

The Effect of Regular Physical Exercise on Catching Upper Respiratory Tract Infections

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BACKGROUND

Acute infections of the upper respiratory tract are among the most common infections of humans, most frequently manifesting as the "common cold." The clinical features are well known: nasal congestion accompanied by watery discharge; sneezing; scratchy, dry sore throat; and a slight increase in temperature.

The relationship between exercise and upper respiratory tract infections (URTI) may be modeled in the form of a "J" curve (Figure 1). This model suggests that while the risk of URTI may decrease below that of a sedentary individual when one engages in moderate exercise training, risk may rise above average during periods of excessive amounts of high-intensity exercise.*

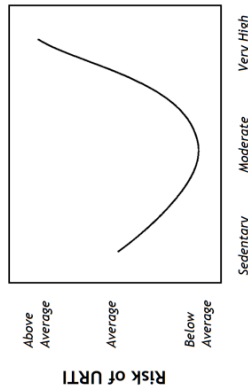


Figure 1 – "J"-shaped model of relationship between varying amounts of exercise and risk of URTI.

*Nieman DC. Exercise, upper respiratory tract infection, and the immune system. *Med Sci Sports Exerc.* 1994 Feb;26(2):128–139.

There are very few studies about the relation between regular physical exercise (RPE) and catching URTI moreover they were conducted with professional athletes, the patients with asthma or HIV (+). The effectiveness of RPE on catching URTI in young and healthy adults is not investigated sufficiently.

We aimed to figure out the association between RPE and catching URTI in healthy young adults.

MATERIALS AND METHODS

This study is a cross-sectional research that had been conducted in Ankara University School of Medicine from December 2014 to March 2015. Target population consisted of medical students who were enrolled to Ankara University School of Medicine in 2014-2015 education semester. 180 medical students had been randomly chosen to find out 7 percent significant difference of catching URTI between the people who does regular physical exercise and who does not.

Classification Criteria

Regular Physical Exercise (RPE): Performing exercise at least 3 times a week for minimum 45 minutes each is defined as regular. The severity of physical exercise is determined by total hours of exercise.

Catching URTI: Participants tracked their symptoms (headache, sore throat, runny nose, fever, cough, sneezing). If they had these symptoms they are assumed as caught URTI.

Sleep Pattern: Less than 6 hours of sleep is considered as inadequate.

Nutrition: Having at least 3 meals a day and at least 5 portions of fresh fruit or vegetables in a week is considered as regular and sufficient.

Stress: Participants marked their physical and mental stress levels from 1 to 5 (min:1. max:5). \geq Level 3 of stress is considered as high.

Dependent Variable :	Frequency of catching URTI
Independent Variables :	Age
	Sex
	Body Mass Index
	Living Conditions
	Dietary Habits
	Sleep Pattern
	Smoking
	Mental Stress
	Physical Stress
	Regular Physical Exercise
	The Place Where Exercise Performed
	Study Period (Month)

Table 1 – Dependent variable and independent variables

Data Collection

The participants, whose informed consent had been taken, received a web-based survey at the end of December, January, February and March. The survey inquired how frequently they performed exercise during that month, whether they caught URTI or not and also if they caught URTI, what the severity of URTI was.

Statistical Analysis

The data were analyzed with Generalised Estimated Equation (GEE) model to evaluate risk factors on catching URTI. A stepwise procedure was used for statistical analysis. All independent variables included in the first model and only the variables found to be important ($p < 0.25$) in the first analysis were included in the final model. The results were summarized by using Odds ratios with their 95% confidence intervals and p values less than 0.05 was considered as statistically significant.

RESULTS

The study conducted with 180 participants who were between 17 and 25 (Mean age: 20.9 years). 87 (48.3%) were women, 33 (18.3%) were smoking. BMIs were between 17.7 and 30.6 kg/m² (Mean: 22.7). (Table 2)

Sex		
Men	93	51,7 %
Women	87	48,3 %
Age		
Mean	20,9	
Range	17-25	
BMI		
Mean	22,7 kg/m ²	
Range	17,7-30,6 kg/m ²	
Accommodation		
Parent's House	108	60 %
Student House	38	21,1 %
Dormitory	34	18,9 %

Table 2 – Sociodemographic characteristics of participants

The number of participants caught URTI in December, January, February and March were 77, 44, 55, 52 (42.7%, 24.4%, 30.5%, 28.8%) respectively. (Figure 2)

66 participants (36.7%) in December, 65 (36.1%) in January, 80 (44.4%) in February, 64 (35.6%) in March performed RPE. (Figure 3)

The risk of catching URTI was 1,851 times higher among the subjects who did not perform RPE than the performed ones ($P=0.005$).

URTI risk was increasing with higher mental stress ($P=0.044$, OR: 1.709 (1.014-2.880)). Study period was found as a risk factor for catching URTI, especially the months December and February have higher risk with regard to March ($P=0.009$).

People who were performing RPE outdoor had less risk than the people performing indoor ($P=0.032$). (Table 3)

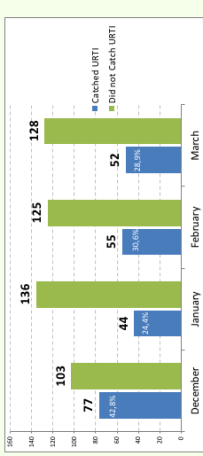


Figure 2 – Frequency of Catching URTI by Months

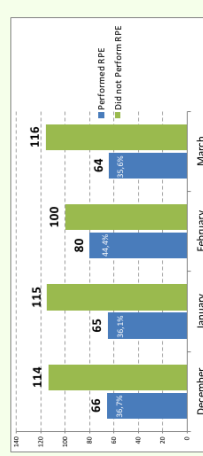


Figure 3 – Frequency of Performing Regular Physical Exercise by Months

Variable	Yes	No	OR (95% CI)	P
Regular Physical Exercise			1	0,005
			1,851(1,210 – 2,832)	
Mental Stress			1	0,044
			1,709(1,014 – 2,880)	
The Place Where Exercise Performed			1	0,032
			0,707(0,445 – 1,124)	
			1,433(0,944 – 1,126)	
Study Period			1	
			1,901(1,128 – 3,125)	
			0,687(0,415 – 1,138)	
			1,455(0,878 – 2,409)	

Table 3 – Risk factors for catching URTI (multivariable analysis)

CONCLUSION

Performing regular physical exercise is found protective against catching URTI even other factors such as nutrition, stress, sleep pattern, smoking, living conditions, have been taken into consideration.