

## Recess Activity and General Health Status among Iranian Elementary Schools' Pupils

Abdolreza Shaghghi<sup>1</sup>, Massumeh Piri<sup>1</sup>, \*Hamid Allahverdipour<sup>1,2</sup>, Mohammad Asghari-Jafarabadi<sup>3</sup>

<sup>1</sup>Department of Health Education & Promotion, Faculty of Health, Tabriz University of Medical Sciences Tabriz 14711, Iran

<sup>2</sup>Clinical Psychiatry Research Center, Tabriz University of Medical Sciences, Tabriz 46184, Iran

<sup>3</sup>Traffic Injury Prevention Research Center, Faculty of Health, Tabriz University of Medical Sciences, Tabriz 14711, Iran

ARTICLE INFO	ABSTRACT
<p><b>Article type:</b> Original Article</p>	<p><b>Background:</b> Regular and daily physical activity during childhood and at school is one of the important part of requirements of normal growth, development and well-being. To achieve physical activity promotion among school child aged population recess as outside of class time efforts is scheduled and allows students to engage in physical and social activities. The purpose of the present study was to assess recess activities as well as status of physical activities among a sample of Iranian students at the primary schools.</p> <p><b>Methods:</b> This cross-sectional study was performed in four randomly selected schools from a list of 26 elementary schools in March, 2012 in the city of Shahindej, located in North-west of Iran. Participants were 439 (10–12 years) elementary schools'. Physical activity level by self-reporting, mental health using the parent-completed Child Health Questionnaire, and happiness was assessed using a Persian translated version of the Subjective Happiness Scale. Hierarchical logistic regression analysis was applied in two steps using the enter method to analyze data in the SPSS version 17.</p> <p><b>Results:</b> Backward logistic regression analysis showed that gender of the parent who answered the study questions, father's education, educational grade of children, BMI, physical function, physical health, health status of the children and family function were significantly related to the children's physical activity level.</p> <p><b>Conclusion:</b> Promoting parents' awareness and schools' staff about importance of physical activities especially in recess times must be an important part of school and community mental health promotion programs.</p>
<p><b>Article history:</b> Received: May 12 2013 Accepted: Aug 05 2013 e-published: Jun 30 2013</p>	
<p><b>Keywords:</b> Recess activity, Physical activity, Happiness, General health</p>	
<p><b>*Corresponding Author:</b> Hamid Allahverdipour Tel: +98 914 3147363; e-mail: allahverdipourh@tbzmed.ac.ir</p>	

**Citation:** Shaghghi A, Piri M, Allahverdipour H, AsghariJafarabadi M. Recess Activity and General Health Status among Iranian Elementary Schools' Pupils. Health Promot Perspect 2013; 3(1): 45-54

### Introduction

Regular and daily physical activity during childhood, especially in schools, is an important requisite to have a normal growth and development and thus to be fit and healthy. Observational studies are suggesting greater health benefits associated with higher levels of

physical activity<sup>1,2</sup>. While current guidelines of daily physical activity recommend regular, moderate to vigorous physical activity for children at least 60 min per day<sup>3</sup> but evidences<sup>2,4-6</sup>, show that current physical activity levels of children in schools is not sufficient

for their growth and development requirements. Levels of physical activity among some of young children have reported to decline to a level that has detrimental consequences for their current and future well-being as well as their quality of life in future<sup>6</sup>.

Research evidences in the United States for instance have shown that 42% of children aged 6–12 years and only 8% of boys and girls aged 12–19 years are performing at least 60 min physical activity with moderate intensity or more (MPA) each day<sup>7</sup>. Playing physically inactive games like video games is currently known as a major leisure time activity among children in many countries of the world<sup>8</sup>. Unfortunately, some aspects of modern life are helping development of physical inactivity during school ages among them; changes in the pattern of favorite playing and a tendency towards playing with electronic games are paramount. Children's desire to use computer based games is threatening well-being of children and adolescents<sup>9,10</sup>.

