

Research on Smartization Upgrade Strategies of Public Sports Services for the Elderly in Shenzhen Community

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Abstract. Modern information technology has brought unprecedented opportunities for the development of public sports services in the new era, and sports services for the elderly are of great significance in promoting healthy and active aging. This study uses field research and questionnaire methods to conduct in-depth research and comparative analysis on the physical fitness and feedback of elderly people in Shenzhen community. The main factors affecting the physical exercise status of the elderly include their cognitive limitations and the inadequate quality of community sports and fitness products and services. Through smartizational upgrade strategies of improving information channels, promoting equipment upgrading and reinforcing linkage between sports and medicine, intelligent services will be upgraded so as to achieve the goal of "healthy aging" and high-quality development of community public sports services.

Keywords: Smart Management, Healthy Aging, Community Public Service, Aged Fitness, Upgrade Strategy

1 Introduction

Modern information technologies such as big data and Internet of Things are constantly introduced into public services, bringing unprecedented opportunities for the development of public sports services in the new era, which specific functions are reflected mainly in the optimization to the management mode and the precise supply^[1]. In addition to the trend of smartization, the strong trend of population aging in China can not be ignored^[2]. Social development is faced with the serious challenge of the increasing burden of social aging, the elderly's life quality and of related public services construction has become a topic of great concern to the whole society, among which the sports services provided for the elderly are of great significance in promoting the healthy and positive aging.

With the continuous improvement of social civilization, the demand for exercise among the elderly keeps growing, and the participation of which in sports such as square dancing, morning exercise has been developed to a certain extent. However, this study found that there are still problems in the course of sports and fitness of the elderly within the communities in Shenzhen, including the limited cognition of themselves, and the inadequate related products

and service provided, in which the top-level design dimension builds a relevant assistance mechanism with the help of modern information technology, in order to enhance the level of public sports services for the elderly in the community through the construction of intelligence.

2 Literature Review

In 2015, the World Health Organization proposed the concept of "healthy aging" and defined it as the process of maintaining and developing the functionality that enables older people to live well^[3]. The exercise prevention centered on "healthy aging" is one of the most important ways to prevent chronic diseases and to restore the self-care ability of the semi-disabled elderly as well^[4]. The report of the 20th Party Congress in China has proposed the implementation of national strategy to actively cope with population aging, and the elderly have become the target group to be concerned about in the practice of public sports services^[5]. In addition, the "Opinions on Building a Higher Level of Public Service System for National Fitness" that promulgated in 2022 has emphasized the implementation of the all-age friendly concept of national fitness and the provision of necessary assistance to the aged for the use of sports services and facilities^[6] which put forward higher requirements for the supply of public sports services. At present, the supply content of public sports services for the elderly has expanded from the services at the level of public goods and facilities to the integration at the behavioral level of policy, management, organization, production and guarantee^[7]. Community is an significant scene of the urban elderly sports public service system in China. In addition, because of the implementation of community-home-based care, community has become the main activity field for the elderly, which makes community sports organization and management become the key path to improve the health and sports participation of the aged residents. In community-dwelling older people, exercise conferred its greatest benefits to improvements in health status in those who were more frail at baseline^[8]. It is crucial to provide high-quality sport services in the age group according to the physical needs or exercise expectations of the elderly^[9].

The addition of information technology is the growth point of social service nowadays^[10]. In order to improve the participation of the elderly in community sports with modern information technologies such as big data and other information technologies, this paper adopts the field investigation and questionnaire survey. Taking Shenzhen as an example, this paper investigated the physical fitness situation and sports public service feedback of the elderly within community under the background of information era, found out the problems and puts forward relevant countermeasures and suggestions. This study is innovative in the following aspects. From the academic aspect, the research results of community public sports services for the aged under the background of information technology are less in previous study, so involved new conclusions in this era is necessary. Not only that, Shenzhen's grassroots governance capacity and technological innovation level are at the forefront of China, but the current academic discussion on the deep connection between Shenzhen's information technology industry and community public sports services for the elderly is still little, and the relevant empirical research of this city needs to be supplemented urgently. Secondly, from the perspective of practical significance, this study drew clear optimization strategies from

quantitative evidence. Meanwhile, this study provides a direction for thinking about the promotion of sports participation of the elderly in the community in the future.

