

THE INFLUENCING FACTORS OF OPENING OF COLLEGE SPORTS RESOURCES IN THE BACKGROUND OF NATIONAL PUBLIC FITNESS SERVICES



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OS FATORES QUE INFLUENCIAM A ABERTURA DE RECURSOS ESPORTIVOS UNIVERSITÁRIOS NO CONTEXTO DO SERVIÇO PÚBLICO DE EDUCAÇÃO FÍSICA NACIONAL

FACTORES QUE INFLUYEN EN LA APERTURA DE LOS RECURSOS DEPORTIVOS EN LAS UNIVERSIDADES

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ABSTRACT

There are some problems such as few and old equipment in urban community sports fitness facilities, which makes it difficult for community fitness resources to continue to meet the fitness needs of community residents. The opening of university sports resources can alleviate the problem of residents' fitness difficulty to a certain extent. In order to explore the problems faced by the opening of university sports resources, this study established the analytic hierarchy process model based on the analytic hierarchy process (AHP) and Delphi law in the background of national public service of fitness, and combined with the questionnaire survey method to study the influencing factors of opening of college sports. The model modified by the Delphi method contains 6 first-level and 22 second-level influencing factors. It is found that the most important factor in the first level is the hardware factor of college sports resources, and the most important factor of the second level is the spatial layout of university sports resources. The results show that improving the hardware facilities of university sports resources, improving the management mode of sports resources, and increasing the targeted financial subsidies and tax reduction and exemption are helpful to enhance the willingness to open sports resources and improve the quality of opened sports resources. It is hoped that this study can promote the opening of college sports resources and promote the continuous improvement of the service level of sports resources.

Keywords: Fitness; colleges and universities; sports resources; opening; analytic hierarchy process.

RESUMO

Há alguns problemas, tais como equipamentos antiquados e em menores quantidades em instalações esportivas na Comunidade urbana, o que dificulta que os recursos de exercícios físicos continuem atendendo as necessidades de atividades físicas dos moradores das comunidades. A abertura de recursos desportivos universitários pode atenuar, em certa medida, o problema da dificuldade dos moradores de praticar atividades físicas. A fim de explorar os problemas enfrentados pela abertura dos recursos desportivos universitários, este estudo estabeleceu o modelo de processo hierárquico analítico baseado no processo hierárquico analítico (Analytic Hierarchy Process — AHP) e na Lei Delphi no contexto do serviço público nacional de atividades físicas, combinado com o método de inquérito por questionário para estudar os fatores que influenciam a abertura dos recursos esportivos universitários. O modelo modificado pelo método Delphi contém 6 fatores influenciadores de primeiro nível e 22 fatores influenciadores de segundo nível. Constata-se que o fator de primeiro nível mais importante é o fator físico dos recursos esportivos universitários, e o fator de segundo nível mais importante é a disposição espacial dos recursos esportivos universitários. Os resultados mostram que a melhoria das instalações físicas dos recursos desportivos universitários, a melhoria do modo de gestão dos recursos desportivos e o aumento dos subsídios financeiros e a redução e isenção de impostos são úteis para aumentar a disponibilidade da abertura dos recursos desportivos e melhorar a qualidade dos recursos desportivos abertos. Espera-se que este estudo possa promover o processo de abertura dos recursos esportivos universitários e promover a melhoria contínua do nível de serviço de recursos esportivos.

Descritores: Fitness; faculdades e universidades; recursos desportivos; abertura; processo hierárquico analítico.

RESUMEN

Explorar los problemas que enfrenta la apertura de los recursos deportivos universitarios, este estudio estableció el proceso de jerarquía analítica (PJA) y la ley Delphi en el contexto del servicio público nacional de educación física, y los combinó con la encuesta por cuestionario para estudiar los factores que influyen en la apertura de los deportes universitarios. El modelo modificado por el método Delphi contiene 6 factores de influencia de primer nivel y 22 de segundo nivel. Encontramos que el factor más importante en el primer nivel es el factor hardware de los recursos deportivos universitarios, y el factor más importante del segundo nivel es la distribución espacial de los recursos deportivos universitarios. Los resultados muestran que mejorar las instalaciones de hardware de los recursos deportivos universitarios, mejorar el modo de gestión de los recursos deportivos y aumentar los subsidios financieros específicos y la reducción y exención de impuestos son útiles para mejorar la disposición



