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Ergenler Arasında Fiziksel Aktivite, Egzersiz Öz-Yeterlilik Düzeyi ve Davranış Değişikliği Aşamalarının Değerlendirilmesi

An Assessment of Physical Activity, Exercise Self-Efficacy Level and Stages of Behaviour Change among Adolescents

[1]Mucahide ONER, [2]Hasret YALCINOZ BAYSAL

[1]Hacettepe University Faculty of Nursing, Department of Public Health Nursing, Ankara, Turkey.
[2]Ataturk University, Faculty of Nursing, Department of Public Health Nursing, Erzurum, Turkey.

Mücahide Öner: https://orcid.org/0000-0003-0445-7035
Hasret Yalçinöz Baysal: https://orcid.org/0000-0003-2177-3486

ÖZ

Amaç: Bu çalışmanın amacı adölesanlarda fiziksel aktivite, egzersiz öz-yeterlik düzeyi ve egzersiz davranışındaki değişim aşamalarını değerlendirmektir.

Materyal ve Metot: Bu araştırma tanımlayıcı olarak yapılmıştır. Araştırmanın evrenini bir lisede okuyan 529 öğrenci oluşturmuştur. Örnek seçim yöntemi kullanılmamıştır. Nüfusun tamamına ulaşılmaya çalışılmış ve çalışma 500 öğrenciyle gerçekleştirilmiştir. Çalışmanın verileri kişisel bilgi anketi, Egzersiz Öz-etkililik Ölçeği, Egzersiz Değişim Aşamaları Kısa Soru Formu ve Uluslararası Fiziksel Aktivite Anketi-Kısa Form kullanılarak toplanmıştır.

Bulgular: Çalışmada adölesanların % 37,6'sının orta düzeyde fiziksel olarak aktif olduğu ve % 36,4'ünün egzersiz değişim aşamalarından düşünme öncesi aşamada olduğu belirlenmiştir. Adölesanlarda egzersiz öz-etkililik skoru orta düzeyde (13,64 ± 6,06) bulunmuştur. Yapılan analizler, adölesanların fiziksel aktivite düzeyleri arttıkça egzersiz öz-etkililik puanlarının arttığını göstermiştir.

Sonuç: Adölesanların hem egzersiz değişim aşamaları hem de fiziksel aktivite düzeyleri arttıkça egzersiz öz-etkililik puanlarının arttığı saptanmıştır. Adölesanların fiziksel aktivite yapmaları için şartlarının uygun hale getirilmesi, uygun zamanın sağlanması ve gençlerin bu konuda isteklerinin arttırılması için eğitim verilmesi önerilmektedir. Eğitimlerin, adölesanların içinde bulundukları değişim aşamaları gözönünde bulundurularak yapılması tavsiye edilir.

Anahtar Kelimeler: Adölesanlar, egzersiz, fiziksel aktivite, öz-etkililik, sağlık davranışı

ABSTRACT

Objective: This study aims to assess the level of physical activity, exercise self-efficacy, and the stages of change for exercise behavior among adolescents.

Materials and Methods: This research was conducted as descriptive. The study population consisted of 529 students attending at a high school. No sample selection method was used. The whole of the population was tried to be reached and the study was carried out with 500 students. The data for the study were collected using a personal information questionnaire, the Exercise Self-efficacy Scale Questionnaire, the Exercise Stages of Change Short Form and International Physical Activity Questionnaire-Short Form.

Results: The study found that 37,6% of the adolescents were physically active at a moderate level and 36,4% were in the pre-contemplation stage of exercise change phases. The mean exercise self-efficacy score among the adolescents was moderate (13,64±6,06). Data analysis showed that as the physical activity levels of adolescents increased, their exercise self-efficacy scores increased.

Conclusion: It was found that exercise self-efficacy scores of adolescents increased as both exercise change stages and physical activity levels increased. It is recommended to provide training for adolescents in order to make their conditions suitable for physical activity, to provide appropriate time and to increase the desire of young people in this regard. It is recommended that the trainings be conducted taking into account the stages of change adolescents are in.

