



## Evaluation of Body Composition and Quality of Life of University Students

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### Abstract

The aim of this study is to evaluate the physical activity levels and the quality of life of the university students. In this purpose, the SF-36 life quality scale was used to examine the quality of life of the participants and physical activity levels were also determined through IPAQ. One-way ANOVA was used to compare the quality of life based on the physical activity levels of the participants. Moreover, the Bonferroni Correction were used to determine which physical activity level causes the difference by keeping the type I error rate fixed at 0.05. Statistically significant results were observed between social function and physical activity levels for the female group. In addition, statistically significant results were found between vitality and physical activity levels for the male group. The results show that there is a significant relationship between physical activity and quality of life. The individuals who feel more fit and social tend to have an active life. Given that it is crucial to intensify the studies on this topic for university students to encourage them for taking up regular physical activity as a part of life style.

**Keywords:** Physical activity, Quality of life, METs, International physical activity questionnaire, Sedentary life, Health.

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**Ethical:** This study follows all ethical practices during writing.

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**Contribution of this paper to the literature:**

This study contributes to existing literature by understanding terms that influence accurate assessment of physical activity of university students.

## 1. Introduction

Measuring the health status and concordantly determining the quality of life of individuals are the most important issues of many disciplines. In this context, it is very important to be healthy for having a quality life (Cihan *et al.*, 2018). Health does not only mean the absence of disease but also complete physical, mental, and social well-being. Quality of life is defined as the perception of the individual's position in life with respect to his / her goals, expectations, standards, and concerns within the culture and value systems experienced by an individual. Quality of life is a comprehensive concept that is influenced complex way by one's physical health, psychological state, personal beliefs, social and environmental relations (World Health Organization, 2019).

Nowadays, it has become to be identified as the idea of improving the quality of life and leading a long life (Akyol *et al.*, 2008). Therefore, in general, neither having a sedentary life style nor being physically active can be considered as an important factor in improving health and quality of life (Fitz and Boland, 2018). Sedentary behavior is characterized by energy consumption of 1.0 to 1.5 METs (metabolic equivalent) when the body is sitting, lying in short resting (Pate *et al.*, 2008; Tremblay *et al.*, 2017; Castro *et al.*, 2018). Changes in physical, social and economic conditions have made sedentary status more common (Castro *et al.*, 2018). Sedentary or inactive lifestyle adversely affects healthy and quality of life and leads to risk of some diseases. Therefore, public health campaigns are organized all over the world in order to motivate people to be physically active (Can, 2019). Public health recommendation is doing 150min / week moderate to vigorous physical activity (MVPA) for a healthy life. This can be explained as a moderate and high intensity exercise for 5 days a week, 30 minutes a day (Creasy *et al.*, 2018). In addition to leading an active life, it will be more beneficial for individuals to adapt that as a lifestyle. A physically active individual who embrace it a part of life style could maintain lifelong wellness and could have good health parameters (Ertop *et al.*, 2012). College years are considered as a significant period in constituting healthy lifestyle behaviors and carrying them to adulthood (Seo *et al.*, 2018).

Today, however, most of the students stay inactive at school and even at home while studying, devoting their leisure time to the things immobilizing them, such as television, computers, cell phones, and Internet, which canalize them to adapt a sedentary lifestyle (Fennell *et al.*, 2019). In line with this information, our study aims to evaluate the physical activity levels and quality of life of the students at Bursa Technical University, Turkey.

## 2. Method

Participants were selected from students who are currently studying in various departments of Bursa Technical University. Total of 193 (Man: n= 108, Woman: n= 85) university students voluntarily attended to the research as given in Table 1. According to the descriptive information of the participants, the BMI values were calculated. The SF-36 life quality scale (Cronbach alfa value .88) study conducted by Kocyigit (1999); Kokandi *et al.* (2019) was used to evaluate the quality of life of the participants (Kocyigit, 1999). The scale consists of 36 items and these items enable the measurement of 8 sub-dimensions. Sub-dimensions, which evaluates the health between 0 and 100 that 0, shows the worst health status and 100 gives the best result. This scale consists of 8 sub dimensions which are; physical function, role-physical, body pain, general health, vitality, social functioning, role emotional, and mental health (Torrance *et al.*, 2009). SF-36 items are identical to the items described in Ware and Sherbourne (1992). Furthermore, short version of International Physical Activity Questionnaire (IPAQ) was applied to all participants in order to gather comparable estimates of physical activity (Cerin *et al.*, 2016). The validity and reliability of the study in Turkish society was carried out by Öztuk (2005).

