

# SCIENTIFIC PHYSICAL EXERCISE IN MAINTAINING HEALTH

EXERCÍCIO FÍSICO CIENTÍFICO NA MANUTENÇÃO DA SAÚDE

EJERCICIO FÍSICO CIENTÍFICO PARA MANTENER LA SALUD



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Yuting Ding<sup>1</sup>   
(Physical Education Professional)  
Xu Sun<sup>2\*</sup>   
(Physical Education Professional)

1. School of Sports and Athletics, Beijing Normal University, Beijing, China.
2. Shenyang Sport University, Shenyang, Liaoning, China.

## Correspondence:

Xu Sun  
Shenyang Sport University,  
Shenyang, Liaoning, 11000, China.  
yangfang202011@163.com

## ABSTRACT

**Introduction:** According to the 2015 National Physical Health Monitoring Report, most of the national physical health indicators have begun to rebound, but some people's physical health is still declining. **Object:** The thesis studies the problems existing in people's physical exercise and guides the development of these people's habits. **Methods:** Our mathematical statistics and other research methods investigate the current situation of people's physical exercise habits, and explore the factors that restrict habits from the factors that affect the formation of sports and fitness concepts. **Result:** The proportion of people developing physical exercise habits is low. People invest less time and energy in physical exercise. **Conclusion:** The less time and energy that people invest in physical exercise is the main reason that affects their belief in exercise and fitness and physical exercise habits. **Level of evidence II; Therapeutic studies - investigation of treatment results.**

**Keywords:** Healthy Lifestyle; Exercise Test; Physical Fitness; Health Risk.

## RESUMO

**Introdução:** De acordo com o Relatório Nacional de Monitoramento de Saúde Física de 2015, a maioria dos indicadores nacionais de saúde física começou a se recuperar, mas a saúde física de algumas pessoas ainda está em declínio. **Objetivo:** a tese estuda os problemas existentes no exercício físico das pessoas e orienta o desenvolvimento dos hábitos dessas pessoas. **Métodos:** Nossas estatísticas matemáticas e outros métodos de pesquisa investigam a situação atual dos hábitos de exercício físico das pessoas e exploram os fatores que restringem os hábitos e os fatores que afetam a formação de conceitos de esportes e preparação física. **Resultado:** a proporção de pessoas que desenvolvem hábitos de exercícios físicos é baixa. As pessoas investem menos tempo e energia em exercícios físicos. **Conclusão:** O pouco tempo e energia que as pessoas investem na prática de exercícios físicos é o principal motivo que afeta sua crença na prática de exercícios e hábitos de exercício físico. **Nível de evidência II; Estudos terapêuticos - investigação dos resultados do tratamento.**

**Descritores:** Estilo de Vida Saudável; Teste de Esforço; Aptidão Física; Risco à Saúde Humana.

## RESUMEN

**Introducción:** De acuerdo con el Informe Nacional de Monitoreo de la Salud Física de 2015, la mayoría de los indicadores nacionales de salud física han comenzado a recuperarse, pero la salud física de algunas personas todavía está en declive. **Objetivo:** la tesis estudia los problemas existentes en el ejercicio físico de las personas y orienta el desarrollo de los hábitos de estas personas. **Métodos:** Nuestras estadísticas matemáticas y otros métodos de investigación investigan la situación actual de los hábitos de ejercicio físico de las personas y exploran los factores que restringen los hábitos y los factores que afectan la formación de conceptos deportivos y la preparación física. **Resultado:** la proporción de personas que desarrollan hábitos de ejercicio físico es baja. La gente invierte menos tiempo y energía en el ejercicio físico. **Conclusión:** El poco tiempo y energía que las personas invierten en la práctica de ejercicio físico es el principal motivo que incide en su creencia en la práctica de ejercicio y hábitos de ejercicio físico. **Nivel de evidencia II; Estudios terapéuticos: investigación de los resultados del tratamiento.**

**Descriptorios:** Estilo de Vida Saludable; Prueba de Esfuerzo; Aptitud Física; Riesgo a la Salud.



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## INTRODUCTION

According to the 2019 National Physical Health Monitoring Report, most of the national physical health indicators have begun to rebound, but some people's physical health is still declining. Contemporary people are affected by bad living habits, work pressure and other factors, their enthusiasm for participating in physical exercise is not high, and a considerable number of people have not developed physical exercise habits, which is one of the main factors leading to the decline in the physical health of the people.<sup>1</sup> This article mainly investigates the physical exercise habits of the people,

starting from the factors that influence the formation of sports and fitness concepts, explores the factors restricting the formation of the people's physical exercise habits, and proposes solutions, which help guide the people to participate in physical exercise activities and develop physical exercises.