There are sufficient evidences to highlight consequences of physical inactivity on children and adolescents' current health and in their later life. Children's physical inactivity with all these background information is now considered as a preventable risk factor for many lifestyle-related diseases such as coronary heart disease<sup>6</sup>, type 2 diabetes mellitus, osteoporosis, different kinds of cancers<sup>11,12</sup> and increasing the rate of over weightiness and obesity<sup>13</sup>. Children who perform sufficient levels of physical activity have a better educational performance<sup>14</sup> and mental status due to a decreased risk of developing anxiety and depression<sup>15</sup>. The World Health Organization have global recommendations on physical activity level to have a better health status and addresses the existent link between the frequency, duration, intensity, type and total amount of physical activity needed for well-being of children and also WHO's recommendations now suggest that children aged 6-17 years should participate in moderate to vigorous physical activity at least 60 minute

each day, and in high intensity, muscle-strengthening and bone strengthening activities for at least three days per week<sup>12</sup>. To achieve WHO recommended physical activity level for children, schools have been identified as one of the important settings to engage students in physical activity<sup>16</sup>. All children regardless of facilities in their living place can be reached<sup>17</sup> and motivated to participate in pre-planned types of physical activities. Findings of a multi-centre study conducted among children in 35 participating countries in Europe and America, have revealed that only 27% of girls and 40% of boys do physical activity in a level that met the guideline of WHO<sup>17</sup>. One of the opportunities within schools that provide a valuable chance for engagement of children in physical activity is school recess times.

Recess is a daily free play opportunity in which children can choose playing that they desire. Interventions to enhance recess activity may include changes in schools' environment, providing playing toys and equipments and marking of playground<sup>2</sup>. Those children, who are typically engaged in structured physical activities during recess, will be prepared physically, mentally and socially better for their later life stage in adulthood<sup>17</sup>. A few studies that have investigated children's physical activity levels during recess revealed that children spend less than 50% of their recess time to engage in moderate level physical activity and boys have indicated to be more active during recess periods than girls<sup>17</sup>. To the best of our current knowledge, there are scant numbers of studies with special focus on recess activity of children in schools of Iran. Findings of a research on 330 boys and girls aged 9 to 12 yr in elementary schools have shown no significant difference between two sexes regarding recess activity<sup>18</sup>. About a quarter of the children who were just out of school in the summer, have had regular exercise<sup>19</sup>.

The main purpose of the present study was to assess recess and physical activity levels

among a sample of Iranian students at the primary schools.

## Materials and Methods

### *Participants*

This cross-sectional study was performed in March 2012 within four schools selected randomly from a list of 26 elementary schools in the city of Shahindej located in North-west of Iran. Participants were 439 students in the age range of 10–12 years and studying in grades 4<sup>th</sup> and 5<sup>th</sup> of the elementary schools. Educational curriculum was similar in all selected schools and every school had existing playground with identical equipments. Physical activity according to the method explained by Donnelly et al. (2009) was studied on 404 children. Peacock's formula was used to calculate the sample size based on 95% confidence level and power of 80%. Relative to the original sample size we also recruited extra people to cover anticipated dropout rate of 10%. Of the 404 children, 203 (50%) were girls and 201 (50%) boys with the mean age of  $10.60 \pm 0.77$  years. All participants followed their normal daily school routine during the study period.

This study was conducted with approval of the Medical Ethics Review Board in the Tabriz University of Medical Sciences. Written informed consent was also obtained from participants and their parents or guardians before data collection.

### Measures

#### *Demographics*

*Students:* the collected background data were included: sex (male, female), age (year), study grade (fourth or fifth), number of siblings and status of educational progress (excellent; good; average; poor). *Parent:* background data collected were sex, age, literacy level (college, high school, secondary school, primary school or illiterate), employment status of father (government or private sector employee; self employed, retired), employment

status of mother (government or private sector employee, housekeeper), and place of residence (house or apartment).

