



# Physical Activity Among Female Students Aged 13-17 Years in Khoy County



## ARTICLE INFO

### Article Type

Descriptive Study

### Authors

Shahbazi H.<sup>1</sup> PhD

Matin H.<sup>2</sup> PhD

Ghofranipour F.\*<sup>1</sup> PhD

### How to cite this article

Shahbazi H, Matin H, Ghofranipour F. Physical Activity Among Female Students Aged 13-17 Years in Khoy County. Health Education and Health Promotion. 2025;13(1):187-193.

## ABSTRACT

**Aims** Regular engagement in physical activity is a prerequisite for physical and mental health and reduces the risk of several diseases and psychological disorders. This study aimed to investigate the status of physical activity among female students aged 13-17 years in Khoy County.

**Instrument & Methods** This descriptive cross-sectional study was designed and conducted during the winter of 2021-2022. The Global School-based Student Health Survey (GSHS) was provided online to all female students aged 13-17 in Khoy County, with 2,225 students completing it. The data were entered into SPSS 22 software, and descriptive statistics (frequency tables) and the chi-square test were used for analysis.

**Findings** Over 58% of the students had not participated in any sports teams in the past 12 months. More than 43% of the surveyed participants had not engaged in any sports to strengthen their muscles in the past week, despite more than 75% reporting that the benefits of physical activity had been discussed with them in at least one of their classes.

**Conclusion** The level of physical activity among female students in Khoy is low.

**Keywords** Physical Activity; Students; Mental Health

## CITATION LINKS

[1] Measurement methods for physical activity ... [2] The effect of education based on planned ... [3] Effectiveness of physical activity interventions for improving depression ... [4] The importance of regular physical activity ... [5] Do adolescents who meet physical activity ... [6] World Health Organization 2020 guidelines ... [7] Comparative effect of aerobic and yogic exercises on the selected ... [8] Home-based stair climbing ... [9] Outdoor activities and outdoor environments for fitness and mental health ... [10] Long-term trends of participation in physical activity during adolescence ... [11] Effect of exercise and obesity ... [12] Physical activity ... [13] Application of the health promotion model in studying physical activity behavior ... [14] Lack of ... [15] Insufficient physical ... [16] Factors affecting physical activity in female high school students ... [17] Physical inactivity and associated factors in Iranian children ... [18] A school-based randomized controlled trial to improve ... [19] Application of pender's health promotion model to ... [20] Global school-based ... [21] TGlobal school-based student ... [22] Association between soft drink ... [23] Noncommunicable disease surveillance ... [24] Global school-based student health survey: Country profiles ... [25] Relationships between health risk behaviors and ... [26] Identifying the key factors affecting ... [27] Reliability and validity of the Persian version of global school-based ... [28] Designing and implementing educational program to promote ... [29] Physical activity ... [30] New WHO-led study says majority ... [31] Physical inactivity in Brazil and Sweden-different ... [32] Evaluation of physical activity status among Yazd high school students on the model ... [33] Level of physical activity among girl high ... [34] Global school-based health survey ... [35] Tonga 2010 global school-based student health ... [36] Applying BASNEF model for predicting regular physical activity of female ... [37] A school-level examination of the association between ... [38] Community-wide youth exercise promotion: Long-term outcomes of the ... [39] "What if others think I look like ..." the moderating role of social ... [40] A qualitative inquiry of females' experiences with a novel ... [41] Physical activity knowledge, attitude, and behaviors among adolescents in the kingdom of Saudi Arabia ... [42] Impact of Corona Virus Disease-19 lockdown on physical activity and energy expenditure ...

<sup>1</sup>Department of Health Education and Promotion, Faculty of Medical Sciences, Tarbiat Modares University, Tehran, Iran

<sup>2</sup>Department of Public Health, Faculty of Medical Sciences and Health Services, Khoy, Iran

### \*Correspondence

Address: Department of Health Education and Promotion, Faculty of Medical Sciences, Tarbiat Modares University, Jalal Al-Ahmad, Nasr Bridge, Tehran, Iran. Postal Code: 1411713116

Phone: -

ghofranf@modares.ac.ir

### Article History

Received: February 1, 2025

Accepted: March 19, 2025

ePublished: March 26, 2025

## Introduction

Physical activity is defined as any bodily movement produced by skeletal muscles that results in energy expenditure [1, 2]. Regular engagement in physical activity is a prerequisite for physical and mental health and reduces the risk of several diseases and psychological disorders [3, 4]. The guidelines set by the World Health Organization recommend that individuals under 18 years of age engage in at least 60 minutes of moderate to vigorous physical activity per day and minimize sedentary time to reduce the risk of cardiovascular diseases; improve body composition, heart and respiratory health, and musculoskeletal fitness; and promote normal growth and development [5, 6].