## METHOD

### Research object

The thesis takes the people's physical exercise habits as the research object and the ordinary people as the survey object.

## RESEARCH METHODS

### Literature data method

Retrieve domestic literature, books and research results related to the people's physical exercise habits in recent years (1999-2019) and related documents of the Ministry of Education to make the preliminary theoretical preparations for this research.

### Questionnaire survey method

According to the research purpose and main content of this subject, we divide the questionnaire into two parts: the first part is the "Physical Exercise Habits Scale," and the second part is the "Questionnaire on Factors Restricting the Formation of Common People's Physical Exercise Habits" by following the design requirements of the questionnaire. "In the 2017-2019 school year, we distributed 800 questionnaires to people in a particular area.<sup>2</sup> The respondents were ordinary people aged 10-20, 21-30, 31-40, 41-50. We collected 765 valid questionnaires, and the effective rate was 95.6%.

### Mathematical Statistics

We use Excel to classify and summarize the recovered effective questionnaires and use SPSS17.0 statistical software to perform descriptive statistics and correlation analysis. Joint posterior distribution of parameter  $(\beta_1, \beta_2, \sigma^2, r)$ :

$$\pi(\beta_1, \beta_2, \sigma^2, r|y) = L(\beta_1, \beta_2, \sigma^2, r | y)\pi(\beta_1)\pi(\beta_2)\pi(\sigma^2)\pi(r) = \prod_{i=1}^r \frac{1}{\sqrt{2\pi\sigma}} e^{-\frac{(y_i - x_i^T \beta_1)^2}{2\sigma^2}} \prod_{i=r+1}^n \frac{1}{\sqrt{2\pi\sigma}} e^{-\frac{(y_i - x_i^T \beta_2)^2}{2\sigma^2}} \times \frac{1}{\sigma^2} \times \frac{1}{n-2p+1} \quad (1)$$

$$I(p \leq r \leq n - p) \quad (2)$$

Therefore, the conditional posterior distribution of the change point position  $r$  is:

$$\pi(r | \beta_1, \beta_2, \sigma^2, y) \propto \pi(r, \beta_1, \beta_2, \sigma^2 | y) \exp \quad (3)$$

$$\left\{ -\frac{\sum_{i=1}^r (y_i - x_i^T \beta_1)^2 + \sum_{i=r+1}^n (y_i - x_i^T \beta_2)^2}{2\sigma^2} \right\} I(p \leq r \leq n - p) \quad (4)$$

And:

$$\pi(\beta_1, \beta_2, \sigma^2, r, y) = \pi(\beta_1 | \sigma^2, r, y) \pi(\sigma^2 | r, y) \quad (5)$$

Remember:

$$X_1^T = (x_1, \dots, x_r), Y_1 = (y_1, \dots, y_r)^T \quad (6)$$

Then:

$$\Sigma_1^{-1} = X_1^T X_1, \bar{\beta}_1 = \Sigma_1^{-1} X_1^T Y_1 \quad (7)$$

### Logical analysis

In the research process, we used the thinking forms of induction, analogy, and synthesis to conduct a logical analysis of the existing theories and the actual data obtained.

## RESULTS

### Nature and formation mechanism of physical exercise habits

Physical exercise habits are the lasting and stable support for exercise and fitness beliefs. Repeatability and willfulness are two characteristics

of physical exercise habits; exercise and fitness beliefs are formed based on the individual's continuous deepening of the knowledge and experience of exercise and fitness in sports practice. The influencing factors of its formation mainly come from the following four aspects: (1) Sports personality tendency; (2) Sports practice activities; (3) Sports value education; (4) Sports support conditions. This article starts from the factors that affect the formation of sports and fitness beliefs and explores the factors that restrict people's physical exercise habits.<sup>3</sup>

## THE CURRENT STATUS OF PEOPLE'S PHYSICAL EXERCISE HABITS

### Comparison of the status quo of people's physical exercise habits in various age groups

Table 1 shows that in general, only 18.6% of the people have developed the habit of physical exercise; 38.3% of people have entered the state of regular physical exercise; 34.2% of people participate in physical exercise occasionally; 8.9% of people Do not participate in physical exercise.<sup>4</sup> We will perform a 4x4 contingency table X2 test for the scores of each interval of physical exercise habits and the number and ratio of age groups in Table 1. The results showed a significant difference in the proportion of people in each interval of physical exercise habits between age groups ( $P=0.034 < 0.05$ ).