#### *Physical activity*

To measure daily and weekly physical activity, data based on the respondents' self report was collected through a written questionnaire. Students were asked to describe or report their recent involvement in physical activity. Students were also requested to record time track they have spent on varying types of physical activity on a daily based reporting sheet within their a normal week. On the reporting sheets, students were also asked to record all the games they had played with demanding physical activity.

#### *Child Health Questionnaire Parent Forms*

For measuring students' health related quality of life, a Persian translated short form of the questionnaire containing 28-items (CHQ-PF28) which had developed by Rat et al.<sup>20</sup> was applied estimated reliability 0.70 and parents asked to complete the questionnaire. The CHQ-PF28 consists of 28 items, which refer to 13 scales. Nine scales measure the well-being of the child; two scales measure the impact of child's health on parent's health related quality of life and two scales measure the impact on the family. Subscales were physical functioning (4 items), every day activity (2 item), pain or physical discomfort, behavioral problems (4 item), mental health (3 items), self esteem (3 items), general health perceptions (3 items), children's health status (1 item). parental emotional worry or concern about child's health (2 items), time spent by parents for child's health (2 items), family activities (2 items) and ability to compromise with family members(1 item). To interpret the results the estimated scores for items was calculated based on 0-100 point scale. Lower scores were representing lower HRQL. In addition, ten of the 13 scales are summed up into two comprehensive health scales to represent the child's physical and psychosocial well-being.

### **Happiness**

Subjective happiness was measured by a modified set of 4 items based on the Lyubomirsky & Lepper's SHS scale<sup>21</sup>. The scale designed to measure self-reported happiness which was modified and response categories were coded from 1-5 reflecting the range of "not a very happy person to a very happy person". The respondents were requested to indicate whether they agree or disagreed with the item statements. Examples of the items include: (1) In general, I consider myself a very happy person and (2) some people are generally very happy. An estimated reliability coefficient ( $\alpha=0.72$ ) indicated that the measure of subjective happiness was internally consistent.

### **Statistical Analysis**

Measures of central tendency and dispersion were applied to present the study data. To investigate the relationship between demographic and physical activity related variables with the outcome variable a series of simple and multiple logistic regressions were performed in the context of univariate and multivariate analyses respectively for computing unadjusted and adjusted Odds Ratios (ORs) with their 95% confidence intervals. In the univariate analyses, each individual variable (demographic or physical activity related) was entered separately and in the next step for multivariate analyses, those variables that indicated a significant relationship with the outcome variable in the univariate analyses were imputed. In addition, in the final steps a backward elimination for multiple logistic regressions was performed to find the set of best predictors of the physical activity. A hierarchical logistic regression analysis was applied in two steps using the enter method. The *P*-values for entry and removal variables in the stepwise logistic regression models were 0.15 and 0.1, respectively. Additionally, the Hosmer and Lemeshow goodness of fit test was used to evaluate the model fit for a logistic regres-

sion. All statistical analyses were performed by SPSS 17 (SPSS Inc., Chicago, IL).

### **Results**

From 439 approached children, 404 students participated in the study (response rate = 92%) of them 201 (49.75%) were boys and 203 (50.24%) girls. The children's ages ranged from 10 to 12 years, with the mean age of 10.60 (SD: 0.77). The anthropometric indices of the children are shown in Table 1. Boys had greater height and BMI than girls and girls had a greater weight ( $P < 0.05$ ) profile. More than 71 (17.6%) of children reported that they had regular physical activity compared to 333 (83.4%) of children who reported that they had not enough daily physical activity. Our findings (Table 2) showed that literacy level of parents, location of residence, employment status of parents, educational grade of the participants, and their educational status were significantly related to physical activity level. However, there was not significant relationship between physical activity level and sex of the parent who completed the study questionnaire for recruited children.