Physical activity levels were determined by IPAQ and divided into 3 different groups. To calculate the energy consumption for physical activities, the weekly duration (minutes) of each activity and the MET energy values generated for the International Physical Activity Survey were multiplied. Moreover, to calculate MET minutes in a week multiplies the MET value given (remember walking = 3.3, moderate activity = 4, vigorous activity = 8) by the minutes the activity was carried out and again by the number of days that that activity was undertaken. For example, if the student exposed to walking of 30 minutes for 5 days in a week then the total MET minutes for that activity were calculated using the formula given by Forde  $3.3 \times 30 \times 5 = 495$  (Forde, 2005). Met minutes per week Met-Minutes/Week values were obtained from participants to be low, medium and high physical activity groups. Total physical activity, which is under the 600 MET-minutes/week, was categorized as low, 600-3000 MET-minutes/week was categorized as moderate and above 3000 MET-minutes/week was categorized as high level physical activity group (Craig *et al.*, 2003). Statistical analyses were performed by using the SPSS version 20.0. One way ANOVA was used to compare the quality of life based on the students' physical activity level. The Bonferroni Correction were also used to find out which physical activity level causes to a difference keeping constant the type I error rate at 0.05 (two-tailed).

## 3. Findings

**Table-1.** Descriptive characteristics of participants.

| Group  | n   | BMI        | Age        |
|--------|-----|------------|------------|
| Male   | 108 | 22,95±3,10 | 21,33±3,02 |
| Female | 85  | 21,43±2,85 | 21,10±2,04 |

Source: Obtained from participants descriptive data.

After calculation of the BMI values, the findings show that body mass index data of the participants are in healthy weight category (WHO, 2019).

**Table-2.** Quality of life scores of the participants according to 8 sub-dimensions.

| Group  | Physical function | Role-physical | Body pain   | General health | Vitality    | Social functioning | Role emotional | Mental health |
|--------|-------------------|---------------|-------------|----------------|-------------|--------------------|----------------|---------------|
| Male   | 66,01±13,53       | 68,10±32,11   | 33,98±22,16 | 49,76±9,67     | 45,50±10,18 | 47,06±14,21        | 46,46±35,19    | 40,42±16,88   |
| Female | 64,29±12,17       | 68,70±25,68   | 33,11±19,72 | 49,58±9,94     | 44,64±10,28 | 45,64±13,19        | 32,54±32,31    | 40,32±17,42   |

Source: Obtained from primal data.

When the **Table 2** containing the quality of life scores of the participants is examined, it can be seen that physical function (Man: 66,01±13,53, Woman: 64,29±12,17) and physical role (Man: 68,10±32,11, Woman: 68,70±25,68) have higher scores than the others.

**Table-3.** Physical activity scores of participants from international physical activity questionnaire (IPAQ).

| Physical activity level | Male | Female |
|-------------------------|------|--------|
| Below 600 Mets          | 33   | 22     |
| 601 – 3000 Mets         | 43   | 45     |
| Above 3000 Mets         | 32   | 18     |
| Total                   | 108  | 85     |

Source: Calculated from participants IPAQ data.

As seen in **Table 3** it was also determined that 55 of the participants (Man: 33, Woman: 22) have low (< 600 Mets), 88 of them (Man: 43, Woman: 45) have moderate (601-3000 Mets) and 50 of them (Man: 32, Woman: 18) have high physical activity level (3001 < ).