3 Research Methods and Analyses

This quantitative study based on on-site research on the participation of elderly people in sports and fitness in various communities in Shenzhen. Data was collected through questionnaire survey to analyze the supply of public sports services for the elderly. The questionnaire was distributed to residents in the community's recreational areas, sports venues, and leisure trails. When necessary, ask-and-record was used to assist the elderly to complete the questionnaire, in addition to filling out the questionnaire, interviews with specific options are conducted to obtain specific and personalized information^[11]. In this study, there are 230 questionnaires in total, of which 200 are valid questionnaires, and the effective rate is about 87%. Finally, the collected questionnaire data statistically analyzed with SPSS 25.0.

3.1 Profile of Sports Participation

3.1.1 Physical Condition

Taking chronic diseases as indicators of the health status of the elderly as shown in Table 1, it is found that the elderly generally suffer from chronic diseases, among which the highest prevalence rates are cardiovascular and cerebrovascular diseases (42.5%), Osteoarthritis diseases (22%), respiratory diseases (17.5%) and digestive diseases (9%). Only a very small number of older people (2.5%) are disease-free, indicating the practical importance of improving the physical health status and quality of life of the elderly people.

Table 1. Physical condition of the elderly in community of Shenzhen.

Type of disease	N	%	Ranking
Cardiovascular and cerebrovascular diseases	85	42.50%	1
Digestive diseases	18	9%	4
Diabetes	10	5%	5
Osteoarthritis	44	22%	2
Respiratory diseases	35	17.50%	3
Others	3	1.50%	7
None	5	2.50%	6

3.1.2 Physical Exercise Frequency and Duration

The surveyed elderly people participate in sports and fitness more frequently as shown in Table 2, with 93% of them exercising 3 or more times a week, and 10% of them exercising 7 or more times a week. In addition, more than half of the elderly exercise for half an hour to one hour, accounting for 68%; The proportion of more than an hour is 23.5%, and there is also a small proportion the elderly whose exercise duration is uncertain (2.5%).

The frequency and duration of participating in physical fitness suggest that most elderly people have regular exercise habits with appropriate time.

Table 2. Physical exercise frequency and duration of the elderly in community of Shenzhen.

Type	Options	N	%
Frequency(weekly)	Less than 1	14	7%
	1-2	41	20.50%
	3-4	96	48%
	5-6	29	14.50%
	more than 7	20	10%
Duration	Less than 0.5hr	12	6%
	0.5-1hr	136	68%
	More than 1hr	47	23.50%
	Uncertain	5	2.50%

3.2 Related Feedback of Sports Services

3.2.1 Sports Places

According to the proportion of respondents' feedback in the survey data as Figure 1 shown, the main problems with sports venues for elderly people in Shenzhen are the high fees charged by some venues (57.5%) and the insufficient sports place for elderly people (49%).

According to field visits, sports venues with better indoor environments are usually more expensive, and elderly people are more willing to engage in free sports and fitness activities outdoors. In addition, there are also other issues related to venue management, such as poor hygiene conditions and the behavior of young people dominating the site.

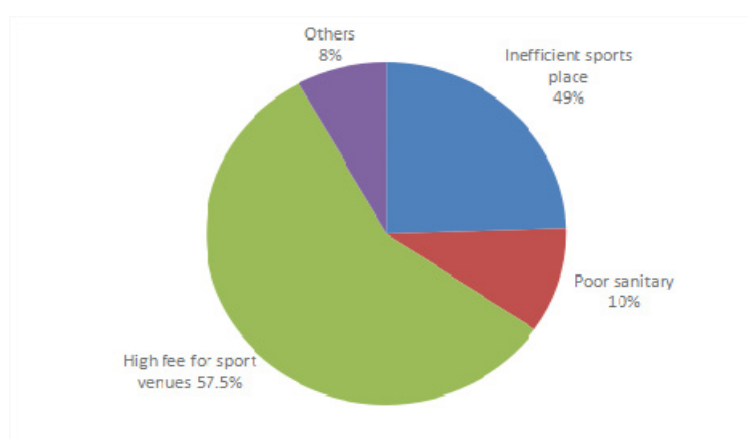


Figure 1. Problems in community sports places(Owner-drawing).

