

# Physical Activity and Influencing Factors of International Students in China

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## ABSTRACT

Despite colleges have been paying attention to students' physical education, the status of international students' physical activity has not received enough attention. The physical activities participation of 238 overseas students in the central region of China was investigated by using the self designed "Questionnaire of the physical activities of overseas students in China". Results: Overseas students are more likely to carry out moderate (69.23%) sports 6 or more times in two weeks, 30m-2.5h (82.57%) each time, and the sports population is 31.2%. Conclusion: The sports population of overseas students is equal to that of Chinese college students, but the intensity and duration of physical activities are higher than those of Chinese college students. Gender, region, sports attitude, playground, projects and motivation have an important effect on their sports participation. Based on these factors, colleges should improve students' sports participation level and attach importance to spread Chinese traditional sports culture.

**Keywords:** Overseas Students, Physical Activities, University, Education.

## 1. INTRODUCTION

Physical activity is associated with a range of physical, mental and social health benefits for students [1-2]. In recent years, there have been many studies on students' physical activity, related to study performance, sleep quality sedentary behavior, activity status, etc [3-8]. Most of the studies are focus on domestic students, but little attention is paid to international students in their countries. In September 2010, the Education Ministry of China issued the "Study in China Program", and international students have gradually become an important part of China's higher education [9]. On March 1, 2017, the Ministry of Education issued the "Introduction to the Work of Studying Abroad in China since the 18th National Congress", reporting that the total number of overseas students in China has exceeded 440,000 since 2016, studying in 811 colleges, research institutes and other teaching institutions in 31 provinces, autonomous regions, and municipalities [10]. Such a large group of international students should not only allow them to achieve success in their studies, but also ensure that they have a healthy body, so that they can better devote themselves to learning and take the Chinese civilization back more actively. Therefore, colleges and universities need to pay attention to the

sports conditions of international students in China. The aim of this study was to investigate the status of physical activity of overseas students in China.

## 2. MATERIALS AND METHODS

### 2.1. Subject

The survey subjects come from 52 countries in Asia and Africa (Japan, South Korea, Pakistan, Mongolia, Tanzania, Ghana, Laos, Egypt, etc.), with a total of 238 international students, with an average age of 26.33±4.9 years old (minimum 17 years old, maximum 46 years old), Male accounted for 60.16%, female accounted for 39.84%.

### 2.2. Methods

On the basis of consulting relevant documents, the questionnaire "Inventory of Sports Activities for International Students in China", which mainly examines information on the demography, sociology and sports behavior of international students was compiled. After evaluation by 5 university teachers with senior professional titles (2 professors and 3 associate professors), they all believe that the questionnaire can

meet the needs of this research. The teacher in charge of international students was asked to help distribute 150 paper questionnaires, 148 were collected, 105 questionnaires were collected through the questionnaire star, a total of 253 questionnaires were collected, and 238 valid questionnaires were collected. The effective response rate was 94.07%.

**2.3. Statistical Analysis**

Analysis was performed with SPSS 19.0 and Excel 2007. Take exercise frequency, intensity and duration as dependent variables, and take demographic, sociological factors (gender, grade, region, economy) and sports factors (sports items, motivation, venue, attitude, exercise time period) as independent variables. The correlation of factors was measured by Mann-Whitney U and Kruskal-Wallis test.

**3. RESULT**

**3.1. Overview of Physical Activity of International Students**

**3.1.1. Exercise Frequency, Duration and Intensity**

The rate of participating in only one physical activity in the "near two weeks" was 8.4%, and the rate not less than 6 times was 31.2%. Only 5.2% of international students did not participate in physical activities; They generally maintained a good duration of exercise, only 8.3% of people exercise less than 30 minutes each time, 60.58% of people participate in sports activities for no less than 1 hour each time, of which 18.67% of international students spend more than 2 hours each time sports activities; International students like to engage in moderate (moderate sweating) and high (profuse sweating) intensity sports, accounting for 69.23% and 24.29% respectively. Only a few (6.48%) participate in low-intensity (slightly sweating) sports. According to the definition of the "sports population": a) exercise more than three times a week, b) exercise no less than 30 minutes each time, c) exercise at a moderate intensity each time, it is found that the sports population ratio of foreign students in China is 31.2% (Table 1) [11].

