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Review on the development and research status of hippotherapy in China

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Abstract. Hippotherapy, a therapy measure involving horses in the rehabilitation process of people with disabilities, has gained widespread application both domestically and internationally. It involves fields such as medicine and psychology and attracts significant attention. Internationally, hippotherapy has garnered immense interest in the therapy field for people with disabilities and the relevant research has developed rapidly. However, in China, hippotherapy is still in its nascent stage and has not yet established a comprehensive hippotherapy course system. This paper reviews the research progress of hippotherapy in China, explores the therapeutic effect of hippotherapy on children with disabilities, and demonstrates that hippotherapy can effectively aid in the rehabilitation of these children, improving their sports abilities and social communication skills. Therefore, this paper provides a reference for the establishment of a hippotherapy system in China, which can help in improving social acceptance for special children and promoting the overall development of rehabilitation for children with disabilities.

Keywords: Hippotherapy, Rehabilitation, Therapeutic Effect, People with Disabilities.

1. Introduction

Hippotherapy is a relatively new auxiliary therapy method, where horses, as carriers of healing, primarily utilize their natural gait and sports patterns to provide sport and sensory output for patients, thereby enhancing the patient's self-awareness [1]. It is a comprehensive therapy method combining physical, psychological, and speech therapies, and it is often used by professional therapists, physical therapists, and speech and language pathologists [2]. Internationally, equine-assisted therapy in the therapy field for people with disabilities is receiving increasing attention, and relevant research is rapidly advancing. However, in China, research on equine-assisted therapy is still minimal, limited to theoretical exploration and a few empirical studies. This paper aims to summarize the impact of structured and educational horseback-riding therapy on patients, review the recent development of hippotherapy in China, and provide better research ideas for future researchers, serving as a reference for further in-depth studies.

2. Development status of hippotherapy

Hippotherapy has been effective in both psychological diseases like autism and physiological diseases like polio. Currently, many countries around the world are developing hippotherapy, which significantly affects human perceptual abilities, promotes the development of the musculoskeletal system, and has a good therapeutic effect on the limbic system, vestibular system, and visual system [3].

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2.1. Development status of hippotherapy internationally

Hippotherapy is widely used in patients with neurological system and communication disorders. More studies explore equestrianism as a sports therapy, investigating its impact on the sports abilities of special children [4-6]. Modern systematic equine-assisted therapy began in the United Kingdom. Starting in 1957, the British recommended equestrianism for people with disabilities as a healing method. In 1965, Norwegian rehabilitation therapist Mrs. Eilset Bodther established the first hippotherapy center in the UK for the therapy of people with disabilities [7]. By 1970, there were 80 hippotherapy centers for people with disabilities in the UK, and by 1986, there were over 350 officially recognized therapeutic hippotherapy centers in North America. Currently, the US has become the country with the largest scale of teaching hippotherapy courses. According to the 2018 statistics from the American PATH Hippotherapy Association, there were 849 registered hippotherapy member entities. According to the 2017 annual report of the British National Hippotherapy Association, there were over 500 hippotherapy entities in the UK that year, showing the rapid global development of hippotherapy courses. Meanwhile, hippotherapy was systematically used abroad to intervene in children with autism, children with Attention Deficit Hyperactivity Disorder (ADHD), and children with cerebral palsy as early as the first half of the 20th century. Several international randomized control trials have shown that hippotherapy significantly impacts the intervention effect on people with disabilities, improving their social communication, emotional expression, attention, and behavioral regulation [8]. Overall, relatively systematic hippotherapy courses have already existed internationally, with research subjects mainly aged between 6 and 16, and the intervention duration is mostly between 45 and 60 minutes. In terms of trial design, the methods primarily used are randomized control and single-subject.

