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Original Article

Investigation the Level of Physical Activity in Elementary Students of Hamadan Province, Iran

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Abstract

Background: Evidence suggests there is a prevalence of sedentary lifestyle in students and adolescents. Physical activity is a crucial factor during childhood and adolescence for health promotion and prevention of chronic diseases during adulthood. The aim of this study was to investigate the level of physical activity in the elementary students of Hamadan province.
Methods: In this descriptive and cross-sectional study, statistical populations included all the elementary students (N=161846) of Hamadan province in the academic year of 2020-2021. Through stratified random sampling, 1879 students were chosen. Data were gathered using the Physical Activity Questionnaire for Older Children and Adolescents, which validity and reliability have both been confirmed. The data were analyzed using descriptive and inferential statistics such as Kolmogorov–Smirnov, one way ANOVA, Independent t test, and Mann–Whitney U in SPSS software.
Results: The mean±SD scores of the total sample (1879 students) in the variables of physical activity was 2.97±0.749. The result of Mann–Whitney U test showed no significant difference in the medians related to the physical activity level of students (boys: Median=3.03, IQR=1.05; girls: Median: 2.91, IQR=1.02, P=0.213). There were no significant differences between the physical activity of elementary students and their fathers' education (lower than high school education=2.92±0.76, high school diploma=3±0.71, associate degree=3.03±0.68, bachelor's degree=2.92±0.717, higher education=3.05±0.85, P=0.1), mothers' education (Under-diploma=2.94±0.73, diploma=2.97±0.74, associate=3.02±0.66, bachelor=2.89±0.72, higher education=2.97±0.74, P=0.477), fathers' job (P=0.422), and mothers' job (P=0.122).
Conclusions: The results showed that a high percentage of students had moderate and low levels of physical activity. Ultimately, it is necessary for managers and authorities to have an educational plan to educate students regarding the promotion of their physical activity.

Keywords: Physical activity, Students, Sedentary behavior, Sport

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1. Introduction

Research has been conducted on the global decrease in physical activity and increase in sedentary lifestyle and obesity, which are major problems for most countries (1). Inactivity and reduced level of physical activity are increasing among students at an alarming rate (2). Lack of physical activity stems from industrialization, urbanization, and mechanization of life. Inactivity will cause physical, mental, and social problems (3). Increase in obesity is the most common health problem among Iranian adolescents such that 27% of children and 21% of adolescents are obese; researchers have predicted that more than 70% of obese adolescents will become obese adults (4). Nowadays, due to the surge in inactivity and obesity, some diseases such as diabetes type II and high cholesterol and blood pressure have become common among students (5, 6). Therefore, physical activity is crucial for health in all people (2-5). A large body of research has indicated the positive effects of physical and sport activities in reducing obesity, overweight, blood pressure or dyslipidemia, thereby highlighting the importance of protection against psychological, social, and cognitive distresses (7). Also, there exist several physical, mental, and cognitive advantages associated with children's engagement in physical activity (8).

Students can be influential in various industrial, economic, cultural, and scientific features in the future of countries, hence the necessity of paying attention to the public health of students (9). Physical activity has positive outcomes in society's health and is therefore key subject and a priority in research on physical education (8, 10). As a result, students' sports play a significant role on different affairs such as Document of Fundamental Transformations in Education, National Charter of youth, and Islamic Republic of Iran's 20-Year Vision Plan (11).

Studies have shown that 20 to 25 percent of girls and 35 to 40 percent of boys have adequate physical activity

in accordance with World Health Organization (WHO) guidelines (daily 60 minutes of physical activity) (10, 12). Moreover, research has shown that more than 70% of Iranian people do not have adequate physical activity (13), and Iranian boys and girls do not perform physical activity in accordance with WHO guidelines (10).

Approximately half of pre-school students do not participate in enough physical activity, and boys participate in physical activities more than girls (14), also, 40% of pre-school students and 42% of students are obese due to inactivity and energy imbalance (15). The other study has documented that students' level of physical activity is moderate (73.8%), low (20.7%), and high (4.4%) (16).