Physical activities and vigorous aerobic exercise are among the best forms of exercise for health [7, 8]. Engaging in these activities not only increases self-confidence and prevents obesity and depression but also lays the foundation for a pattern of activity in adulthood [9-11].

Adolescence is the optimal time to adopt physical activity [12]. Despite this, a sedentary lifestyle is common among adolescents, adults, and elderly individuals almost everywhere in the world. Throughout life, there is a clear and distinct age-related decline in physical activity; in particular, a phase of this decline occurs during adolescence. This downward trend begins in early adolescence and continues into later adolescence [13]. A lack of physical activity is one of the current concerns of the World Health Organization [14]. In Canada and the United States, insufficient physical activity has been identified as a major public health concern, as it leads to death, diseases, and disabilities such as cardiovascular disease, colon cancer, breast cancer, stroke, respiratory diseases, and diabetes [15].

There is no tendency to increase physical activity among Iranian adolescents, and their level of physical activity is very low; in particular, this level of activity is lower in girls than in boys [16]. Research indicates that physical activity rates decline significantly during the high school years, particularly among adolescent girls, which is exacerbated by cultural barriers [17, 18]. Female Iranian adolescents face cultural challenges that hinder their ability to achieve sufficient physical activity for health benefits. These challenges include societal norms that discourage women from engaging in exercise, such as bicycling, despite such activities not being legally prohibited [18].

The existence of a low level of physical activity among Iranian adolescents, its detrimental effect on the health of this group, and the potential continuation of this effect into adulthood necessitate immediate actions to enhance our understanding of physical activity behavior in this population. Many studies have been conducted on the factors affecting physical activity in children and adolescents, especially in

Western countries, and reports indicate that physical activity is related to a variety of psychological, behavioral, environmental, and social factors [19].

The Standard School Health Questionnaire was designed in 2001 by the World Health Organization (WHO) in collaboration with UNAIDS, UNICEF, and UNESCO, with technical assistance from the U.S. Centers for Disease Control and Prevention (CDC) [20]. The Global School-based Student Health Survey (GSHS) is an important international project implemented to investigate and monitor current health and health-protective behaviors in students aged 13-17 years worldwide. It helps countries implement accurate and appropriate strategies, programs, and policies to address the health status of this segment of society based on the results of these studies [21]. To date, approximately 104 countries have implemented or are implementing this project [21, 22]. Countries develop their country-specific questionnaires using standardized core and core-expanded questions, to which they may add country-specific questions [23]. This questionnaire examines ten main causes of death among students: alcohol use; eating behaviors; drug use; personal hygiene; mental health; physical activity; protective factors; sexual behaviors; tobacco use; and violence and unintentional injuries [20]. The WHO recommends that this project be conducted every three years in different countries, but this questionnaire has been used less frequently in Iran [24]. The availability of reliable data will enable experts to examine the impact of health-risk behaviors on adolescents worldwide and develop health policies and interventions to reduce undesirable health effects on population health [25].

As previously mentioned, physical activity plays a vital role in the health of adolescents and ensures their well-being in the years to come. Despite the importance of this issue, the level of physical activity among Iranian adolescents remains low, and researchers have found no comprehensive study on the status of physical activity among adolescents in the city of Khoy. Therefore, this study aimed to examine the status of physical activity among female high school students aged 13-17 years in the city of Khoy.

## Instrument and Methods

This cross-sectional descriptive study was designed and conducted in the winters of 2021-2022. Khoy is the largest city in West Azerbaijan Province and the second largest city in terms of population. The 2016 census recorded the population of the city as 198,845 people in 59,964 households [26]. The study population consisted of 9,777 female students aged 13-17 years in the first and second high schools in Khoy city.