2.2. Development status of hippotherapy in China

In recent years, hippotherapy in China has gradually been introduced for the therapy of children with cerebral palsy, primarily aiming to improve their balance and walking abilities. In 2006, the China Rehabilitation Research Center's Beijing Boai Hospital initiated a special children's hippotherapy project in collaboration with the Beijing Yanlong International Equestrianism Training Base. The project, "Equestrian Training for Disabled Children," involved over 200 sessions at Beijing Boai Hospital with weekly hippotherapy. Two years of clinical practice and research demonstrated significant improvements in children's gait balance, speech expression, emotional control, and alleviation of limb muscle spasms, greatly enhancing sports functions and social interaction abilities [9]. Suzhou Industrial Park's Boai School, in close cooperation with international academic entities, has significantly enhanced the rehabilitation therapy of children with cerebral palsy and other disabilities through hippotherapy, filling the gap in simultaneous rehabilitation medical treatment and special education for neurologically impaired children [10].

Social interaction disorder is one of the most typical symptoms of children with autism, characterized by poor expressive abilities and communication difficulties [11]. Clinical research and practice have proven that horse-assisted healing has a significant improvement in therapy for patients with psychosomatic diseases and neurodevelopmental disorders, effectively enhancing the patient's cognitive functions and social communication skills. The Nanjing Disabled Persons' Federation issued the "Basic Rehabilitation Service Standard for Children with Autism," a municipal-level local standard, providing a technological guide for autism rehabilitation assistance. To support the rehabilitation of children with autism, Rhode International Equestrianism Academy, based on 10 years of research and practice, partnered with Nanjing Feixiang Horse International Equestrianism Club to establish the "Stars on Horseback" public welfare project, undertaking all operational expenses for the "Equine-Assisted Therapy for the Rehabilitation of Autism Children" project. Chengdu Disabled Equestrian Rehabilitation Association, with the aim of providing long-term and continuous care and services for special groups, has organized several equestrian rehabilitation public welfare events at the Wenjiang Ivies Equestrianism Club for rehabilitation courses. The "Equestrian Rehabilitation Public Development Fund" has been established under the Chengdu Charity Federation, hoping to gather more socially responsible individuals and enterprises to help vulnerable groups by further promoting this

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scientifically-backed hippotherapy course, enabling more people with disabilities to participate in equestrian sports for psychological and physical rehabilitation auxiliary therapy.

As of now, according to public information from China's Ministry of Civil Affairs, hippotherapy entities registered with local civil affairs departments include Chengdu Disabled Equestrian Rehabilitation Center, Beijing HOPE Equestrian Rehabilitation Therapy Center, Shenzhen Xingji Equestrian Manor, and Xi'an Lianhu District Sunshine Angels Disabled Equestrian Rehabilitation Center. Although the number of entities specialized in hippotherapy services registered with the National Civil Affairs Department is not large, many local equestrianism clubs have started to develop their hippotherapy courses. Incomplete statistics indicate that cities in mainland China that have introduced hippotherapy courses include Beijing, Shanghai, Shenzhen, Nanjing, Jinan, Qingdao, Dalian, Nanning, Haikou, Yinchuan, Wenzhou, Xi'an, Wuhan, Suzhou, Hangzhou, and Yulin.

Currently, domestic equine-assisted therapy courses are not yet standardized, and most are conducted by equestrian coaches with two main methods: being horse-mounted and being left unmounted. In mounted sessions, activities include sitting still on horseback, maintaining balance, stretching limbs, practicing relaxation and meditation, and balancing while the horse moves in circles. Unmounted courses involve observing horses in the pasture, putting on and leading horses with halters, as well as grooming, bathing, and communicating with horses.

