



The Relationship between Physical Literacy of Adolescents and the Socioeconomic Status of Families

Mansoure Alipour-Anbarani¹, Mohtasham Ghaffari¹, Ali Montazeri², Amir Kavousi³, *Ali Ramezankhani¹

¹Department of Public Health, School of Public Health and Safety, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

²Health Metric Research Center, Iranian Institute of Health Sciences Research, ACECR, Tehran, Iran.

³Health Promotion Research Center and Department of Epidemiology, School of Public Health and Safety, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Abstract

Background: In recent years, the relationship between social factors and health status has attracted the attention of health researchers, and several studies have attested to the relationship between socioeconomic status and people's health. This study aims to determine the physical literacy of Iranian adolescents based on the educational level and economic status of students' families.

Materials and Methods: In this cross-sectional study, 510 Iranian adolescents aged 16 to 18 years were selected by random sampling from Tehran high schools in Tehran, Iran, in 2021. The data collection tool was a questionnaire with two parts: general characteristics and the physical literacy of adolescents. It contained 34 items across four dimensions: information acquisition, information comprehension, information assessment, and self-care skills. Data were analyzed using SPSS software (version 16.0).

Results: The 510 adolescents in the study consisted of 256 girls (50.2%), and 254 boys (49.8%). The ANOVA test showed a significant difference between the average score of physical literacy of adolescents and the education level of the mother ($p=0.001$), and father ($p=0.007$). The average physical literacy score of adolescents was higher for mothers with a university education (73.84 ± 14.96 , out of 100), and fathers with a university education (73.11 ± 14.74). There was no relationship between the mean physical literacy score of adolescents and their family's economic status ($p = 0.068$), except in the domain of self-care ($p=0.021$).

Conclusion: Based on the results, the parental education level had a positive effect on the physical literacy of adolescents. Also, there was a significant relationship between family economic status and physical literacy score in the domain of self-care.

Key Words: Adolescent, Economic status, Educational level, Iran, Physical literacy.

*Please cite this article as: Alipour-Anbarani M, Ghaffari M, Montazeri A, Kavousi A, Ramezankhani A. The Relationship between Physical Literacy of Adolescents and the Socioeconomic Status of Families. Health Provid 2022; 2(1): 1-11. doi: **10.22034/HP.2023.418462.1041**

*Corresponding Author:

Ali Ramezankhani, PhD, Professor, School of Public Health and Safety, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Email: ramezankhaniali1@gmail.com

Received date: Jan. 10, 2022; Accepted date: Jun.22, 2022

1- INTRODUCTION

Physical literacy is essential to achieving a healthy and dynamic lifestyle in adolescents (1). The concept of physical literacy was introduced by Margaret Whitehead in 1993 and includes motivation, confidence, physical competence, and knowledge and understanding to engage in physical activity in life (2). According to the findings, the mean physical literacy score of adolescents is a moderate 63% for boys and 62% for girls, and usually, girls have a lower mean physical literacy score than boys (3, 4). A report by the World Health Organization (WHO) shows that there are 1.6 billion people with a body mass index of higher than 25 and 400 million with a body mass index of higher than 30 globally (5). A literature review reported that the prevalence of a sedentary lifestyle in Iran is between 30 and 70% (6).

Physical inactivity is not only associated with mortality and disability from chronic diseases but also places a heavy burden on society in terms of treatment costs and reduced production (7, 8). Studies have shown that the economic status of the family in early life is an essential factor in the well-being of adolescents. The wealth of the family is related to the provision of resources and a better learning environment (9-11). Another study on family income and adolescent health concluded that parents with higher income and adolescents from higher-income families had better health due to access to higher-quality medical care and physical activity (12). Other studies have shown that economically deprived girls and ethnic minorities have lower physical activity levels (13, 14).