**Table-4.** Comparison of the quality of life of male participants according to physical activity level.

| Variables          | Physical activity level | n  | $\bar{x}$ | sd      | F     | p     | Bonferroni   |
|--------------------|-------------------------|----|-----------|---------|-------|-------|--|
| METs               | Low (1)                 | 33 | 322,39    | 290,76  | 49,15 | 0,000 | p=0,009;<br>between 1-2<br>p=0,000;<br>between 1-3 |
|                    | Moderate (2)            | 43 | 1897,60   | 605,60  |       |       |  |
|                    | High (3)                | 32 | 5568,68   | 1942,62 |       |       |  |
| Physical function  | Low (1)                 | 33 | 66,81     | 2,15    | 0,091 | 0,913 | p>0,05   |
|                    | Moderate (2)            | 43 | 65,47     | 1,90    |       |       |  |
|                    | High (3)                | 32 | 65,90     | 2,82    |       |       |  |
| Role-physical      | Low (1)                 | 33 | 68,48     | 5,34    | 0,564 | 0,571 | p>0,05   |
|                    | Moderate (2)            | 43 | 71,42     | 4,76    |       |       |  |
|                    | High (3)                | 32 | 63,48     | 6,14    |       |       |  |
| Body pain          | Low (1)                 | 33 | 36,06     | 3,89    | 0,378 | 0,686 | p>0,05   |
|                    | Moderate (2)            | 43 | 34,40     | 3,50    |       |       |  |
|                    | High (3)                | 32 | 31,36     | 3,77    |       |       |  |
| General health     | Low (1)                 | 33 | 51,36     | 1,29    | 1,509 | 0,226 | p>0,05   |
|                    | Moderate (2)            | 43 | 50,35     | 1,32    |       |       |  |
|                    | High (3)                | 32 | 47,42     | 2,16    |       |       |  |
| Vitality           | Low (1)                 | 32 | 41,66     | 2,07    | 4,073 | 0,020 | p=0,018<br>between 1-3                             |
|                    | Moderate (2)            | 43 | 46,19     | 1,40    |       |       |  |
|                    | High (3)                | 33 | 48,48     | 1,49    |       |       |  |
| Social functioning | Low (1)                 | 33 | 47,60     | 2,16    | 0,112 | 0,894 | p>0,05   |
|                    | Moderate (2)            | 43 | 46,35     | 2,05    |       |       |  |
|                    | High (3)                | 32 | 47,78     | 3,01    |       |       |  |
| Role emotional     | Low (1)                 | 33 | 45,18     | 5,78    | 0,457 | 0,635 | p>0,05   |
|                    | Moderate (2)            | 43 | 50,38     | 5,15    |       |       |  |
|                    | High (3)                | 32 | 42,78     | 6,91    |       |       |  |
| Mental health      | Low (1)                 | 33 | 41,54     | 2,78    | 0,327 | 0,722 | p>0,05   |
|                    | Moderate (2)            | 43 | 41,09     | 2,33    |       |       |  |
|                    | High (3)                | 32 | 38,45     | 3,469   |       |       |  |

Source: Obtained from primal data.

The analysis of the male students shows in **Table 4** that there is a statistically difference ( $p<0,00$ ) on Mets. Post hoc analysis with Bonferroni Correction for multiple comparisons indicates that individuals with moderate physical activity levels (2) have more Met Scores (1897,60) than low physical activity levels (322,39) ( $p=0,009$ ) and individuals with high physical activity levels (3) have more Met scores (5568,68) than individuals with low physical activity levels (322,39) ( $p=0,000$ ). Another statistically significant difference ( $P<0,020$ ) was also observed on vitality, which is one of the sub-dimensions of quality of life. The reason for this difference is that individuals with high physical activity levels have higher vitality (high=48,48; low=41,66;  $p=0,018$ ) values than individuals exposed to low physical activity levels.

**Table-5.** Comparison of the quality of life of female participants according to physical activity level.

| Variables          | Physical activity level | n  | $\bar{x}$ | sd      | F      | p     | Bonferroni   |
|--------------------|-------------------------|----|-----------|---------|--------|-------|--|
| METs               | Low (1)                 | 22 | 419,13    | 302,10  | 103,44 | 0,000 | p=0,000;<br>between 1-2<br>p=0,000;<br>between 1-3 |
|                    | Moderate (2)            | 45 | 1687,38   | 671,30  |        |       |  |
|                    | High (3)                | 18 | 5466,27   | 1257,63 |        |       |  |
| Physical function  | Low (1)                 | 22 | 64,54     | 9,74    | 0,058  | 0,943 | p>0,05   |
|                    | Moderate (2)            | 45 | 63,88     | 13,07   |        |       |  |
|                    | High (3)                | 18 | 65,00     | 13,28   |        |       |  |
| Role-physical      | Low (1)                 | 22 | 74,31     | 21,17   | 0,704  | 0,498 | p>0,05   |
|                    | Moderate (2)            | 45 | 66,77     | 26,73   |        |       |  |
|                    | High (3)                | 18 | 66,66     | 28,32   |        |       |  |
| Body pain          | Low (1)                 | 22 | 29,31     | 22,42   | 0,554  | 0,577 | p>0,05   |
|                    | Moderate (2)            | 45 | 34,22     | 18,91   |        |       |  |
|                    | High (3)                | 18 | 35,00     | 18,78   |        |       |  |
| General health     | Low (1)                 | 22 | 49,09     | 6,29    | 2,365  | 0,100 | p>0,05   |
|                    | Moderate (2)            | 45 | 51,44     | 9,97    |        |       |  |
|                    | High (3)                | 18 | 45,55     | 12,47   |        |       |  |
| Vitality           | Low (1)                 | 22 | 44,77     | 6,98    | 0,672  | 0,514 | p>0,05   |
|                    | Moderate (2)            | 45 | 45,55     | 10,61   |        |       |  |
|                    | High (3)                | 18 | 42,22     | 12,74   |        |       |  |
| Social functioning | Low (1)                 | 22 | 47,45     | 8,96    | 3,303  | 0,050 | p=0,050;<br>between 2-3                            |
|                    | Moderate (2)            | 45 | 39,11     | 16,26   |        |       |  |
|                    | High (3)                | 18 | 47,55     | 13,07   |        |       |  |
| Role emotional     | Low (1)                 | 22 | 31,90     | 27,67   | 0,117  | 0,890 | p>0,05   |
|                    | Moderate (2)            | 45 | 36,00     | 34,04   |        |       |  |
|                    | High (3)                | 18 | 34,16     | 34,88   |        |       |  |
| Mental health      | Low (1)                 | 22 | 40,81     | 16,28   | 0,955  | 0,389 | p>0,05   |
|                    | Moderate (2)            | 45 | 42,06     | 17,54   |        |       |  |
|                    | High (3)                | 18 | 35,38     | 18,458  |        |       |  |

