



Body Mass Index (BMI) Scores and Attitudes towards Physical Activity

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Abstract

Today, the increase in incidence of obesity is one of the most serious threatening problems to human health. This study aims at defining body mass indexes (BMI) and attitudes of primary, secondary and high school students and their parents towards physical activity in Burdur province in Turkey. Data were collected through the "Scale of Attitudes towards Physical Activity" developed by the researchers. The sample of study covered a total of 2642 people. The average age of the sample group was 21.5 years while 1359 subjects (51.4%) were male and 1283 (48.6%) were female. Findings have shown that the overweight and obesity incidence increased as the age level went up. An analysis of the scores of attitudes towards physical activity according to age groups revealed that the attitude scores of primary and secondary school students were higher than that of students older than 15 years. It can be possible to ensure increased attitude scores towards physical activity at older ages through adopting regular exercise habits at early ages.

Keywords: BMI, Attitude, Physical activity, Physical education, Burdur

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INTRODUCTION

Current physical activity recommendations encourage children and adolescents to accumulate at least 60 minutes per day of moderate-to-vigorous physical activity (USDHHS, 2008). Physical activity is defined as body movements produced by contraction of skeletal muscles and requiring energy consumption over the basal level brings many benefits for health. Physical activity helps reduce the risk for premature mortality as well as development of diabetes and colon cancer and balancing the high blood pressure. It also has positive impacts on body weight control, healthy and well-developed bone, muscle and tendon systems and improved movement and balance for elderly people as well as ensure psychological well-being and reduce depression and anxiety for individuals.

Regular physical activity helps individuals to keep their body mass index scores within normal levels. Maintenance of the habit of regular physical exercises at middle and elderly ages hinges upon development of positive attitudes towards physical activity at early ages of individuals.

In development of psychomotor skills and behaviors, affective process is as important as cognitive process. Attitudes are developed as a result of individual experience, and these attitudes are supposed to further develop into positive ways. Attitudes are not directly observed but in situations where people change their attitudes into behaviors (Tavsancil, 2005).

Rikard and Banville (2006) stated that attitudes are born from beliefs that one has about him or herself and things. Researchers indicated that children who have more positive attitudes toward physical activity are reported to be more likely to participate in physical activity outside of school (Chung & Phillips, 2002; Ding, Wright & Li, 2006; McKenzie, 2006; Portman, 2003) and Hagger, Cale and Almond (1997) demonstrate higher physical activity levels than those with less positive attitudes towards physical activities.

Having positive attitudes towards physical activity also brings in sufficient physical activity level. The aim of this study is to define BMI and attitudes of primary, secondary and high school students and their parents towards physical activity in Burdur province in Turkey. The main question dealt with in the study was “what are the variables that affect body mass index scores and attitudes towards physical activity?” Accordingly, the following secondary questions were also raised:

- Is there any difference in BMI scores according to age groups?
- Is there any correlation between age level and BMI scores?
- Is there any difference in attitudes towards physical activity between genders in terms of age groups?
- Is there any difference in attitudes towards physical activity according to age groups and BMI scores?

METHOD

The population of this study in which the descriptive research technique was implemented was 157.690 people who live in central district of Burdur province and its villages (www.tuik.gov.tr). Samples were selected randomly. The research team tried to reach out to students attending to schools in the 2012-2013 year of education and their parents to make them fill in the questionnaire. In this study with a population of 157,690 people and a sample of 2642 people,

although 661 people were sufficient to compose the sample at a confidence interval of 99%, more people were reached out to make the sample more representative of the population. The error margin was calculated to be 2.48 at 99% confidence interval of depending on the size of the population. Results of the questionnaire therefore have a very high representation level. 1359 participants (51.4%) were male while 1283 (48.6%) were female. Descriptive statistics of the participants are presented in Table 1.