INTRODUCTION

Since China's reform and opening up, the construction of socialist market economy and the transformation of intensive economy have promoted the modernization of cities and improved the living standards of urban residents. With the improvement of living standards, residents' requirements for quality of life are rising, so the demand for sports resources is also increasing.¹ In the 12th Five Year Plan, the government should strengthen the public fitness service system. In the early stage of urban construction, the lack of planning amount of sports resources and the old damage of the original sports resources make it difficult for the existing urban sports resources to meet the residents' needs for national fitness, and the lack of resources in the public service system of national fitness makes it difficult to realize the national fitness. Colleges and universities are places to transport talents for the society, whose essence is to serve the society.² Colleges and universities shoulder the mission of social responsibility. In the case of idle and low utilization rate of college sports resources and serious lack of social sports resources, the opening of university sports resources has become an important method to solve the contradiction between supply and demand of community sports resources.³ In order to speed up the opening of university sports resources, this study uses the analytic hierarchy process (AHP) to make qualitative and quantitative analysis on the influencing factors of college sports resources opening.

Analytic hierarchy process (AHP) is a multi-objective decision-making problem as a system, which decomposes all relevant factors in multi-level, and carries out qualitative and quantitative analysis according to the hierarchy. The main content of this study is divided into five parts. The second part introduces the domestic and foreign scholars' research on public sports resources. The third part introduces the analytic hierarchy process (AHP) and constructs the analytic hierarchy process (AHP) model of influencing factors of college sports resources opening. In the fourth part, based on the analytic hierarchy process (AHP) model, a questionnaire survey is carried out to determine the weight of each influencing factor. The fifth part summarizes the research content and points out the shortcomings of this study.

Public sports resources are the basis of realizing the public service system of national fitness. In recent years, many scholars at home and abroad have carried out a series of studies on the investment and utilization of public sports resources. Alakshendra based on the phenomenon that the main source of funds for the construction of professional stadiums and stadiums is public funds. Through the investigation on the financing methods of stadiums in recent years, alakshendra reviewed the impact of public funds on stadiums and gymnasiums, and proposed that the government should not provide public subsidies for the construction of sports venues with high budget.⁴ Baker used literature research and questionnaire survey to analyze the sources of funds and profit-making methods of stadiums and stadiums in the United States. Through discussing the financing methods of stadiums, it was concluded that the government should limit unnecessary public financial expenditure.⁵ In order to study the competitive environment of stadium industry, Xu et al. Took Wuhu Olympic Sports Center Stadium as an example to analyze the influence of existing competitors,

new entrants, substitutes, suppliers, customers and complements on the development of stadiums and stadiums. The results show that the flexibility of market competition is very important to the development of stadiums and stadiums.⁶ Based on the lack of fitness resources, Yuxian Li and his colleagues studied the non venue sports resources in eight cities by using the methods of literature statistics and questionnaire survey, and concluded that the sports resources in Colleges and universities can meet the needs of citizens' fitness.⁷

To sum up, many studies only focus on the investment profit problem of large-scale community sports venues and the security of university stadiums, while the research on the opening of university sports resources is less. Therefore, under the background of national fitness public service, this study analyzes the influencing factors of college sports resources opening, aiming to promote the development of public service system of national fitness.⁸

Research analysis and Discussion

Based on the analytic hierarchy process (AHP) model, this paper designs a questionnaire to investigate the managers of sports venues in Colleges and universities in our province. The number of respondents is 41. Yaahp 6.0 software was used to process the survey results. If the first level influencing factors are national policy factors, fund guarantee factors, management organization structure factors, residents factors, university sports resources hardware factors, human resources factors of university sports resources, taking a university sports venue manager as an example, the corresponding judgment matrix of the first level of the questionnaire filled by the manager is as follows ()

$$\begin{pmatrix} 1 & 1/3 & 1/5 & 3 & 1/2 & 5 \\ & 1 & 1 & 4 & 1/2 & 6 \\ & & 1 & 3 & 1/2 & 5 \\ & & & 1 & 1/3 & 2 \\ & & & & 1 & 7 \\ & & & & & 1 \end{pmatrix}$$

