

Relationship between physical activity and constipation in university students

Relationship between physical activity level and constipation severity

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Abstract

Aim: This study investigates the relationship between the physical activity level and constipation severity in university students.

Material and Methods: The study included 155 females with a mean age of $20,93 \pm 1,8$ years. Mini Nutritional Questionnaire-Short Form (MNQ-SF), International Physical Activity Questionnaire-Short Form (IPAQ-SF), The Constipation Severity Instrument (CSI) were used for evaluation. Female students between the ages of 18 and 25 years who received more than 12 points, which means normal nutritional status, from the MNQ-SF were included in the study.

Results: The physical activity levels of the cases were compared and we found out that there was no significant difference between groups in the sub-scales and total score of CSI ($p>0.05$). There was no relationship between subgroups and total score of IPAQ-SF and sub-scales and total score of CSI ($p>0.05$)

Discussion: In conclusion, we couldn't find a relationship between physical activity level and constipation severity in individuals included in the study. Although this research provides insights into the relationship between the physical activity level and constipation severity in the university student, studies with samples including different age groups should be planned in the more widespread population for future research.

Keywords

Constipation; Students; Female

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Introduction

Constipation, which negatively affects health-related quality of life affecting physical, mental and social well-being, is a very common health problem in the community [1]. While healthcare professionals define constipation as defecation less than three times a week, patients often describe incomplete discharge sensation, strain, hard stool, defecation that requires inadequate effort in bowel movements [2].

There are so many studies all around the world about prevalence of constipation, for instance, USA, Sweden, Taiwan, Germany, France, China, Hong Kong, Spain, South Korea, and Iran. According to these studies, prevalence of constipation varies from %2 to %35 [3,4,5]. The prevalence rate of constipation in our country was found to be between 22-40% [6].

Several studies have reported that female gender, older age, low socioeconomic level, experiencing anxiety, depression, increased body mass index, low dietary fiber intake, positive family history, stressful life events, and decreased physical activity level are more related to constipation [7,8].

Physical activity is a life-long, complex behavior that provides protection and improvement of cardiorespiratory resistance, reduces obesity and related diseases, resulting in a longer life span [9]. Many studies have shown that walking is positively associated with bowel movements [10,11]. Exercise, which is one of the subgroups of physical activity, includes planned, structured, repetitive body movements aimed at improving one or more components of physical fitness; It is negatively related to constipation in adults [3,8,12].

It has been stated that daily moderate- intensity exercise reduces constipation by 44% in women. The inability to define constipation in a homogeneous way in the literature results in contradictions and many difficulties in its interpreting [8].

The aim of this study is to examine the relationship between the level of physical activity and constipation severity in university students.

Material and Methods

This study was carried out on 155 female (mean age 20,93 ± 1,8 years) students studying at Pamukkale University, Physical Therapy and Rehabilitation Department and volunteering to participate in the study.

Informed consent was obtained from the individuals who accepted to participate in the study and participants were informed about the study based on the Helsinki Declaration. This study was approved by Pamukkale University, Faculty of Medicine, Non-Interventional Clinical Research Ethics Committee (60116787-020/1693).

Female students aged between 18 and 25 years who received more than 12 points, which means normal nutritional status, from the Mini Nutritional Questionnaire-Short Form were included in the study. Exclusion criteria were individuals who used regular medication and underwent surgery related to the digestive system, and did not satisfy the inclusion criteria.

Instruments

Age, gender, height, body weight and health information of the students participating in the study were obtained. In addition, the amount of meals consumed daily and water consumption were also recorded. The existence of constipation

was determined by students' self-assessment such as "I have constipation or not".

Mini Nutritional Questionnaire-Short Form

Mini Nutritional Questionnaire-Short Form is a nutritional screening tool which is short and valid for older populations. It takes 10-15 minutes to complete. This questionnaire contains Screening and Evaluation sections. Scan section consists of 6 questions ranging from 0-14 points. Points from 0 to 7 are evaluated as "Malnutrition", 8-11 points as "At risk of malnutrition" and 12-14 points are evaluated as "Normal nutritional status" [13]. Mini Nutritional Questionnaire was found valid by Sarikaya et al [14].

The International Physical Activity Questionnaire- Short Form (IPAQ-SF)

Physical activity levels of the participants were evaluated using the International Physical Activity Questionnaire-Short Form. In this questionnaire, the individual fills his/her vigorous physical activity, moderate physical activity and walking activities with the duration and frequency for the last 7 days [15]. The metabolic equivalent (MET) values (vigorous-intensity activity = 8 MET, moderate- intensity activity = 4 MET, walking = 3.3 MET) assigned to the activities are multiplied by duration (min) and frequency (days) and the total score is calculated. Accordingly, weekly MET-min scores of individuals are obtained. According to the scores obtained, individuals are categorized as inactive, minimally active and very active [9]. Turkish reliability and validity study was done by Saglam et al [16].

The Constipation Severity Instrument(CSI)

The Constipation Severity Instrument was developed by Varma et al [17]. This questionnaire evaluates individuals' frequency of defecation, stool density, and difficulty during defecation. This scale can also be used to measure constipation symptoms. It has 3 subscales (Obstructive Defecation, Colonic Inertia, Pain). The points that can be obtained from the scale vary between 0 and 73. As the score increases, constipation severity increases. Turkish validity and reliability version was done by Kaya and Turan [18].

Statistical Analysis

The data were analyzed with the SPSS 25.0 package program. The normality test was done with the Kolmogorov-Smirnov or with the Shapiro-Wilk tests. Quantitative data were presented by the mean and standard deviation values ($X \pm SD$) and median (min-max). Number (n) and percentage (%) were used for the presentation of the qualitative data. Comparisons between groups were made using one-way ANOVA and the Kruskal-Wallis test. Correlation coefficients and statistical significance were calculated with the Spearman correlation coefficient. The statistical significance level was $p < 0.05$.

