stages variables and well-being (Table 6).

Discussion

We have investigated the mean physical activity level, physical activity behavior, and well-being index in different work domains. The level of total, moderate, and vigorous physical activity, and walking were higher in employees who worked in service units. Moreover, the sitting state was higher in academic positions. Our finding demonstrated that the total well-being index in men was higher than in women. Participants in the maintenance stage were mostly in the maintenance stage and women in the pre-contemplation stage. Results of a study on Iranian nursing and midwifery students revealed that many of them were in the inactive stage. In this survey, participants were mostly women (86%), 29% of them were in the contemplation stage (33), which is close to our data, 33%. Results from a cross-sectional descriptive study on exercise behavior among female students from Hamadan University of Medical Sciences revealed that most of the students were in the contemplation stage, and not sufficiently active (34). Irwin et al by analyzing a total of 35,747 university students (20,179 women and 15,568 men) from 27 countries (Australia, Canada, China, Germany, Nigeria, United States, and 21 European countries) found that women were among the least active students (35). Our study showed that intense physical activity at the workplace for men was significantly higher than for women. In fact, the literature is consistent in presenting that men have more practicing physical activity than women (36, 37). According to a cross-sectional study comprised of adult participants from Tehran, Momenn et al reported that the prevalence of physical inactivity was 69.8% and only 30.3% of women had adequate physical activity (38). Our results also indicated that men were more active in their leisure time than women. These findings are inconsistent with those of

Table 5. Relation Between Physical Activity Levels With Well-being Index and Physical Activity Behavior Stages

| Well-being index | Physical Activity Level | P-value |
|------------------|------------------------|---------|
| Well-being ≤50   | High (39.7%)           | 69      |
| Well-being >50   | Moderate (24.1%)       | 42      |
|                  | Low (36.2%)            | 63      |

Table 6. logistic Regression Model (Crude and Adjusted Odd’s Ratio) of Well-being Based on Physical Activity Levels and Physical Activity Behavior Stages Before and After Adjusting for Sex, Marital Status, Work Shifts and Location, and the Duration of Physical Activity

| Physical activity levels/ Physical activity behavior stages (Reference group) | Crude OR | P-value | Adjusted OR | P-value |
|-----------------------------------------------------------------------------|---------|---------|-------------|---------|
| High PA                                                                     | 1.598 (1.02-2.488) | 0.034 | 1.685 (1.035-2.742) | 0.036 |
| Moderate PA                                                                 | 1.342 (0.806-2.234) | 0.250 | 1.074 (0.618-1.865) | 0.843 |
| Contemplation stage (ref: Pre-contemplation stage)                          | 1.426 (0.778-2.613) | 0.250 | 1.118 (0.62-2.276) | 0.612 |
| Preparation stage                                                           | 2.58 (1.302-5.115) | 0.007 | 2.249 (1.082-4.676) | 0.035 |
| Action stage                                                                | 1.90 (0.942-3.835) | 0.073 | 1.491 (0.699-3.181) | 0.388 |
| Maintenance stage                                                           | 3.932 (1.977-7.849) | 0.001 | 3.355 (1.576-7.142) | 0.002 |

*According to the WHO, the Well-being index was classified as 2 groups: well-being ≤50; well-being >50.

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a study on college students enrolled in health education, analyzed via the trans-theoretical model. Results demonstrated that compared with women, men are not only intended to spend less sitting time but also are more likely to perform frequent movements to avoid or interrupt extended sitting time (39).

The inverse relationship between mental health problems with physical activity is widely accepted. However, research on the association between physical activity and positive mental health outcomes is limited. Thus, our secondary objective was to investigate the possible relationships between physical activity and well-being. The results of our study revealed that having vigorous physical activity compared with a low level can increase well-being by 1.59 times. Consistent with our result, a study in young adults reported that when compared with moderate physical activity, vigorous exercise has been associated with reduced stress, increased mental health, and fewer symptoms of depression (40). Children and adolescents who suffer from mental health problems, along with moderate to vigorous physical activity of <60 minutes a day, are more prone to poor quality of life (41). Previous studies have shown that interventions that modify health-related parameters such as physical activity and well-being, can indirectly elicit improvements in quality of life (42). As well, results of a recent study suggested that vigorous physical activity was associated, both directly and indirectly, with mental well-being and physical and psychological quality of life (43). In accordance with earlier researches, the current results demonstrated that women were more likely to experience poorer physical activity and well-being than men.