Also, the results of previous studies have shown that boys participate in sports more than girls (17), and most of the girls (68%) are inactive (18). In this regard, other studies have showed that about half of the girls carry out moderate physical activity (19), and the rate of physical activity in 95.8% of female students was lower than that recommended by WHO (i.e. 60 minutes per day) (20). A significant relationship has been reported between student's physical activity and their fathers' jobs. On the other hand, the level of mothers and fathers' education, mothers' jobs and household income has no significant effect on students' physical activity (18).

Students are important assets to the Ministry of Education, increasing students participation in sport and physical activities will improve community health (21) and result in better academic performance (7). Physical education is an essential and inseparable part of education that can enhance students' physical and mental capabilities (10), improve their cognitive functions (22), help them cope with stress (23), motivate them (21), and decrease their depressive symptoms (24).

Curriculum planning and policy making in education to increase students' physical activity will require accurate knowledge and further investigations of their physical activity. Very little is known about the level of physical activity in the elementary students of Hamadan province. Since the individual, social, cultural, and economic differences affect the level of physical activity in students, it was challenge for us to determine the level of physical activity in elementary students of Hamadan province, Iran.

2. Methods

A cross-sectional survey approach was chosen for the present study. The Ethics Review Board of BU-Ali Sina University of Hamadan approved the present study with the code of IR.BASU.REC.1400.052. The study was conducted in the elementary students of Hamadan province, Iran between September 2020 and February 2021. All of the participants provided written informed consent.

Participants

The statistical population included all of the elementary students (N=161846) of Hamadan province in the academic year of 2020-2021. 1879 (46.2% boys and 53.8% girls) elementary students (grades 1-6) were selected through stratified random sampling (140 schools form Hamadan province). The stratified random sampling had three stages: In the first stage, the departments of education in Hamadan province were divided into three areas (privileged area, semi-privileged area, and non-privileged area); in the second stage, privileged areas (the center of the province), semi-privileged areas (two cites), and non-privileged areas (three cites) were chosen by indexes of facilities and students' populations. The third stage in every city was based on students' populations (public schools, private schools, rural schools, urban schools, and gender) which were randomly selected (140 schools form Hamadan province). Mean and standard deviation of age was 10.27±1.95 years. Statistical sampling included 1663 students of public schools, 216 students of private schools, 437 students of rural schools, and 1442 students of urban schools. The inclusion criteria were: 1) studying in elementary schools of Hamadan province, 2) grade 1-6 students, 3) consent to participate in the study, 4) studying in public and independent schools, 5) and being healthy without any acute physical or mental disorders. Exclusion criteria were incomplete response to the questionnaire and unwillingness to continue the research.

Instruments

In the present study, data were gathered using the Physical Activity Questionnaire for Older Children and Adolescents (PAQ) (25). The questionnaire was sent online (Shad Web) for schools that were randomly selected with the collaboration of the education department of Hamadan province. The PAQ provides a general measure of physical activity for youth in grades 4-12 (ages 8-20) (25). The PAQ questionnaire uses a common scoring system and has been successfully applied in many studies (25, 26). It is a nine-item self-administered 7-day recall questionnaire where each

question is scored using a Likert scale that ranges from 1 (the lowest physical activity) to 5 (the highest physical activity). Once there is a value from 1 to 5 for each of the 9 items (items 1 to 9) used in the physical activity composite score, the mean of the 9 items is determined, resulting in the final PAQ-C activity summary score (25). Therefore, the scores are categorized into 3 levels (1-2.33: lower PA, 2.34-3.66: moderate PA, and 3.67-5: high PA) (25). Eight faculty members assessed and confirmed the content validity, and the content validity index (CVI) and content validity ratio (CVR) were reported to be 0.78 and 0.83, respectively. To determine the face validity of the questionnaire, this scale was provided to 12 physical education experts; after removing the ambiguities of the questions of this scale, the 9 item form was approved; the reliability of the questionnaire was measured and the Cronbach's alpha coefficient was α=0.85.

