Original article

The association of various social capital indicators and physical activity participation among Turkish adolescents

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Abstract

Background: Physical activity participation (PAP) has been proven to improve health and promote optimal growth among adolescents. However, most adolescents do not meet the current physical activity (PA) recommendations in Turkey. The role of the social environment and social factors on PAP is being increasingly recognized. Although social capital (SC) indicators have been examined in high-income countries, there are few studies on developing countries. The aim of this study was to examine the relationship between SC indicators and PAP among Turkish adolescents.

Methods: A survey was conducted among 19 high schools in 4 different cities in Turkey in 2016. A total of 506 female and 729 male high school students participated in this study. The dependent variable was overall PAP, which was measured using the short form of the International Physical Activity Questionnaire. The independent variables included self-perceived family, neighborhood, and school SC. Self-rated health and obesity status, measured by body mass index, were other study covariates in multiple binary logistic regression models. Chi-square tests were used to assess the differences between genders.

Results: PAP levels were significantly different between males and females. A higher percentage of males reported PAP (77.4%) compared to females (51.0%). Among males, teacher–student interpersonal trust and informal social control were inversely associated with PAP, while high students interpersonal trust was positively associated with increased odds of PAP. For females, students interpersonal trust was inversely associated with PAP.

Conclusion: Various SC indicators are associated with PAP for males and females. These associations are different from findings of studies conducted in developed countries. Therefore, health-promotion interventions and policies should consider gender and different social agents on the social and cultural background to improve PAP among Turkish adolescents.

1. Introduction

Physical activity participation (PAP) is one of the determining factors for optimal growth and development of children and adolescents.[1,2] There is also evidence to suggest that physical inactivity during early periods of life may track into adulthood and affect quality of life.[3] However, the majority of children and adolescents do not meet the current international guidelines for physical activity (PA), and 4 out of 5 adolescents do not participate in PA at the recommended level.[4,5] Physical inactivity is one of the major causes of various non-communicable diseases and premature deaths.[6]

Prevention and control of physical inactivity related noncommunicable diseases, such as cardiovascular disease, cancer, and diabetes, are a major challenge in developing countries.[7] Turkey is a developing country on the verge of a physical inactivity crisis.[4] The World Health Organization reported that 77.1% of male adolescents and 86.9% of female adolescents in Turkey are inactive.[8] As a consequence of an inactive lifestyle and in line with global World Health Organization reports, the Turkish Statistical Institution[9] reported that the majority of deaths in Turkey are caused by cardiovascular diseases and various types of cancers. Therefore, eliminating physical inactivity among Turkish adolescents is vitally important to

decrease non-communicable diseases and their associated deaths.[6]

Social factors are highlighted as important determinants of individual health along with positive and risky health-related behaviors such as unhealthy diet, smoking, and physical inactivity.[10] Providing a positive social environment is emphasized as a possible mediator of PAP.[11] Recent attention has focused on social capital (SC) as a factor contributing to health outcomes such as PA behavior.[12,13] SC is defined as "social networks and the associated norms of reciprocity and trustworthiness"[14] and it is different from other social determinants of health as it is based on an individual's direct choices and behaviors.[15] Measures such as cooperation, interpersonal trust and reciprocity, and exchange of social support within a group are determinants of SC.[16] Higher levels of SC perceptions have been linked to higher levels of PA among adults.[17] However little is known about SC and PAP in adolescents. How a SC mechanism may affect PAP in adolescents is explained as (1) informal social control decreases juvenile delinquency, therefore encouraging residents to exercise in outdoors; (2) collective efficacy improves access to PA opportunities, and (3) social norms related to healthy behaviors promote PA.[18]

Although PAP is important for the health and development of adolescents,[19] most of the studies exploring the relationship between SC and PAP have focused on adult populations. In addition, most studies examining the associations between SC and health outcomes have been conducted in high-income countries resulting in a lack of information related to populations from middle- and low-income countries and those from different cultures. Exploring these associations may help to reverse the physical inactivity trend among Turkish adolescents and to increase health quality among the Turkish population. The aim of this study was to examine the association between various SC indicators and PAP among high school-aged Turkish adolescents.