Keywords: Adolescents, exercise, health-related behavior, physical activity, self-efficacy

Sorumlu Yazar / Corresponding Author:
Hasret Yalcinoz Baysal
Ataturk Universty, Faculty of Nursing, Department of Public Health Nursing, Erzurum, Turkey.
Tel: +90 442 231 5791, 0545744 2725
Fax: +90 442 236 0984
E-mail: h.yalcinoz@hotmail.com, hasret@atauni.edu.tr

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INTRODUCTION

Physical inactivity is also held responsible for 6-10% of cases of coronary heart disease, diabetes, breast cancer and colon cancer and 9% of premature mortality worldwide. WHO estimates that two-thirds of the adolescents in Europe are not sufficiently physically active.[1] Globally, 81% of adolescents aged 11-17 had insufficient physical activity in 2010.[2] There have been no studies in Turkey targeting youth at national level, that is, most of them were regional studies. Previous studies found that the rate of inactivity in adolescents was between 26% and 79%. All these figures indicate physical inactivity is very common among adolescents in Turkey.[3-5] Helping adolescents adopt a physical activity habit is of crucial importance as it is likely for them to practice this behavior in their future life. Unfortunately, adopting a new habit is not an easy process. The Transtheoretical Model (TTM) of behavior change, which offers a convenient intervention opportunity in line with a person's stage of change is often used as a guideline to facilitate the adaptation of this habit. This model explains the change in a person's physical activity status step by step. This change; It consists of five stages; precontemplation, contemplation, preparation, action, and maintenance. This model states that in order to make behavioral change easier, an appropriate education or initiative should be done in accordance with the change step the individual is in.[6]

Self-efficacy is defined as the personal thoughts and beliefs of a person about his/her ability to succeed in acquiring a certain behavior.[7] The self-efficacy levels of individuals have an impact on their motivation to take action. The studies made on the basis of TTM to help individuals gain an exercising behavior have shown that the self-efficacies of those at the pre -contemplation stage are low and the self-efficacies of those at more advanced stages of change increase linearly.[8,9]

Identifying self-efficacy levels towards physical activity and exercise in adolescence will help raise awareness among adolescents of this issue. As far as public health is concerned, it is an important practice to determine the number of adolescents who are not physically active enough for a healthy life, and take action according to the results.[10] We think that identifying the exercise stages of change among adolescents will guide through future interventions and especially through educational activities targeting them.[11] Nurses in schools can play an active role in school-based physical activity programs. They can cooperate with school management, classroom teachers and physical education teachers to raise awareness of the needs of the physical activity program.[12]

This study aims to assess the level of physical activity, exercise self-efficacy, and the stages of change for exercise behavior among adolescents.

MATERIALS AND METHODS

Ethics Committee of the Faculty of Health Sciences of Atatürk University, (Date: 21/12/2015 decision no: 36) and institutional permits were obtained. Informed consents of the students and their families were obtained before the start of the study. Participation in research was on a voluntary basis.

The study was conducted as descriptive. The study population consisted of the students attending a high school (529 students) located in the east of Turkey. No sample selection method was used. The whole of the population was tried to be reached and the study was carried out with 500 students. It was not possible to reach 29 students for various reasons (student leave or disagreeing to participate in the study). The data for the study were collected using a personal information questionnaire, the Exercise Self-efficacy Scale Questionnaire, the Exercise Stages of Change Short Form and International Physical Activity Questionnaire-Short Form.

***Data Collection*: S**ince the age of the adolescents was small, written consent was obtained from their parents. Adolescents whose consent was received from their families were informed about the study and voluntary participation was provided. The questionnaires were distributed to the adolescents who received the consent form at the time allowed by the school administration, and they were re-collected at the end of the period (20-25 min).

Personal Information Questionnaire: Prepared by the researchers in line with the recent literature, the personal information questionnaire consisted of 8 questions inquiring about the respondents' age, gender, class standing, socioeconomic status (students were asked how they perceived their socioeconomic status: good, medium or bad), physical activity status, the reasons for not engaging in physical activities, and the most frequently performed physical activities.[3,4,11,13]

Exercise Self-efficacy Scale: Developed by Marcus et al.[14], and adapted into Turkish by Ay and Temel[15] in 2008, this scale is used to assess the way how individuals perceive themselves in their ability to control their physical activity habits at various levels. The general Cronbach's Alpha of the scale was 0.90. In our study, this value was determined as 0.88. The scale consisted of 6 items and used a 5-point Likert-type scale. The respondents were asked to choose a score from 1 to 5 that indicates their degree of confidence in their ability to engage in exercise in a certain situation. The highest score that

a person could receive from the scale was 30 and the lowest score was 6. In the evaluation of the scale; as the item score average increases, the self-efficacy of the individual also increases.

