Current Situation and Future Development Trends of the Studies on Physical Activity Behaviors of the Elderly in China

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Abstract
This paper described and summarized the historical evolution and current situation of the researches of physical activity behaviors of the elderly in China by means of literature review. It is believed that there are some problems in the study of physical activity behaviors of the elderly in China, such as few of advanced research methods, lacking systematic views, inadequate studies on the influencing mechanisms, and insufficient researches on the theoretical localization. In the future, it is needed that the multi-disciplinary research and cross-disciplinary research, in-depth localization research be strengthened, and the guiding value of the theoretical model and the collection of multi-party evidence be paid attention.

Keywords
Current Situation of Studies; Future development trends of studies; Physical activity behaviors; The elderly; China.

1. Introduction

With the development of economy and the progress of society, the average life span of mankind had been prolonged. On the basis of the decrease of birth rate and death rate, the aging of population has become an inevitable result of the economic and social development to a certain period, and also a worldwide problem in the 21st century. China is the country with the largest number of elderly population at present. By the end of 2017, 241 million people, or 17.3% of the total population[1], were aged over 60, but the aging situation is still increasing. It is expected that the elderly population will reach 350 million by 2030[2]. The task of healthy aging is very arduous for China. The physical function of the elderly is declining, and the incidences of chronic diseases and illnesses have also been greatly improved. As well, they are troubled by pessimism, loss, loneliness and other adverse psychological emotions. In this serious situation, a healthy physical exercise lifestyle can not only enhance physical fitness and regulate emotions, but also prevent and treat psychological diseases, improve the quality of life and social adaptability, so it has become one of the most economical and effective choice for the elderly to maintain health in China.

At present, China is in the historical background of promoting the implementation of the "Healthy China" national strategy. The new ideas and measures of national governance provide good research conditions for exploring the law of physical activity behaviors of the elderly in China. The analysis on the behavior characteristics of physical exercise of the elderly, exploring the influencing mechanism of their behavior modes, and intervention strategies and measures are not only the theoretical research needs to explain the elderly physical activity behaviors, but also the practical needs to carry out social intervention and promote healthy aging. This review was based on major databases, including PubMed, EMBASE, Cochrane Library, WanFang, CNKI, and VIP, were searched for studies published in English or Chinese between January 2000 and December 2015. No other sources or search strategies were sought. A search of article titles and abstracts was conducted by the primary author. The keyword terms used in the search
included “physical activity”, “exercise”, “running”, “walking”, “aerobic training”, “cycling”, “Tai Chi” or “Tai Ji”, “Qigong”, “cognition”, “neural plasticity”, “hippocampus”, “dementia”, “Alzheimer”, “neurodegenerative”, “older adults”, “elderly”, “China”, “Chinese”, “Hong Kong”, and “Taiwan”. Review articles were also used as a source in a search or additional studies. The historical evolution, research status, shortcomings and the future development’s direction of physical activity behaviors of the elderly in China were tried to analyze.

2. Researches on the History of Physical activity behaviors of the Elderly in China

In the 1960s and 1970s, with the development of life style-related risk factors for chronic diseases in the medical field, the academic circles began to pay attention to the relationship between life styles and health. A large number of research results at home and abroad have been confirming that a good lifestyle is an important means and method to maintain health, prevent and control chronic diseases, and is a cost-effective means of health promotion. Physical activity behaviors as a part of health-related lifestyle, relevant researches have entered the public health, sports science, sociology, demography and other multi-disciplins’ research vision.

From Reform to the Opening-up to the 16th National Congress of the Communist Party of China was an important historical period of China’s economic and social transformation. The development of sports business in this period was to promote the development of mass sports and school sports with the development of competitive sports. With the developing competitive sports as the main objective[3]. From the perspective of the development process of public sports services, sports undertakings in this stage had made remarkable improvements in policy support, venue construction and capital investment. Consequently, in the early 1980s, under the background of the rapid development of social politics, economy, culture, sports policy and competitive sports, systematic research on physical activity behaviors came into being. In this period, the researches were mostly based on the psychological view, and Chinese scholars drewed lessons from foreign physical activity behaviors’ theories and models, from individual level, to explain and intervene in behaviors, and as an independent theoretical concept to the localization and cross-cultural researches. Scholars took ethology, psychology, sociology, anthropology, communication and other disciplines’ theories and techniques, combined with inductive reasoning and deductive reasoning research thinking methods, around the characteristics of physical activity behaviors, impacting mechanism and so on to carry out researches.