Family education is a significant factor in human progress in today's world. The education level of parents can play an important role in how they raise their children. Educated parents usually have better income due to landing better jobs,

positively affecting the children's attitude towards their parents and their sense of security and self-confidence. As a result, they can better communicate with their environment, causing their talent to grow and flourish. Low income can harm students and cause complications such as impatience and reluctance to do activities (15). Inadequate physical activity is the leading major risk factor for death worldwide, and about 3.2 million people die each year due to lack of physical activity (16). Physical activity has decreased in all age groups in the last two decades. More than 80% of the world's adolescent population is not physically active (6). School age is one of the most important periods in life to ensure health during adulthood, as proper physical activity during the development years helps stabilize health status. Therefore, there is a huge potential for maintaining health in this age group (17, 18).

Due to the position of adolescents in public health, they can form the basis of the future of social health (19). In Iran, the evidence indicates a rapid increase in the prevalence of chronic diseases among adolescents, with overweight being one of the most common problems among them (20, 21). Therefore, since adolescence is an important stage for developing healthy behaviors, promoting physical activity during this period can have significant long-term health benefits (22). Physical literacy requires the cooperation of all individuals, including parents, principals, and teachers of physical education, sports associations, and gym trainers (23).

Most worldwide studies on physical literacy have been conducted on children aged 8 to 12 years, usually using the Canadian Assessment of Physical Literacy (CAPL), which assesses the physical literacy of Canadian children of this age group in four areas (knowledge and understanding, motivation and confidence, physical merits, and daily behavior); and is

used as a standard questionnaire to measure the physical literacy of children aged 8 to 12 years (3, 4, 24). In one study, only the dimension of physical literacy knowledge was examined using the Physical Literacy Knowledge Questionnaire (PLKQ) (24). The present study uses the physical literacy questionnaire of adolescents aged 16 to 18 years, which is designed based on Iranian culture and attitude (25), and includes the dimensions of physical literacy. The aim is to investigate the physical literacy of adolescents based on parental educational levels and the economic status of students' families.

2- MATERIALS AND METHODS

2-1. Study Design

In this cross-sectional study, 510 Iranian adolescents were selected by random sampling from high schools in Tehran, Iran, in 2021. The adolescents' physical literacy was assessed based on parental educational levels and the economic status of their families.

2-2. Participants and method

The study population was Iranian adolescents aged 16 to 18 studying in high schools in Tehran, Iran. The research setting was high schools for girls and boys in education districts 1, 2, 4, and 6 of Tehran. The sample size was determined based on the following formula:

$$n = \frac{Z_{1-\frac{\alpha}{2}}^2 p(1-p)}{d^2}$$

Where, $p=0.50$ (the proportion of people with sufficient physical literacy), $\alpha=0.05$, confidence level=95%, and $d=0.05$ (margin of error). A total of 424 samples were considered, including 10% attrition.

Initially, for the proper coverage of samples, the city of Tehran was divided into five parts: northeast, northwest, southeast, southwest, and center. Four

districts (1, 2, 4, and 6) were selected randomly out of 19 education districts. Then, one high school for girls and one high school for boys were randomly selected from each district. After visiting the selected schools, the researcher first introduced himself and gave a brief explanation of the research plan to school principals. Then, in coordination with school principals and assistants, a class was randomly selected from each grade and field of study. All students in selected classes participated in the study with consent as a sample.

2-3. Data collection

The data collection tool was a valid and reliable questionnaire (25) consisting of two parts: general characteristics with 12 items and physical literacy of adolescents with 34 items across four dimensions (skills of information acquisition, information comprehension, information assessment, and self-care). Personal characteristics included age, gender, and educational grade, field of study, parents' education, parents' occupation, and the economic status of the family, sports club membership, and source of receiving physical activity information.

The physical literacy section included 34 items across four skill domains: information acquisition (8 items), information comprehension (11 items), information assessment (6 items), and self-care (9 items). The five-point Likert scale rated the responses as never (1 point), rarely (2 points), sometimes (3 points), most of the time (4 points), and always (5 points) (25).