An online questionnaire was made available to all the students for completion. Due to pandemic

restrictions that prevented the researcher from attending virtual school classes, the link to the questionnaire, along with the necessary explanations, was initially provided to all school principals by the Department of Education in the form of official correspondence. They were then asked to distribute the link to all the students in their schools.

Full explanations, including the study's purpose, the confidentiality of information, the fact that students were not required to provide their names, and the voluntary nature of participation, were communicated to the school principals. Parental consent was also obtained through an online form included in the questionnaire. The school principals were instructed to convey these details to the students before they completed the questionnaire. Students who were interested voluntarily participated in the study, and ultimately, 2,225 students from 23 schools completed the questionnaire.

The data collection tool used was the GSHS. Its validity and reliability have been confirmed in a study by Ziaei *et al.* [27] (Cronbach's  $\alpha=0.69$ ). The questionnaire consisted of two parts. The first part covered demographic factors, such as age, grade level, weight and height, parents' education and occupation, and body mass index. The second part included questions related to health behaviors and health-protective factors, with a focus on physical activity in this study. This section included questions about participation in sports teams in the past 12 months; muscle-strengthening exercises in the past seven days; and questions about knowledge, attitudes, skills, and information sources related to physical activity, such as training on developing a physical health plan and preventing injuries during physical activity.

After the data were entered into SPSS 22 statistical software, descriptive statistics (frequency tables) and the chi-square test were used for data analysis.

## Findings

The mean age of the students was  $15.27 \pm 1.41$  years. The participants included students from 25 first and second high schools in Khoy City. Eighth-grade students had the highest level of participation in the study (19.9%), whereas twelfth-grade students had the lowest level of participation (11.5%). A total of 682 (30.7%) of the mothers and 648 (29.1%) of the fathers in the study sample had a high school diploma. Additionally, 1,996 (89.7%) mothers were housewives, and 1,676 (75.3%) fathers were self-employed (Table 1).

Among the students, 1,299 (58.4%) had not participated in sports teams in the past 12 months. In the past 7 days, 959 (43.1%) of the study participants had not performed any muscle-strengthening exercises. Furthermore, 679 (30.5%) of them had not

engaged in any stretching exercises in the past 7 days (Table 2).

**Table 1.** Frequency of demographic and background characteristics of the participants

Parameter	Category	Values
Age (year)	13	300(13.5)
	14	481(21.6)
	15	392(17.6)
	16	426(19.1)
	17	626(28.2)
School grade	7 <sup>th</sup>	418(18.8)
	8 <sup>th</sup>	442(19.9)
	9 <sup>th</sup>	399(17.9)
	10 <sup>th</sup>	391(17.6)
	11 <sup>th</sup>	319(14.3)
	12 <sup>th</sup>	256(11.5)
Mother's education	University	337(15.1)
	Diploma	682(30.7)
	Associate's degree	490(22.0)
	Elementary school	568(25.5)
	Illiterate	148(6.7)
Father's education	University	437(19.6)
	Diploma	648(29.1)
	Associate's degree	500(22.5)
	Elementary school	553(24.9)
	Illiterate	87(3.9)
Mother's occupation	Employee	173(7.8)
	Self-employed	56(2.5)
	Homemaker	1996(89.7)
Father's occupation	Employee	462(20.8)
	Self-employed	1676(75.3)
	Unemployed	78(3.9)
Body mass index (BMI)	Underweight	543(24.4)
	Normal weight	1373(61.7)
	Overweight	252(11.3)
	Obese	57(2.6)

A total of 1,671 (75.1%) of the students had received education about the benefits of physical activity in at least one of their classes during the current academic year. Moreover, 1,266 (56.9%) had received training on how to develop a personal physical health plan (Table 3).

**Table 2.** Frequency of physical activity among the participating students

Parameter		Values
During the past 12 months, how many sports teams did you play?	Did not play on any team	1299(58.4)
	1 team	509(22.9)
	2 teams	253(11.4)
	3 or more teams	164(7.4)
In the past 7 days, how many days did you do exercises to strengthen your muscles, such as push-ups, sit-ups, or weight lifting?	Did not do any	959(43.1)
	1	303(13.6)
	2	234(10.5)
	3	250(11.2)
	4	151(6.8)
	5	116(5.2)
	6	48(2.2)
	7	164(7.4)
In the past 7 days, how many days did you do stretching exercises, such as touching your toes, bending your knees, or stretching your legs?	Did not do any	679(30.5)
	1	356(16.0)
	2	300(13.5)
	3	258(11.6)
	4	173(7.8)
	5	148(6.7)
	6	68(3.1)
	7	243(10.9)

