Investigation of the Interaction Between Physical Activity Levels and Quality of Life of Desk-Based Staff in a State University: A Cross-Sectional Study

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Absract

Aim: This study aims to evaluate the relationship between physical activity levels and the quality of life of rectorate staff who have been working at a state university for at least one year.

Method: The study, conducted from June 2021 to January 2022, included adults aged 30-65 who were predominantly sedentary in their occupational roles, had a body mass index greater than 18.5 kg/m², and had been employed at the state university rectorate for at least one year. A total of 60 participants were enrolled. The International Physical Activity Questionnaire, the SF-36 (Health Form-36) Quality of Life Scale, and the TANITA MC-780 Black Bioelectrical Impedance Analysis (BIA) for measuring body mass index were utilized as assessment instruments.

Results: The examination of the sub-dimensions of the SF-36 revealed the following mean scores: physical function was 69.43±18.65, physical role difficulty was 74.17±35.04, emotional role difficulty was 73.45±28.21, pain was 78.42±20.43, energy/vitality was 56.25±6.61, social functioning was 71.71±20.23, mental health was 49.2±7.33, and general health was 50.13±12.48. The Total Physical Activity Score was 2876.02±1547.95. No statistically significant correlation was observed between the participants' physical activity levels and their overall quality of life (p>0.05). However, a significant difference was detected between physical function and gender (p<0.05).

Conclusion: The findings from this study indicate that the participants generally exhibited a satisfactory quality of life, as measured by the SF-36. However, it was noted that certain aspects, such as physical function and general health, were comparatively lower among the participants. Despite the expectation that higher physical activity levels would correlate with an enhanced quality of life, the analysis did not reveal a statistically significant relationship between these variables.

Keywords: Office workers, physical activity, quality of life.

Bir Devlet Üniversitesinde Masa Başı Çalışan Personelin Fiziksel Aktivite Düzeyleri ile Yaşam Kalitesi Arasındaki Etkileşimin Araştırılması: Kesitsel Bir Çalışma

Özet

Amaç: Bu çalışma, bir devlet üniversitesinde en az bir yıldır çalışan rektörlük personelinin fiziksel aktivite düzeyleri ile yaşam kaliteleri arasındaki ilişkiyi değerlendirmeyi amaçlamaktadır.

Yöntem: Çalışma Haziran 2021'den Ocak 2022'ye kadar yürütülmüş olup mesleki rollerinde ağırlıklı olarak hareketsiz olan, vücut kitle indeksi 18,5 kg/m²'den fazla olan ve en az bir yıldır devlet üniversitesi rektörlüğünde çalışan 30-65 yaş arası yetişkinler dahil edilmiştir. Toplam 60 katılımcı çalışmaya dahil edilmiştir. Değerlendirme araçları olarak Uluslararası Fiziksel Aktivite Anketi, SF-36 (Sağlık Formu-36) Yaşam Kalitesi Ölçeği ve vücut kitle indeksini ölçmek için TANITA MC-780 Siyah Biyoelektrik Empedans Analizi (BIA) kullanılmıştır.

Bulgular: SF-36 Yaşam Kalitesi Ölçeğinin alt boyutları incelendiğinde, fiziksel fonksiyon 69,43±18,65, fiziksel rol güçlüğü 74,17±35,04, duygusal rol güçlüğü 73,45±28,21, ağrı 78,42±20,43, enerji/canlılık/vitalite 56,25±6,61, sosyal fonksiyon 71,71±20,23, mental sağlık 49,2±7,33 ve genel sağlık ortalamaları 50,13±12,48 olarak bulunmuştur. Toplam Fiziksel Aktivite Skoru 2876.02±1547.95 olarak bulunmuştur. Katılımcıların fiziksel aktivite düzeyleri ile yaşam kaliteleri arasında istatistiksel olarak anlamlı bir fark bulunmamıştır (p>0.05). Fiziksel fonksiyon ile cinsiyet arasında anlamlı bir fark bulunmuştur (p<0.05).