Based on the cut-off points of 50, 66, and 84, the physical literacy of adolescents was rated at four levels: insufficient (scores 0 to 50), not sufficient (50.1 to 66), good (66.1 to 84), and excellent (84.1 to 100) (26). Data was collected by filling out a questionnaire as a self-report. Due to the concurrence of data collection with the

COVID-19 pandemic, the questionnaire was completed in person in some schools and online in others. Data collection was performed in two months (April to May 2021). Students completed 406 questionnaires out of 955 questionnaire visits on the Press Line website, and 126 questionnaires were completed in person. After reviewing 532 completed questionnaires, those with information deficiencies were excluded from the research process, and finally, 510 questionnaires with complete information were included in the research for analysis (510 questionnaires were higher than the sample size because more questionnaires were sent to the Press Line system for online completion).

2-4. Inclusion criteria

Participants were included in the study if they were aged from 16 to 18, an Iranian student at the time of study, actively participated in the study, had no physical disability, and had informed consent to participate in the research.

2-5. Exclusion criteria

Withdrawal from the research and incomplete questionnaires were the exclusion criteria.

2-6. Validity and reliability of the tool

The psychometric properties of this tool have been investigated in previous studies in Iran, and the validity of the tool has been confirmed in terms of content, appearance, and culture. Cronbach's alpha reliability for this tool was reported as 0.93. Accordingly, this tool is valid and reliable in Iran (25).

2-7. Ethical considerations

Ethical confirmation was obtained from the Research Center of Public Health and Safety School of Shahid Beheshti University of Medical Sciences (IR.SBMU.PHNS.REC.1398.125).

Conscious consent to participate in the study was received in writing from each participant. Participants were assured that the information received was confidential.

2-8. Data analysis

Normality was tested using the Kolmogorov-Smirnov test. Descriptive statistics (frequency, mean, and standard deviation) and inferential statistics (independent t-test, one-way ANOVA test) were used to analyze the data. SPSS software version 16.0 was also used for statistical analysis. A p-value less than 0.05 was considered statistically significant.

3- RESULTS

Out of 510 adolescents participating in the study, 256 were girls (50.2%), and 254 were boys (49.8%). The frequency and percentage of adolescents were 134 people with 16 years (26.3%), 207 people (40.6%) with 17, and 169 people (33.1%) with 18 years. The frequency and percentage of participants by field of study are shown in **Table 1**. Based on the results, 55.3% of the mothers in the study had an academic education. Also, 62.7% of fathers had an academic education, and 63.1% were unemployed. Results showed that 49.6% of adolescents stated that the economic situation of the family was average. According to the physical literacy score, 6.7% of adolescents (34 students) had insufficient physical literacy, 28.6% (146 students) had insufficient physical literacy, 43.7% (223 students) had good physical literacy, and 21% (107 students) had excellent physical literacy (**Table 1**).

The one-way ANOVA test showed a significant difference between the mean score of physical literacy and the field of study among adolescents ($p=0.001$). The post-hoc test showed a significant difference in the mean score of physical literacy of adolescents between the disciplines of Technical and Vocational

Training ($p=0.001$), Vocational Training and Humanities ($p=0.001$), and Vocational Training and Experimental sciences ($p=0.004$). Also, the one-way ANOVA test showed a significant difference between the mean scores of acquisition ($p=0.001$), comprehension ($p=0.001$), information

assessment ($p=0.001$), and self-care ($p=0.010$) dimensions with the field of education among the studied adolescents. Also, the mean score of physical literacy was higher in the Technical field of study (75.56 ± 13.82) than in others (**Table 2**).

Table-1: The general characteristics of the participants (n = 510).

