

Characteristics, Challenges and Countermeasures of Scientific Fitness Knowledge Communication under the Background of Epidemic Prevention and Control Normalization

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Abstract: The characteristics, challenges and development countermeasures of scientific fitness knowledge communication in the context of normalization of epidemic prevention and control were discussed using the literature and logical analysis method. The results show that the characteristics of scientific fitness knowledge communication in the post-epidemic era are mainly manifested in the diversification and popularization of communication subjects and contents, the networking and intelligence of communication media, and the autonomy and agglomeration of communication audiences. In the post-epidemic era, the challenges faced by the communication of scientific fitness knowledge mainly include “uneven” communication content caused by lack of censorship mechanism, neglected demand of marginal audience caused by “flow economy”, and coexistence of “inertia” and “retaliatory exercise” leading to the improvement of communication effect. Suggestions: the government and the market should cooperate in governance, strengthen the supervision and guidance of online media, combine initiative with passivity to promote the creation of a scientific fitness atmosphere, and integrate online and offline development to meet the needs of diverse audiences.

1. Introduction

In January 2020, the sudden outbreak of COVID-19 epidemic swept across the whole country and rapidly developed into a global public health event, which brought great impact on China's economy and society. At present, although the peak period of the epidemic has passed in China, it is still in the normalization stage of epidemic prevention and control of preventing both inbound cases and domestic resurgence, making the problems of where, when and what kind of sports to carry out under the epidemic become the common concern of the public. In March, 2020, the General Office of the State General Administration of Sport issued the *Notice on Vigorously Promoting Home-based Scientific Fitness Methods*, which clearly stated that all kinds of media should be used to widely publicize the importance of home-based fitness, promote home-based fitness methods and popularize scientific fitness knowledge^[1]. However, a number of sudden sports death events in the

normalization of epidemic prevention and control show that there are still big problems in the communication of scientific fitness knowledge. Therefore, in this paper, it is of great guiding value to explore the characteristics of scientific fitness knowledge communication in the post-epidemic era, analyze the challenges faced by scientific fitness knowledge communication in the post-epidemic era, and put forward development strategies for comprehensively improving the effectiveness of national fitness work in the post-epidemic era.

2. Background of Normalization of Epidemic Prevention and Control and Communication of Scientific Fitness Knowledge

2.1 Logical starting point

Popularizing scientific fitness knowledge has been an important means to promote national fitness since the launch of the National Fitness Program. In 2013, the State Council issued *Several Opinions on Promoting the Development of Health Service Industry*, pointing out that it is necessary to further publicize and popularize scientific fitness knowledge and raise people's awareness of physical fitness. The *Healthy China Action (2019-2030)* puts forward the construction of a scientific fitness communication system from three levels: individual, society and government, and points out that the exercise prescription library should be aimed at different groups, different regions and different physical conditions. In recent years, the government has increased the investment in fitness for all, which has significantly improved various public sports facilities in China and significantly increased the number of people participating in physical exercise. However, there have been more frequent sports injuries and even sudden death during sports. Over 60% of the 20,000 participants in the Qingyuan Marathon in Guangdong in 2016 were treated for injuries, and even five runners died suddenly^[2].

The sudden COVID-19 outbreak has caused people to think about health. "There can be no moderately prosperous society in all respects without health for all" and "fitness for all promotes health for all" have become the consensus and actions of the whole society. In this context, active participation in physical exercise has become the conscious choice of more public. The increasing enthusiasm of the public for participating in physical exercise also puts forward higher requirements for the popularization of scientific fitness knowledge. However, if the scientific fitness literacy can't keep up with the enthusiasm of sports participation, it will bring greater harm to health. Sudden sports death and sports injuries are common occurrences in the normalization stage of epidemic prevention and control. Therefore, how to spread the national fitness culture and scientific fitness knowledge has become an urgent problem to be solved in order to promote the in-depth development of national fitness.