From the analysis of the judgment matrix, we can see that for the manager, the order of the six first level influencing factors from important to unimportant is the hardware factor of university sports resources, the management organization structure factor, the fund guarantee factor, the national policy factor, the resident factor, and the human resources factor of university sports resources. The factors of capital guarantee are equally important. Yaahp6.0 is used to calculate the maximum eigenvalue $\lambda_{\max} = 6.3944$ of the judgment matrix and check its consistency. The maximum eigenvalue and consistency ratio $CR = 0.0626 < 0.10$ are obtained. It can be considered that the importance ranking weight of influencing factors corresponding to the judgment matrix is credible. The weight of the hardware factor of university sports resources is 0.3028, the weight of management organization structure factor is 0.2497, the weight of fund guarantee factor is 0.2279, the weight of national policy factor is 0.1198, the weight of resident factor is 0.0650, and the weight of human resource factor is 0.0348, as shown in Figure 1. That is to say, the managers of the university sports resources think that the hardware facilities of university

sports resources are the most important factors affecting the opening of university sports resources, the importance of management organization structure and fund guarantee factors is not much different, residents and human resources factors are the two least influential factors .

At the second level, the manager thinks that the judgment matrix of national policy factors is $\begin{pmatrix} 1 & 3 & 1/5 \\ & 1 & 1/7 \\ & & 1 \end{pmatrix}$, and the order of three second level

factors is policy support, policy effectiveness and policy soundness. Using yaahp6.0, $\lambda_{\max} = 3.0649$, consistency ratio $C.R. = 0.624 < 0.10$ are obtained, and the importance ranking weights of influencing factors corresponding to the judgment matrix are credible, and the corresponding weights are 0.1884, 0.0810 and 0.7306 respectively. In other words, among the factors of national policies, the soundness of policies is the most important and the effectiveness of policies is the least important. Management organization structure factors corresponding to the judgment matrix $\lambda_{\max} = 4.2244$, consistency ratio $C.R. = 0.0840 < 0.10$, secondary factors and their corresponding weights are: university sports resource management mode weight 0.6386, assessment mechanism weight 0.0932, incentive mechanism weight 0.0770, authority range weight 0.1912.

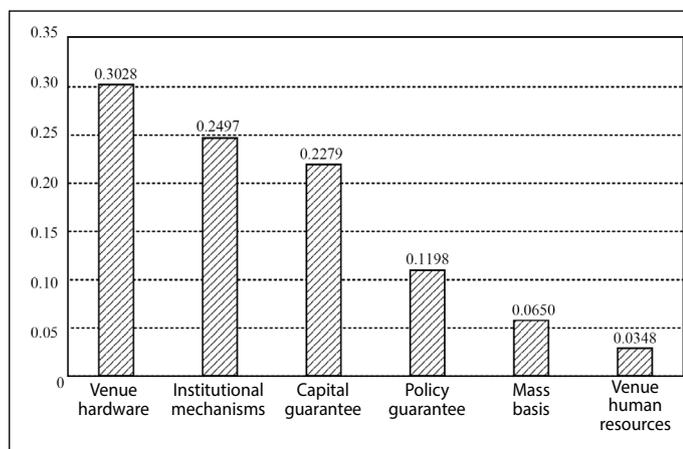


Figure 1. First-level influence factors final weight

The corresponding judgment matrix $\lambda_{\max} = 3.0183$, consistency ratio $C.R. = 0.0176 < 0.10$, secondary factors and their corresponding weights are 0.4844, 0.4232 and 0.0924 respectively.