Variables	Number	%
Gender		
Boy	254	49.8
Girl	256	50.2
Age (year)		
16	134	26.3
17	207	40.6
18	169	33.1
Field of study		
Vocational Training	103	20.2
Technical Training	96	18.8
Humanities	108	21.2
Experimental Sciences	111	21.8
Mathematics & Physics	92	18
Mother's education level		
Illiterate	6	1.2
Primary school	25	4.9
High school	197	38.6
University degree	282	55.3
Father's education level		
Illiterate	10	2
Primary school	32	6.3
High school	148	29
University degree	320	62.7
Father's job		
Unemployed	322	63.1
Retired	38	7.5
Employed	150	29.4
Economic situation		
Very bad	11	2.2
Bad	26	5.1
Average	253	49.6
Good	171	33.5
Very good	49	9.6
Physical literacy score		
Insufficient	34	6.7
Not very sufficient	146	28.6
Good	223	43.7
Excellent	107	21

Table-2: Comparison of mean scores of adolescents' physical literacy and its dimensions based on the study field of students.

Field of study	Dimensions of Physical literacy								Total physical literacy	
	Acquisition		Comprehension		Assessment		Self-care		Mean	SD
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Vocational Training	68.05	18.83	69.26	17.44	64.60	18.39	59.62	18.34	65.61	14.06
Technical	78.93	15.75	79.47	15.59	74.04	17.64	68.77	18.90	75.56	13.82
Humanities	77.80	19.58	79.79	17.91	76.04	17.96	62.19	27.63	74.01	16.46
Experimental Sciences	77.30	17.86	78.56	15.82	74.84	16.25	60.03	20.66	72.71	13.04
Mathematics & Physics	75.20	19.05	76.21	17.49	71.96	18.56	59.32	18.12	70.76	14.17
P-value	0.001		0.001		0.001		0.010		0.001	

SD: Standard deviation.

The one-way ANOVA test showed a significant difference between the mean score of physical literacy among adolescents and the maternal level of education ($p=0.001$). The post-hoc test showed a significant difference in the mean score of physical literacy of adolescents between the maternal education levels of primary school and university degree ($p=0.008$), and high school and university degree ($p=0.025$).

Also, the one-way ANOVA test showed a significant difference between the mean scores of various dimensions of physical literacy among adolescents, i.e., acquisition ($p=0.001$), comprehension ($p=0.019$), assessment ($p=0.030$), and self-care ($p=0.002$) with mother's education. Based on the results, the mean score of physical literacy was higher in adolescents whose mothers had university degrees (73.84 ± 14.93) than in others (**Table 3**).

Table-3: Comparison of mean scores of adolescents' physical literacy and its dimensions based on mother's education.

Mother's education level	Dimensions of Physical literacy								Total physical literacy	
	Acquisition		Comprehension		Assessment		Self-care		Mean	SD
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Illiterate	68.22	19.40	75.75	16.43	71.52	28.31	39.81	16.06	63.74	10.73
Primary school	62.87	16.59	69.00	15.21	64.33	15.12	58.77	21.80	64.03	13.20
High school	74.22	18.39	75.09	17.05	70.87	17.81	59.22	20.87	69.94	14.14
University degree	77.61	18.48	78.52	17.38	74.12	18.19	64.56	21.36	73.84	14.96
P-value	0.001		0.019		0.030		0.002		0.001	

SD: Standard deviation.

In addition, the one-way ANOVA test showed a significant difference between the mean score of adolescents' physical literacy and father's level of education ($p=0.007$). The post-hoc test showed a significant difference in the mean score of physical literacy among adolescents whose fathers had elementary and university degrees ($p=0.008$). In addition, the one-way ANOVA test showed a significant difference between the mean scores of

dimensions of physical literacy among adolescents, i.e., acquisition ($p=0.010$), comprehension ($p=0.006$), and assessment ($p=0.031$) with father's level of education. However, there was no significant difference between the mean score of self-care ($p=0.125$), and the father's level of education. The mean score of physical literacy was higher among adolescents whose fathers had university degrees (73.11 ± 14.74) than in others (**Table 4**).