**Table 3.** Frequency of sources of knowledge acquisition about physical activity among the students participating

Parameter		Values
During this school year, were you taught in any of your classes the benefits of physical activity?	Do not know	258(11.6)
	No	296(13.3)
	Yes	1671(75.1)
During this school year, have you received any training on how to develop a personal physical health program in any of your classes?	Do not know	406(18.2)
	No	553(24.9)
	Yes	1266(56.9)
During this school year, have you received any training on preventing injuries during physical activity in any of your classes?	Do not know	389(17.5)
	No	646(29.0)
	Yes	1190(53.5)
Have you been told about opportunities for physical activity in the community in any of your classes during this school year?	Do not know	502(22.6)
	No	479(21.5)
	Yes	1244(55.9)

The number of schools attended was significantly different for all the questions, except for strength training exercises (all  $p \leq 0.001$ ). In some schools, both physical activity and training in the field of physical activity were at an acceptable level, whereas in others, they were very poor. Additionally, the students' BMI significantly differed across schools ( $p \leq 0.001$ ). While parents' education significantly correlated with strength ( $p = 0.007$  and  $p = 0.014$ , respectively) and stretching exercises ( $p = 0.001$  and  $p = 0.020$ , respectively), parents' occupation did not significantly affect these physical activities (all  $p \geq 0.05$ ).

## Discussion

This study aimed to determine the physical activity status of girls aged 13-17 years in Khoy County. Various studies worldwide on physical activity have shown a significant decline in physical activity during adolescence [28]. The WHO recommends that children and adolescents aged 5-17 engage in at least 60 minutes of moderate to vigorous physical activity at least one day per week [29]. For adolescents, the situation is even more concerning, with over 80% failing to achieve the recommended 60 minutes of daily physical activity. Specifically, 85% of adolescent girls and 78% of boys do not meet these guidelines [30, 31]. Here, over 58% of the students had not participated in sports teams in the past year, approximately 15% of the students had engaged in muscle-strengthening exercises at least five days a week, and approximately 21% had performed stretching exercises. Naserpoor *et al.*'s study [19] revealed that only 4.4% of Omidiyeh students engage in 30 minutes of moderate physical activity six or seven days a week. In Vakili *et al.*'s study [32], only 11.6% of Yazd students have reported at least 60 minutes of physical activity daily, and over 44% have not participated in any sports team in the past year. Bashiri Moosavi *et al.* [33] showed that only 32% of the Tarom students are active, while 68% are inactive. Abeer & Badr's study [34] revealed that 21% of Kuwaiti students engage in physical activity for five or more days in the past seven days. According to a study by WHO [35], 25.1% of students engage in physical activity five or more days a week.

Over 67% of the students had engaged in muscle-strengthening exercises for less than two days in the past seven days, and 60% had engaged in stretching exercises. This finding is consistent with the results of Vakili *et al.*'s study [32], where 62% and 65% of Yazd students, respectively, have engaged in these exercises for less than two days a week.

While 29% and approximately 13% of the students reported that they had not received any training on preventing physical injuries during sports activities and on the benefits of physical activity, respectively, during the school year, these figures are greater than 57% and 50% among Yazd students [32]. This significant difference may be due to the time gap between the two studies and the locations of the studies.

Furthermore, parents' education significantly correlated with their children's performance of strength exercises and stretching exercises, which is consistent with the findings of Vakili *et al.*'s study [32]. A comparison of the results of the studies mentioned above revealed a low level of standard physical activity among adolescent girls. Identifying barriers to regular physical activity can help researchers and health planners develop appropriate strategies to increase physical activity and ultimately promote health [36]. Education aimed at increasing physical activity in adolescents and young adults can be an important strategy to enhance their sports behavior. However, our results showed that although 75% of the students stated that they had received the necessary training on physical activity and its benefits during the previous school year, the performance of female students in this area was not at the desired level. Therefore, in addition to educational interventions in schools regarding physical activity, health planners should provide physical activity programs; pay more attention to physical education in schools; offer the necessary facilities for physical activity in schools, parks, and public places; hold educational classes for student's families; and ensure the availability of necessary resources and sports facilities. These strategies can be beneficial for promoting physical activity among adolescent girls [28].