**3.1.2. Type of Exercise**

Running (29.41%), football (25.88%), basketball (23.53%), badminton (21.96%), and fitness (19.61%) are the five most popular sports for international students (Table 1). This reminds that: a) International students prefer group sports such as football, basketball and other ball games; b) International students have better sports awareness.

**Table 1.** Reporting of Physical Activity of International Students in China(N=238)

Item	Indicators	Rate/%
Exercise times per week	≥3 times	31.2
Duration of each exercise	<30min	8.3
	≥1h	60.58
Exercise intensity	High intensity	24.29
	Medium intensity	69.23
	Low intensity	6.48
Main sports	Run	29.41
	Football	25.88
	Basketball	25.53
	Badminton	21.96
	Fitness	19.61
Main exercise period	6:00-8:00	19.5
	16:00-20:00	66.4
Main sports venue	Campus outdoor stadium	60
	Campus gymnasium	30.8
Activity motivation	Enhance physical fitness	49.6
	Personal hobby	41.67
	Bodybuilding	39.68
	Improve athletic ability	27.78
Sports attitude	High	49.01
	Middle	47.81
	Low	3.19

**3.1.3. Exercise Period and Venue**

International students mainly participate in sports activities between 6:00-8:00 (19.5%) and 16:00-20:00 (66.4%). On-campus sports venues are their main venues (30.8% in campus gymnasiums, 60% in campus outdoor stadiums), but off-campus sports venues play an important role in the participation of international students in sports (12.8% in off-campus gymnasiums, 23.2% in off-campus outdoor stadiums), and 20.8% of international students carry out sports activities in the dormitories (Table 1). In addition, it can be seen that most international students have the habit of morning exercises and evening exercises, and have a wider space for sports activities.

**3.1.4. Sports Motivation and Attitude**

The main motivations for international students to participate in physical activities are: promoting physical fitness (49.6%), personal hobbies (41.67%), bodybuilding and losing weight (39.68%), and improving athletic ability (27.78%). They may not attend physical education classes (3.17% and 2.78% are motivated to attend classes and prepare for physical examinations), and they rarely participate in sports

competitions (5.19%) are motivated to prepare for competition). Only 3.19% of them do not pay attention to sports, and 49.01% pay attention to it, which shows that international students have a good attitude towards sports activities (Table 1).

### 3.2. Influencing Factors of Exercises Frequency, Duration and Intensity

#### 3.2.1. Demographic and Sociological Factors

##### 3.2.1.1. Gender

Boys (31.91%) are more willing to participate in high-intensity sports than girls (12.5%); Girls (13.4%) who exercise less than 30 minutes each time are more than boys (5%); Boys who exercise more than 1.5 hours each time (48.56%) are more than girls (25.77%), and the differences in exercise intensity and duration between men and women are statistically significant ( $P < 0.01$ ) (Table 2).

##### 3.2.1.2. Grade

According to the Mann-Whitney U test, the rankings of different grades in terms of exercise intensity, duration, and frequency from high to low are masters, bachelors and doctors, but the difference is not statistically significant ( $P > 0.05$ ) (Table 2).

##### 3.2.1.3. Area

According to the Kruskal-Wallis test, there is no significant difference in the exercise intensity and duration of foreign students from different regions ( $P > 0.05$ ), but the difference in the exercise frequency is statistically significant ( $P < 0.05$ ). The ranking from high

to low is West Asia, Southeast Asia, Africa, South Asia and East Asia, in which the difference between West Asia and East Asia students is statistically significant ( $P < 0.05$ ) (Table 2).