Exercise Stages of Change Short Form: This scale was developed by Marcus et al.[14], and was subsequently adapted for Turkish people by Ay and Temel[15] in 2008. Kappa index validity of the Exercise Stages of Change Short Form is 0.81. The scale consists of five questions which reveal a person's stage of change. These questions reveal the stage of change that the individual is in. These stages are, in order, pre-contemplation, contemplation, preparation, action, and maintenance.[15-16]

Participants were asked if they were regularly engaged in moderate-intensity physical activity for at least 30 minutes a day, five or more times a week, and were presented with five options and were asked to mark only one. To this question;

1. Those who answer "No, and I do not intend to start doing physical activity regularly within the next 6 months" are in the " pre-contemplation " stage,
2. Those who answer "No, but I intend to start doing physical activity regularly in the next 6 months" are in the " contemplation " stage,
3. Those who reply "No, but I intend to start doing activities regularly within the next 30 days" are in the "preparation" stage,
4. Those who reply "Yes, I have been doing it for less than 6 months" are in the "action" stage,
5. Those who answered "Yes, I have been doing it for more than 6 months" were accepted in the "maintenance" stage.

International Physical Activity Questionnaire-Short Form (IPAQ-SF): Developed by Craig et al.[17], the questionnaire was tested for validity in Turkey by Saglam et al.[18], in 2010. This questionnaire collects data on the time people spent while doing low, moderate and vigorous-intensity physical activities. A separate question is asked about the time spent sitting. IPAQ short form produced repeatable data (r=0.69).

The questionnaire inquired about the time respondent spent doing following activities in the last 7 days:

1. Vigorous physical activity (basketball, football, fast cycling, heavy lifting, etc.) amount (min),
2. Moderate physical activity (carrying light loads, dancing, table tennis, bowling, etc.) amount (min),
3. Walking and daily sitting time (min).

The time spent doing physical activities was converted into Metabolic Equivalent of Task (MET), which corresponds to the Basal Metabolic Rate, then the total physical activity score (MET-min/week) was calculated.

- Vigorous activity score (MET-min/week)= 8 x vigorous activity time x days of vigorous activity
- Moderate activity score (MET-min/week)= 4 x moderate activity time x days of moderate activity
- Walking score (MET-min/week)= 3.3 x walking time x days of walking
- Total physical activity score (MET-min/week)= Walking + moderate activity + vigorous activity score

The physical activity levels of respondents are classified as low, moderate and high depending on their total physical activity scores.

Physical Activity Levels

1. Low level: Less than 600 MET-min/week
2. Moderate level: Between 600-3000 MET-min/week
3. High level: More than 3000 MET-min/week

Data Analysis: Statistical analysis was performed using SPSS software (version 17). A p-value of less than 0.05 was considered as statistically significant. Mean percentages, min and max values were calculated and Kruskal Wallis test was used to analyze the data. The Mann Whitney U test was applied for post hoc analysis.

RESULTS

Of the adolescents surveyed, 55.4% were male, 36.8% were 11th grade students and 66.6% had moderate socio-economic status. The rate of adolescents who engaged in physical activity was 56.6%. Those who stated that they did not do physical activity in the personal information questionnaire mostly (37.2%) stated that they did not do it because the conditions were not suitable. Walking was the most common (82.8%) physical activity among the adolescents (Table 1).

The distribution of adolescents by physical activity and exercise stage of change is presented in Table 2. The percentage of the adolescents who demonstrated a moderate level of activity was 37.6. According to the exercise stages of change, 36.4% of the adolescents were at the Pre-contemplation stage, 15.6% at the Contemplation stage, 12.4% at the Preparation stage, 18.8% at the Action stage and 16.8% at the Maintenance stage.

The distribution of the mean International Physical Activity scores and self-efficacy scores of adolescents is presented in Table 3. The mean International Physical Activity scores of the adolescents was

2550.49±2821.50. The mean exercise self-efficacy score of the adolescents was 13.64±6.06 and the scores ranged between 6 and 30.

A comparison of mean exercise self-efficacy score by exercise stage of change and physical activity level is presented in Table 4. The difference between the mean exercise self-efficacy scores by the exercise stages of change was statistically significant ($p<0.05$). The post hoc analysis made to determine from which stage of change the difference originated showed that the self-efficacy levels of those whose exercise stage of change was pre-contemplation, contemplation and preparation were lower compared to those whose exercise stage of change was action and maintenance. The self-efficacy levels of those at the pre-contemplation stage were lower compared to those at the contemplation and preparation stages, and the self-efficacy levels of those at the contemplation stage were lower compared to those at the preparation stage.