Awareness of the level of physical activity in children and adolescents and the identification of factors



affecting it can aid in educational and executive planning to encourage children and adolescents to engage in physical activity and allow for timely interventions to correct any deficiencies [28]. Therefore, repeating similar descriptive studies at appropriate time intervals can be useful for evaluating the interventions performed.

Research indicates that school-based interventions can effectively promote physical activity among female students. Comprehensive approaches that incorporate physical education, extracurricular activities, and community partnerships have yielded positive results [37]. Long-term community-wide interventions, which combine school-based behavioral education with broader community strategies, have resulted in lasting improvements in adolescent physical activity, particularly for female students [38]. These findings underscore the importance of integrating educational efforts within schools with community-wide initiatives to foster healthier lifestyles among adolescents, especially girls, who may face unique barriers to physical activity [39]. Such comprehensive strategies can create supportive environments that encourage sustained engagement in physical activity [40].

The most significant limitation of the present study is that it coincided with the COVID-19 pandemic, which certainly affected the study results. The COVID-19 pandemic has significantly impacted physical activity levels among adolescents, with approximately 60% reporting decreased physical activity during lockdowns [41].

A study in India reported a substantial decrease in self-reported physical activity and energy expenditure among middle adolescents during lockdown [42]. Therefore, the results are not generalizable to other periods (without the coronavirus) or to other regions or populations. This study was conducted solely on high school-aged girls, which is another limitation, and it is recommended that future studies focus on the physical activity of boys and research comparing physical activity between the two genders based on the GSHS. Other limitations of this study included self-reporting and the lack of researcher contact with the participants due to the outbreak of coronavirus in the country and limitations in internet access.

Based on the study results, health programs related to physical activity can be designed, implemented, and evaluated. Future research should aim to include a more diverse sample population by incorporating male students and participants from various regions to enhance the generalizability of the findings. Employing alternative methods, such as in-person interviews or objective activity measures, could mitigate self-reporting biases and limit researcher interaction. Comparative gender studies and replication in non-pandemic settings would improve the accuracy of assessing physical activity levels. Additionally, evaluating school-based intervention

programs could provide actionable insights for policies promoting student physical activity.

## Conclusion

The level of physical activity among female students in Khoy is low.

**Acknowledgments:** This article is derived from project number 988176, entitled "Assessment of Health Behaviors and Health-Protective Practices in Female Students in Khoy City and Development of an Educational Package." The researchers extend their sincere gratitude and appreciation to the General Directorate of Education of West Azerbaijan Province and the Education Department of Khoy County, as well as to the esteemed principals and students of the secondary schools in Khoy County for their wholehearted cooperation.

**Ethical Permissions:** Ethical clearance was obtained from Tarbiat Modares University (IR.MODARES.REC.1398.207). The purpose of the study, confidentiality of information, non-requirement to provide names, and the voluntary nature of participation were explained to the school principals. Parental consent was obtained through an online form included in the questionnaire. The school principals were instructed to share these details with the students.

**Conflicts of Interests:** The authors declared no conflicts of interests.

**Authors' Contribution:** Shahbazi H (First Author), Assistant Researcher/Discussion Writer/Statistical Analyst (30%); Matin H (Second Author), Introduction Writer/Assistant Researcher (30%); Ghofranipour F (Third Author), Introduction Writer/Methodologist/Main Researcher (40%)

**Funding/Support:** This research was funded by the National Institute for Medical Research Development (NIMAD) of Iran.

## References

- 1- Ndahimana D, Kim EK. Measurement methods for physical activity and energy expenditure: A review. *Clin Nutr Res*. 2017;6(2):68-80.
- 2- Asa-Kohnefroody Z, Peyman N, Ghodsikhah F, Shakeri-Nejad G. The effect of education based on planned behavior theory on physical activity of high school girls. *Iran J Health Educ Health Promot*. 2020;8(3):210-23. [Persian]
- 3- Singh B, Olds T, Curtis R, Dumuid D, Virgara R, Watson A, et al. Effectiveness of physical activity interventions for improving depression, anxiety and distress: An overview of systematic reviews. *Br J Sports Med*. 2023;57(18):1203-9.
- 4- Lopes Martinez VM, Marrero SG. The importance of regular physical activity in the mental health of the older adults. *Appl Psychol Res*. 2024;3(1):1255.
- 5- Galindo-Perdomo F, Peiró-Velert C, Valencia-Peris A. Do adolescents who meet physical activity recommendations on weekdays also meet them on weekends? A cross-sectional study in Colombia. *Int J Environ Res Public Health*. 2021;18(3):897.
- 6- Bull FC, Al-Ansari SS, Biddle S, Borodulin K, Buman MP, Cardon G, et al. World Health Organization 2020 guidelines on physical activity and sedentary behavior. *Br J Sports Med*. 2020;54(24):1451-62.
- 7- Chandrashekar C. Comparative effect of aerobic and yogic exercises on the selected physical, physiological and academic performance of non-participants of sports at