Table-4: Comparison of mean scores of adolescents' physical literacy and its dimensions based on father's education.

Father's education level	Dimensions of Physical literacy								Total physical literacy	
	Acquisition		Comprehension		Assessment		Self-care		Mean	SD
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Illiterate	70.31	22.64	75.68	20.49	74.58	20.26	60.83	20.22	70.29	12.56
Primary school	65.33	15.58	66.69	13.13	63.80	15.74	59.11	18.52	63.86	10.87
High school	74.85	18.84	76.45	16.71	71.56	18.54	58.85	23.43	70.56	15.06
University degree	76.93	18.38	77.84	17.52	73.51	17.94	63.66	20.59	73.11	14.74
P-value	0.010		0.006		0.031		0.125		0.007	

SD: Standard deviation.

The one-way ANOVA test did not show a significant difference between the mean score of physical literacy among adolescents and the economic status of their families ($p=0.068$), except in the domain of self-care ($p=0.021$). Also, there was no significant difference between other dimensions and the mean scores of various areas of physical literacy among adolescents and the economic status of the family ($p>0.05$), except for self-care. The mean score of physical literacy was higher among adolescents with very good economic status (74.31 ± 15.56) than others

(**Table 5**). The one-way ANOVA test did not show a significant difference between the mean score of physical literacy score and the father's job among the adolescents ($p=0.119$). There was also no significant difference between the mean scores of various dimensions of physical literacy and the father's job among the adolescents (acquisition, $p=0.242$; comprehension, $p=0.267$; assessment, $p=0.459$; self-care, $p=0.246$). The mean score of physical literacy was higher in adolescents whose father was self-employed (73.75 ± 13.75) than in others (**Table 6**).

Table-5: Comparison of mean scores of adolescents' physical literacy and its dimensions based on the economic status of students' families.

Economic status	Dimensions of Physical literacy								Total physical literacy	
	Acquisition		Comprehension		Assessment		Self-care		Mean	SD
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Very bad	61.36	19.77	67.35	11.95	67.04	19.58	51.01	20.53	61.56	12.58
Bad	75.60	17.58	75.00	16.94	72.75	20.14	60.68	24.18	70.96	15.36
Average	74.95	18.59	76.09	17.29	72.44	17.21	59.96	21.86	70.91	14.18
Good	77.17	18.28	77.84	17.50	72.36	18.37	63.72	20.13	72.98	15.08
Very good	75.31	19.52	78.80	17.15	72.87	21.05	68.87	20.34	74.31	15.56
P-value	0.093		0.262		0.910		0.021		0.068	

SD: Standard deviation.

Table-6: Comparison of mean scores of adolescents' physical literacy and its dimensions based on their father's job.

Father's job	Dimensions of Physical literacy								Total physical literacy	
	Acquisition		Comprehension		Assessment		Self-care		Mean	SD
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Unemployed	74.35	19.33	75.71	17.83	71.82	18.19	60.55	21.94	70.70	15.02
Retired	76.48	18.74	77.57	17.29	74.56	18.24	63.52	20.20	73.07	15.27
Employed	77.72	16.90	78.70	15.91	73.09	18.04	64.57	20.36	73.75	13.75
P-value	0.242		0.267		0.459		0.246		0.119	

SD: Standard deviation.

4- DISCUSSION

People with high physical literacy can show proper behavior in a new situation by using the acquired skills. Healthy behaviors and habits are formed during adolescence, and sufficient physical literacy skills can support a consciously healthy lifestyle. Therefore, physically literate adolescents can reduce the adverse consequences of insufficient physical activity at a generational level (27). The available evidence in Iran indicates a rapid increase in the prevalence of chronic diseases among adolescents so that overweight is one of the most common problems among them (20). Therefore, promoting physical activity during this period can have significant and long-term health benefits, as adolescence is an important stage of life in terms of creating healthy behaviors. The development of physical literacy requires the cooperation of all people, including parents, physical education managers and teachers, sports associations, and club managers (23).