According to our findings, employees in the preparation and maintenance stages of physical exercise behavior felt 2.25 and 3.35 times better wellbeing feeling than those in the pre-contemplation stage. To the best of our knowledge, this relationship has not been addressed in other relevant studies. It seems that at the preparation stage, the motivation at the beginning of activity probably improves the well-being feelings of the individuals. At the maintenance stage, the good impact of regular physical exercise for more than 6 months has been discovered, which may increase employee well-being feelings. Previous researches from several countries showed that physical activity for leisure time appears to have a stronger association with mental health than other domains of physical activity (44, 45); consistent with this, our results indicated that men were more energetic and active than women in the leisure domain, which could explain their greater well-being feelings.

It could be suggested that improving well-being indicators by increasing vigorous physical activity may be beneficial. These results should be considered for future evidence-based approaches and policies on targeting physical activity interventions to promote well-being and other positive constructs of mental health especially in women.

Interventions aimed at people and communities, for example, that use social support, rewards, and modifying societal norms to promote favored behavior changes are advised (46). Policy, regulatory, and environmental development measures may be beneficial in encouraging employees to engage in physical activity at work. The Policy Regulatory and Environmental Development interventions could be effective in promoting physical activity at the workplace (47).

These findings may provide important information on changing physical activity behaviors to improve employees’ well-being. Nonetheless, while this study has a number of strengths, limitations should also be considered. First, because the present study was cross-sectional, no cause-effect connections between physical exercise and well-being could be established. Second, the study participants were all employees of a medical university, which may limit the applicability of the findings to employees of other organizations.

Conclusion

The findings of this study showed that men have more vigorous physical activity than women, and employees with high physical activity levels had better well-being feelings than those with low physical activity levels. The findings of this study are significant in terms of understanding the link between workplace physical exercise and degrees of well-being. As a result, it may be hypothesized that increasing physical exercise, particularly among women, would be beneficial for improving academic well-being.

Compliance with Ethical Standards

This study was approved by the ethics committee of Iran University of Medical Sciences (Ethics code: IR.IUMS.REC.1397.733); and the Preventive Medicine and Public Health Research Center financially supported this research.

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Conflict of Interests

The authors declare that they have no competing interests.