Correlation coefficient of 0.00-0.19 means "no or negligible relationship", 0.20-0.39 is "weak", 0.40-0.59 is "moderate", 0.60-0.79 is "strong" and 0.80-1.0 is "very strong correlation" [19].

Results

One hundred fifty-five females with the mean age 20.93±1.8 years were included in this study. Demographic data of the cases participating in the study are shown in Table 1.

In this study, no significant relationship was found between age

and constipation severity obtained from the total score of CSI ($r = -0.051$, $p = 0.528$). In addition, no relationship was found between smoking frequency and daily water consumption ($r = 0.149$, $p = 0.065$, $r = -0.112$, $p = 0.164$).

Students' IPAQ-SF score was calculated as 1377 MET x min/week. According to scores, 21.9% were inactive, 60% were minimally active and 18.1% were very active.

When physical activity levels of the cases were compared, there was no significant difference between groups in the subscales and total score of CSI ($p > 0.05$) (Table 2).

There was no relationship between sub-groups and the total score of IPAQ-SF and sub-scales and the total score of CSI ($p > 0.05$) (Table 3).

Table 1. Physical and demographic characteristics of females

Variables	X ± SD	Min. – Max.
Age(yr)	20.93 ± 1.80	18 - 25
Weight (kg)	63.11 ± 9.40	48 - 98
Height (cm)	163.87 ± 5.22	150 - 175
BMI (kg/m ²)	23.48 ± 3.11	19.1 - 34.72
Frequency of smoking (day)	2.47 ± 10.94	0 - 72
Constipation duration of complaints (day)	18.88 ± 65.52	0 - 365
Daily of water consumption (glass)	7.17 ± 3.41	0.5 - 20

X ± SD: mean ± standard deviation, Min-max: minimum -maximum

Discussion

According to the results obtained from our study, although the cases who have constipation were young population, the physical activity level of them was low. No correlation was found between physical activity level and constipation severity.

The mean age of individuals who participated in our study was 20.93 years. Studies have reported that women experience constipation problems more frequently than men do, and this rate is 2 times more common in women [20,21]. There is no study that clearly explains this difference.

Some studies link higher prevalence in women to factors such as gut function differences [22] and nutritional habits [23]. In our study, the presence of constipation was asked according to self-reported cases, not based on any criteria. But nutritional states are specifically questioned and cases who get 12 or more scores from the MNQ-SF are included in the study. This shows that our study is different from other studies.

Chaud et al. [24] reported that constipation is associated with daily fluid consumption in university students. In the study by Chang et al. [23], they found that constipation is related to fast food and snack eating habits, frozen food consumption, daily water consumption and physical activity level. In our study, no relation was found between daily water consumption and CSI.

According to Karakaya et al. [25], there is a relation between physical activity level and constipation. But we could not find any relationship between subgroups and total score of IPAQ-SF and subscales and total score of CSI. Moreover, we could not find any significant difference between the sub-parameters of the physical activity level (inactive, minimally active, very active) in terms of CSI sub-scales and total score.

Table 2. The distribution of the CSI scores according to physical activity level

Physical Activity Level	CSI								
		Obstructive Defecation**		Colonic Inertia*		Pain**		Total*	
		X ± SD (min-max)	p	X ± SD (min-max)	p	X ± SD (min-max)	p	X ± SD (min-max)	p
Inactive	12.18 ± 4.76 (5 - 25)	0.301	7.97 ± 5.18 (0 - 18)	0.762	1.53 ± 2.46 (0 - 9)	0.256	21.68 ± 10.4 (7 - 49)	0.459	
Minimally Active	10.44 ± 5.77 (0 - 23)		7.80 ± 5.64 (0 - 23)		0.97 ± 1.72 (0 - 7)		19.2 ± 11.07 (0 - 46)		
Very Active	10.86 ± 5.78 (0 - 22)		8.54 ± 5.29 (1 - 22)		1.82 ± 2.88 (0 - 11)		21.21 ± 12.14 (5 - 50)		

CSI: The Constipation Severity Instrument, X ± S.D: mean ± standard deviation, min-max: minimum-maximum *: ANOVA. **: Kruskal-Wallis Test, p: Statistical Significance Level, r: Correlation Coefficient

Consequently, we couldn't find a relationship between physical activity level and constipation severity in individuals included in our study. We think that the age of the individuals is young and the nutrition level is normal, which affects this result. In the literature, we did not find any other study which evaluates the relationship between the constipation severity and physical activity level and in which only one gender is included and nutrition levels of cases are normal. In the future, studies with samples including different age groups should be planned in a more widespread population.

Table 3. The relationship between IPAQ-SF scores and CSI scores

IPAQ-SF	CSI				
		Obstructive Defecation	Colonic Inertia	Pain	Total
		r (p)	r (p)	r (p)	r (p)
Vigorous intensity activity		0.112 (0.165)	0.143 (0.076)	0.019 (0.814)	0.121 (0.134)
Moderate intensity activity		0.092 (0.257)	0.080 (0.319)	0.054 (0.501)	0.097 (0.228)
Walking		-0.048 (0.550)	-0.058 (0.474)	0.033 (0.682)	-0.055(0.500)
Total		-0.015 (0.855)	0.024 (0.769)	0.035 (0.661)	0.007 (0.929)

Spearman's Correlation Test, p: Statistical Significance Level, r: Correlation Coefficient

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

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