Sonuç: Çalışmadan elde edilen bulgular, katılımcıların SF-36 ile ölçüldüğü üzere genel olarak tatmin edici bir yaşam kalitesi sergilediklerini göstermektedir. Bununla birlikte, fiziksel işlev ve genel sağlık gibi bazı hususların katılımcılar arasında nispeten daha düşük olduğu kaydedilmiştir. Daha yüksek fiziksel aktivite seviyelerinin daha iyi bir yaşam kalitesi ile ilişkili olacağı beklentisine rağmen, analiz bu değişkenler arasında istatistiksel olarak anlamlı bir ilişki ortaya koymamıştır.

Anahtar kelimeler: Ofis çalışanları, fiziksel aktivite, yaşam kalitesi

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INTRODUCTION

The physical activity level of office workers is becoming increasingly important due to the intense pace of modern work life and long-term desk work habits. Decreased physical activity has become one of the main causes of many health problems (Michalchuk et al., 2023). Therefore, increasing the physical activity levels of employees in the office environment and promoting healthy lifestyles is an important issue at both individual and organizational levels (Landais et al., 2022).

Many office workers often spend hours going to work in the morning before leaving home and hours relaxing after returning home in the evening. This limits the opportunity to get enough physical activity during the day. Sitting at a desk for long hours can lead to a sedentary lifestyle and cause a range of health problems over time, including obesity, cardiovascular disease, back and neck pain, musculoskeletal disorders and mental health problems (Halling Ullberg, et al., 2023).

Assessing the quality of life of office workers is vital for improving the quality of healthcare services, optimizing occupational performance, increasing job satisfaction and staff retention, as well as strengthening the personal well-being of individuals (Sadick & Kamardeen, 2020).Office workers with high quality of life may be more satisfied with their jobs and more willing to stay in their jobs longer. Moreover, assessing the quality of life of healthcare workers can help them combat factors such as job stress, fatigue and emotional exhaustion, thus improving their personal well-being by increasing their overall health and happiness (Meijer et al., 2009). In this context, the aim of this study was to examine the relationship between physical activity levels and quality of life of office workers.

H0: There is no significant relationship between the physical activity levels of the rectorate staff who have been working at a state university for at least one year and their quality of life.

H1: There is a significant relationship between the physical activity levels and quality of life of the rectorate staff who have been working at a state university for at least one year.

METHOD

Study Location and Duration

The examination of total and segmental body parameters, along with questionnaire values, was conducted at the rectorate building of xxx University from June 2021 to January 2022. Ethical approval was obtained from the Eskişehir Osmangazi University Scientific Research Ethics Committee (number: E-25403353-050.99-180726).

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Study Sample

The study population comprised individuals employed at xxxx University's rectorate for a minimum of one year. The study aimed to include all rectorate staff; thus, no sampling was undertaken. Inclusion criteria encompassed adults aged 30-65, predominantly sedentary in their roles, with a body mass index exceeding 18.5 kg/m², and having worked at the xxx Rectorate for at least one year. The study enrolled a total of 60 participants.

Data Collection Instruments

Data collection involved utilizing the extended version of the International Physical Activity Questionnaire to evaluate participants' exercise levels, the Health Status Questionnaire (SF-36) to assess their quality of life, and the TANITA MC-780 Black Bioelectrical Impedance Analysis (BIA) for measuring body mass index.. All participants provided informed consent prior to participation.

International Physical Activity Questionnaire

To evaluate the exercise status of participants who provided informed consent, the long form of the International Physical Activity Questionnaire was employed (USDHHS, 1996; Saglam et al., 2010). This comprehensive questionnaire captures data regarding sitting time, walking, moderately vigorous activities, and time dedicated to vigorous activities. Each activity is evaluated under the assumption of being performed for at least 10 minutes consecutively. By multiplying minutes, days, and METs (multiples of resting oxygen consumption), a score is derived as "MET-minutes/week". Physical activity levels were categorized as follows: physically inactive (<600 MET-min/week), low physical activity (600 - 3000 MET-min/week), and adequate physical activity (>3000 MET-min/week) (Kayapinar, 2012). Energy expenditure for each physical activity was calculated by multiplying the weekly duration (in minutes) of the activity by its corresponding MET energy value as specified in the International Physical Activity Questionnaire. Consequently, energy expenditures for vigorous, moderate, walking, sitting, and total physical activities were obtained in MET-min/week units. Cronbach's Alpha Reliability Coefficient of the questionnaire was found to be 0.770 (Kabalı, 2024). In our study, Cronbach's Alpha Reliability Coefficient was found to be 0.70.