##### 3.2.1.4. Economic situation

According to the 2017 world GDP ranking published by the World Economic Information Network, this study divides the nationalities of international students into Type A countries (countries with GDP before 100) and Type B countries (countries with GDP after 100) [12]. The results showed that there is no statistically significant difference in the intensity, duration and frequency of exercise among foreign students from different countries ( $P > 0.05$ ) (Table 2).

#### 3.2.2. Sports Factors

##### 3.2.2.1. Sports attitude

In the Mann-Whitney U test, sports attitudes are divided into three groups ("1" is important, "2" is general, and "3" is not important). Because the sample size of the "not important" group is too small, only the first two categories are analyzed here. Statistics show that the group considering exercise is important performs better in terms of exercise intensity, duration and frequency than the group with a general attitude, and the difference between the two is statistically significant ( $P < 0.01$ ) (Table 3).

##### 3.2.2.2. Sports motivation

International students motivated by personal hobbies (41.67%) tend to exercise for a long time ( $P < 0.01$ ). Those who exercise for bodybuilding and weight

**Table 2.** The Influence of Demographic and Sociological Factors on the Exercise Intensity, Frequency and Duration (N=238)

Variable		Exercise intensity			Exercise frequency			Exercise duration		
		Average rank	Z/H value	P value	Average rank	Z/H value	P value	Average rank	Z/H value	P value
Gender	Men	114.24	-3.331	0.001	131.26	1.556	0.12	132.63	3.24	0.001
	Women	139.35			116.86			103.74		
Grade	Bachelor	123.62	5.778	0.056	122.23	2.049	0.359	121.85	2.23	0.328
	Master	116.97			132.58			125.68		
	Doctor	142.33			115.58			107.3		
Area	East Asia	115.55	3.641	0.602	98.89	12.632	0.027	105.5	10.9	0.053
	West Asia	112.62			161.72			139.57		
	South Asia	132.9			121.21			112.87		
	Southeast Asia	130.93			130.41			127.3		
	Africa	122.17			127.14			129.91		
Economic status	Type A	126.78	-0.578	0.563	135.47	-1.662	0.096	119.14	0.322	0.747
	Type B	122.38			119.8			122.07		

**Table 3.** The Influence of Exercise Attitude and Motivation on the Exercise Intensity, Frequency and Duration (N=238)

Variable		Exercise intensity			Exercise frequency			Exercise duration		
		Average rank	Z/H value	P value	Average rank	Z/H value	P value	Average rank	Z/H value	P value
Attitude	Important	105.21	4.97	0.000	140.98	-3.306	0.001	138.25	-3.994	0.000
	General	141.76			110.98			103.32		
Motivation										
Enhance fitness	Yes	116.54	-1.88	0.06	124.13	-0.193	0.847	124.96	0.894	0.371
	No	130.35			125.88			117.14		
Hobby	Yes	115.22	-1.929	0.054	132.95	1.488	0.137	135.83	2.906	0.004
	No	129.56			119.3			110.12		
Bodybuilding	Yes	124.42	0.205	0.837	143.68	3.38	0.001	121.98	0.185	0.853
	No	122.88			112.47			120.34		
Improve athletic ability	Yes	111.53	-2.035	0.042	133.98	1.24	0.215	133.74	1.845	0.065
	No	128.17			121.49			115.89		

loss (39.68%) have a higher frequency of exercises ( $P < 0.01$ ). Those who improve their athletic ability (27.78%) prefer high-intensity exercise ( $P < 0.05$ ). Compared with other foreign students, students motivated by physical fitness (49.6%) have no difference in exercise intensity, duration and frequency ( $P > 0.05$ ) (Table 3).