3. Research status of hippotherapy

3.1. Research status of hippotherapy internationally

Equestrianism sport possesses its own rhythm, and the frequency of a horse's movement is similar to human walking. In the process of hippotherapy, patients seated on horseback receive various sensory stimulation, thereby enhancing concentration, improving balance, promoting limb coordination, and restoring joint and muscle functions [12]. By comparing horseback riding sport and trunk stability sport on the static and dynamic balance of normal adults, Hyeon Su Kim et al. [13] found that horseback riding may improve musculoskeletal functions and increase stability, possibly stimulating proprioceptive neurological inputs. Furthermore, as highly social animals, horses have acute environmental perception and sensitivity to emotional and non-verbal communication cues. Interaction with horses can alleviate the stress and anxiety of patients, fostering their confidence and decision-making skills, and enhancing their concentration and focus [14]. García-Gómez et al. [15] studied 14 students with ADHD. The experimental design divided them into experimental and control groups. Using hippotherapy methods, the plan included 24 bi-weekly courses over approximately three months. Employing the "Behavior Assessment System for Children (BASC)" and a temporary quality of life questionnaire, results indicated a reduction in aggressive behavior and improvements in interpersonal relations, suggesting that hippotherapy has an anxiety-relieving effect and a calming influence on patients with ADHD. During the riding instruction process, therapists and trainers can assist children in enhancing cognition, language, learning self-control, and attention control through course settings and instructional tasks. Studies demonstrate that hippotherapy is an effective and medically recognized intervention for gross motor function rehabilitation. Kaya et al. [16] selected 34 children with Down syndrome, randomly divided into experimental and control groups. Both groups received balance training as part of physical therapy, but the experimental group additionally received equestrian therapy as a comprehensive therapy. Pre- and post-intervention assessments were conducted using the Pediatric Balance Scale (PBS), Timed Up and Go test (TUG), and the Functional Independence Measure for Children (WeeFIM) for statistical analysis. As a result, post-intervention improvements were shown in PBS and TUG scores for both groups, while WeeFIM scores improved for the experimental group receiving hippotherapy, indicating that incorporating equestrian therapy into physical therapy can more effectively enhance functional independence in children with Down syndrome. Zhao [17] conducted a controlled trial with 84 children aged 6-12, diagnosed with autism. After a 16-week intervention, compared to the control group, children participating in equine-assisted therapy showed significant enhancements in social interaction, communication, responsibility, and self-control, improving social

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and communication skills. The research of Pan et al. [18] indicates that cortisol levels in autistic patients decrease after equestrian intervention therapy. They concluded that there is a positive correlation between cortisol levels and irritability levels. The cortisol secretion levels of the experimental group receiving hippotherapy were lower than that of the control group not receiving hippotherapy, suggesting that hippotherapy might influence patients' hypersensitivity and hyperactive behavior by regulating cortisol levels.

3.2. Research status of hippotherapy in China

Hippotherapy, utilizing the multidimensional movement of horses, can improve posture, balance, and overall motor functions. Zhang et al. [19] used a single-subject reversal design (A-B-A-B) to conduct a 10-week equestrian intervention on the balance, strength, and flexibility of two children with autism. Comparing these children who received equestrian intervention with those who did not and only underwent regular physical education training, results indicated significant improvements in balance, strength, and flexibility in the children who received the equestrian intervention. However, the trial only involved two subjects, making the sample size too small. Wang et al. [20] conducted an equine-assisted intervention on 30 children with Autism Spectrum Disorder, divided into control and experimental groups. Using the Autism Treatment Evaluation Checklist (ATEC), Social Responsiveness Scale (SRS), and the Cerebral Palsy Gross Motor Function Parental Assessment (CPGMFQ), they assessed the cognitive abilities, social skills, and motor functions of both groups, performing a statistical analysis of the pre- and post-assessment scores. The research indicated that equine-assisted intervention improved the cognitive abilities, motor functions, and social skills of children, with enhancements in social interaction, interpersonal communication, and imitation abilities. Wang [21] compared the intervention effects of hippotherapy and traditional rehabilitation training on the social interaction abilities of 30 children aged 5-8 with mild autism through a randomized controlled trial. Comprehensive assessments using the Childhood Autism Rating Scale (CARS) and the SRS showed that equestrianism sport significantly improved the social interaction abilities of children with mild autism. Compared to traditional physical education interventions, equine-assisted intervention was more effective in enhancing the social interaction abilities of these children. Yi [22] selected 23 children with autism, dividing them into experimental and control groups, and conducted a 12-week equestrianism sport intervention for the experimental group. Assessments were performed every four weeks during the intervention, including six physical form indicators, five physical fitness tests, one physical function indicator, and three behavioral-psychological indicators, as well as three medical diagnostic scales. Observations of the maintenance of intervention effects were continued post-intervention. The trial results confirmed that equine-assisted intervention significantly improved overall behavioral-psychological scores and some physical form and function indicators in children with autism. The improvements generally lasted for 4-8 weeks or more, with some behavioral-psychological and physical quality indicators maintaining improvement for up to 24 weeks. Through hippotherapy intervention, patients showed notable improvements in self-care abilities, increased upper limb dimensions, enhanced strength, and significant improvements in balance, coordination, and cardiorespiratory function. A systematic review and analysis of domestic literature related to hippotherapy revealed that research in this field began later in China, with relatively few experimental papers.