3. Research Status

3.1. Researches on the Status Quo of Behavior

Multiple levels and multiple views were applied to depict the characteristics of physical activity behaviors of the elderly. Chinese scholars had started late about the elderly people's physical activity behaviors researches, and is now still in the primary stage. In recent years, with the acceleration of China’s aging society and the implementation of the national body-building strategy, the elderly population has gradually received the attention of Chinese scholars. Chinese scholars have focused on the describing on characteristics of physical activity behaviors of the elderly, including the time, space and activity mode of physical exercise of the elderly groups, and they had investigated and analyzed the frequency, items, venues and participation of sports association’s situations of the physical activity behaviors. Wang Dongmin and Chen Gong[4] had found that the age, health status, attention to their appearance, sports places, the convenience to go to the hospital and other variables were significantly related to the elderly participation in physical exercise; Chen Jinao[5] studied the
effects of population factors (age, sex, social and economic status), social and cultural factors (family members, peers, social sports workers) on the elderly sports participation from the sociological perspective. Sun Ying[6] and others took the elderly population in Xuzhou as the research object, analyzed the influence of psychological factors, individual factors and social and environmental factors on the persistence of physical exercise.

3.2. Researches on Influencing Factors and Influencing Mechanism

In terms of influencing factors, relevant studies have been carried out at various levels. Referring to foreign research results and other related disciplines and theories, more and more factors have been identified from physiological, psychological and social perspectives at different levels. For example, at the individual level, they focused on the social demographic characteristics, sports motivation, health status, self-efficacy and other related factors, such as divorce, widowhood has a significant impediment; At the interpersonal level, the relationship between social support from family members, social network and physical activity behaviors of the elderly was discussed. At the community level, there are a small number of studies on community security, community capacity; At the social level, in addition to more theoretical and logical analysis, there are also a small number of influencing mechanisms about sports facilities, built environment, urban-rural differences, public sports services and other factors. Wang Huan's[7] research shows that the complete sports facilities, the convenience of reaching the venue, accessibility and so on have a positive correlation with the occurrence of physical activity behaviors of the elderly. Kee-Lee Chou[8] and others, by investigating the sports behavior of the elderly in Hong Kong, and combining the viewpoint of the Transtheoretical Model, put forward the conclusion that self-efficacy significantly affects physical activity behaviors remarkably. Ling-Yen Pan [9] and others analyzed the physical exercise situation of the elderly in Taiwan, and concluded that the track pattern of physical activity behaviors of the elderly was heterogeneous in time, and the intervention measures for physical activity behaviors should be based on group characteristics. Wang Fubaihui[10] and others pointed out that family exercise behavior has obvious intergenerational interaction through the study of the characteristics of Chinese family physical activity behaviors and intergenerational interaction, showing the characteristics of two-way socialization model.