secondary school level. *Int J Adv Res Sci Commun Technol.* 2024;4(2):47-50.

8- Michael E, White MJ, Eves FF. Home-based stair climbing as an intervention for disease risk in adult females; A controlled study. *Int J Environ Res Public Health.* 2021;18(2):603.

9- Nugraha H, Hernawan, Ali M, Rahmat A, Septianto I, Aryati A, et al. Outdoor activities and outdoor environments for fitness and mental health: A systematic review. *RETOS.* 2024;59:642-8.

10- Priesmeyer J, Fedewa AL, Toland M. Long-term trends of participation in physical activity during adolescence with educational ambition and attainment. *J Sch Health.* 2019;89(1):20-30.

11- Naureen I, Saleem A, Naeem M, Bilal NM, Hassan GM, Shafiq M, et al. Effect of exercise and obesity on human physiology. *Sch Bull.* 2022;8(1):17-24.

12- Kumar B, Robinson R, Till S. Physical activity and health in adolescence. *Clin Med.* 2015;15(3):267-72.

13- Taymoori P, Falhahi A, Esmailnasab N. Application of the health promotion model in studying physical activity behavior of students in Sanandaj, Iran. *J Sch Public Health Inst Public Health Res.* 2011;9(1):35-46. [Persian]

14- Weisser B. Lack of physical activity. *DEUTSCHER ÄRZTEVERLAG.* 2015;112:563.

15- Sinha RN. Insufficient physical activity: A global public health concern. *J Compr Health.* 2020;8(1):1-5.

16- Mohamadian H, Eftekhari Ardebili H, Kordzanganeh J. Factors affecting physical activity in female high school students: A study based on the health promotion model using path analysis approach. *PAYESH.* 2015;14:205-15. [Persian]

17- Kelishadi R, Qorbani M, Djalalinia S, Sheidaei A, Rezaei F, Arefirad T, et al. Physical inactivity and associated factors in Iranian children and adolescents: The weight disorders survey of the CASPIAN-IV study. *J Cardiovasc Thorac Res.* 2017;9(1):41-8.

18- Taymoori P, Niknami S, Berry T, Lubans D, Ghofranipour F, Kazemnejad A. A school-based randomized controlled trial to improve physical activity among Iranian high school girls. *Int J Behav Nutr Phys Activ.* 2008;5:18.

19- Naserpoor F, Shahry P, Zamani-Alavijeh F, Saki-Malehi A. Application of pender's health promotion model to predict physical activity among female school students in Omidyeh, Iran. *J Health Syst Res.* 2017;13(1):111-8. [Persian]

20- Low WY, Binns C. Global school-based student health survey, Malaysia. *Asia Pac J Public Health.* 2014;26(5):7S-8S.

21- Haji E, Jamsheer F, Jassim G, Sabt A, AlSabagh AA, Nasar LM, et al. Global school-based student health survey 2016-Bahrain: Mental health. *J Bahrain Med Soc.* 2023;35(1):34-41.

22- Shi Z, Malki A, Abdel-Salam ASG, Liu J, Zayed H. Association between soft drink consumption and aggressive behavior among a quarter million adolescents from 64 countries based on the global school-based student health survey (GSHS). *Nutrients.* 2020;12(3):694.

23- WHO. Noncommunicable disease surveillance, monitoring and reporting [Internet]. Geneva: World Health Organization [cited 2022 November 11]. Available from: <https://www.who.int/teams/noncommunicable-diseases/surveillance>.

