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Evaluation of the Optimization and Application Effect of the Forest Recuperation Plan of the Plateau Army

Xue Chen, Pengfei Li, Nan Li, Jing Wang, Jinqiao Li, Guang Zhao*

Xingcheng Special Duty Sanatorium of the Joint Logistics Support Force of the Chinese People's Liberation Army, Huludao 125105, Liaoning, China

****Author to whom correspondence should be addressed.***

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Abstract: Forest health and wellness is a new model of health and wellness therapy that aligns perfectly with the recovery and rehabilitation needs of military personnel stationed in high-altitude regions. The unique environment of high-altitude regions can easily cause both physical and psychological harm to military personnel stationed there. Traditional convalescence models are limited in scope and may lead to drug dependency, whereas forest-based antioxidant therapy, drawing on the unique ecological factors of the forest—such as its climate and temperature—and integrating disciplines such as psychology and nursing, can provide non-pharmacological interventions for both the mind and body. This approach effectively regulates the physiological functions of high-altitude military personnel and restores their emotional regulation. This study aims to provide theoretical foundations and practical experience for the development of this field by examining forest wellness theory and the recovery status of military personnel stationed at high altitudes.

Keywords: Forest wellness; High-altitude military personnel; Interdisciplinary studies; Physical and mental development

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1. Research background

Forest health and wellness is currently a new trend in health and wellness therapy. By utilising the natural environment and exercise interventions to regulate bodily functions, it has gained widespread popularity both domestically and internationally due to its gentle, eco-friendly nature, long-term effectiveness and low level of intervention. China's vast territory features complex and diverse topographical conditions; these regions, characterised by unique geographical locations and climates, place particularly demanding physical requirements on military personnel stationed there[1]. Extreme environments place dual physiological and

psychological strain on military personnel stationed in such areas; prolonged exposure to such conditions can also lead to systemic compensatory mechanisms. For example, high-altitude units face a climate characterised by low atmospheric pressure, low oxygen levels, intense ultraviolet radiation, dry conditions and significant diurnal temperature variations. For the officers and soldiers stationed there, this can result in sleep disturbances and cardiovascular and endocrine imbalances; over time, this may cause irreversible effects on bodily functions[2]. Consequently, implementing forest wellness programmes to provide intervention and treatment for high-altitude troops allows them to engage with the natural environment and a milder climate, thereby effectively regulating the physical functions that have been compromised by their deployment. This aligns with the current requirements for high-quality military development and can further advance the refinement of military management practices. Compared with traditional convalescence, forest wellness integrates natural healing by utilising negative oxygen ions and the vital energy of plants found in forests to gradually alleviate the long-term stress experienced by stationed troops in their nervous and endocrine systems, as well as psychologically. Traditional treatments, which primarily rely on bed rest and medication, cannot fundamentally alleviate emotional tension and similar conditions among stationed troops; consequently, the use of forest wellness therapy is becoming a growing trend[3]. China's natural environment is exceptionally favourable, allowing for the full integration of the physical and technical capabilities of high-altitude troops to develop personalised wellness programmes. This provides excellent support services to help personnel unwind, relieve physical and mental fatigue, and improve sub-health conditions.

2. Current state of research

The academic theory underpinning forest wellness is now relatively well-established. Scholars unanimously agree that the climate, temperature and negative ion-rich ecological environment found in forests play a crucial role in the restoration of human physiological functions; they can effectively regulate the endocrine system, improve negative emotions and alleviate stress, thereby promoting overall health[4]. Integrating interdisciplinary fields such as kinesiology, psychology and rehabilitation science can effectively enhance the recovery of physical capabilities in extreme environments. At the same time, the scope of forest wellness applications within the military is continually expanding and diversifying[5]. Given the unique environmental conditions faced by high-altitude units, rehabilitation programmes must be tailored to practical circumstances to gradually improve personnel's physical fitness whilst avoiding excessive medication that could lead to drug dependence. Forest wellness has now been adopted as one of the therapeutic models, offering a more immersive experience and a higher degree of suitability compared to traditional convalescence methods. Furthermore, a series of achievements have been made regarding acclimatisation to and deacclimatisation from low-oxygen conditions at high altitudes. For instance, altitude-gradient wellness programmes, which combine exercise interventions with psychological counselling, have further enhanced the recovery efficiency of military personnel. As China remains in the early stages of exploration in this field, with many initiatives still in their infancy, it continues to face serious challenges such as poorly adapted treatment protocols, a lack of personalised service plans and a shortage of specialist personnel. These areas represent key directions for future research and practice.