2.2 Theoretical framework

In the field of communication, H. D. Lasswell's "5W" communication theory is an important theory of information communication by domestic and foreign scholars, namely, communication subject (Who), communication content (Says What), communication medium (In Which Channel), communication audience (To Whom) and communication effect (With What Effect), also known as "5W" model^[3], as shown in Fig. 1. "Communication subject" refers to the organization or individual that uses some communication technology and tools to spread information and actively acts on others. The subject of scientific fitness knowledge communication includes sports departments at all levels. "Communication content" refers to the information and content of communication, and the content of scientific fitness knowledge communication includes scientific fitness methods, sports skills, fitness effects and the promotion of new health concepts.

“Communication media” is the intermediary of information from the subject to the audience. The media in the communication of scientific fitness knowledge include brochures, newspapers, magazines, websites, sports apps, etc. “Communication subject” is the active receiver of information, the disseminator of information reprocessing and the feedback source of communication activities. The subject for the communication of scientific fitness knowledge is the social public including all groups. “Communication effect” refers to the influence of the audience’s learning on their own behavior after receiving the information, including emotion, cognition and other aspects. It is one of the important indicators to test whether the scientific fitness knowledge communication system is effective^[4]. There is an interdependence and mutual influence between the communication of scientific fitness knowledge and various elements. In this study, the characteristics, challenges and countermeasures of scientific fitness knowledge communication in the post-epidemic era will be analyzed from the various elements of the 5W theory, as shown Fig.1.

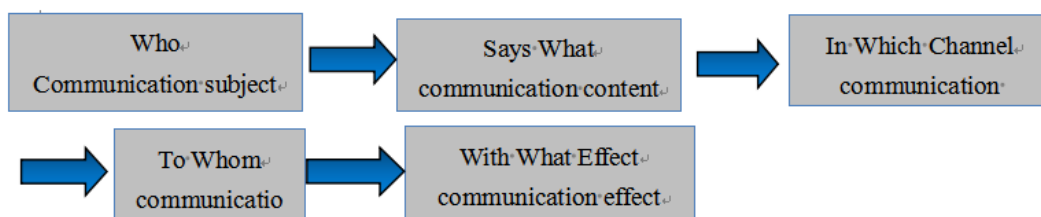


Figure 1 H. D. Lasswell model theory —“5W” communication theory

Communication subject (Who) → communication content (Says What) → communication medium (In Which Channel) → communication audience (To Whom) → communication effect (With What Effect)

3. Characteristics of Scientific Fitness Knowledge Communication in the Context of Normalized Epidemic Prevention and Control

3.1 Diversification and popularization of communication subjects

Over a long period of time, the main body of scientific fitness knowledge communication in China is mainly the staff of sports departments at all levels of government, sports experts and sports teachers, etc. Social forces are gradually involved in the process of scientific fitness knowledge communication, but their volume is small. Administrative power is the dominant force in the communication of scientific fitness knowledge, which spreads from top to bottom. Ordinary people are only the audiences of communication and recipients of knowledge, and it is difficult for them to participate in the chain of production, creation and communication of scientific fitness knowledge. However, the COVID-19 outbreak accelerated the process of social subjects participating in the communication of scientific fitness knowledge, and gave birth to the pattern of scientific fitness knowledge communication promoted by multiple subjects such as the government, social sports organizations and individuals. At the government level, a centralized network diffusion model of scientific fitness knowledge was formed during the epidemic period, which included content production by authoritative sports research institutions, content release by the State General Administration of Sports, secondary diffusion of social sports instructors at all levels, teachers and students of sports colleges and universities, and community sports staff ^[5]. At the social level, online fitness platforms are constantly emerging, and the development of online scientific fitness knowledge platforms such as fitness live broadcast, fitness APP and fitness WeChat official account has entered a new era. On the one hand, online fitness expands the main body of scientific fitness knowledge communication. Major online fitness platforms have provided media for sports stars and

professionals to engage in the communication of scientific fitness knowledge. They have released and produced a large number of home fitness video tutorials. For example, Liu Genghong has over 30 million fans on the online platform as a result, becoming the most influential “circle broken” blogger for a time. On the other hand, the development of Internet information technology provides great convenience and freedom for people's social interaction, which makes every netizen become a producer of scientific fitness knowledge and disseminator of scientific fitness knowledge content through “circle of friends”. The dual changes of the development of Internet technology and the normalization of epidemic prevention and control have broken the one-way mode in which the communication subject and the object were completely separated in the past, digested the boundary between the subject and the object, made the communication subject present the characteristics of decentralization and diversification, and narrowed the distance between scientific fitness and the public, which laid a solid foundation for the public to understand the knowledge of physical fitness and participate in physical exercise^[6].