Short form 36 (SF-36)

To assess the quality of life of study participants, the SF-36 scale was utilized. Originally developed by the Rand Corporation in 1992, its validity and reliability in our country were confirmed by (Kocyigit et al., 1999). Comprising eight health domains, the SF-36 serves as a comprehensive measure capturing various aspects of functional status and well-being (Ware et al., 2004). Widely accepted as a general health questionnaire, it has been employed across diverse populations, treatment cohorts, diseases, and age groups. Its versatility allows for applications ranging from evaluating health enhancements to assessing treatment efficacy and comparing disease burdens (Gandek et al., 2004).

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This self-report scale evaluates health across eight dimensions through thirty-six items. It includes items addressing physical function, social function, physical and emotional role limitations, mental health, vitality (energy), pain, and general health. Completion of the SF-36 typically takes around 5 minutes. Each sub-dimension is scored individually on a 100-point scale, where higher scores denote better health status, while lower scores suggest a decline in health (Ware et al., 1996). The SF-36 offers insights into physical functionality, physical role, bodily pain, general health perception, vitality, mental health, social functioning, and emotional role limitations. Cronbach's alpha values were found between 0.792-0.992 (Kaya & İçağasıoğlu, 2018) . In our study, Cronbach's alpha values were found between 0.72-0.88.

Data Evaluation

Data collected in the study were analyzed using the IBM SPSS Statistics 25 software. Statistical analysis of categorical variables was conducted using the SPSS program, including Chi-Square analyses for comparing categorical variables and creating cross-tabulations. For quantitative variables, parametric tests such as the Independent Samples T-Test, One-Way ANOVA, and Tukey's post hoc test were applied to data meeting the necessary conditions in SPSS 25.0.. Pearson's correlation analysis was employed to examine relationships between variables, supplemented by descriptive statistics to summarize the data. A significance level of 0.05 was used for all analyses. The choice of analysis methods for scale variables involved first performing a Kolmogorov-Smirnov test to assess normality. Parametric tests were applied to scales that met the normal distribution condition.

Limitations of the Study

Limitations of the study encompassed data collection solely from employees of a single institution, the imposition of pandemic-related restrictions during the research period, and reliance on self-report scales based on participants' subjective responses. While it was assumed that participants provided accurate information, there exists the potential for participants to present themselves differently in self-report scales than they are in reality.

RESULTS

A total of 60 individuals participated in the study, of which 65% (39) were male and 35% (21) were female. The distribution of age, height, weight and BMI values of the participants according to gender is given in Table 1.

Table 1. Physical characteristics of the participants (n=60)

	Male			**Woman**			**General**
	Mean	**Min.**	**Max.**	**Mean**	**Min.**	**Max.**	**Mean SD**
Age (years)	37	22	53	29.14	22	38	34.25±9.36
Height (cm)	174.33	162	185	162.52	153	175	170.2±8.16
Weight (kg)	78.49	52.7	100.3	57.21	42.3	73.3	71.05±13.90
BMI (kg/m^2)	25.86	17.10	32.8	21.66	16.1	27.6	24.39±19.31
BMI: Body Mass Index, SD: Standart Deviation							

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The evaluation results of the individuals who participated in the SF-36 Quality of Life Scale are presented in Table 2.