The difference between the mean exercise self-efficacy scores of the adolescents with respect to their International Physical Activity statuses was statistically significant ($p<0.05$). Post hoc analysis

Table 1. The Demographic Characteristics of Adolescents (N=500)

	Number	**%**
Gender		
Female	223	44.6
Male	277	55.4
Education class		
9th grade	155	31.0
10th grade	124	24.8
11th grade	184	36.8
12th grade	37	7.4
Income Level		
High income	135	27.0
Medium income	333	66.6
Low income	32	6.4
Physical activity status		
Physically active	283	56.6
Non-physical	217	43.4
The reason for not doing physical activity (n=215)		
Conditions are not conducive	80	37.2
Absence of time	72	33.5
Unwillingness	63	29.3
Applied physical activities		
Walk	414	82.8
Running	375	75.0
Bicycle	274	54.8
Basketball	266	53.2
Volleyball	261	52.2
Swimming	255	51.0
Folk game	223	44.6
Tennis	218	43.6
Dance	210	42.0
Aerobic	192	38.4
	Mean	**SD**
Age	15.87	1.06
BMI	24.17	4.71

Table 2. The distribution of adolescents by physical activity and exercise stage of change (N=500).

	Number	%
Physical activity category Low	142	28.4
Moderate	188	37.6
High	170	34.0
Total	500	100
Stages of change Maintenance	84	16.8
Action	94	18.8
Preparation	62	12.4
Contemplation	78	15.6
Pre-contemplation	182	36.4

Table 3. The distribution of the mean International Physical Activity Scores and exercise self efficacy scores of adolescents.

	N	Min	Max	Mean±SD
International Physical Activity total score	500	4.00	23609.50	2550.49±2821.50
Exercise self-efficacy	500	6.00	30.00	13.64±6.06

Physical activity score (MET-min/week) was calculated.

made to determine from which activity group the difference originated showed that all groups were different from each other. Those at higher levels had larger scores than those at moderate and low levels and those at moderate levels had larger scores than those at low levels.

DISCUSSION AND CONCLUSION

The results of this study which aimed to assess the level of physical activity, exercise self-efficacy and stages of change for exercise behavior among adolescents are discussed with respect to previous studies and current literature.

Table 4. A comparison of mean exercise self-efficacy score by exercise stage of change and physical activity level (N=500).

	Self-efficacy scale score	
	Mean±SD	**Significant**
Stages of change Maintenance[1]	18.70±6.31	KW=203.162 p<**0.001**
Action[2]	17.13±4.59	
Preparation[3]	15.08±4.90	
Contemplation[4]	13.50±5.00	
Pre-contemplation[5]	9.06±3.65	
* 5<4<3<2<1		
Physical activity status		
Low[1]	11.35±5.40	KW=39.449 p<**0.001**
Moderate[2]	13.56±5.72	
High[3]	15.68±6.26	
* 1<2<3		

* Mann Whitney U test was used as post hoc analysis.

In this study, 56.6% of the adolescents reported that they engaged in physical activity. Another study conducted with adolescents found that 27.8% of adolescents involved in regular exercise.[19] Previous studies showed that participation in physical activity was at a moderate level.[20] According to the WHO (2015), 20% of adolescents have a sufficient level of physical activity.[1] Contrary to other study results and literature, more than half of the adolescents in our study responded positively to the question "Do you engage in any physical activity?". However, the distribution of the international activity scores of the adolescents showed that slightly more than one-third of them (37.6%) had a moderate physical activity level. When we look at the distribution of exercise stages of change among the adolescents, we can see that more than one-third of them (36.4%) were in the pre-contemplation stage and only 35.6% reported that they did regular physical activity at the desired level (action stage: 18.8%, maintenance stage: 16.8%). This can be explained by the fact that the adolescents considered themselves physically active, but when it comes to their state of doing regular physical activity at the desired level (exercise stages of change), it indicates that their performance was inadequate (as most of them were in the pre-contemplation stage).

In this study, the respondents indicated the following the reasons for their physical inactivity: unfavorable conditions (37.2%), lack of time (33.5%), and unwillingness (29.3%). A similar study with adolescents listed the following reasons for inactivity: unwillingness, having no friends to do physical activity together, lack of time, dangerous environment, challenges faced and low self-sufficiency.[21] In accordance with our results, previous studies have identified the lack of favorable conditions (physical environment) and time, and unwillingness as grounds for inactivity.

A review of the physical activities reported in the study showed that the most engaged physical activity among adolescents was walking with a rate of 82.8%. Due to the physical conditions of the province where the study was conducted, schools are mostly located in a short distance to the dwellings. The ease of walking and the absence of a requirement for driving to school are thought to be the reasons why adolescents are engaged in the walking activity at a high rate.