3.2 The diversity and lifestyle of communication content

The communication of scientific fitness knowledge in the traditional media environment mainly includes sports health knowledge, physical exercise frequency, physical exercise intensity, etc., whose advantage lies in the complete and detailed publicity content, which gives readers a sense of authority and a high degree of conviction, while its disadvantage lies in the fixed and rigid content, which gives the audience a strong publicity feeling and does not closely connect with the exercise needs of the people. In the normalization stage of epidemic prevention and control, the new media mainly based on the Internet flexibly provide the public with interesting life science in the form of relaxed and pleasant content (such as real person guidance, training, 3D animation demonstration, etc.), with a very wide range of communication content, including both ball teaching and fitness guidance, humorous language style and diverse presentation forms, which meet the diversified fitness needs of the public. In addition, according to the actual situation of the home-based management during the epidemic period, a parent-child fitness program was launched to better fit the people's daily life and attract the participation of the general public. The content of scientific fitness knowledge in life has greatly changed the cognitive gap between scientific fitness and ordinary people in the traditional sense, and has also changed the serious and rigid impression of the public on the national fitness knowledge, which is helpful for sports to enter into life and sports to be integrated into life.

3.3 Networking and intelligence of communication media

In the era of mass communication, newspapers, magazines, books and periodicals and other traditional media are the most important communication channels to construct people's “social picture”, form social focus, set social issues and guide public opinion^[7]. During this period, the communication media of scientific fitness knowledge are mainly newspapers, magazines, websites, prints and brochures which have undergone earth-shaking changes in the normalization stage of epidemic prevention and control. A communication system combining online and offline has gradually taken shape, and intelligence and networking have become the main features of scientific fitness knowledge communication media. Scientific knowledge of national fitness during the epidemic mainly spread through offline communication channels with community managers and social sports organizations as the main body and online communication with network technology as the main body. On the one hand, during the normalization stage of epidemic prevention and control, a large number of Internet industry giants poured into the sports fitness industry, which not only promoted the business layout but also provided a wide range of media for the communication of

scientific fitness knowledge. For example, Internet companies such as Ali Entertainment, Suning, WeChat and Tik Tok have created a series of scientific fitness promotion activities such as *Let's Stay at Home*, *Fat Burning and Parent-child*, and also cooperated with offline sports organizations to continuously export content to provide guidance and help for people's scientific fitness. Apps such as Yuedongquan and Keep also actively worked out intelligent, personalized and customized fitness methods to actively provide support for the networking and intelligent communication of scientific fitness knowledge^[8]. The normalization of epidemic prevention and control has greatly accelerated the integration of traditional mainstream media and online communication channels, and networking and intelligence have become an important feature of scientific fitness knowledge communication in the post-epidemic era.

3.4 The autonomy and agglomeration of the communication audience

In the era of traditional media, ordinary people play a passive role in the communication of scientific fitness knowledge, which is transmitted in one direction by the government and other communication subjects. Especially, the elderly groups can only passively receive the content from community bulletin boards, brochures and news releases, and it is difficult for the audience to acquire scientific fitness knowledge according to their own needs. During the epidemic period, the opportunity of isolation at home provided objective conditions for people to participate in the communication of scientific fitness knowledge, and they began to independently search and acquire sports content and fitness knowledge that they were interested in under the action of abundant communication content and convenient communication channels, and turned passive acceptance into active acquisition. For one thing, the public has time and energy to participate in the communication of scientific fitness knowledge, and can publish their own popular science articles and videos through various social media. The audience, on the other hand, can participate in the discussion of a certain sports event or controversial sports topic by posting, replying, commenting and forwarding, which greatly enhances their participation and autonomy. For example, SOMA Step, which appeared after the modification of the basketball rules, was discussed in various sports websites and video software. During the epidemic, many netizens uploaded their own videos to discuss whether there was a violation of walking with ball, which enabled the audience to accept scientific fitness knowledge and promote the new basketball rules. In the new media environment, the discussion of sports-related topics has become the daily entertainment of the network, and a network community has been set up with some labels as nodes for sharing their own feelings of participating in sports in a fixed field, sharing scientific fitness knowledge, and even holding offline meetings, which makes the communication of scientific fitness knowledge evolve from individual acquisition to group carnival. As a result, social networks with different fitness knowledge are gradually enriched, and the spread of scientific fitness knowledge is also moving from dispersion and individualization to the network community with the same label, and the autonomy of the audience is revealed.