References

1. Bauman AE. Updating the evidence that physical activity is good for health: an epidemiological review 2000-2003. J Sci Med Sport. 2004;7(1 Suppl):6-19.
2. Biddle SJ, Asare M. Physical activity and mental health in children and adolescents: a review of reviews. Br J Sports Med. 2011;45(11):886-95.
3. Larun L, Nordheim LV, Ekeland E, Hagen KB, Heian F. Exercise in prevention and treatment of anxiety and depression among children and young people. Cochrane Database Syst Rev. 2006(3):CD004691.
4. Ahmad S, Sajjadi H, Nejad FN, Ahmadi N, Karimi SE, Yoosof M, et al. Lifestyle modification strategies for controlling hypertension: How are these strategies recommended by physicians in Iran? Med J Islam Repub Iran. 2019;33:43.
5. WHO/WEF. Preventing noncommunicable diseases in the workplace through diet and physical activity: WHO/World Economic Forum report of a joint event. Geneva : World Health Organisation / World Economic Forum. 2008.
6. Matwiejczyk L, Field L, Withall E, Scott J. An Online Workplace Healthy Lunchbox Challenge for Adults. J Nutr Educ Behav.
2015;47(4):399-401.e1.
7. Grawitch MJ, Ballard DW, Erb KR. To Be or Not to Be (Stressed): The Critical Role of a Psychologically Healthy Workplace in Effective Stress Management. Stress Health. 2015;31(4):264-73.
8. Hughes MC, Yette EM, Hannon PA, Harris JR, Tran NM, Reid TR. Promoting tobacco cessation via the workplace: opportunities for improvement. Tob Control. 2011;20(4):305-8.
9. Ainsworth BE, Der Ananian C, Soroush A, Walker J, Swan P, Poortvliet E, et al. "ASUKI Step" pedometry in intervention in university staff: rationale and design. BMC Public Health. 2012;12:657.
10. Attasalo M, Rinne M, Pasanen M, Kukkonen-Harjula K, Vasan Kar T. Promoting walking among office employees - evaluation of a randomized controlled intervention with pedometers and e-mail messages. BMC Public Health. 2012;12:403.
11. McCaehan RK, Lawton RJ, Jackson C, Conner M, Meads DM, West RM. Testing a workplace physical activity intervention: a cluster randomized controlled trial. Int J Behav Nutr Phys Act. 2011;8:29.
12. Pillay JD, Kolbe-Alexander TL, Proper KJ, van Mechelen W, Lambert EV. Steps that count! The development of a pedometer-based health promotion intervention in an employed, health insured South African population. BMC Public Health. 2012;12:880.
13. Linnan L, Bowling M, Childress J, Lindsay G, Blakey C, Pront S, et al. Results of the 2004 National Worksite Health Promotion Survey. Am J Public Health. 2008;98(8):1503-9.
14. Prevention CfDCa. The National Healthy Worksite Program 2011 Evaluation Report. [http://www.cdc.gov/nationalhealthyworksite/about/index.html].
15. Carlson SA, Atienza JA, Pratt M, Yang Z, Adams EK. Inadequate physical activity and health care expenditures in the United States. Prog Cardiovasc Dis. 2015;57(4):315-23.
16. Goetzel RZ, Poi Xi, Tabrizi MJ, Henke RM, Kowlessar N, Nelson CF, et al. Ten modifiable health risk factors are linked to more than one-fifth of employer-employee health care spending. Health Aff (Millwood). 2012;31(11):2474-84.
17. Wang F, McDonald T, Champagne LJ, Edington DW. Relationship of body mass index and physical activity to health care costs among employees. J Occup Environ Med. 2004;46(5):428-36.
18. Fox KR. The influence of physical activity on mental well-being. Public Health Nutr. 1999;2(3a):411-8.
19. Thogersen-Ntoumani C, Loughren EA, Taylor IM, Duda JL, Fox KR. A step in the right direction? Change in mental well-being and self-reported work performance among physically inactive university employees during a walking intervention. Menst Health Practic Actic. 2014;7(2):89-94.
20. Kamal SHM, Basakha M, Harouni GG. Women’s well-being in Iran: Territorial analysis using a multidimensional approach. Soc Indic Res. 2018;137(3):1061-72.
21. Kamal SHM, Basakha M, Khojasteh A, Parnian P. Global physical activity levels: surveillance progress, pitfalls, and prospects. Lancet. 2012;380(9838):247-57.
22. da Silva JA, da Silva KS, da Silva Lopes A, Nahas VM. Behavior change stages related to physical activity in adolescents from Santa Catarina: prevalence and associated factors. Rev Paul Pediatr. 2016;34(4):476-83.
23. Momenan AA, Delshad M, Mirrhamn P, Ghanbarian A, Azizi F. Leisure Time Physical Activity and Its Determinants among Adults in Tehran: Tehran Lipid and Glucose Study. Int J Prev Med. 2011;2(4):243-51.
24. Han H, Pettee Gabriel K, Kohl HW, 3rd. Application of the transtheoretical model to sedentary behaviors and its association with physical activity status. PLoS One. 2017;12(4):e0176330.
25. Gerber M, Brand S, Hermann C, Colledge F, Holsboer-Trachsler E, Puhse U. Increased objectively assessed vigorous-intensity exercise is associated with reduced stress, increased mental health and good objective and subjective sleep in young adults. Physiol Behav. 2014;135:17-24.
26. Sharpe H, Patalay P, Fink E, Vostanis P, Deighton J, Wolpert M. Exploring the relationship between quality of life and mental health problems in children: implications for measurement and practice. Eur Child Adolesc Psychiatry. 2016;25(6):659-67.