The present study aimed to determine the physical literacy of adolescents based on the parental educational levels and economic status of students' families, conducted on 510 students studying in selected high schools in Tehran, Iran. The findings indicated that the mean score of physical literacy was higher in adolescents studying in the technical field of education than in others. A significant difference was found between the average physical literacy score and the field of study ($p=0.001$).

Special attention to strengthening the abilities of adolescents in theoretical courses may be the cause of lower physical literacy in theoretical disciplines. These findings suggest the need for more planning and attention to physical education courses in schools and providing physical education books to promote adolescents' physical literacy. Adolescents have creative physical literacy and high

skills in the acquisition, comprehension, and assessment of information of physical activity and take measures towards their health by continuous physical activities and maintaining a healthy lifestyle (28).

The findings of the present study also showed a significant difference between the mean physical literacy score of adolescents with maternal ($p=0.001$), and paternal ($p=0.007$) education levels. Adolescents whose parents had academic degrees had a higher average physical literacy, which was consistent with the findings of Valadi et al. (29). Adequate parental information about the benefits of physical activity encourages adolescents to engage in physical activity and improve their physical literacy. Also, the parents' awareness of and the ability to explain the physical activity-related contents to the adolescents simply and clearly will help them understand the related contents and, as a result, use it in relevant situations (30).

Based on the current study, there was no significant difference between the mean physical literacy score of adolescents and family economic status ($p=0.068$). However, the one-way ANOVA test showed a significant difference in the domain of self-care ($p=0.021$). Also, the average score of physical literacy of adolescents with good economic status was slightly higher than others. For adolescents, financial issues include the cost of enrolling in the gym and purchasing sports equipment and facilities, expenses of possible sports injuries, and costs of hiring tutors to keep up with the school lessons when pursuing sports activities, which can be barriers to seeking their favorite physical activity. Adolescents with better economic situations can participate in physical activities more often and, as a result, have higher physical literacy (31). With efforts from educational institutes and the support of municipalities, sports clubs can be

available for teenagers from families with lower economic status, so the participation of teenagers in physical activity can be increased and their physical literacy improved (32). The findings of the present study did not show a significant relationship between the father's employment and the physical literacy score of adolescents ($p = 0.119$). Teenagers who had a working father had more physical literacy than teenagers whose fathers were unemployed or retired, possibly because a working father is more active and family members have more motivation to do physical activity. In addition, due to the higher income of the working father, the teenagers did not have a problem with the cost of registering for sports clubs and buying sports equipment (33). In the studies of Valadi et al. and Ahmadi et al., it was found that adolescents with fathers working in the military had a lower average physical literacy score. Because of long missions and higher fatigue, military fathers are willing to rest when at home and pay less attention to the physical activity of their teenagers (29, 34).

4-1. Study Limitations

Limitations of the research include 1- The reluctance of some people to participate in the study. They were encouraged to participate by stating the importance and benefits of this project to overcome this limitation; 2- Lack of cooperation of some schools, which was addressed by adding another school after the necessary coordination with the education department of the mentioned district; and 3- The self-report method in completing the adolescent physical literacy questionnaire makes it difficult to compare observable differences between individuals.

5- CONCLUSION

Based on the results, the parental education level had a positive effect on the

physical literacy of adolescents. Therefore, measures such as educational classes should be considered to improve parents' information about the physical literacy of adolescents. There was a significant relationship between the economic status of the family and physical literacy in the domain of self-care. It is suggested to use the support of other organizations to provide physical activity services to improve the physical literacy of adolescents.

6- ACKNOWLEDGMENTS

The study authors would like to thank health education and promotion specialists and physical training professionals, as well as school principals and students participating in the study. This study is part of the first author's Ph.D dissertation.