4. Challenges Faced by Scientific Fitness Knowledge Communication under the Background of Normalization of Epidemic Prevention and Control

4.1 Lack of censorship leads to uneven content

The diversity of communication subjects not only enriches the content of scientific fitness knowledge, but also brings "uneven" communication content, which greatly hinders the audience's understanding of scientific fitness knowledge and standardizing the technical movements of sports events. The convenience and freedom of the new media means that the threshold for the

communication of scientific fitness knowledge has been greatly lowered, so there are not only real sports experts and fitness experts, but also “fake experts” who lack professional qualities and aim at attracting people’s attention. The mixed quality of communication subjects directly leads to the mixed content of communication, which is mainly reflected in the rampage of “headline attractors”. The anonymity of the network driven by the traffic economy and the economic benefits brought by the clicks make the latter run rampant on the network. Some of them master the audience’s psychology of curiosity-seeking and fear-prone, and specially concoct eye-catching headlines for the purpose of chasing profits. For example, “You Can Slim Your Legs/Stomach/Arms Down in Half a Month by Sticking to This Movement Every Day” and “You Can Have the Abdominal Muscles in X Weeks”, etc. Such news exaggerates the function of physical exercise and alienates physical exercise into an “omnipotent” medicine, completely deviating from the original intention of spreading and developing scientific fitness knowledge in China. Second, the content is inaccurate and not scientific enough. Some of the communication subjects unconsciously spread low-quality or even wrong scientific knowledge due to their insufficient cognition and scientific literacy. “The more you sweat, the better your fat-reducing effect?” “Running will make your legs thicker?” The news with eye-catching headline and seemingly reasonable copywriting and the cloak of science, are actually unproven pseudoscience. Research shows that more than 50% of the “fitness tweets” during the epidemic did not specify the people for whom the fitness program was created, and about 10% of the tweets had the problem of inaccurate description of sports technology^[9]. The fundamental reason for the frequent occurrence of such phenomena lies in the lack of normative supervision mechanism. New media is a double-edged sword, which not only improves the speed of communication, but also provides a wide spread soil and environment for all kinds of “rumors”, thus multiplying its negative side and greatly reducing the quality of scientific fitness knowledge communication.

4.2 Traffic economy leads to the neglect of the needs of marginal audiences

The audience of the communication of scientific fitness knowledge is not the same labeled entirety, but the individuals with huge differences in education level, sports hobbies and other aspects, so the demand for scientific fitness knowledge presents diversified characteristics. At present, a large number of profit-oriented market players are flooding into the scientific fitness knowledge communication system, whose market-oriented and utilitarian value trend leads to more emphasis on scientific fitness content that is interested in hot issues and high-frequency people, such as women’s weight loss, men’s muscle gain and other topics, and lack of relevant content about the scientific fitness knowledge needs of vulnerable groups such as the elderly, the disabled and special children. The elderly, because of their limited education level, are apt to listen to all kinds of fitness tweets that attract attention and lack scientific basis, and they often intend to exercise but cause sports injuries because of unscientific exercise. For example, many square dance participants think that the longer the dance time, the better the exercise effect. However, because most of them are middle-aged and elderly people with common problems such as rotator cuff aging and joint wear, so high-intensity waving of limbs can easily lead to joint inflammation^[10]. Relevant investigations and studies have shown that in sports medicine outpatient departments, more than 60% of elderly patients’ sports injuries are caused by excessive exercise and unscientific exercise^[11]. On the whole, in the Internet age when information communication is highly developed, there is a situation of information excess and knowledge scarcity in the communication of scientific fitness knowledge, and the digital divide has further widened the gap of health literacy among different groups.