Residents' factors correspond to the $\lambda_{\max} = 3.0092$ of the judgment matrix, and the consistency ratio $\lambda_{\max} = 3.0092$ is 0.0890, 0.3234 and 0.5876 respectively. Hardware factors correspond to $\lambda_{\max} = 4.2558$ and consistency ratio $C.R. = 0.0958 < 0.10$ of judgment matrix, in which the spatial distribution weight of university sports resources is 0.5611, the function design weight is 0.2613, the weight of equipment quantity and quality is 0.0709, and the weight of supporting facilities is 0.1067. Human resource factors correspond to $\lambda_{\max} = 5.4305$ of judgment matrix, consistency ratio $C.R. = 0.0348 < 0.10$, in which the professional quality weight of sports resource service personnel is 0.5303, reward and punishment rule weight is 0.0644, training system weight is 0.2378, assessment system weight is 0.0962, volunteer service system weight is 0.0713. Similar methods are used to process the data of the rest of the questionnaire survey results, and the results are summarized as shown in Figure 2.

As can be seen from Figure 2, the weight of the factors influencing the opening of university sports resources from large to small are the spatial layout of university sports resources, the management mode of university sports resources, government financial subsidies, national tax and fee relief, policy soundness, sports resource function design, scope of authority, residents' fitness hobby degree, supporting facilities, other subsidy items, sports consumption ability and equipment number Quantity and quality, incentive mechanism of sports resources, policy support, assessment mechanism, professional quality of service personnel, policy effectiveness, training system of service personnel, population density of residents, assessment system of service personnel, reward and punishment system of service personnel and voluntary service system. Therefore, in order to promote the process of opening sports resources in Colleges and universities and promote the development of public service system of national fitness, colleges and universities should devote themselves to improving the hardware facilities of university sports resources and improving the management mode of sports resources. The government should also increase the targeted financial subsidies and tax and fee relief to provide financial guarantee for colleges and universities.