The result of univariate logistic regression revealed that physical function, general health perceptions, family activities, BMI, and birth rate and number of sisters had significant relationship with physical activity level. However, every day activity, feeling bodily pain or physical discomfort, behavioral problems, mental health, self-esteem, general health perceptions, parental emotional worry or concern about child's health, time spent by parents for their child's health, ability to compromise with family members and age of children was not significantly related to physical activity. By adding one unit in physical function, general health perceptions, family activities, BMI, and birth rate the odds of having physical activity were increased by 9%, 12%, 17%, 8% and 7% respectively (Table3).

**Table1:** Summary statistics for anthropometric variables

Characteristics	Boy(n:201)mean(SD)	Girl (n:203)mean(SD)	Total (404)
Age(yr)	10.63 (0.82)	10.56 (0.72)	10.60 (0.77)
Height (cm)	145.09 (8.0)	143.45 (8.1)	35.03 (8.37)
Weight (kg)	33.88 (7.9)	63.18 (8.6)	144.27 (8.14)
BMI	28.66 (3.04)	17.49 (3.4)	16.73 (3.31)

**Table 2:** Socio-Demographic Characteristics of children who Have Had a Physical activity and Have not had a physical activity (n =404)

Variables		Having Physical activity n(%)	Not having Physical activity n(%)	P-value
Father's literacy level	College	11(15.5)	82(24.6)	0.009
	High school	16(22.5)	65(19.5)	
	Guidance	24(33.8)	73(21.9)	
	Primary	16(22.5)	39(11.7)	
	Illiterate	3(4.2)	53(15.9)	
Mother's Literacy level	College	6(8.5)	80(24.0)	0.004
	High school	10(14.1)	60(18.0)	
	Guidance	23(32.4)	73(21.9)	
	Primary	29(40.8)	67(20.1)	
	Illiterate	14(19.7)	79(23.7)	
Residence place type	Apartment	57(80.3)	254(76.3)	<0.001
	Villa	10(14.1)	99(29.7)	
Employment status of father	employee	0	12(3.6)	<0.001
	Retirement	61(85.9)	222(66.7)	
	Business	2(2.8)	42(12.6)	
Employment status of mother	employee	69(97.2)	291(87.4)	<0.001
	Housekeeper	57(80.3)	153(45.9)	
Sex of parent	male	14(19.7)	180(54.1)	0.426
	Female	0	202(60.7)	
Sex of child	Girl	71(100.0)	131(39.3)	1.000
	Boy	24(33.8)	222(66.7)	
Children's educational grade	Five	47(66.2)	111(33.3)	<0.001
	Four	21(29.6)	133(39.9)	
Educational progress	High	3(4.2)	38(11.4)	<0.001
	Very good	37(52.1)	132(39.6)	
	Good	10(14.1)	30(9.0)	

P- Value based on chi square test using exact method.

Findings based on the backward logistic regression (Table 4) showed that sex of parent who completed the study questionnaire, father's literacy level, grade of education; BMI, physical function, general health perceptions, and family activities were significantly related to physical activity in the multivariate analysis. The adjusted odds of having physical activity

increased 8%, 8%, 9% and 10% by one unit increase in BMI, physical function, general health perceptions and family activities respectively and by 25% by one unit increase in children's health status. In addition, for children whose father completed the survey questionnaire the odds of physical activity was 80% less than those children that their moth-

**Table 3:** Relationship between children’s Physical activity and variables of Child Health Questionnaire – Parent-completed Form 28 (n= 404)