3.2.2 Sports Facilities

The research found that the main problems of physical fitness equipment in Shenzhen community as shown in Figure 2 are: insufficient suitable equipment for the elderly, serious aging of equipment, untimely maintenance of equipment and so on 52% of the respondents believe that the fitness equipment in the community where they live is not suitable for the elderly; 24% of respondents believe that the maintenance of community fitness equipment is not timely; 11% of respondents believe that the aging of community fitness equipment seriously affects daily use. And only a few respondents reported that few communities do not even have sports and fitness equipment, and the elderly need to go to parks or open spaces out of community for sports and fitness activities.

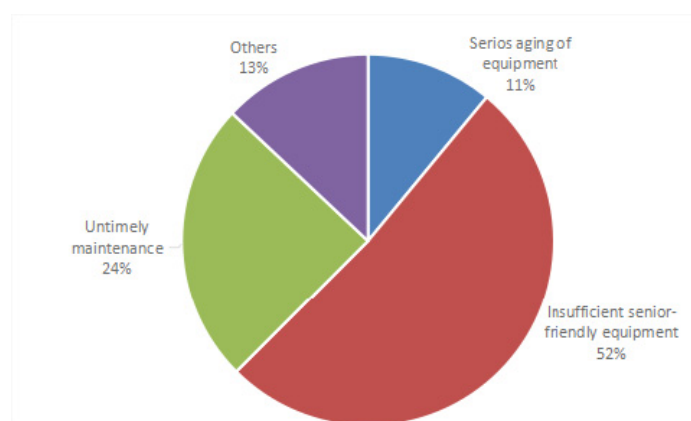


Figure 2. Problems in community sports facilities(Owner-drawing).

3.2.3 Physical Fitness Instructor

Doing exercise without scientific guidance for long might cause sports injuries of the elderly, which will bring irreversible physical and mental effects According to the field research, none of the communities surveyed are equipped with professional physical fitness instructors for the elderly. Corresponding questionnaire results show that 84% and 14% of the interviewees are not clear about the setting of community sports fitness instructors as Figure 3 shown. Only 4 seniors indicated that the community is equipped but the actual situation is that there are very few communities in the holidays. The audience interaction and the cooperation with universities to organize volunteers to carry out health education and residential guidance have significant corresponding defects in the diversity and professionalism of the guidance services, which can not be compared with the community professional sports instructors.

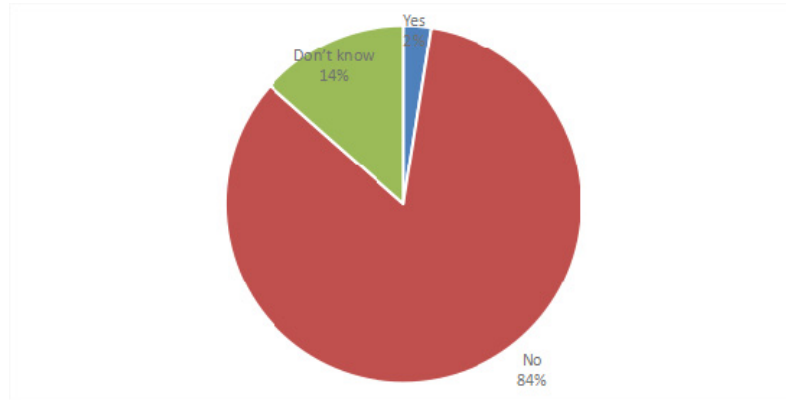


Figure 3. Provision of physical fitness instructor within community(Owner-drawing).