### Comparison of the status quo of physical exercise habits of people of different genders

We performed a 2x4 contingency table X2 test on the number of male and female students in each interval. The results showed that the ratios of physical exercise habits in each interval were significantly significant between male and female students ( $P < 0.001$ ). Table 2 shows that the proportion of boys who have developed physical exercise habits is 25.5%, and that of girls is 11.7%; the proportion of boys who have entered regular physical exercise is 41.8%, and that of girls is 34.8%, and occasionally participate in sports.<sup>5</sup>

The above survey results show that overall, the development of people's physical exercise habits is not optimistic. Only 18.6% of people have developed physical exercise habits.<sup>6</sup>

## FACTORS RESTRICTING THE FORMATION OF PEOPLE'S PHYSICAL EXERCISE HABITS

### Personality tendency of physical exercise

Physical exercise personality tendencies include sports values, interests, needs, etc., which are the psychological basis for initiating exercise behavior and the driving force for physical exercise. Recognizing the

**Table 1.** Distribution of scores of people's exercise habits in different age groups.

|       | First interval | Second interval | Third interval | Fourth interval | Total     |
|-------|----------------|-----------------|----------------|-----------------|-----------|
| 10-20 | 22(9.4%)       | 89(38.0%)       | 86(36.8%)      | 37(15.8%)       | 234(100%) |
| 21-30 | 14(6.9%)       | 67(33.0%)       | 79(38.9%)      | 43(21.2%)       | 203(100%) |
| 31-40 | 13(7.4%)       | 47(26.7%)       | 84(47.7%)      | 32(18.2%)       | 176(100%) |
| 41-50 | 19(12.5%)      | 59(38.8%)       | 44(28.9%)      | 30(19.7%)       | 152(100%) |
| Total | 68(8.9%)       | 262(34.2%)      | 293(38.3%)     | 142(18.6%)      | 765(100%) |

Note: The first section: never participate in physical exercise; the second section: occasionally participate in physical exercise; the third section: initially enter the state of regular physical exercise; the fourth section: develop physical exercise habits.

**Table 2.** Distribution of the number and rate of exercise habits of people of different genders.

|                 | Boys       | Schoolgirl | Total      |
|-----------------|------------|------------|------------|
| First interval  | 19(5.0%)   | 49(12.7%)  | 68(8.9%)   |
| Second interval | 105(27.6%) | 157(40.8%) | 262(34.2%) |
| Third interval  | 159(41.8%) | 134(34.8%) | 293(38.3%) |
| Fourth interval | 97(25.5%)  | 45(11.7%)  | 142(18.6%) |
| Total           | 380(100%)  | 385(100%)  | 765(100%)  |

importance of physical exercise, the emotional love of physical exercise, the desire to have a healthy body and mind, and other personality tendencies can enable individuals to actively participate in physical exercise, which makes it easier to deepen their understanding of sports and fitness and form sports and fitness beliefs.

1. The public's awareness of the importance of physical exercise. The public's understanding of physical exercise mainly comes from direct experience (such as their own exercise experience) and indirect experience (such as the accumulation of sports knowledge, others' exercise experience, etc.). The survey on the importance of physical exercise (Table 3) found that 78.7% of people think physical exercise is essential for themselves, 18.7% think it is fair, and only 2.5% think it is not essential.

2. The needs of the people to participate in physical exercise. The need for physical exercise is an advanced need for physical exercise, and the motivation for physical exercise is generated based on it. Physical exercise needs are the initial motivation for physical exercise behavior. Generally speaking (Table 4), 37.6% of people have strong demand, 36.2% have a demand for physical exercise, and 27.2% have less demand for physical exercise.<sup>7</sup> Physical exercise can improve people's physical and mental health, relieve work pressure, and increase leisure and entertainment.

3. Survey on people's interest in participating in physical exercise. Interest is the individual's psychological tendency to try to understand a particular thing or engage in a particular activity. From Table 5, we can see that 75.9% of the people are very or relatively interested in physical exercise, and only 24.0% are generally or not interested. From an overall point of view, people are still more interested in physical exercise. The generation and development of interest generally go through a gradual deepening process.