Variables	Have Had Physical Activity	Have not had Physical activity	Odds Ratio	95%C.I.for Odds Ratio		p value
	Mean (SD)	Mean (SD)		Lower	Upper	
Physical function	12.25(3.20)	13.03(3.08)	1.09	-1.58	0.02	0.055
Everyday activity	6.90(1.29)	7.04(1.22)	0.82	-0.18	0.46	0.394
Pain or physical discomfort	4.21(1.11)	4.22(1.148)	0.90	-0.28	0.29	0.967
Behavioral problems	14.11(2.39)	13.90(2.59)	1.08	-0.84	0.41	0.498
Mental health	10.19(1.68)	10.04(2.017)	1.01	-0.60	0.30	0.512
Self-esteem	13.33(1.88)	10.04(2.01)	0.94	-0.42	0.56	0.781
General health perceptions	15.01(2.85)	14.42(2.83)	1.12	-1.33	0.14	0.113
Children’s health status	4.25(0.95)	4.38(0.85)	0.76	-0.10	0.35	0.263
Parental emotional worry or concern about child’s health	7.45(2.52)	7.15(2.71)	0.97	-0.96	0.36	0.372
Time spent by parents for child’s health	6.95(1.44)	6.95(1.33)	1.03	-0.35	0.35	0.099
Family activities	8.07(2.03)	7.40(2.18)	1.17	-1.19	-0.13	0.014
Ability to compromise with family members	3.98(1.13)	3.95(1.06)	0.99	-0.3	0.25	0.863
Happiness	16.60(3.31)	16.07(2.74)	1.07	-1.28	.0	0.151
BMI	16.92(3.35)	15.94(3.00)	1.08	-1.78	0.19	0.016
Rating birth	2.30(1.44)	2.67(1.57)	0.08	-0.01	0.74	0.57
Number of brother	0.87(0.86)	1.00(0.94)	0.95	-0.11	0.35	0.295
Number of sisters	0.87(1.02)	1.15(1.19)	0.87	0.01	0.55	0.044

P-value <0.05

**Table 4:** Relationship between children’s Physical activity with socio-demographic and variables of Child Health Questionnaire – Parent-completed Form 28 (n = 404)

Variables		B	S.E.	Odds Ratio	95%C.I.for EXP(B)		P value
					Lower	Upper	
Gender of parent	Male	-1.60	0.34	0.20	0.10	0.40	<0.001
	Female	Referent	-----	-----	-----	-----	-----
Father’s literacy level	College	2.56	0.66	12.89	12.89	47.19	<0.001
	High School	1.35	0.51	3.84	1.43	10.35	0.008
	Guidance	0.88	0.48	2.40	0.94	6.14	0.067
	Primary	0.41	0.44	1.51	0.64	3.57	0.350
	Illiterate	Referent	-----	-----	-----	-----	-----
Students Educational grade	Forth	Referent	-----	-----	-----	-----	-----
	Fifth	1.54	0.33	4.64	2.44	8.82	<0.001
BMI		0.08	0.05	1.08	0.98	1.20	0.128
Physical function		0.08	0.05	1.08	0.98	1.19	0.105
General health perceptions		0.09	0.06	1.09	0.98	1.23	0.121
Children’s health status		-0.29	0.19	0.75	0.51	1.09	0.133
Family activities		0.09	0.05	1.10	1.01	1.20	0.037

Results based on multiple logistic regression analysis/The Hosmer– Lemeshow goodness of fit test (Chi2 =7.136, DF=8, P=0.522)

ers completed it. Increase of the parent's educational level, the odds of having a higher level of physical activity increased. Based on the findings 5<sup>th</sup> grade students had a 4.64 times greater odd to do sufficient physical activity compared to 4<sup>th</sup> grade students.