4.3 The co-existence of “inertia” and “revenge exercise” makes the communication effect to be improved

Communication effect refers to the effective result of communication activities on people’s behavior, which usually means the extent to which communication activities achieve the intention or purpose of the communication subject. When the information sent by the communication subject is transmitted to the audience through the media, which causes the audience to change, it usually goes through three stages: the change of ideas, the improvement of knowledge level and the change of behavior^[12]. A sudden COVID-19 outbreak quickly plunged human society into a consensus crisis situation. With regard to individual health needs, the function and value of sports have been improved unprecedentedly, people have a strong demand for scientific fitness knowledge, and the overall scientific fitness literacy has been greatly improved. However, the specific behavior has not changed significantly, which is mainly reflected in the following two aspects. First, the public attention to scientific fitness knowledge shows obvious stages. As people’s life, work and study gradually normalized after the normalization of epidemic prevention and control, their concerns became diversified, and their attention to scientific fitness knowledge dropped significantly. According to the survey and research, with the improvement of the epidemic situation, the total amount of WeChat tweets related to scientific and fitness knowledge is gradually increasing, but the daily reading volume of audience tends to decrease. Secondly, the change of ideas has not been further internalized into the change of behavior. After the epidemic control was relaxed, there appeared “retaliatory consumption”, “retaliatory diet”, and “retaliatory exercise”, which brought about frequent sports sudden death. Therefore, the author summarized some cases of sudden sports death during the normalization of epidemic situation (Table 1). The sudden death group includes both students in physical education class and “veterans” who have been engaged in physical exercise for a long time. The causes of sudden death include cardiovascular diseases and improper intensity control. In essence, however, it is that scientific fitness knowledge is not applied to sports practice. Third, home-based exercise has become a mere formality. During the epidemic, schools all over the country implemented “suspended classes without stopping exercises”, and online physical education was carried out vigorously. However, the effect of home-based exercise for middle school students was not significant in reality. Relevant research data show that only 50% of the students completed the exercise daily attendance according to the requirements, let alone the effect of exercises^[13]. The above phenomenon has also been verified after the students return to school. The results of the author's field investigation in Hunan, Guangdong and other places show that most physical education teachers in colleges and universities think that the growth of students’ participation in physical exercise groups is not obvious after returning to school, and the increase of non-physical education population to physical education population is small, as shown table 1.

Table 1 Some cases of sudden sports death during epidemic normalization

Places	Time	Sports event	Age
Shenzhen	June 5	badminton	40
Suzhou	August 11	Running	46
Suzhou	August 11	Running	43
Jinan	August 3	Running	36
Zhoukou	May 5	Running	15
Zhuzhou	September 1	Badminton	30
Changsha	April 30	Running	14
Jiaxing	July 22	Basketball	27
Yuyao, Ningbo	May 31	Football	31
Hefei	March 19	Football	42
Chengdu	June 6	Football	52
Wenzhou	April 14	Running	16
Dancheng	April 24	Running	15

5. Communication Strategies for Scientific Fitness Knowledge under the Background of Epidemic Prevention and Control Normalization

5.1 Cooperative governance of government and market to strengthen supervision and guidance of online media

In the post-epidemic era, it is far from enough to rely solely on the power of the government in order to spread the scientific fitness knowledge on a large scale. At the age of information free communication without supervision, however, there are inherent defects in the unlimited participation of social forces in the communication of national fitness knowledge, because a large amount of unfiltered information is full of falsehood and distortion. The quality control of scientific fitness knowledge communication needs the cooperation of government and market. The government should strengthen the supervision of the spread of scientific fitness knowledge, formulate a content control system for typical rumors in the spread of online fitness knowledge, and claim responsibility of groups that illegally spread scientific fitness knowledge. In this foundation, the government management departments should increase the intensity of the audit of fitness communication content, require the network administrator to regularly clean up the false information, and clearly prompt the users. At the same time, relevant departments should speak out through the mainstream media to dispel rumors in time. From the social point of view, the network media industry should be promoted to perfect self-regulation, and the basic goal of self-purification of the network industry and its information content should be achieved by self-management and self-discipline through the introduction of industry standards. In view of the scientificity and authenticity of sports culture communication in the media, the We-Media should establish a self-discipline mechanism of scientific fitness knowledge industry, instead of spreading unverified scientific fitness knowledge unscrupulously, so as to promote the prosperity and development of scientific fitness communication market. In short, in the post-epidemic era, it is even more necessary to combine the public welfare of government communication with the industry of the market, the regulation of the government with the subjective initiative of the market, so as to create high-quality and high-efficiency scientific fitness knowledge communication content.