Statistical Analyses

Data were analyzed by the use of SPSS software version 26. In this research, the descriptive statistics consisted of means, standard deviations, percentages, and frequencies which were used to describe the research variables. Kolmogorov-Smirnov, one way ANOVA (parents' educations, grade1-6), Independent t-test (parents' jobs), and Mann-Whitney U (boys and girls) were used for group comparison. Values were reported as mean±standard deviation (SD) and the alpha level was set at 0.05.

3. Results

Descriptive Statistics

A total of 1879 elementary students (10.27±1.95 years) from the schools in Hamadan, Iran participated in this study; among these students, 437 were from rural schools and 1442 were students of urban schools. The inclusion criteria were: 1) studying in the elementary schools of Hamadan province, 2) grade 1-6 students, 3) consent to participate in the study, 4) studying in the public and independent schools, and 5) being healthy without any acute physical or mental disorders. Exclusion criteria were incomplete response to the questionnaire and unwillingness of participants to continue the research.

There were 177, 224, 266, 257, 375, and 580 students in grades 1, 2, 3, 4, 5, respectively. The mean of students' age was 10.27±1.95 (boys=10.67±2.007, girls=9.92±1.83, t=8.44, P<0.001). The mean±SD scores of the total sample (1879 students) in the variables of physical activity was 2.97±0.749 (boys=2.98±0.78, and girls=2.96±0.72).

Table 1 shows the results obtained from the classification of students' physical activity (boys, girls, and total).

The descriptive statistics show that the rate of physical activity in elementary students was as follows: low (20.6%), Moderate (60.6%), and high (18.8%) (Table 1).

Table 2 shows the results obtained from comparing the medians of students' physical activity in the groups (boys, girls; city, village).

The Mann-Whitney U test revealed no significant difference between the medians of girls and boys regarding level of physical activity (P>0.05), but there was a significant difference between the medians of city and village in terms of physical activity (P=0.012).

Table 3 shows the results of one way ANOVA analyses of students' physical activity according to the students' grade, educational level of parents and their jobs.

The results of one-way ANOVA test showed that

Table 1: Categorizing students' physical activity (boys and girls)

Groups	Category	Frequency	Percentage frequency	Cumulative percentage frequency
Boys	Low physical activity	178	20.05	20.05
	Moderate physical activity	516	59.04	80
	High physical activity	174	20	100
Girls	Low physical activity	209	20.07	20.07
	Moderate physical activity	622	61.05	82.02
	High physical activity	180	17.08	100
Total	Low physical activity	387	20.06	20.06
	Moderate physical activity	1138	60.06	81.02
	High physical activity	354	18.08	100

Table 2: Comparison of the medians of students' physical activity in the groups

	Groups	Median	IQR	Mann-Whitney U	z	P value
Comparison of groups	Boys	3.03	1.05	424164.00	-1.246	0.213
	Girls	2.91	1.02			
	City	2.87	1.15	290158.5	2.508	0.012*
	Village	2.99	1.04			

*P<0.05, N=1879

Table 3: One way ANOVA analyses of students' physical activity according to students' grade, educational level of parents, and parents' jobs

Variable		Frequency	Students' Physical activity	P value
Students' grade	1	177	2.94±0.8	0.047
	2	224	3.11±0.68	
	3	266	2.89±0.80	
	4	257	2.95±0.78	
	5	375	2.97±0.74	
	6	580	2.95±0.71	
Fathers' education	High school or lower	704	2.92±0.76	0.10
	High school diploma	638	3±0.71	
	Associate degree	93	3.03±0.68	
	Bachelor's degree	249	2.92±0.717	
	Higher Education	195	3.05±0.85	
Mothers' education	High school or lower	632	2.94±0.73	0.477
	High school diploma	767	2.97±0.74	
	Associate degree	101	3.02±0.66	
	Bachelor's degree	293	2.89±0.72	
	Higher Education	86	2.97±0.74	
Fathers' job	Government position	530	2.94±0.73	0.422
	Self-employment	1349	29.97±0.77	
Mothers' job	Employed	290	2.90±0.80	0.122
	Housewife	1589	2.98±0.73	

*P<0.05, N=1879

the mean of students' physical activity was statistically significant (F=2.24, df=5, P=0.047); however, Scheffe post-hoc test revealed that the mean of students' physical activity was not statistically significant in terms of educational levels (grade 1- grade 6) (P>0.05). Based on the results of one-way ANOVA test, the mean of students' physical activity was not statistically significant regarding fathers' level of education (F=1.93, P=0.10) and mothers' level of education (F=0.877, P=0.477). According to the independent t test, there was significant difference in physical activity concerning fathers' jobs (t=0.80, P=0.422), and mothers' jobs (t=1.58, P=0.122).