Table 2. SF-36 quality of life scale assessment (n=60)

Parameters	Woman Mean	Male Mean	General Mean±SD
Physical Function	78.10	65.90	69.43± 18.65
Physical Role Difficulty	66.67	78.21	74.17± 35.04
Emotional Role Difficulty	68.33	76.07	73.45± 28.21
Agri	73.33	81.15	78.42± 20.43
Energy / Vitality / Vitality	57.86	55.38	56.25± 6.61
Social Functioning	71.71	71.43	71.53± 20.23
Mental Health	48.19	49.74	49.20± 7.33
General Health	48.33	51.20	50.13± 12.48

When the sub-dimensions of the SF-36 Quality of Life Scale were examined, the mean physical function was 69.43±18.65, mean physical role difficulty was 74.17±35.04, mean emotional role difficulty was 73.45±28.21, mean pain was 78.42±20.43, mean energy/vitality/vitality was 56.25±6.61, mean social functioning was 71.71±20.23, mean mental health was 49.2±7.33 and mean general health was 50.13±12.48.

The relationship between quality of life and gender of the participants was analyzed. The test results are presented in Table 3.

Table 3. Comparison of gender and quality of life scores (n=60)

		N	Mean±SD	p
Physical Function	Male	39	87.94±14.17	0.01*
	Woman	21	78.09±24.05	
Physical Role Difficulty	Male	39	78.20±34.49	0.44
	Woman	21	66.66±35.64	
Emotional Role Difficulty	Male	39	76.06±26.43	0.44
	Woman	20	68.33±31.48	
Energy / Vitality / Vitality	Male	39	55.38±6.42	0.78
	Woman	21	57.85±6.81	
Mental Health	Male	39	49.74±7.93	0.42
	Woman	21	48.19±6.12	
Social Functioning	Male	35	71.42±21.12	0.52
	Woman	19	71.71±19.02	
Pain	Male	39	81.15±19.58	0.65
	Woman	21	73.33±21.49	
General Health	Male	25	51.20±12.93	0.58
	Woman	15	48.33±11.90	

*p < 0.01, t = 2.71

According to the results of the independent sample t test applied for the analysis of the relationship between gender and quality of life of individuals; a significant difference was found between physical function and gender (p=0.008). The total physical function score of male individuals was significantly higher. No significant difference was found between other scale sub-dimensions and gender (p>0.05).

The relationship between quality of life and BMI values of the participants was analyzed. The test results are presented in Table 4.

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Table 4. Comparison of BMI values and quality of life scores (n=60)

		n	Mean±SD	p	F-value
Physical Function	Normal	33	84.09±21.30	0.394	0.85
	Overweight	21	87.61±14.37		
	Obese	6	75.83±15.62		
	Total	60	84.50±18.65		
Physical Role Difficulty	Normal	33	75.00±34.79	0.184	1.32
	Overweight	21	79.76±30.22		
	Obese	6	50.00±47.43		
	Total	60	74.16±35.04		
Emotional Role Difficulty	Normal	32	71.87±25.55	0.875	0.95
	Overweight	21	74.60±29.63		
	Obese	6	77.77±40.36		
	Total	59	73.44±28.21		
Energy / Vitality / Vitality	Normal	33	55.90±7.01	0.910	1.12
	Overweight	21	56.66±6.19		
	Obese	6	56.66±6.83		
	Total	60	56.25±6.61		
Mental Health	Normal	33	49.81±7.07	0.510	1.07
	Overweight	21	49.14±8.21		
	Obese	6	46.00±5.51		
	Total	60	49.20±7.33		
Social Functioning	Normal	29	71.55±19.16	0.767	1.09
	Overweight	20	70.00±23.43		
	Obese	5	77.50±13.69		
	Total	54	71.52±20.23		
Pain	Normal	33	79.39±18.14	0.861	1.15
	Overweight	21	76.42±24.18		
	Obese	6	80.00±21.38		
	Total	60	78.41±20.43		
General Health	Normal	21	50.00±12.84	0.867	1.08
	Overweight	16	50.93±12.93		
	Obese	3	46.66±10.40		
	Total	40	50.12±12.48		

There was no significant difference between participants' BMI categories and quality of life (p>0.05).

Table 5 presents the results, which analyze the relationship between the quality of life and the age of the participants.