This kind of researches mainly rely on the related theories of behavioral science, organizational behavior, comparative behavior, psychology, anthropology, biology, culture, sociology, communication and economics, and adopts the method of deductive reasoning and inductive reasoning. In the mid and late 1970s, foreign scholars applied the theoretical model of social behavior to the study of exercise behavior, attempted to systematically reveal the causal relationship between the influencing factors of exercise behavior, and established theoretical models of exercise behavior with high explanatory value, such as Health Belief Behavior Theory, Transtheoretical Model, Reasonable Behavior Theory, Planned Behavior Theory, Social Cognition Theory, Behavior Change Theory, Social-ecology Theory, and provided an important theoretical basis to formulate policies and adopt measures for developed countries. Chinese scholars draw lessons from foreign sports exercise behavior theory and model, committed to localization and cross-cultural research. From the early they had focused on the theoretical logic of macro-level research, but also gradually strengthened the micro-level research and empirical research. Especially in recent years, China had taken adolescent population as the main test and research hypothetical population, adopted the research strategy of combining multiple theoretical models, adopted structural equation model, multiple regression model and other analysis methods, from cognitive, psychological, environmental and other aspects whose intermediary variables and moderating variables that affect exercise behavior are discussed in depth. Xie Bin[11] and other scholars have made a detailed discussion on the related concepts of the Transtheoretical Model and the related research in the field of physical training in China, and pointed out the problems existing in the application of the Transtheoretical Model in the
field of physical training in China and the future development trend. Yi Xiangren[12] used the method of qualitative and quantitative analysis to analyze the data from three dimensions of individual, society, organization and environmental resources, and constructs the Social-ecology model of habitual physical activity of the Chinese elderly. Zhang Xueqin[13] explained the feasibility of applying the behavioral change theory model to physical activity behaviors, expounded the reasonable grafting between behavioral change theory model and physical activity behaviors, and the significance of this grafting. Bai Wenfei[14] makes a detailed study of the theory of phase change and its research results in the field of physical exercise psychology at home and abroad, and tried to provide a reference for the scientific guidance of physical exercisers to implement exercise plans. Zhao Yan[15] used the Social Cognitive Theory Model to investigate the effects of self-efficacy, self-regulation behavior, result expectation and perceived obstacles on College Students’ physical activity behaviors. Xie Hongguang[16] based on the Health Belief Theory Model, the physical health belief scale and exercise attitude scale to measure college students. By constructing structural equation model, the mechanism of health belief affecting health behavior was studied, and it was concluded that "perceived exercise benefit" was the most important factor affecting self-efficacy. Zhao Yan[17] and others investigated the status quo of community residents' physical fitness and exercise behavior, and adopted the behavior change theory pattern to implement different intervention measures for residents' physical fitness and exercise. From the perspective of social ecology, Li Weiguang[18] made a comprehensive analysis of the sports for the aged in Xiamen by using the "Ari's Principle", "Limiting Factor Law" and "Flower Pot Effect" in the Social-ecology Model, and explored the existing problems.

3.3. Intervention Studies

Chinese scholars have explored through constructing theoretical models and empirical tests. In recent years, they have used quantitative analysis techniques to systematically explore the factors influencing the physical activity behaviors of the elderly from the individual, organizational, social and environmental resources and other levels at the same time in a study. However, the number of related studies is not large, and there is no systematic discussion on the nature of cross-level factors. Generally speaking, scholars paid attention to the individual and psychological factors affecting physical activity behaviors of the elderly, and have made progress in stages, but the research on the influencing factors of social environment is weak. At the same time, few scholars in China have reported on the relationship between the influencing factors of physical activity behaviors of the elderly, and more tended to theoretical research while the empirical research is relatively scarce, resulting in the proposed measures of theoretical system is not strong and the actual operation is not strong. At present, many scholars in China have put forward some theories or measures to promote physical activity behaviors of the elderly after studying the characteristics and influencing factors of physical activity behaviors. For example, Liu Zhaodong[19] and others through a variety of factors to improve the physical fitness of the elderly in Haidian District for the purpose of government-led (sports policy and other software and sports facilities and other hardware), personal participation as the content of the scientific exercise model. Li Hang[20] and others put forward a community-based citizen health service model based on the Internet era from the perspectives of citizens, health needs, technical support, process design and so on, and demonstrated the basic elements that affect the construction of community health movement promotion model. Liu Ying[21] made a comparative study on the sports participation of the elderly, the sports venues and sports events of the elderly between China and Japan, and put forward some suggestions such as strengthening the macroscopic guidance of the government and speeding up the training of sports instructors.
4. Research Deficiencies

4.1. The Methodological Study Lacks Advanced Nature

In terms of research design, the number of studies designed with status studies and recall reports is large, but there is a lack of case-control studies, cohort studies and intervention studies with higher intensity of causality tests. Chinese scholars basically use questionnaire survey method to obtain relevant data through sampling, which may be affected by memory loss of the elderly, physical function decline and other factors, resulting in information bias conclusions, and reducing the authenticity of the results.

4.2. The Research Was Weak in Systematicness and Comprehensiveness

Whether the identification of influencing factors or the exploration of the relationship between influencing factors, there is still a lack of comprehensiveness and systematicness. According to the existing literature on the influencing factors of physical activity behaviors in China, the research perspective is single, mostly confined to the internal level of the individual, and lacks of a holistic and macroscopic interpretation of the mechanism of behavior. Individual factors, such as gender, age, marital status and so on, tend to conceal higher-level social factors, while little research has been done on organizational level, community factors and public policy.