7- CONFLICT OF INTEREST: None.

8- REFERENCES

1. Silverman S, Mercier K. Teaching for physical literacy: Implications to instructional design and PETE. *Journal of Sport and Health Science*. 2015;4(2):150-5.
2. Whitehead, M. *Physical Literacy: Throughout the Lifecourse*. 1st ed. New York: Routledge; 2010.
3. Brown DM, Dudley DA, Cairney J. Physical literacy profiles are associated with differences in children's physical activity participation: A latent profile analysis approach. *Journal of Science and Medicine in Sport*. 2020;23(11):1062-7.
4. Tremblay MS, Longmuir PE, Barnes JD, Belanger K, Anderson KD, Bruner B, et al. Physical literacy levels of Canadian children aged 8–12 years: descriptive and normative results from the RBC Learn to Play–CAPL project. *BMC Public Health*. 2018;18(2):1036.
5. Pasdary, Y, Niazi, P, Darbandi, M, Khalvandi, F, Izadi, N. Effect of physical activity on body composition and quality of life among women staff of kermanshah university of medical sciences in 2013. *J of*

Rafsanjan University of Medical Sciences. 2015;14(2):99-11.

6. Fakhrzadeh H, Djalalinia S, Mirarefin M, Arefirad T, Asayesh H, Safiri S. Prevalence of physical inactivity in Iran: a systematic review. *Journal of cardiovascular and thoracic research*. 2016;8(3):92.

7. Ali Taghipour, Mohammad Vahedian Shahroudi, Hamed Tabesh, Ali Safari-Moradabadi, Mansoure Alipour Anbarani. The effect of educational intervention based on the theory of planned behavior and stages of change construct on women's physical activity. *J Educ HealthPromot*.2019;9(10):1-9.

8. Shirvani ZG, Ghofranipour F, GHarakhanlou R, Kazemnejad A. Examination of factor structure of the developed theory of planned behavior with the action and coping planning scale of physical activity in the wives of the military personnel. *Journal Mil Med*. 2015;17(1):25-33.

9. Siddiqi A, Kawachi I, Berkman L, Subramanian SV, Hertzman C. Variation of socioeconomic gradients in children's development across advanced capitalist societies: analysis of 25 OECD nations. *Int J Health Serv. International Journal of Health Services*; 2007. 37(1):63-87.

10. Victorino CC, Gauthier AH. The social determinants of child health: variations across health outcomes - a population-based cross-sectional analysis. *BMC Pediatric*; 2009. 9:53.

11. Bornstein Marc H. (Ed); Bradley, Robert H. (Ed). *Socioeconomic status, parenting, and child development* (pp. 29-82). Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers; 2003: 287.

12. Crespo AM. Child health, household income and the local public provision of health care in Brazil, Mimeo 2008. http://www.cid.harvard.edu/neudc07/docs/neudc07_s3_p03_crespo.pdf

13. Lämmle L, Worth A, Bös K. Socio-demographic correlates of physical activity and physical fitness in German children and adolescents. *The European Journal of Public Health*. 2012;22(6):880-4.

14. Brophy S, Rees A, Knox G, Baker J, Thomas NE. Child fitness and father's BMI are important factors in childhood obesity: a school based cross-sectional study. *PloS one*. 2012;7(5):e36597.

15. CSDH. Closing the gap in a generation: health equity through action on the social determinants of health. Final Report of the Commission on Social Determinants of Health. Geneva, World Health Organization 2008. Available at: <http://apps.who.int/iris/bitstream>.

16. Shirvani ZG, Ghofranipour F, GHarakhanlou R, Kazemnejad A. Path analysis of physical activity based on the theory of planned behavior in women residing in tehran's organizational townships. *International Journal of Behavioral Sciences*. 2015;9(2):159-67.