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Table 5. Comparison of age values and quality of life scores (n=60)

		N	Mean±SD	p	F-value
Physical Function	25 years and below	8	88.12±16.67	0.25	0.95
	26 and 39 age range	36	81.25±20.78		
	40 years and older	16	90.00±12.90		
	Total	60	84.50±18.65		
Physical Role Difficulty	25 years and below	8	78.12±33.90	0.42	1.10
	26 and 39 age range	36	69.44±37.37		
	40 years and older	16	82.81±29.88		
	Total	60	74.16±35.04		
Emotional Role Difficulty	25 years and below	8	41.66±23.57	0.002*	4.25
	26 and 39 age range	35	79.04±24.36		
	40 years and older	16	77.08±29.10		
	Total	59	73.44±28.21		
Energy / Vitality / Vitality	25 years and below	8	56.25±8.76	0.90	0.85
	26 and 39 age range	36	55.97±6.84		
	40 years and older	16	56.87±5.12		
	Total	60	56.25±6.61		
Mental Health	25 years and below	8	50.00±5.65	0.92	0.98
	26 and 39 age range	36	49.22±7.93		
	40 years and older	16	48.75±7.03		
	Total	60	49.20±7.33		
Social Functioning	25 years and below	7	71.42±11.88	0.15	1.20
	26 and 39 age range	33	67.80±23.18		
	40 years and older	14	80.35±12.70		
	Total	54	71.52±20.23		
Pain	25 years and below	8	70.31±26.13	0.21	1.15
	26 and 39 age range	36	77.22±21.13		
	40 years and older	16	85.15±13.97		
	Total	60	78.41±20.43		
General Health	25 years and below	4	46.25±16.52	0.70	0.75
	26 and 39 age range	25	49.80±11.50		
	40 years and older	11	52.27±14.02		
	Total	40	50.12±12.48		

*One-Way ANOVA; Tukey HSD post hoc test:; 2>1; 3 >1

It was concluded that there was a significant difference between emotional role difficulty and age (p=0.002). Emotional role difficulty was quite low in the group aged 25 years and younger.

According to the data obtained from the International Physical Activity Questionnaire of the participants, information on the categories of physical activity is given in Table 6.

Table 6. Physical activity category scores (n=60)

Physical Activity Category (MET-min/Week)	UFAA Score Range		Mean±SD
	Minimum	**Maximum**	
Severe Activity Score	66	2880	520.41±746.57
Moderate Activity Score	60	4200	903.21±1174.34
Walk Score	49.5	2772	445.22±580.48
Seating Score	180	2100	1007.16±495.10
Total	720	6852	2876.02±1547.95

Participants' Physical Activity Levels and Quality of Life Scores were compared by One Way Anova Test analysis. The results of the analysis are presented in Table 7.

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Table 7. Comparison of physical activity levels and quality of life scores (n=60)

		n	Mean±SD	p	F-value
Physical Function	Inactive	9	78.88±14.74	0.60	1.20
	Low	22	86.36±17.80		
	Adequate	29	84.82±20.50		
	Total	60	84.50±18.65		
Physical Role Difficulty	Inactive	9	58.33±35.35	0.26	1.10
	Low	22	72.72±39.27		
	Adequate	29	80.17±30.89		
	Total	60	74.16±35.04		
Emotional Role Difficulty	Inactive	8	62.50±27.81	0.15	2.30
	Low	22	68.18±31.66		
	Adequate	29	80.45±24.42		
	Total	59	73.44±28.21		
Energy / Vitality / Vitality	Inactive	9	56.11±5.46	0.94	0.80
	Low	22	55.90±7.34		
	Adequate	29	56.55±6.56		
	Total	60	56.25±6.61		
Mental Health	Inactive	9	48.00±7.21	0.32	1.15
	Low	22	51.09±8.18		
	Adequate	29	48.13±6.63		
	Total	60	49.20±7.33		
Social Functioning	Inactive	9	69.44±23.47	0.92	0.90
	Low	20	71.25±19.06		
	Adequate	25	72.50±20.72		
	Total	54	71.52±20.23		
Pain	Inactive	9	76.38±18.96	0.94	1.10
	Low	22	78.97±20.96		
	Adequate	29	78.62±21.12		
	Total	60	78.41±20.43		
General Health	Inactive	8	50.00±12.53	0.94	1.05
	Low	16	50.93±13.31		
	Adequate	16	49.37±12.36		
	Total	40	50.12±12.48		

There was no statistically significant difference between the participants' physical activity levels and quality of life ($p>0.05$).