Source: Obtained from primal data.

The analysis of the female students shows in Table 5 that there is a statistically difference ( $p < 0.00$ ) on Mets. Post hoc analysis with Bonferroni Correction for multiple comparisons indicates that individuals with moderate physical activity levels (2) have more Met Scores (1687,38) than low physical activity levels (419,13) ( $p = 0,009$ ) and individuals with high physical activity levels (3) have more met scores (5466,27) than individuals with low physical activity levels (419,13) ( $p = 0,000$ ). One more statistically significant difference ( $P < 0,020$ ) was observed on vitality, which is one of the sub-dimensions of quality of life. The reason for this difference could be that individuals with high physical activity levels have higher social functioning (moderate=36,00; high=47,55;  $p = 0,050$ ) values than individuals with moderate social functioning levels.

#### 4. Discussion and Conclusion

The aim of this study is to investigate the quality of life of university students considering their physical activity levels.

When the results obtained from male students were examined, only statistically significant differences were observed on vitality of sub-dimensions of the quality of life scale. According to the results obtained from the data of female students, a statistically significant difference was found in the social function of sub-dimension of the quality of life scale. Therefore, it can be said that male students with high physical activity level feel more energetic than other students who have low or moderate physical activity levels. Additionally, female students with high physical activity level feel more social than other students, who have low physical activity levels.

When the studies parallel to our study were examined, Daskapan *et al.* (2005) observed that there was a positive relationship between habitual physical activity level and health-related quality of life. They also found some significant differences between the activity groups examined according to the weekly energy expenditure. In addition, more active students (1500 calories / week) had higher scores for the most of the 8 subscales of SF-36 (Daskapan *et al.*, 2005).

In another similar study published by Çiçek *et al.* it was reported that level of physical activity is related to quality of life (Çiçek, 2018). Ruseski *et al.* observed that there is a strong relation among the physical activity, well-being and happiness. (Ruseski *et al.*, 2014; Wicker *et al.*, 2014). Ertop *et al.* (2012) realized that the students exercising regularly are more successful in presenting healthy lifestyle behaviors than those who do not exercise regularly (Ertop *et al.*, 2012).

Among the participants in the sample groups, 10.18% of the male group and 15.29% of the female group were in the overweight class according to BMI classification. In the study of Çiçek (2018) this rate was found to be approximately 17%. In the study of Avşar *et al.* (2013) this rate was 16.5%. This is because of that the group of participants in our study is less than these studies might be the reason of this percentage difference.

In the study of Kokandi *et al.* (2019), more than 50% of the participants had low activity level, only 13% were high and 30% were moderate physical activity. In our study, these rates were 30.55% for male with low physical activity and 25.88% for female. Moderate physical activity is 39.81% for males and 52.94% for females. It clearly shows that health-related quality of life is significantly correlated with physical activity levels. Although the percentage of people having low physical activity is lower in our study than the similar study, the sub-dimensions of the quality of life scale was obtained less than the expected. It can be concluded that the main reason of this case might be the participants who know the importance of physical activity but not apply it in their daily life routines.

University years are an important time for personal development and are ideal environments for implementing health education and health management programs. This lifetime affects the health status after graduation. Using

the existing facilities and resources of the university such as fitness and health centers would be cost effective and convenient for many students (Seo *et al.*, 2018). Healthy life and exercise routines provided by the students in the university could be checked with longitudinal studies during their education period and even after their education life.

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