4 Research Results

Of the above related investigation concluded that the current constraints on the elderly sports participation and public sports services factors mainly include their concepts, venues, facilities, and guidance services and other reasons for the promotion of public sports services for the elderly related strategies to provide realistic basis for discussion.

4.1 Cognitive Limitation of the Elderly

Along with modern information technology information dissemination channel unceasingly expands sports information along with various kinds of media infiltrates in the life corner. However, the research results suggest that old people lack the way and understanding of sports information, lack the cognition of scientific sports knowledge and lack the correct and positive attitude towards fitness. The survey found that there are two misconceptions among the elderly. One is to equate physical exercise with random and simple activities. It is true that having the consciousness of simple activities and putting them into practice has certain positive significance for individuals, but it is difficult to achieve the purpose of exercise without normative and scientific activities, and even insisting on irregular and unscientific actions may do some damage to the body. The second is to equate physical exercise with exercise. Most elderly people suffer from chronic diseases, some of which are not suitable for sports. Some elderly people therefore have the idea that their bodies cannot do physical exercise. In fact, sports can also be divided into intensity. The elderly can choose sports according to their application.

4.2 Inadequate Places, Facilities and Services

Fitness places and facilities are the prerequisites and guarantees for sports. However, most communities in Shenzhen have inadequate sports parks and fitness equipment, the fitness venues in the community also can not meet the fitness needs of the elderly, which leads to the disappointment of the elderly in their fitness venues and fitness equipment, which affects their enthusiasm for physical exercise. The survey found that most of the free outdoor sports venues in the community are open spaces with a small amount of simple fitness equipment placed in

small-area parks, and there are few venues designed for sports events. Most communities have no indoor activity places, and a few communities with indoor venues usually focus on chess and card rooms with higher fees. In addition, some communities have certain problems in venue management, which are occupied by healthy young people. It is also worthy of attention. Apart from the site factors, the equipment is old and single in variety, and many fitness equipment is not suitable for the elderly. It is understood that most elderly people will choose sports such as walking, running, playing a kind of traditional Chinese Shadowboxing (Tai Chi Quan) and dancing Square Dance, which can be carried out independently without any equipment. Other interviewees reported that some equipment and facilities did not know how to use them and were afraid of being injured and did not dare to use them rashly. Some interviewees said that they had been injured because of improper exercise. Therefore, based on the solidified cognition of the elderly to a certain extent, physical exercise instructors must provide professional professors and guidance for the elderly. At present, there are no professional physical training instructors in the investigated communities, only the project guidance related to festival activities and volunteers with different qualifications can provide certain guidance in a specific.

5 Upgrade Strategies Discussion

Community, as the primary field bearing the "last mile" governance of society, is the primary place for the elderly to live. The intelligent supply of community sports services for the elderly is the thoughtful supply of sports services. The concrete manifestation is to provide sports services for the elderly groups in specific communities with the help of intelligent concepts, intelligent equipment, and professional teams^[12]. Based on this construction direction and the problems revealed by the survey and research results, a series of upgrading strategies have been proposed as shown in Figure 4.

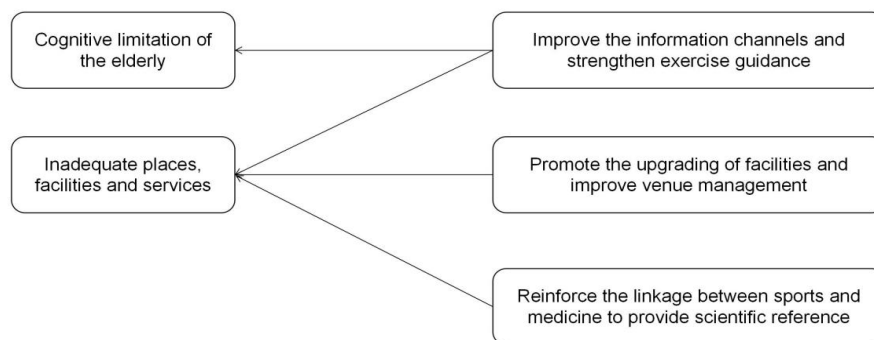


Figure 4. Upgrade strategies(Owner-drawing).