DISCUSSION

A review of the literature reveals a study conducted in healthy adult desk workers and the results of this study show that there is a decrease in some sub-dimension values. Physical Function, Physical Role Difficulty and General Health are among the dimensions where these decreases are evident (Vural et al., 2010). Among the main reasons for this decrease, it can be suggested that workplace ergonomics and environmental factors that can be associated with the advancement of technology (İkiz & Ergin, 2023). In particular, factors such as the necessity to work more sitting in modern workplaces and the increase in immobility with the automation and workflow facilities provided by technology may cause decreases in these dimensions by reducing the physical

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activity levels of individuals. In this context, it should be taken into account that the negative effects on health may increase with the decrease in physical activity and this may lead to significant consequences on the overall health and work performance of employees (Kropman et al., 2022).

According to the results of the independent sample T test applied for the analysis of the relationship between gender and quality of life of individuals; the total physical function score of male individuals was significantly higher. A significant difference was found between physical function and gender ($p<0.05$). No significant difference was found between other scale sub-dimensions and gender. In a study conducted by Aktaş & Ozvurmaz on nurses in 2019, a significant difference was found between physical function and gender, similar to our study (Aktaş & Ozvurmaz, 2019). It is known that physical function and physical capacities differ according to gender. After puberty, biological-environmental interactions result in increasingly large effects on tasks where different hormonal influences can affect performance (e.g., tasks involving strength, power, muscular endurance, and cardiovascular endurance). Boys are larger due to more muscle mass and a longer growth period. Girls experience an increase in adipose tissue during puberty. Therefore, boys will typically perform better in tasks where strength, power and size are important (Tsunoda et al., 2013).

As a result of the analysis, it was determined that there was a significant difference between emotional role difficulty, one of the subscales of quality of life, and age ($p<0.05$). In particular, a significant low level of emotional role difficulty was observed in the group aged 25 years and younger. Emotional role difficulty is quite low in this age group. This finding suggests that emotional problems of young individuals tend to be more negatively affected by work or other daily activities. At this point, some studies in the literature also support similar findings. For example, Stawski and colleagues (2008) found that reported exposure to daily stressors decreases in old age (Stawski et al., 2008). This finding may indicate that older individuals are less sensitive to daily stressors and therefore emotional role difficulties are less pronounced in old age. Similarly, Almeida et al. (2023) investigated how exposure to and emotional responses to daily stressors change with age over 20 years in adults aged 22 to 77 years. The results showed age-related benefits over time. Younger adults (<30 years) initially experienced higher levels of stress and reactivity, but these decreased with age. Overall, there was an 11% reduction in stressor occurrence over time, with younger adults experiencing a steeper decline in stress reactivity (47% reduction). Stressor occurrence continued to decrease for middle-aged and older adults, but stress reactivity remained stable over time for those aged 54 years and older at baseline (Almeida et al., 2023). Our findings support the literature in this regard.

In our study, according to the data obtained from the International Physical Activity Questionnaire, the mean total score of International Physical Activity was found to be 2876.03± 1547.95 MET-min/week. In a study by Yıldız and Baysal (2023), it was aimed to compare the effect of web-based and face-to-face training on obesity-related health beliefs and physical activity levels among office workers. Similar to our study, the mean total score of Physical Activity before training was found to be low for each group (Yıldız & Baysal, 2023).

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CONCLUSION

In conclusion, no direct link was found between physical activity levels and quality of life. Among desk-based workers, it was observed that individuals aged 25 years and older were more effective in combating difficulties encountered at work or in other daily activities due to emotional problems. In addition, men were found to have higher levels of physical functioning than women.

Acknowledgement

Conflict of Interest

Authors have no conflict of interest to declare.

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