## **Discussion**

Regular physical activity rate among the studies school children was less than the anticipated WHO recommended level; however students of the fifth-grade had a better physical activity profile than the fourth grade students. The results also showed that the literacy level of parents, location of residence, and employment status of parents, educational grade and educational status were significantly related to physical activity level of the students and the reported general health of the children. These findings suggested that daily physical function, general health perceptions, and birth order have a significant relationship with physical activity level. The observed low level of physical activity among the studied children is relatively concurrent with the reported physical activity level of school-aged children in other countries. Cardon reported that pre-schools children spent only 11.2% of their recess time in doing moderate to vigorous activity and 61.3% spent this time by sedentary activities<sup>22</sup>. Based on the findings of the study it was suggested that playground markings or providing playing equipments could be an effective step to promote physical activity levels in recess times. Thus lacking a sufficient space for playing and shortage of playing equipments may result to sedentary activities among pupils even during pre-school recess times. Strauss reported a significant decline in physical activity levels of school-aged teenagers between the ages of 10 to 16 years old, particularly among girls. Findings of this study showed that children spend 75% of their daily times (5.2 ±1.8) hours by watching television, working with computer, and doing

homework<sup>23</sup>. Ridgers noted that, girls had 13.8% more sedentary activity and 8.2% less vigorous activity than boys during recess. Children with no access to playing equipments during recess have a higher chance to engage in sedentary activities and have less moderate activity than children provided with equipments<sup>2</sup>. Concerning mental health of children, San Francisco asserted that frequency of physical activity seems to be related to improved mental health status<sup>24</sup> which is inconsistent the findings of current study and must be further scrutinized in future studies. Richard reported that high level of physical activity could be associated with improved self-esteem<sup>25</sup>. Ekeland also indicated that exercise may have short-term beneficial effects on self-esteem in children and adolescents<sup>26</sup> but they are inconsistent with the results of this study. Such differences must be interpreted with caution since intervening factors may have role. Concerning age of pupils Stratton & Mullen reported that physical activity level decreases with age. However, Pate pointed out that age was not a significant predictor of moderate to vigorous physical activity (MVPA) or vigorous physical activity (VPA)<sup>27</sup>. Ridgers; Fairclough, and Twisk reported that boys and girls have spent 32.9% and 23% of their recess times engaged in physical activity respectively<sup>28</sup>. Mota et al. conversely pointed out that boys spent 31% of recess time in moderate to vigorous physical activity (MVPA) while girls spent 38% of their recess time in moderate to vigorous physical activity (MVPA)<sup>29</sup>. Jimmy, Praz and Martin-Diener indicated that 40% of the children spent less than two hours a day on MVPA and 14% and 6% less than an hour on Sundays and on school days, respectively<sup>30</sup>. A number of studies in Iran indicated that adolescent physical activity level was significantly related to mothers' education, which is not consistent with the finding of our study<sup>31</sup>. Another study showed no significant relationship between physical activity level and body mass index of boys of 11-14 years<sup>32</sup>. Findings of other study

in Iran showed that there is no significant relationship between physical activity levels and body mass index<sup>33</sup>.

This study has certain limitations. The information about physical activity level is based on self-reporting, which always prone to a risk of recall bias. We have not any information about the direction of recall bias and that it would affect the result. Furthermore, selecting participants from students of four schools and their parents may affect general visibility of the results to other populations.

## Conclusion

The outcomes of this study revealed that majority of the studied children had not the required level of physical activity. A major gap was observed between the potentials to do physical activity especially in schools' environment and actual engagement of schools' children in recess activities. Physical inactivity is a new phenomenon of urbanization and pattern of life style change which need to be intervened through advocating policy makers in order to legislate supportive policies about recess time to encourage physical activity as part of children's right and consequently to have healthy and happy population of children.

## Authors' contributions

All authors read and approved the final manuscript. H.A. conceived the study and participated in the research design, data analysis, and preparation of the manuscript. A.S. participated in the research design and preparation of the manuscript. M.P. participated in the study design, data collection as well as preparation of the manuscript. M.A. participated in data analysis and manuscript preparation.

## Acknowledgements

Funding for the study was provided by the Deputy of Research of Tabriz University of Medical Sciences and also authors appreciate schools' staff for their sincere cooperation.

## Competing interests

The authors declare that there is no conflict of interests.

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