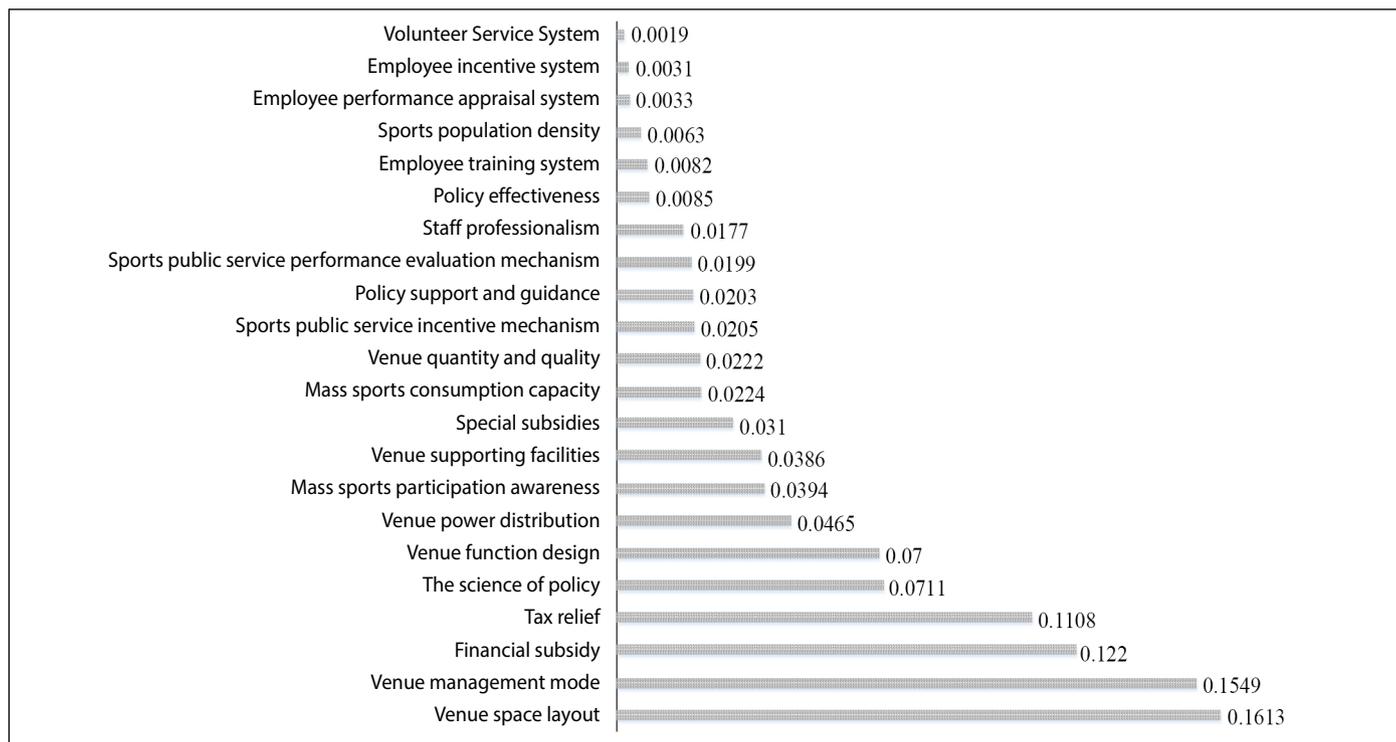


Figure 2. Second-level influencing factors weight and ranking.

CONCLUSIONS

The construction of public service system of national fitness is an important demand of urban modernization construction. However, national fitness is faced with the obstacle of insufficient community sports resources. The mismatch between supply and demand of urban sports resources makes the opening of university sports resources more important. In order to expand the community sports resources, this study analyzes the factors influencing the opening of university sports resources, aiming to accelerate the establishment of public service system of national fitness. Using analytic hierarchy process, combined with literature research, expert interview and Delphi method, this paper constructs the influencing factors model of college sports resources opening. A questionnaire survey was conducted among 41 college sports resource managers. Yaahp software was used to calculate the weight and evaluate the consistency of the survey results. The results showed that the weight of the first level influencing factors from large to small was hardware factor, management organization structure factor, fund guarantee factor, national policy factor, resident factor and human resource factor of university sports resource. The first four influencing factors in the second level are the spatial distribution of university sports resources, the management mode of university sports resources,

government financial subsidies and national tax and fee reduction. From the weight of the influencing factors, we can see that the improvement of hardware facilities, the improvement of management mode, and the strengthening of government funding guarantee can optimize the opening service of university sports resources and promote the construction process of public service system of national fitness. Since the survey samples are university sports resource managers, the sample size of this study is small. In the future research, we can further enrich the sample size to reduce the individual error of the research results.

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REFERENCES

1. Heinrich KM, Haddock CK, Natinee J, Hughey J, Berkel AL, Walker SC. Perceptions of Important Characteristics of Physical Activity Facilities: Implications for Engagement in Walking, Moderate and Vigorous Physical Activity. *Frontiers in Public Health*. 2017; 5(21):319-327.
2. Mwangi FM, Rintaugu EG. Physical Activity and Health Related Physical Fitness Attributes of Staff Members in a Kenyan Public University. *International Journal of Sports science*. 2017; 7(2):81-86.
3. Cardinal BJ. Beyond the Gym: There Is More to Physical Education than Meets the Eye. *Journal of Physical Education, Recreation & Dance*. 2017; 88(2):3-5.
4. Alakshendra A. How are we funding professional sports stadiums? An overview. *Managerial Finance*, 2016, 42(9):885-890.
5. Baker N. Playing a Man Down: Professional Sports and Stadium Finance—How Leagues and Franchises Extract Favorable Terms from American Cities. *Boston College Law Review*; 2018. 59(1):281-317.
6. Xiu L, Jia-Yun XU, Li-Shui W, et al. Six Force Analysis of the Competitive Environment of Stadium Industry—Taking the Olympic Sports Center Stadium in Wuhu as An Example. *Journal of Anhui Vocational & Technical College*. 2016;15 (04):44-54.
7. Yuxian Li, Lixin Zhu. Development and utilization of non-stadium sports resources in colleges and universities. *Experimental Technology and Management*. 2017;034(010):238-243.
8. Liyan Jin, Zhang JJ, Byon KK. Planned behavior and college football consumers' intention to donate to green stadium initiatives. *Asian Sports Management Review*. 2016; 45(3):465-471.