### Individual time and energy devoted to physical activities

Sports practice activities are rich and colorful, not limited to physical exercise. Physical exercise is an essential physical practice activity for forming individual sports fitness beliefs and the most direct source of experience for forming sports fitness beliefs. Under normal circumstances, the more time and energy people actively invest in physical exercise. Without guaranteeing sufficient time and frequency of physical exercise, the effect and experience of physical exercise will be significantly reduced, which will hinder the formation of sports and fitness beliefs. It isn't easy to guarantee the achievement of physical exercise habits. It can be seen that the less time and energy invested by people in physical exercise is a significant factor that affects their belief in sports and fitness and the formation of physical exercise habits.

**Table 3.** Survey of the awareness of the importance of physical exercise.

|              | Very important | Important | General | Unimportant | Total |
|--------------|----------------|-----------|---------|-------------|-------|
| Percentage/% | 50.5           | 28.4      | 18.7    | 2.5         | 100   |
| Frequency    | 386            | 217       | 143     | 19          | 765   |

**Table 4.** Public demand for physical exercise.

|              | Very necessary | Need | General | Not needed | Total |
|--------------|----------------|------|---------|------------|-------|
| Percentage/% | 37.6           | 36.2 | 19.5    | 9.7        | 100   |
| Frequency    | 288            | 277  | 126     | 74         | 765   |

**Table 5.** Public interest in physical exercise.

|              | Very interested | More interested | Average interest | Not interested in | Total |
|--------------|-----------------|-----------------|------------------|-------------------|-------|
| Percentage/% | 34.1            | 41.8            | 18.8             | 5.2               | 100   |
| Frequency    | 261             | 320             | 144              | 40                | 765   |

Among the factors that hinder people from exercising, the top three are "lack of time and energy" (65.1%), "lack of suitable exercise facilities" (53.5%), and "lack of exercise knowledge" Or skills" (47.3%), and other factors are "too tired of exercising" (38.8%), "lack of exercise partners" (37.0%), "lack of interest in exercise" (27.1%), and "other reasons" (accounting for 13.5 %), "Limited economic level" (7.5%), "Physical condition is not suitable for physical exercise" (4.4%). From the above survey, time and energy factors, venue facilities, exercise knowledge, and skills prevent people from exercising.

### Sports value education for individuals

Sports value education refers to the transformation of individual sports thoughts and sports values through education to enhance their understanding of the social status and role of sports and deepen their understanding of physical exercise's significance to promote physical health. Sports value education is an important influencing factor of sports personality tendency, sports practice activities and sports fitness beliefs. People with better sports value education are more likely to have sport's needs, from sports interests and hobbies, and more easily recognize the effects of physical exercise. Promote the value and advantages of their physical and mental health, and it is easier to form a firm belief in sports and fitness. Modern people receive sports value education in many aspects, mainly from society, family and school.

### Material factors supporting physical exercise

Sports facilities are the material foundation and condition guarantee for people to carry out various sports activities, and they are indispensable external conditions for people to carry out physical exercises. The socially improved, safe and convenient sports facilities and facilities will increase the people's enthusiasm to participate in physical exercise. In contrast, the imperfect sports facilities will significantly reduce the people's enthusiasm to participate in physical exercise, which is not conducive to the formation of physical exercise habits. According to the survey of people's satisfaction with social sports facilities, "completely satisfied" and "relatively satisfied" accounted for only 34.6%, "average" accounted for 42.6%, and "dissatisfied" accounted for 22.7. %. Through visits and investigations, the main reasons are: (1) The facilities are aging and damaged. If nearly 25% of the basketball court facilities are damaged to varying degrees and not repaired in time; (2) The ratio of venues for some projects is not reasonable, such There are only three tennis courts under construction; (3) The lack of supporting service facilities, such as lights, drinking water sports, and medical stations. It can be seen that although there are many existing sports facilities in the society, they cannot meet the needs of most people for physical exercise.

### CONCLUSION

The proportion of people developing physical exercise habits is low. In terms of age comparison, the proportion of people in the 21-30 age group is the highest, followed by the 41-50 age group, and the 10-20 age group is the lowest; in terms of gender comparison, the proportion of boys is significantly higher than that of girls. Most people have different knowledge and behaviors in physical exercise, and the formed interest in physical exercise is unstable. More people have less demand for exercise, which affects the formation of physical exercise habits. The less time and energy that people invest in physical exercise is a primary reason that affects their belief in exercise and fitness and physical exercise habits. The three primary factors that hinder them from physical exercise are time and energy factors, venue facilities, and exercise knowledge and skills.

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