Physical activity among female students aged 13--17 years in Khoy County

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. The aim of this study was to investigate the status of physical activity among female students aged 13--17 years in Khoy County.

Participants & Methods: This descriptive cross-sectional study was designed and conducted during the winter of 2021--2022. The Global School-based Student Health Survey (GSHS) questionnaire was provided online to all female students aged 13--17 in Khoy County, with 2,225 students completing it. The data were entered into SPSS22 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 team 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 results of this study indicate that merely focusing on individual awareness and education about physical activity and its benefits in schools is insufficient to encourage physical activity among female students. Therefore, attention to nonindividual determinants—such as access to facilities, a safe environment, and the provision of necessary infrastructure for girls' physical activity—is essential.

Keywords: Physical activity, female students, Khoy

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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 are to have at least 60 minutes of moderate to vigorous physical activity per day and minimize sedentary time for people under 18 years of age to reduce the risk of cardiovascular diseases; improve body composition, heart and breathing, and musculoskeletal fitness; and promote normal growth and development [5,6].

Physical activities and vigorous aerobic exercise are the best exercises for health [7,8], and engaging in these activities, in addition to increasing self-confidence and preventing obesity, depression, and fitness, is a basis for the pattern of activity in adulthood [9–11].

Adolescence is the best time to accept 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 downward slope for physical activity; in particular, a phase of this decline occurs in adolescence. This downward slope starts in early adolescence and then continues into 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, a lack of 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 physical activity level 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 high school years, particularly among adolescent girls, exacerbated by cultural barriers [17,18]. Female Iranian adolescents face cultural challenges that hinder the ability to achieve sufficient physical activity (PA) for health benefits. These challenges include societal norms discouraging women from engaging in exercise, such as bicycling, despite such activities not being legally prohibited[19].

The existence of a low level of physical activity among Iranian adolescents, its destructive effect on the health of this group, and even the continuation of this effect into adulthood require immediate actions to increase 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[20].

The standard School Health Questionnaire was designed in 2001 by the World Health Organization (WHO) in collaboration with UNAIDS, UNICEF, and UNESCO, as well as with the technical assistance of the U.S. Centers for Disease Control and Prevention (CDC) [21]. GSHS is an important international project that is implemented to investigate and monitor up-to-date health and health-protective behaviors in students aged 13--17 years worldwide and helps countries implement accurate and appropriate strategies, programs, and policies to control the health status of this segment of society on the basis of the results of these studies [22]. To date, approximately 104 countries have implemented or are implementing this project [22,23]. Countries develop their country-specific questionnaires via standardized core and core-expanded questions, to which they may add country-specific questions[24]. This questionnaire examines 10 main causes of death in students: alcohol use; eating behaviors; drug use; personal hygiene; mental health; physical activity; protective factors; sexual behaviors; tobacco use; and violence and unintentional injuries [21]. The World Health Organization recommends that this project be carried out every three years in different countries, but this questionnaire has been used less in Iran [25]. 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 decrease undesired health impacts on population health[26].

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 was conducted with the aim of examining the status of physical activity among female high school students aged 13--17 years in the city of Khoy.

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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 measured the population of the city as 198,845 people in 59,964 households[27]. 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. Owing to pandemic restrictions that prevented the researcher from attending virtual school classes, the link to the questionnaire, along with the necessary explanations, was first 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 Global School-based Student Health Survey (GSHS) questionnaire. Its validity and reliability were confirmed in a study by Ziaei et al.[28,29] (Cronbach's alpha = 0.69%). The questionnaire consisted of two parts. The first part covered demographic variables 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 7 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 results revealed that the mean age of the students was 15.27 ±1.41 years. The participants in this study included students from 25 first and second high schools in Khoy city. Eighth-grade students had the highest degree of participation in the study (19.9%), whereas twelfth-grade students had the lowest degree 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, 1996 (89.7%) mothers were housewives, and 1676 (75.3%) fathers were self-employed. Other demographic information of the study sample is presented in Table 1.

Table 1: Frequency and relative frequency distributions of demographic and background variables of the participants

Variable	Category	Frequency	Relative Frequency (%)
Age	**13**	300	13.5
	14	481	21.6
	15	392	17.6
	16	426	19.1
	17	626	28.2
School Grade	**7th Grade**	418	18.8
	8th Grade	442	19.9
	9th Grade	399	17.9
	10th Grade	391	17.6
	11th Grade	319	14.3
	12th Grade	256	11.5
Mother's Education	**University**	337	15.1
	Diploma	682	30.7
	Associate's Degree	490	22.0

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	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

Among the students, 1299 (58.4%) had not played on 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 performed any stretching exercises in the past 7 days (Table 2).

Table 2: Determining the frequency and relative frequency of physical activity among the

Variable		Frequency	Relative Frequency (%)
During the past 12 months, on 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, on 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 day	303	13.6
	2 day	234	10.5
	3 day	250	11.2
	4 day	151	6.8
	5 day	116	5.2
	6 day	48	2.2
	7 day	164	7.4
In the past 7 days, on how many days did you do stretching exercises, such as touching your toes, bending your knees, or stretching your legs?	**Did not do any**	30.5	679
	1 day	16.0	356
	2 day	13.5	300
	3 day	11.6	258
	4 day	7.8	173
	5 day	6.7	148
	6 day	3.1	68
	7 day	10.9	243

participating students

A total of 1671 (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, 1266 (56.9%) had received training on how to develop a personal physical health plan (Table 3).