Table 1: Descriptive statistics of participants of the study

Variable	N	Min.	Max.	Mean	SD
Age	2642	7	69	21,54	12,76
Height (M)	2642	104	199	157,50	12,29
Weight (Kg)	2642	19	140	54,34	19,18

Data in table 1 revealed that the age interval ranged between 7 and 69. It is safe to suggest that a sufficient number of individuals from different age groups participated in the study. We see that the body height ranged between 104 and 199cm while the body weigh was between 19 and 140kg.

Data Collection Tool

“The Scale of Attitudes towards Physical Activity” developed by Savaş and Çelik Kayapınar (2013) in this study. The scale has three dimensions and 25 items. The first dimension, titled as “equipment & hardware”, was composed 9 items while the second dimension had 9 items and was titled as “health”. The last dimension consisted of 7 items and was titled as “social-affective”. Reliability of the scale used in the study (Alpha) was defined as 0.93.

Statistical Techniques Applied

Descriptive statistics such as arithmetic mean, standard deviation, percentage and numbers were used whereas the chi square technique, the Pearson correlation and the Two-way Analysis Variance was used in comparative analysis. Body Mass Index (BMI) was calculated by division of the body weight (kg) into the square of the body height (m) (kg/m^2). The following classification was applied in this calculation:

- Underweight: $\text{BMI} < 18.50$
- Normal weight: $18.51 \leq \text{BMI} < 25.00$
- Overweight: $25.01 \leq \text{BMI} < 30.00$
- Obese: $\text{BMI} \geq 30.01$

The Turkish Health Survey (2012) conducted by TUIK (Turkish Statistics Institute) covers the data for the age group of 15 and 15+ years only, the study made two groupings such as those younger and older than 15.

FINDINGS

Findings concerning secondary questions of the study are presented in tables below

Table 2: Chi Square Test Results for Age Groups and BMI Scores

Age Interval	F/%	Underweight : BMI < 18.50	Normal Weight: 18.51 ≤ BMI < 25.00	Overweight: 25.01 ≤ BMI < 30.00	Obese: BMI ≥ 30.01
7-14 years	F	749	576	48	6
	%	54,3	41,8	3,5	0,4
15-69 years	F	75	698	408	82
	%	5,9	55,3	32,3	6,5
Total	F	824	1274	456	88
	%	31,2	48,2	17,3	3,3

$X^2 = 909,496$; $sd=3$; $p<0,001$

Table 2 revealed a significant difference in age groups according to BMI scores ($X^2 = 909,496$; $sd = 3$; $p<0,001$), which suggests accordingly that participants younger than 15 years had lower or normal BMI scores whereas those older than 15 years were either normal or overweight. Moreover, an increase in obesity and BMI scores was observed starting from the late adolescence period irrespective of the life styles of individuals. The obesity incidence was 0.4% for those younger than 15 years while it went up as high as 6.5% for those older than 15.

Table 3: Pearson Correlation Results Concerning the Correlation between Age and BMI Scores

	Age	BMI
	Pearson Correlation	1 ,655**
Age	Sig. (2-tailed)	,000
	N	2642 2642

** . Correlation is significant at the 0.01 level (2-tailed).

$R^2=0,429$

Table 3 indicates a moderately positive and significant correlation between the age level and BMI scores ($r=0,665$ $p<0,001$), which suggests accordingly that the BMI scores go up as the age level increases. Considering the determination co-efficient ($R^2= 0,429$), it would be safe to suggest that approximately 43% of the total variance in BMI scores is due to age.

Table 4: Descriptive statistics concerning the physical activity attitude scores based on age group and gender

	Male			Female			Total		
	N	X	S	N	X	S	N	X	S
7-14 years	733	111,35	13,48	646	110,51	13,12	1379	110,96	13,31
15-69 years	626	106,68	14,65	637	105,66	15,15	1263	106,16	14,91
Total	1359	109,20	14,22	1283	108,10	14,36	2642	108,67	14,30

Table 4 suggests that attitude scores of males and females at the 7-14 age intervals were higher than that of individuals at age of 15 or older. Physical activity attitude scores of males are higher than females in any age group.