5.1 Improve Information Channels and Strengthen Exercise Guidance

The physiological function of the elderly is in a declining stage because of misconceptions. Not exercising or taking inappropriate sports and sports may not prevent diseases for the elderly, but will be harmful to their health. Therefore, it is particularly important to make up the correct cognition of physical exercise through the improvement of information channels

that the community management department might improve the sports theory and practice information acquisition channels of the elderly by building a community sports information dissemination service system for the elderly and relying on the information technology foundation. The first task is to improve the concept of physical exercise for the elderly through teaching interaction. Further measures are to organize the elderly to watch and listen to scientific fitness-related knowledge videos regularly. On the one hand, it uses the Internet to actively publicize popular science to residents' families. On the other hand, it organizes an online physical exercise community for the elderly in private social media to transmit conceptual knowledge to the elderly individuals; At the level of practical knowledge, the establishment of a community sports professional guidance team is an important way to improve the scientific and reasonable physical exercise for the elderly in the community.

5.2 Promote Facilities Upgrading and Improve Venue Management

As an important material guarantee for residents to participate in physical exercise, sports venues and facilities are the key factors affecting public sports services. The management and operation of intelligent stadiums and equipment is a key measure to realize the integration of sports resources and improve the efficiency of sports resources, and it is also an important link to establish and improve the community public service system. Therefore, community management departments should actively promote the intelligent construction of existing sports venues, equip the management of venues and the use of facilities with modern information technologies such as big data and Internet of Things, and connect them to the information integration platform, so that the elderly can perceive the existence of sports venues and facilities through the public visual information of the data integration platform and understand their use, so as to obtain public sports resources and make reasonable arrangements for sports exercise. To strengthen the management of smart sports venues, the community must first establish a complete operation management system to form convenient services such as setting of offline and online comprehensive management, inquiring and booking, and publishing sports activities. In addition, community management departments can establish intelligent sports management system, which is mainly used for internal management of places to improve the work efficiency of managers and staff, including site management, monitoring and business management.

5.3 Reinforce the Linkage between Sports and Medicine

The integration of sports and medicine refers to improving the efficiency of health services through the resource integration and mutual coordination of sports and medical and health systems^[13]. It is found that the medical and health system information of most elderly people suffering from chronic diseases might provide individual targeted and effective prescriptions for physical exercise of the elderly and provide them with professional theoretical guidance for improving their illness through exercise. Community health service centers regularly carry out routine sports rehabilitation projects for the elderly in the community, but the results are often difficult to contact with promoting their targeted sports rehabilitation projects. Therefore, community management departments can carry out certain linkage with health service centers on such medical data, and establish a personalized sports rehabilitation demand information base for the elderly in the community on the basis of the data to scientifically guide and supervise the physical exercise of the elderly.

6 Conclusion and Prospect

The reasons that affect the physical exercise status of the elderly include the cognitive limitation of the elderly themselves and the poor physical fitness products and services in the community. It is necessary to formulate a scientific and long-term mechanism to improve the physical exercise of the elderly in Shenzhen. The research result shows that the future community management department will improve the public sports service for the elderly with the idea of intelligent informationization. Specifically, improving information channels, promoting equipment upgrading and deepening the linkage between medicine and sports are the ways to realize "healthy aging" for the needs of the elderly in Shenzhen community management.

There are still some limitations in this study. The number of samples is relatively small, which can not completely summarize the sports fitness needs and service strategies of the elderly in the whole community. There are omissions in the extraction of effective information, which restricts the diversity and integrity of sample data future research will consider sampling more areas in Shenzhen for research, expanding the sample size in the elderly community service centers, establishing the research model, and screening respondents with typical characteristics to carry out in-depth interviews to further supplement this study.

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