4. Discussion

This study indicated that the level of students' physical activity was moderate, and there was no significant difference in the medians of students' physical activity. There were no significant differences in the physical activity of elementary students in terms of fathers' education, mothers' education, fathers' jobs, and mothers' jobs.

In addition, the level of students' physical activity was moderate which is consistent with previous research (16, 17, 19, 20). The results of the present study are consistent with a previous study which reported that the physical activity level of 22% of 13-year-old Malaysian students was low (27). Nonetheless, some researchers have shown that pre-school students' physical activity (Malt country) was low, which is not in line with the results of the present study (15). Some reasons of inactivity among pre-school students (Malt country) included academic pressure, academic activities, and lack of physical activity.

In one study, about half of pre-school students (2-6 year) from seven countries did not participate in adequate physical activity, which is inconsistent with

the findings of the present study (14). Previous studies have documented that children avoid attending in physical activities (14, 18). The age of students in the present study was 6-16 but in Tucker's study (2008), it was 2-6.

On the other hand, an investigation has shown that more than 70% of Iranians do not do enough physical activity (13), which is inconsistent with the present study. Several reasons can affect this inconsistency such as more free time, more leisure time, low age, and higher physical activity of students compared to other members of society. Furthermore, the level of physical activity decreases after adolescence; in girls, this reduction starts at the age of 14. For instance, inactivity in American girls decreased from 8% to 15% between 9th and 12th grade (28). So, it is a necessity for authorities to have plans for increasing the level of physical activity among the students of higher grades.

Some investigations have shown that most girls are inactive (6, 18), which is not in accordance with the results of the present study probably because of social and cultural limitations and the age of female students.

The results of Mann-Whitney U test indicated no significant difference between male and female level of physical activity. These results are not in line with that of previous investigations in which significant differences were detected between boys and girls in regard to the level of physical activity (1, 14-17, 29). They showed that the level of physical activity was higher in boys than in girls. In the present study; however, sexual differences did not influence the students' physical activities, and girls' physical activity was similar to boys' activity. Changing the culture of participation in sports activities will help people to increase their physical activity. In this regard, researchers have reported that girls tend to do team sports more than boys (30). Sports programs must be tailored to students' interests.

According to our findings, there was no significant difference in physical activity regarding fathers' education, mothers' education, mothers' jobs, and fathers' jobs, which is in line with the results of an earlier study (18); on the other hand, in another investigations, parents' education affected students' physical activities (31). Previous studies showed inconsistent results in regard to the level of physical activity of students and parental demographic factors (18, 31). Therefore, further research is needed on this subject.

Furthermore, social support, culture, friends, and classmates, especially group activities are important determinants that can help increase physical activity among students (32).

There were some limitations in the present study. As we measured the level of physical activity during the COVID-19 pandemic, it should be repeated furthermore after the COVID-19 pandemic to validate its result. We did not measure schools' sports facilities and the socio-economic condition of the students; thus, more research is needed in these areas.

Conclusions

It can be concluded that it is a necessity to prepare a national plan and program to improve physical activity in order to help students to increase physical activity. These strategies, plans and programs must take into account the specifics of the environment, customs and cultural features of the region. Therefore, it is suggested that teachers, parents and the authorities of the Education Department of Hamadan province, Iran take effective measures and follow-up monitoring with the help of physical education experts to address this subject. Changing the lifestyles of students will have a positive effect on the overall health of the society.

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Ethical Approval

The Ethics Review Board of BU-Ali Sina University of Hamadan, approved the present study with the code of IR.BASU.REC.1400.052. Also, written informed consent was obtained from the participants.

Conflict of Interests: None declared.

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