The data on the stages of change for exercise behavior among the adolescents showed that they were in the pre-contemplation stage with a rate of 36.4%. We found that more than one-third of the adolescents were in the pre-contemplation stage (currently not exercising and no intention of starting exercising regularly within the next 6 months) and only 35.6% of them (action stage: 18.8% + maintenance stage: 16.8%) did regular physical activity at the desired level. The large number of adolescents who are in the pre-contemplation stage in our study suggests that a considerably large proportion of the adolescents lead a sedentary lifestyle and may continue to live so in the future.

In the study of Kim et al.[22], 54.6% of Korean adolescents being inactive (precontemplation or contemplation) or exercise irregularly (preparation). A study conducted in Iran found that the adolescents were mostly in the preparation stage with a rate of 32.6%.[23] We can see that the findings related to the stages of change for exercise behavior generally differs between studies conducted with different groups both in Turkey and other countries. Although the adolescents in our study were physically active at a moderate level, unfortunately, more than one-third of them (36.4%) did not do regular exercise nor intend to start exercising within the coming 6 months (pre-contemplation stage).

More than one-third of adolescents in the present study (37.6%) had a moderate physical activity level. In most of the studies conducted with adolescents, the activity level of adolescents was found to be at a low level.[19,20] The results of the existing studies conducted with adolescents show that youth is in general insufficiently physically active.

The mean exercise self-efficacy score of the adolescents surveyed was found to be 13.64±6.06 based on 6-30 points score assessment. A study with adults identified the mean exercise self-efficacy score as 2.43±0.98.[24] In an interventional study, the mean self-efficacy score before the intervention was found to be 14.32±4.15 in the treatment group and 13.81±4.65 in the control group.[25] In our study, it was determined that the mean score for self-efficacy was moderate. Individuals' level of exercise self-efficacy is desirable because it is an effective factor in their motivation to act.

The results of the International Activity Questionnaire showed that the mean total activity score was 2550.49±2821.50 MET-min in the adolescents in the present study. The mean total activity score was found to be 4685.18±5454.42 MET-min in another study.[26] This value obtained from our study means that the majority of adolescents show moderate physical activity (37.5%). Our finding is similar to other studies, and the desired increase in physical activity level of adolescents is desired.

The difference between the exercise stages of change of the adolescents and their mean self-efficacy scores was significant. It has been identified that the exercise self-efficacy scores increased from the pre-contemplation through the maintenance stage. The results of many studies based on the Transtheoretical Model show that there is a significant positive correlation between the stages of

change for exercise behavior and the exercise self-efficacy score.[13,25,27] The literature on the exercise stage of change has demonstrated that the self-efficacy of individuals in the pre-contemplation stage is low, and the self-efficacy of those in higher stages of change increases linearly.[28] The results of the current study are similar to the other research findings and the current information in the literature.[29]

This study has found that the mean self-efficacy score of the adolescents increased linearly as their physical activity level increased from low to high. The self-efficacy of individuals is an influential factor in their motivation to take action. In a study conducted with children and adolescents with disabilities, a strong relationship was found between sports participation and exercise self-efficacy.[30] We have not found any study comparing individuals' self-efficacy levels to their International Physical Activity Questionnaire scores. In the present study the fact that more than one-third of the adolescents were moderately active while having moderate mean self-efficacy score supports this result.

In conclusion, in this study, it was determined that as the exercise stages of the adolescents change and their physical activity levels increased, their self-efficacy scores increased. Of the students surveyed, 37.6% had self reported moderate physical activity levels. We also found that more than one-third of the adolescents were in the pre-contemplation stage, which means that they did not exercise currently and had no intention of beginning to exercise within the next six months. Moreover, most of the adolescents who engaged in exercise were found to have a moderate level of physical activity. In the light of these results, we recommend that nurses encourage adolescents to engage in physical activity by providing training to increase the level of physical activity of adolescents. In addition to education, we recommend that adolescents be made suitable for physical activity, providing them with the necessary opportunities and providing appropriate time for physical activity. It is recommended that the trainings be conducted taking into account the stages of change adolescents are in.

This research; It is limited to the students at Muş Anatolian High School in the 2015-2016 academic year, where the study was conducted.

Ethics Committee Approval: Ethical approval for the study was obtained from the Ethics Committee of the Faculty of Health Sciences of Atatürk University (Date: 21/12/2015 decision no: 36).

Conflict of Interest: No conflict of interest was declared by the authors.

Author Contributions: Concept - HYB; Supervision – MÖ,HYB; Materials - MÖ,HYB; Data Collection and/or Processing - MÖ; Analysis and/ or Interpretation - MÖ,HYB.; Writing MÖ,HYB.

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