Table 5: Two-Way Analysis of Variance Statistics Based on Physical Activity Attitude Scores According to Age Groups and Genders

Variance Source	Total of Squares	sd	Mean of Squares	F	P
Age Group	14928,00	1	14928,00	75,06	.000
Gender	574,70	1	574,70	2,89	.089
Age x Gender	5,11	1	5,11	,026	.873
Error	524638,16	2638	198,87		
Total	540367,85	2641			

Table 5 indicates significant difference in physical activity attitudes based on age group only $F(1-2638) = 75,061$; $p < 001$). There was no significant between gender scores $F(1-2638) = 2,890$; $p > .05$) and gender scores according to age group $F(1-2638) = 0,026$; $p > .05$).

The study attempted to answer the question whether there is a difference between physical activity attitudes in the BMI scores according to age groups. In order to find a response to this question, two-way variance analysis was conducted and presented in tables 6 and 7.

Table 6: Descriptive Statistics of Physical Activity Attitude Scores according to Age Groups and the grouped BMI Scores

Age	N	Underweight: BMI < 18.50		Normal Weight: 18.50 ≤ BMI < 25.00			Overweight: 25.00 ≤ BMI < 30.00			Obese: BMI ≥ 30.00			Total		
		X	S	N	X	S	N	X	S	N	X	S	N	X	S
7-14 y	749	111,41	13,28	576	110,41	13,25	48	112,70	11,48	6	93,33	24,17	1379	110,96	13,31
15-69 y	75	106,73	14,19	698	105,89	15,54	408	106,78	14,01	82	104,90	14,53	1263	106,16	14,91
Total	824	110,98	13,42	1274	107,93	14,72	456	107,41	13,87	88	104,11	15,45	2642	108,67	14,30

Table suggests that the physical activity attitude scores of obese individuals in the age group of 7-14 were lower than that of normal and overweight individuals while the physical activity attitude scores of individuals older than 15 years were close to one another in any group.

Table 7: Two-Way Analysis of Variance concerning Physical Activity Attitude Scores Based on Age Group and the Grouped BMI Scores

Variance Source	Total of Squares	sd	Mean of Squares	F	P
Age Group	57,35	1	57,35	,28	,591
Grouped BMI	2432,52	3	810,84	4,08	,007
AGE x BMI	1532,30	3	510,76	2,57	,052
Error	522515,29	2638	198,37		
Total	540367,85	2641			

Table 7 suggests a significant difference in physical activity attitude scores according to the grouped BMI scores only $F(3-2638) = 4,087; p < .05$). No significant difference was observed between the Age Group $F(1-2638) = 0,289 p > .05$) and BMI Scores according to Age Groups $F(3-2638) = 2,575; p > .05$).

2642 individuals between the ages of 7 and 69 participated in this study, which aim at defining body mass indexes and attitudes of primary, secondary and high school students and their parents towards physical activity in Burdur province in Turkey. Body mass index scores and attitudes of individuals towards physical activity were defined in this study.

CONCLUSIONS

BMI scores for individuals younger than 15 years are low and normal.

BMI scores for individuals older than 15 years are mostly normal and overweight.

BMI scores increase as the age level goes up.

Attitude scores of males and females at the age interval of 7 and 14 are higher than that of individuals at 15 years and older.

Physical activity attitude scores of males are higher than that of females in any age group.

Physical activity attitude scores of obese individuals in the age group of 7-14 years are lower than that of normal and overweight individuals.

Physical activity attitude scores of individuals older than 15 years according to BMI scores are close to one another in all age groups.

Recommendations

- Individuals should be informed at school ages of the BMI scores that go up in line with the age.
- The decreased physical activity attitude scores in line with the age can be prevented through adoption of the regular exercise habit before individuals reach middle and elderly ages.
- Women should be provided with regular activity opportunities and facilities within their own living areas by local administrations.
- Disadvantages of being overweight and advantages of having a healthy and quality life before the age of 15 should be explained to individuals at schools Awareness should be further raised through practical performance homework or assignments.

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