17. Marashi T, Safari-Moradabadi A, Ahmadi F, Alipour-Anbarani M. The effect of education based on the theory of planned behavior on the promotion of physical activity and knowledge of students about diabetes prevention. *Int J Health Promot Educ*. 2020;60(6):316-28.

18. Peyman N, Alipour-Anbarani M. The Effect of Training Diabetes Prevention Behaviors on Promotion of Knowledge, Attitude and Practice of Students for Prevention of Diabetes in Mashhad City. *Int J Pediatr*. 2015;1.3(2-2):501-7.

19. UNICEF. *Progress for Children: A report card on adolescents*. New York USA: UNICEF;2012.

20. Panahi R. The Survey of association between health literacy and BMI among adolescents. *Journal of Health Literacy*. 2017;2(1):22-30.

21. Vakili R, Kiani MA, Saeidi M, Hoseini BL, Alipour Anbarani M. Junk Food Consumption and Effects on Growth Status among Children Aged 6-24 Months in Mashhad, Northeastern Iran. *Int J Pediatr*. 2015;3(4.2):817-22.

22. Laggao S, Bebeley S, Tucker H. Adolescents' Physical Literacy Level Due

Locomotor-&-Body, Sending and Receiving Skills. *PARIPEX-Indian Journal of Research*. 2017;6(1):255-7.

23. Whitehead M, Murdoch E. Physical literacy and physical education: Conceptual mapping. *Physical Education Matters*. 2006;1(1):6-9.

24. Longmuir PE, Woodruff SJ, Boyer C, Lloyd M, Tremblay MS. Physical Literacy Knowledge Questionnaire: feasibility, validity, and reliability for Canadian children aged 1 to 12 years. *BMC Public Health*. 2018;18(2):1035.

25. Alipour-Anbarani M, Ghaffari M, Montazeri A, Kavousi A, Ramezankhani A. Development and Psychometric of a Physical Literacy Questionnaire for Young Adolescents (16 - 18 Years of Age): A Mixed-Method Study. *Shiraz E-Med J*. 2023;24(9):e138738.

26. Tavousi M, Haeri-Mehrzi A, Rakhshani F, Rafiefar S, Soleymanian A, Sarbandi F, et al. Development and validation of a short and easy-to-use instrument for measuring health literacy: the Health Literacy Instrument for Adults (HELIA). *BMC Public Health*. 2020;20(1):656.

27. Ghaddar SF, Valerio MA, Garcia CM, Hansen L. Adolescent health literacy: the importance of credible sources for online health information. *The Journal of school health*. 2012;82(1):28-36.

28. Alipour-Anbarani M, Ghaffari M, Montazeri A, Kavousi A, Ramezankhani A.

Physical Literacy of 16-18-Years Adolescents: A Qualitative Study. *International Journal of Pediatrics*. 2022;10:15116-1525.

29. Valadi S, Hamidi M. Studying the level of physical literacy of students aged 8 to 12 years. *Research on Educational Sport*. 2020;8(20):205-26.

30. Aslam M, Kingdon G. Parental education and child health –understanding the pathways of impact in Pakistan. *World Dev*; 2011. 40(10):2014-32.

31. Lundborg P, Nilsson A, Rooth DO. Parental education and offspring outcomes: Evidence from

the Swedish compulsory school reform. *Am Econ J*; 2014. 6(1):253-78.

32. Ghanbari S, Ramezankhani A, Montazeri A, Mehrabi Y. Health Literacy Measure for Adolescents (HELMA): Development and Psychometric Properties. *PLoS One*. 2016;11(2):e. 0149202.

33- Ahmadi K, Yelveh M, Afshardir B, Khodabandeh L. Effect of father's degree and quality on mental health of offspring of military personnel. *J Behav Sci* 2013;7(3):239-44.

34. Ahmadi K, Abdolmalaki H, Azmarsabadi E, Reyasi F. The quality of spending leisure time and its relation to cultural and social vulnerability among military families. *Sports Psychology* 2010;1(2):1-12.