24- Abdalmaleki E, Abdi Z, Isfahani SR, Safarpour S, Haghdoust B, Sazgarnejad S, et al. Global school-based student health survey: Country profiles and survey results

in the eastern Mediterranean region countries. *BMC Public Health.* 2022;22:130.

25- Tawfik E. Relationships between health risk behaviors and protective factors among adolescent school students by adopting the structural equation model. *Egypt Nurs J.* 2017;14:109-23.

26- Hakimi H, Naghibi H, Asghari Zamani A, Babaii Aghdm F. Identifying the key factors affecting the expansion of informal settlements by structural analysis method (case study: Shahr Khoy). *J Geogr Plan.* 2024;28(90):256-30. [Persian]

27- Ziaei R. Reliability and validity of the Persian version of global school-based student health survey adapted for Iranian school students. *J Clin Res Gov.* 2014;3(2).

28- Solhi M, Zinat Motlagh F, Karimzade Shirazi K, Taghdisi MH, Jalilian F. Designing and implementing educational program to promote physical activity among students: An application of the theory of planned behavior. *J Intern Med Today.* 2012;18(1):45-52. [Persian]

29- WHO. Physical activity [Internet]. Geneva: World Health Organization; 2024 [cited 2025 Feb 27]. Available from: <https://www.who.int/news-room/fact-sheets/detail/physical-activity>.

30- WHO. New WHO-led study says majority of adolescents worldwide are not sufficiently physically active, putting their current and future health at risk [Internet]. Geneva: World Health Organization; 2019 [cited 2019 November 22]. Available from: <https://www.who.int/news/item/22-11-2019-new-who-led-study-says-majority-of-adolescents-worldwide-are-not-sufficiently-physically-active-putting-their-current-and-future-health-at-risk>.

31- Stein R, Börjesson M. Physical inactivity in Brazil and Sweden-different countries, similar problem. *Arq Bras Cardiol.* 2019;112(2):119-20.

32- Vakili M, Mirzaei M, Mohaqiq Z, Ahmadi M, Alavirad E. Evaluation of physical activity status among Yazd high school students on the model of the world health organization in 2015. *J Commun Health Res.* 2017;6(1):10-7. [Persian]

33- Bashiri Moosavi F, Farmanbar R, Taghdisi M, Atrkar Roshan Z. Level of physical activity among girl high school students in Tarom County and relevant factors. *Iran J Health Educ Health Promot.* 2015;3(2):133-40. [Persian]

34- Abeer A, Badr H. Global school-based health survey [dissertation]. Charlottetown: University of Prince Edward Island; 2011.

35- WHO. Tonga 2010 global school-based student health survey final report. Geneva: World Health Organization; 2012.

36- Rostami Moez M, Hazavehei SMM, Moeini B, Roshanaei G, Taheri M. Applying BASNEF model for predicting regular physical activity of female high school students in Hamadan: A cross-sectional theory based study. *J Adv Med Biomed Res.* 2014;22(92):96-107. [Persian]

37- Burns KE, Vermeer J, Battista K, Leatherdale ST. A school-level examination of the association between programs and policies and physical activity outcomes among females from the COMPASS study. *Int J Environ Res Public Health.* 2021;18(6):3314.

38- Kelder SH, Perry CL, Klepp KI. Community-wide youth exercise promotion: Long-term outcomes of the Minnesota heart health program and the class of 1989 study. *J Sch Health.* 1993;63(5):218-23.

39- Meyer S, Lang C, Ludyga S, Grob A, Gerber M. "What if others think I look like ..." the moderating role of social physique anxiety and sex in the relationship between

physical activity and life satisfaction in Swiss adolescents. *Int J Environ Res Public Health*. 2023;20(5):4441.

40- Lodewyk KR, Beni S, Foley J, Zakaria T, Mercier DR, Portsmouth L. A qualitative inquiry of females' experiences with a novel high school intramural program. *Phys Educ*. 2023;80(2).

41- Almutairi N, Burns S, Portsmouth L. Physical activity

knowledge, attitude, and behaviors among adolescents in the kingdom of Saudi Arabia prior to and during COVID-19 restrictions. *J Obes*. 2022;2022:1892017.

42- Rathod VJ. Impact of Corona Virus Disease-19 lockdown on physical activity and energy expenditure among middle adolescence-a cross-sectional e-survey. *Arch Med Health Sci*. 2021;9(1):35-8.