4.3. The Mechanism and Theoretical Research on the Exercise Behavior of the Elderly Is Not Enough

In terms of mechanism research, there is a lack of discussion on the relationship between various factors. Most of the time, it is not the predictive function that needs to be paid attention to, but the mechanism and importance of various factors. Especially through the path analysis of many factors in each independent variable on the importance of the impact of dependent variable analysis, we can understand from the complex relationship between factors affecting the principle of behavior, and find out those core factors, so as to effectively formulate programs and Countermeasures in practical intervention.

4.4. Lack of Mechanism and Localization Research on Exercise Behavior of the Elderly

Although Chinese scholars have carried out ecological model explanations and application studies on the physical activity behaviors of the elderly, localization research is still insufficient, and this research still needs to be strengthened. There are great differences in social, economic and cultural development between China and Western countries, especially in public service, community development, family concept, interpersonal communication and so on. However, the exercise behavior of the elderly is closely related to them. In borrowing various foreign sports theories, we have not fully taken into account the cultural, regional and ethnic differences between China and other countries. It should be noticed that the foreign physical exercise model theory is based on the local customs and human feelings. When it is transformed into the study of physical activity behaviors in China, it is necessary to establish a scientific model framework theory based on China’s national conditions.

5. Future Development of Directions

Strengthen multidisciplinary and cross-disciplinary research, incorporate multivariate analysis methods, and consider the combined effects of various factors. From the perspective of the combination of physical education and medicine, it should be discussed about the individual, psychological, social, environmental cultural and other factors with the multi angle, multi level and multiple factors. Conduct cross-disciplinary research on the methodology of public health, sports, sociology, psychology, medical care and other disciplines, and form an interdisciplinary research team to conduct extensive, systematic and in-depth research on physical activity
behaviors of the elderly. And draw lessons from foreign advanced mature theory and practical experience, to achieve the transformation of key research areas, as well as enhance the interaction between theory and practice. In the interdisciplinary and integration, explore physical activity behaviors.

In drawing lessons from various theories and models abroad, we should devote ourselves to localization and cross culture research. Since the establishment of various models in foreign countries, the time is still short. The theoretical framework needs to be improved and developed. The research field should be expanded, and the research methods should be constantly explored and updated. China’s verification and construction of theoretical models and empirical intervention will be the main research direction in the future. Therefore, cross-cultural validity test should be carried out according to China’s national conditions and culture, and its innovation and rationality should be fully absorbed, so as to establish a scientific model framework theory based on the elderly population in China.

Attach importance to the guiding value of each theoretical model. In the design of influencing factors study, if the important influencing factors are not considered and included, it will lead to the conclusion of the study fallacies directly, so the systematic study of influencing factors is related to the internal validity of the study. From the results of foreign research, environmental factors may be more profound and important aspects of determining people's physical activity behaviors. Although Chinese scholars generally pay attention to the relevant factors at the individual level, they still lack the attention to the environmental factors such as interpersonal, organizational, institutional and social factors. Based on the research of social ecology model, there is a clear lack of research on the relationship among various factors. Therefore, it is necessary to attach importance to the theoretical concepts of each model and consider the population characteristics of the elderly and their behavioral effects, and from the individual, community, social and other levels and from many angles to investigate, analyze and explore the influence factors of physical activity behaviors of the elderly, so as to truly reflect the law of behavior.

We should focus on collecting research evidence and improving the quality of research design. In the study of exercise behavior mechanism of the elderly, the influencing factors involve many aspects, levels and variables, and the relationship between them is complex and interlaced. Biases easily occur in the selection of research subjects, information collection, control of confounding factors and so on, affecting the authenticity of the results. Researchers attach importance to the combination of qualitative and quantitative research methods in their research strategies, applying advanced information collection techniques, and using more objective and accurate data collection methods such as pedometers to measure exercise behavior. Choose research designs with higher intensity, such as setting up control group, collecting information at multiple time points, evaluating the effect of medium-term and long-term behavior, and adopt multi-level, comprehensive evaluation and analysis methods to improve the external validity of the study, and strive to reveal its inherent laws comprehensively and objectively.

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