**3.2.2.3. Sports venues**

International students who exercise in school gymnasiums (30.8%) have higher exercise intensity, duration and frequency ( $P < 0.01$ ). Students who exercise in school outdoor field (60%) have higher exercise intensity ( $P < 0.05$ ). The exercise intensity and duration is relatively low in students who exercise in dormitories ( $P < 0.05$ ). There is no difference between the foreign students who exercise in the off-campus gymnasiums (12.8%) and outdoor field (23.2%) and other foreign students ( $P > 0.05$ ) (Table 4).

**3.2.2.4. Main sports**

International students participating in basketball (25.53%) and football (25.88%) have higher exercise intensity and duration than other international students ( $P < 0.05$ ). Students participating in fitness (19.61%) exercise more frequently than other international students ( $P < 0.05$ ). Running (29.41%) and badminton (21.96%) were not different from other international students in exercise intensity, duration and frequency ( $P > 0.05$ ) (Table 4).

**4. DISCUSSION**

**4.1. Sports Population of Foreign Students**

According to Jun Qiu's definition of the sports population, it is found that the sports population ratio of foreign students is 31.2%, which is consistent with the

study of Zheng Xiang and Weiqing Huang [13-14]. This indicates that the sports population ratio of overseas students is equivalent to that of Chinese college students.

31.2% of foreign students exercise more than three times a week, which is consistent with the proportion of the sports population. This shows that exercise frequency is the most important factor affecting the foreign students' sports population [15]. International students who exercise three times a week all reached the sports population standard of exercise intensity and exercise duration (91.7% in each exercise  $\geq 30$ min, 93.52% in each exercise  $\geq$  medium intensity), which is different from Chinese students. Huimin Pang found that 45.3% of Chinese college students are doing low-intensity exercise, and Peiji Yang's survey found that 43.3% of Chinese male students and 54% of female students exercise less than 30 minutes each time [16-17]. Xiaohong Du et al found that 8% of students did not meet the sports population standard only because of low exercise intensity or short exercise duration [18]. Therefore, it can be seen that although international students participate in sports no more than Chinese college students, they will reach the appropriate intensity and duration each time they participate.

**4.2. The Influence of Demographic and Sociological Factors on Exercise Intensity, Frequency and Duration**

This study shows that male international students prefer longer and higher intensity exercises than female students, which is consistent with the results of Zhongjiang Zhang and Qionghua Xia [19-20].

According to Yuan Rao 's research, this study divides the sports culture region of Asia into East Asia, West Asia, Southeast Asia, and the Indian cultural zone

**Table 4.** The Influence of Sports Venues and Events on the Exercise Intensity, Frequency and Duration (N=238)

Variable		Exercise intensity			Exercise frequency			Exercise duration		
		Average rank	Z/H value	P value	Average rank	Z/H value	P value	Average rank	Z/H value	P value
Sports venues										
School gymnasiums	Yes	106.95	-2.81	0.005	145.04	3.231	0.001	138.44	2.957	0.003
	No	129.27			113.69			110.79		
School outdoor field	Yes	115.89	-2.23	0.026	128.33	1.308	0.191	121.2	0.472	0.637
	No	132.52			116.33			117.03		
Dormitory	Yes	139.56	2.373	0.018	115.81	-0.885	0.376	86.07	-3.867	0.000
	No	118.1			125.56			127.94		
off-campus gymnasiums	Yes	128.05	0.58	0.562	122.66	-0.073	0.942	122.02	0.22	0.826
	No	121.69			123.63			119.14		
off-campus outdoor field	Yes	124.12	1.245	0.806	123.03	-0.058	0.954	119.7	0.025	0.98
	No	122.01			123.64			119.44		
Main sports										
Running	Yes	117.98	-1.071	0.284	137.98	1.784	0.074	125.07	0.607	0.544
	No	126.58			120.25			119.27		
Basketball	Yes	103.28	-3.193	0.001	140.98	1.917	0.055	138.32	2.204	0.028
	No	130.65			120.61			115.64		
Football	Yes	100.2	-3.83	0.000	140.41	1.908	0.056	140.62	2.697	0.007
	No	132.33			120.48			113.91		
Badminton	Yes	134.3	1.5	0.134	134.12	1.009	0.313	119.25	-0.21	0.834
	No	121.05			123.07			121.48		
Fitness	Yes	114.65	-1.282	0.2	143.59	1.994	0.046	123.7	0.312	0.755
	No	126.37			120.98			120.31		