4. Future development trends of hippotherapy in China

Hippotherapy primarily targets special groups with psychological, intellectual, and physical disabilities. However, currently, as hippotherapy is in its initial stage in China, its application is relatively limited, and numerous challenges remain to be overcome during its implementation.

Widely establishing non-profit organizations primarily regarding hippotherapy as their main service project across the country will not only promote the spread of equestrian rehabilitation therapy among people with disabilities nationwide but also advance the domestic equestrian rehabilitation therapy industry. These organizations aim to establish industry associations for people with disabilities, advocating public welfare assistance, and serving as a link connecting social disability assistance

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entities, equestrianism sport institutions, people with disabilities, philanthropists, groups, and relevant government departments. Integrating the efforts of the government, disabled persons' federations, and philanthropic enterprises and individuals will help the beneficiary disabled groups better participate and integrate into social life. Additionally, these associations should fully leverage their functions, introduce advanced international equestrian rehabilitation therapy systems, learn from the operational models of foreign professional entities, and explore establishing a sustainable development system for equestrian rehabilitation that suits China's national conditions.

The field of hippotherapy is still in its infancy, and although many hippotherapy institutions and equestrianism clubs in China have gradually started relevant therapy courses, there is a deficiency in understanding and applying hippotherapy techniques themselves. The volume of literature on relevant hippotherapy courses is far less than in other countries where hippotherapy is more established, and the content mostly remains at a superficial level of observing therapeutic effects. In-depth research into the mechanisms behind neurotransmitters, hormones, and neural pathways in equine-assisted therapy could be beneficial. Utilizing technological methods such as electroencephalography and functional magnetic resonance imaging, more standardized therapy plans can be developed to achieve better rehabilitation effects. Future research can be expanded to other types of autism, speech and language development disorders, and ADHD, exploring the impact of hippotherapy on these children.

Additionally, stables need to train and prepare horses with professional therapy qualities, requiring horses with even body types, moderate height, and a gentle disposition to ensure the effectiveness and safety of hippotherapy. Many local horse breeds in China meet the requirements for therapy horses. By training and conditioning horses specifically for therapy use, the utilization of domestic horses in China's hippotherapy can be expanded. For example, the Debao pony, a representative of Chinese ponies, with a height of around 110 cm and a gentle temperament, is particularly suitable for therapy with children with autism and ADHD.

The professional system for hippotherapy in China is still underdeveloped, with inconsistent qualification standards for practitioners and an urgent need to perfect the safety assurance system in hippotherapy to ensure the safety of therapists and patients during therapy. Effective communication between therapists and equestrian coaches is crucial to maximize the advantages of equine-assisted therapy and ensure therapeutic effects. Therefore, in the future, it is necessary to establish unified course standards, striving to explore unique teaching models and therapy systems.

5. Conclusion

With the development of the economy and society, the unique hippotherapy has begun to gain attention. equine-assisted rehabilitation for special groups is a relatively new research field in China. According to statistics, the number of equestrianism clubs in China has exceeded 3095, indicating that China already has the conditions to carry out equestrian interventions. On the other hand, the rehabilitation therapy of numerous special children is not only an economic burden for families but also a serious social issue. Therefore, conducting experimental research to design functional rehabilitation interventions for special children from the perspective of hippotherapy not only tailors to China's national conditions but is also innovative and feasible. It has great practical significance in providing a basis for China to improve intervention methods for the rehabilitation of special children.

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