27. Monyeki MA, Neetens R, Moss SJ, Twisk J. The relationship between body composition and physical fitness in 14 year old adolescents residing within the Tlokwe local municipality, South Africa: the PAHL employee wellness program. PLoS One. 2017;12(5):e0176872.
28. Booth M. Assessment of physical activity: an international perspective. Res Q Exerc Sport. 2000;71(2 Suppl.S114-20.
29. Vasheghani-Farahani A, Tahmashi M, Asheri H, Ashraf H, Hedjat S, Kordi R. The Persian, last 7-day, long form of the International Physical Activity and Health (IPAQ) questionnaire: translation and validation study. Asian J Sports Med. 2011;2(2):106.
30. Van Krieket IE, van't Veer J, de Vries F, deWit M, Verbeek J, Visser EM. The transtheoretical model (TTM) to gain insight into young women's long-term physical activity after bariatric surgery: a qualitative study. Obes Surg. 2019.
31. Topp CW, Östergaard SD, Søndergaard S, Bech P. The WHO-5 Well-Being Index: a systematic review of the literature. Psychother Psychosom. 2015;84(3):167-76.
32. Godoy P, Hewit NJ, Alenbach U, Andersen ME, Ansari N, Bhattacharya S, et al. Recent advances in 2D and 3D in vitro systems using primary hepatocytes, alternative hepatocyte sources and non-parenchymal liver cells and their use in investigating mechanisms of hepatotoxicity, cell signaling and ADME. Arch Toxicol. 2013;87(8):1315-530.
33. Losina E, Yang HY, Deshpande BR, Katz JN, Collins JE. Physical activity and unplanned illness-related work absenteeism: Data from an employee wellness program. PLoS One. 2017;12(5):e0176872.
34. Kahn EB, Ramsey LT, Brownson RC, Heath GW, Howze EH, Powell KE, et al. The effectiveness of interventions to increase physical activity. A systematic review. Am J Prev Med. 2002;22(4 Suppl):73-107.
35. Pront NP. Physical activity promotion in business and industry: evidence, context, and recommendations for a national plan. J Phys Act Health. 2009;6 Suppl 2:S220-35.
36. Sarvestani MMMRS. Assessing Stages of Exercise Behavior Change, Self Efficacy and Decisional Balance in Iranian Nursing and Midwifery Students. J ICBNM. 2013;1.
37. Emdadi S, Nilsaze M, Hosseini B, Sohrabi F. Application of the Trans-Theoretical Model (TTM) to Exercise Behavior among Female College Students. J Res Health Sci. 2007;7(2):25-30.
38. Irwin JD. Prevalence of university students' sufficient physical activity: a systematic review. Percept Mot Skills. 2004;98(3 Pt 1):927-43.
39. Hallal PC, Andersen LB, Bull FC, Guthold R, Haskell W, Ekelund U. Global physical activity levels: surveillance progress, pitfalls, and prospects. Lancet. 2012;380(9838):247-57.
40. Gerber M, Brand S, Hermann C, Colledge F, Holsboer-Trachsler E, Puhse U. Increased objectively assessed vigorous-intensity exercise is associated with reduced stress, increased mental health and good objective and subjective sleep in young adults. Physiol Behav. 2014;135:17-24.
41. Sharpe H, Patalay P, Fink E, Vostanis P, Deighton J, Wolpert M. Exploring the relationship between quality of life and mental health problems in children: implications for measurement and practice. Eur Child Adolesc Psychiatry. 2016;25(6):659-67.
42. Monyeki MA, Neetens R, Moss SJ, Twisk J. The relationship between body composition and physical fitness in 14 year old adolescents residing within the Tlokwe local municipality, South Africa: the PAHL employee wellness program. PLoS One. 2017;12(5):e0176872.
43. Eddolls WT, McNary MA, Lester L, Winn CON, Stratton G, Mackintosh KA. The association between physical activity, fitness and body mass index on mental well-being and quality of life in adolescents. Qual Life Res. 2018;27(9):2313-20.
44. Hamer M, Stamatakis E, Steptoe A. Dose-response relationship between physical activity and mental health: the Scottish Health Survey. Br J Sports Med. 2009;43(14):1111-4.
45. Asztalos M, Wijndaele K, De Bourdeaudhuij I, Philippaerts R, Matton PE, De Bourdeaudhuij I. Global, Physical activity levels: surveillance progress, pitfalls, and prospects. Lancet. 2012;380(9838):247-57.
46. Oliveira Anna FB, Pedro Oliveira-Brochado, Brito Pedro. Effects of physical activity promotion in business and industry: evidence, context, and recommendations for a national plan. J Phys Act Health. 2009;6 Suppl 2:S220-35.
47. Sarvestani MMMRS. Assessing Stages of Exercise Behavior Change, Self Efficacy and Decisional Balance in Iranian Nursing and Midwifery Students. J ICBNM. 2013;1.
48. Emdadi S, Nilsaze M, Hosseini B, Sohrabi F. Application of the Trans-Theoretical Model (TTM) to Exercise Behavior among Female College Students. J Res Health Sci. 2007;7(2):25-30.
49. Irwin JD. Prevalence of university students' sufficient physical activity: a systematic review. Percept Mot Skills. 2004;98(3 Pt 1):927-43.
50. Hallal PC, Andersen LB, Bull FC, Guthold R, Haskell W, Ekelund U. Global physical activity levels: surveillance progress, pitfalls, and prospects. Lancet. 2012;380(9838):247-57.