5.2 Integrating online and offline development to meet the needs of diverse audiences

As a result of the extensive development of national fitness, the audience of scientific fitness knowledge communication is a multi-layered and complex collection. Against this background, the satisfaction of users' personalized needs has become the key promotion field of scientific fitness knowledge communication. First of all, the communication subject can combine big data technology with scientific fitness knowledge communication, draw "user portraits" by integrating data resources, and formulate personalized fitness programs according to the audience's physical condition, sports preferences and living environment, so as to achieve accurate science popularization and improve user stickiness. Secondly, it is necessary to explore the deep integration of sports +5G, give full play to the advantages of 5G technology, change the original communication channels of scientific fitness knowledge, create a brand-new industrial form of application scenarios, and improve the communication efficiency of scientific fitness knowledge, such as using VR and AR to transmit and receive video information, and relying on 5G to realize real-time interaction of AR, which will promote the communication of scientific fitness knowledge in media industry to usher in a new era of AR/VR universality and normalization, and lead to a qualitative change of scientific fitness knowledge communication^[14]. Thirdly, in the process of online and offline communication, attention should be paid to the needs of minority groups, vulnerable groups and marginal population, the content of communication should be diversified,

and the public welfare and inclusive effects of nationwide fitness should be brought into play to effectively improve people's sense of gain. Since it is difficult to form large-scale economic benefits by spreading scientific fitness knowledge among special groups, market-oriented uploaders and individuals will not get involved. Therefore, it is necessary for the government to shoulder its due responsibilities and meet the scientific fitness knowledge needs of special groups through offline methods. Specifically, field research can be done through all levels of universal fitness centers and local PE associations for special groups such as the elderly, disabled people, and special children's physical needs and physical and mental conditions, so that colleges can develop individualized fitness knowledge through sports and local social sport counselor resources for popular science work. Finally, the local government should encourage the sports elites of local colleges and universities to participate in the communication of scientific fitness knowledge of special groups through lectures in the community, and the program of serving the country people in three aspects, etc. For example, the government can cooperate with sports colleges and universities by way of purchase to set up a sports prescription bank on the cloud platform that is in line with the actual situation in the region, and put forward differentiated fitness guidelines for people of different ages and different health levels.

5.3 Promoting actively and passively to create a scientific fitness atmosphere

At present, due to the lack of initiative, the scientific fitness knowledge communication network composed of official and social forces greatly limits the scope and ability of scientific fitness knowledge communication. In order to improve the efficiency of popularization, in addition to passive communication, we should take the initiative to explore new positions for the communication of scientific fitness knowledge from the following two aspects. First, increase the authority of scientific fitness knowledge. The communication authority mainly includes two levels: the authoritative communication medium and the authority of the communication subject. The former emphasizes the internal legitimacy of communication, while the latter pays more attention to its external influence in communication. The main approach is that the mainstream media delivers scientific fitness knowledge with its authoritative media advantage. Authorities should swallow their pride and actively expand the network front for new media, carry out product research and development from user preferences, and transfer authoritative scientific fitness knowledge with professional knowledge.

Secondly, establish a deep cooperation mode between scientific fitness knowledge and primary and secondary schools. Physical education and health courses in primary and secondary schools should be an important field for the communication of scientific fitness knowledge. Popularizing the relevant knowledge of physical fitness in the campus by creating school-based textbooks and carrying out popular education of fitness knowledge can effectively improve young students' view of physical education^[15].

Thirdly, promote the integration of scientific fitness knowledge and smart community platform. At present, communication platforms with WeChat group as the main starting point have been formed in grass-roots community organizations, which can incorporate scientific fitness knowledge into the community communication network, combine the authority of community communicators with the advantages of wide coverage and high efficiency of the network platform, to realize the efficient communication of scientific fitness knowledge.

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