2. Materials and methods

A cross-sectional study design was implemented in 2016 among high school students from urban areas in 4 Turkish cities (Ankara, Eskişehir, İstanbul, and Ordu). İstanbul and Ankara are large size urban cities with a population of 15,000,000 and 5,000,000 people, respectively. Eskişehir with a population of 850,000 people and Ordu with a population of 750,000 people are mid-size urban cities. Schools were randomly selected from a list of all public schools. All participants, school principals, and participants' parents were informed about the aim, procedure, and the data collection tools of the study. Participants and their parents signed informed consent forms. Only students who volunteered to participate in the study completed the data collection tool. The study was approved by Ethical Board Committee of the Hacettepe University and Turkish Ministry of Education. The data collection tool was administered to 19 high schools out of 1935 high schools in the referenced cities. Researchers selected 20 adolescents from each grade of each school for a total of 1520 adolescents invited to participate in this study. The participation rate was 81.25%. A total of 506 female (54.9 ± 8.5 kg, 163.8 ± 6.5 cm, 20.4 ± 2.8 kg/m^2) and

729 male (64.7 ± 11.1 kg, 174.0 ± 7.7 cm, 21.3 ± 3.0 kg/m^2) high school students from Grades 9–12 (aged 14–18 years) participated in this study.

The outcome, PAP, was assessed by the short form of International Physical Activity Questionnaire (IPAQ) that provides total PA in the last 7 days as metabolic equivalent hours per week (MET-hours per week).[20] The short form of IPAQ was previously adapted into Turkish and validated.[21] The validation study reported moderate and significant relationship between the short form of the Turkish IPAQ and energy expenditure measured with an accelerometer. The IPAQ consists of 3 PA sections: vigorous-, moderate-, and walking PA. Based on PA recommendations calling for 60 min/day of PA in adolescents,[22] the PA score was dichotomized into yes or no for at least 60 min daily participation for overall PAP. Self-reported average PA min/day was multiplied by days/week and divided by 7 to determine the cut-point for dichotomized PAP as active or non-active.[23]

In addition to the IPAQ, participants answered survey questions about their perceptions of SC in the school, neighborhood, and family settings.[24] The survey consists of 6 questions about SC perceptions (Fig. 1). School SC was composed of 3 indicators: interpersonal trust between teachers and students, interpersonal trust among students, and collaboration between students. Neighborhood SC was composed of 2 indicators: trust in the neighborhood and informal social control. Family SC was assessed by a single indicator. Participants answered questions using a 5-item Likert scale ranging from *strongly agree* (5) to *strongly disagree* (1). Each SC indicator was transformed into dichotomous variables as high (*strongly agree*, *agree*) and low (*neither agree nor disagree*, *disagree*, and *strongly disagree*). The survey was adapted into Turkish according to recommendations related to intercultural inventory adaptations.[25] All questions were analyzed as independent variables.

Study covariates were body mass index (BMI) and self-rated health. Self-rated health was assessed by a single question (How do you perceive your overall health?) with responses ranging from *very poor*, *poor*, *regular*, *good*, or *excellent*. The responses were also dichotomized as poor (*very poor*, *poor*, and *regular*) and good (*good*, *excellent*) health status. BMI was included as a categorical variable in the statistics, calculated as self-reported weight in kilograms divided by self-reported height in meters squared. Overweight cut points ranged from 22.6 to 25.0 in males and from 23.3 to 25.0 in females. Obesity cut points ranged from 27.6 to 30.0 in males and 28.6 to 30.0 in females. Methods used to calculate gender and age-specific cut points are presented elsewhere.[26]

Before data analyses, multiple imputation analyses were conducted for missing data.[27] The variables with the highest missing data were PA variables (22.7%) and BMI (3.8%). The SC indicator with the most missing data was collaboration between students (1.7%). Descriptive statistics were calculated to explain features of the study population. Chi-square (χ^2) tests were used to compare all categorical variables between genders. Finally, multiple binomial logistic regression was used to identify the associations of SC indicators and PAP adjusting for BMI and self-reported health. Models for PAP were first