Table 3: Determining the frequency of sources of knowledge acquisition about physical activity among the students participating

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Variable		Frequency	Relative Frequency (%)
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 research findings indicated that the number of schools attended was significantly different for all the questions in Tables 2 and 3, 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. Even the students' BMI significantly differed across schools ($P \leq 0.001$). While parents' education significantly differed 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 [30]. The World Health Organization (WHO) recommends that children and adolescents aged 5--17 engage in at least 60 minutes of moderate to vigorous physical activity [1] day [31]. 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[32,33]. In the present study, over 58% of the students had not played on sports teams in the past year, approximately 15% of the students had engaged in muscle-strengthening exercises at least 5 days a week, and approximately 21% had performed stretching exercises. Naserpoor et al.'s study [20] revealed that only 4.4% of Omidiyeh students engaged in 30 minutes of moderate physical activity 6 or 7 days a week. In Vakili et al.'s study [34], only 11.6% of Yazd students reported at least 60 minutes of physical activity daily, and over 44% had not played on any sports team in the past year. Bashiri Moosavi et al.[35] showed that only 32% of the Tarom students were active and that 68% were inactive. Al Baho et al.'s study[36] revealed that 21% of Kuwaiti students had engaged in physical activity for 5 or more days in the past 7 days. According to a study by Tonga [37], 25.1% of students engaged in physical activity 5 or more days a week.

The present study revealed that over 67% of the students had engaged in muscle-strengthening exercises for less than 2 days in the past 7 days, and 60% had engaged in stretching exercises, which is consistent with the findings of Vakili et al.'s study [34], where 62% and 65% of Yazd students, respectively, had engaged in these exercises less than two days a week.

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While 29% and approximately 13% of the students in the present study stated that they had not received any training on preventing physical injuries during sports activities and the benefits of physical activity, respectively, during the school year, these figures were greater than 57% and 50% in Yazd students [34]. This significant difference may be due to the time gap between the two studies and the location of the studies.

However, parents' education significantly differed according to their performance of strength exercises (P=0.007 and P=0.014, respectively) and stretching exercises (P=0.001 and P=0.020, respectively), which is consistent with the findings of Vakili et al.'s study [34].

A comparison of the results of the above studies 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 [38]. Education to increase physical activity in adolescents and young adults can be an important strategy to promote their sports behavior, but the results of the present study 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, providing physical activity programs by health planners; paying more attention to physical education in schools; providing the necessary facilities for physical activity in schools, parks, and public places; holding educational classes for students' families; and providing the necessary resources and sports facilities are among the strategies that can be beneficial for promoting physical activity in adolescent girls[30].

Awareness of the level of physical activity in children and adolescents and identifying the factors affecting it can help in educational and executive planning to encourage children and adolescents to engage in physical activity and intervene in a timely manner to correct it [30]. Therefore, repeating similar descriptive studies at appropriate time intervals can be used to evaluate the interventions performed.

Research indicates that school-based interventions can effectively promote physical activity among female students. Comprehensive approaches incorporating physical education, extracurricular activities, and community partnerships have yielded positive results [39] .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[40]. These findings underscore the importance of combining educational efforts within schools with community-wide initiatives to foster healthier lifestyles among adolescents, especially girls, who may face unique barriers to physical activity[41]. Such comprehensive strategies can create supportive environments that encourage sustained engagement in physical activity[42]

Study limitations:

The most important 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 (PA) levels among adolescents, with approximately 60% reporting decreased PA during lockdowns[43]. A study in India reported a substantial decrease in self-reported PA and energy expenditure among middle adolescents during lockdown[44]. Therefore, the results are not generalizable to other periods (without the coronavirus) or other regions or populations. This study was conducted only on high school-aged girls, which is one of the limitations of this study, and it is recommended that other studies be conducted on the physical activity of boys and research comparing physical activity between the two genders on the basis of the GSHS questionnaire. Other limitations of this study were self-reporting and the lack of researcher contact with the samples due to the outbreak of coronavirus in the country and limitations in internet access.

Conclusion:

The results of the present study revealed that the level of physical activity of female Khoy students is low. Therefore, on the basis of the study results, health programs in the field of 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 improve

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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 nonpandemic settings would improve accuracy in assessing physical activity levels. Additionally, evaluating school-based intervention programs could provide actionable insights for policies promoting student physical activity.

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Ethical Permissions: Ethical clearance was obtained from Tarbiat Modares University (IR.MODARES.REC.1398.207). The purpose of the study, confidentiality of information, nonrequirement to provide names, and 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 interest: There are no conflicts of interest.

Authors' Contribution: Shahbazi H (First Author), Conceived and designed the analysis, Performed the analysis, Wrote the paper (30%), **Matin H** (Second Author), Collected the data, Wrote the paper (30%), **Ghofranipour F** (Third Author), Methodologist/Main Researcher, Wrote the paper (40%).

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