(South Asia), and divides Africa into a single region [21]. There are differences in exercise frequency among foreign students from different regions. West Asia (5.69 times) is higher than Southeast Asia (4.61 times), Africa (4.39 times), South Asia (4.14 times) and East Asia (3.39 times). The reasons are as follows: firstly, it may be due to ethnic differences. White people live in West Asia. Lots of studies have shown that white people have unique advantages in athletic ability and talent [22]; secondly, it may be due to religious and cultural differences. Countries in West Asia are dominated by Christianity and Islam, but countries in East Asia, South Asia, and Southeast Asia are dominated by Buddhism, Hinduism, and Taoism. Different religions and cultures may affect people's physical activity [23].

Although studies have shown that economic capacity has a positive effect on sports participation [24]. However, this study shows that there is no significant difference in the participation of foreign students from countries with different economic conditions in physical activities. It may be that the economic status of international students is not much related to the national economic level. The relationship between economic status and sports participation needs further research.

### 4.3. The Influence of Sports Factors on Exercise Intensity, Frequency and Duration

This study shows that exercise attitude is an important factor affecting the intensity, duration and frequency of exercise of international students, which is consistent with the results of most studies such as Yimin Liu and Zhengguo Liu [25-26].

Exercise intensity, frequency and duration of international students on campus are all above average. The reason is that the school is the main living area for international students and school sports facilities are an important factor affecting their participation in sports, which reminds that schools should pay full attention to it.

Hobby, bodybuilding, weight loss, and exercise motivation to improve athletic ability have significant effects on exercise duration, frequency and intensity, respectively, but the motivation to enhance physical fitness cannot effectively promote sports participation. The reason may be that strengthening physical fitness is an ambiguous concept, it is well known but it cannot directly guide actual sports participation. Hobbies, bodybuilding, weight loss and improving sports ability have a clearer direction for sports participation.



International students participating in basketball and football have higher exercise duration and intensity, and those who participate in physical fitness exercise more frequently. Students like running and badminton have the same performance in sports participation. The reason is that to achieve the exercise purpose, running needs to meet the requirements of intensity and durations, students generally fail to meet the corresponding requirements because of the low interest of running. Although badminton is more interesting, students must have a certain level of skill to achieve the corresponding intensity of exercise. The study also found that less than 6% of Chinese traditional sports are involved, which fails to achieve the purpose of spreading Chinese traditional sports culture to overseas students.

## 5. CONCLUSION

Overseas students in China tend to do more than 6 times (31.2%) moderate-intensity (69.23%) exercises in the outdoor and indoor venues of the college during two weeks, each time lasting 30m-2.5h (82.57%), and the sports population reaches 31.2 %; The sports population of foreign students is the same as that of Chinese college students, but the intensity and duration of each exercise is higher than that of Chinese students. Different gender, region, sports attitude, sports venue, sports categories and motivation have important influence on their exercise intensity, duration and frequency.

Colleges and universities should pay full attention to the sports participation of female and East Asian students, and strive to improve the comprehensive level of sports participation of international students on the basis of understanding their differences. Actively increase the importance of international students to sports, increase the construction of stadiums and facilities, ensure sufficient sports venues, and set up relevant courses at the same time to promote the participation in collective sports such as basketball and football. It is also crucial to increase students' interests in different sports through a variety of activities, promote the popularization of traditional Chinese sports, propose the overall goal of physical fitness and also specific goals such as bodybuilding and weight loss and improving athletic ability.

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