3. Challenges faced

3.1. Inadequate adaptability of health and wellness programmes, making it difficult to align with actual conditions

Although the fundamental theoretical framework for forest-based antioxidant therapy has gradually been refined, the majority of current health and wellness programmes are aimed at the general public[6]. In terms of the direction of intervention, intensity and other aspects, they are primarily designed for people accustomed to life at low altitudes. Consequently, these service methods—which are tailored to such populations—cannot be directly applied to military personnel and guests residing at high altitudes, who are chronically exposed to specific environmental conditions, such as intense ultraviolet radiation, low oxygen levels and low temperatures[7]. Over time, their bodies have developed specific adaptations; consequently, varying degrees of damage have occurred in multiple systems, including cardiopulmonary function and the neuroendocrine system. Therefore, during the health and wellness phase, greater attention should be paid to effectively addressing the complex, acute health issues faced by military personnel. This requires taking into account the unique characteristics of forest-based health and wellness programmes, utilising the environmental and climatic conditions of the forest to fully harness the restorative functions of forest ecological factors, thereby providing an optimal environment for the recovery and rehabilitation of military personnel. However, at present, high-altitude military personnel are constrained by duties such as operational duties and training during their rehabilitation process; the overall programme does not fully align with actual circumstances, resulting in issues such as antioxidant programmes lacking sufficient adaptability.

3.2. Lack of a tiered service system

As domestic approaches to rehabilitation treatment and the welfare of high-altitude military personnel are currently in an exploratory phase, there is a lack of a clearly defined system for formulating personalised services based on tiered classification during the treatment process[8]. The homogenisation and 'one-size-fits-all' approach to service provision is a prominent issue in current health and wellness programmes. Firstly, given the individual physical differences among high-altitude military personnel, the recovery process does not effectively distinguish between factors such as altitude, post type and total years of comprehensive training; consequently, it is impossible to formulate targeted recovery plans based on actual circumstances. Manifestations of sub-health vary considerably: some personnel experience severe sleep disorders, anxiety and other psychological stress responses, whilst others primarily suffer from physiological issues such as cardiopulmonary fatigue and muscle strain. The majority of personnel experience varying degrees of overlapping physical and psychological issues; however, during the antioxidant recovery phase, the same standardised intervention protocol is uniformly applied[9]. Furthermore, physical and mental screening is conducted through standardised activity schedules, exercise intensity levels and psychological counselling sessions, with a lack of personalised programme design. This not only reduces the precision of therapeutic interventions and the absence of a personalised adjustment mechanism, but also leads to adverse outcomes such as inconsistent physical conditions and experiences, as well as unstable results throughout the entire recovery process.

3.3. Lack of multidisciplinary professionals

Health and wellness is, by its very nature, an interdisciplinary field that integrates environmental science, high-altitude knowledge, rehabilitation science, silviculture and kinesiology, amongst others. Practitioners

providing health and wellness therapies must not only be familiar with military-style attendance management, the task characteristics of different individuals and their physical conditions, but must also be able to independently design, organise and implement relevant programmes whilst possessing an understanding of common medical conditions[10]. However, at present, many practitioners do not fully understand the relevant work context or the intensity of the role, nor are they capable of independently handling interdisciplinary aspects such as the management of underlying medical conditions and psychological support. Consequently, this leads to situations where treatment outcomes are less than ideal during the delivery of services.

4. Improvement strategies

4.1. Strengthening tailored programmes

In view of the physical and mental wear caused by the plateau troops in carrying out tasks and in the extreme environment of low temperature and hypoxia for a long time, health treatment services should not only consider basic nursing, but also strengthen the personalized service customization for different types of loss. First of all, before carrying out Kangyang services, the physical and mental health status of the troops' personnel needs to be evaluated uniformly. Through multi-dimensional evaluation, combined with the characteristics of forest health care, the natural ecological factors of resources and environment are actively integrated into the process of health care recovery and serve as a unified basic standard for plateau officers and soldiers to carry out health recovery. On this basis, there are different gradient recovery plans according to the physical and mental loss of the troops. Through gradient health treatment, resources can be coordinated, and the needs of different types of anti-care personnel can be taken into account, which can effectively improve the efficiency and quality of health recovery. Secondly, it is necessary to fully explore the traditional anti-repair mode of forest health channels and paths, mainly with rest and exercise as the supplement. However, forest health mainly lies in the integration between the human body and nature. With the help of natural ecological factors, it helps the human body recover from injuries. By creating a good natural environment, it can help health recovery personnel. It provides a good emotional place to guide the flow of emotions, so as to facilitate psychological guidance. Combined with the characteristics of forest health care, by carrying out entertainment game-themed activities, actively encourage maintenance and recovery personnel to participate in them, so as to effectively alleviate the long-term psychological depression and extreme emotions of officers and soldiers of the plateau troops. Third, the formulation of targeted service plans also requires regular review and feedback of service plans, so as to adjust the service focus in time and ensure that the overall service can effectively promote the treatment of plateau troops personnel. Relevant practitioners can regularly conduct online and offline questionnaires and personal interviews to clearly understand the changes in the psychological state and real needs of health care personnel at different nodes, which is convenient for timely adjustment, and lays a good foundation and experience for the formulation of follow-up health care services.

4.2. Strengthening personalised services

Customized personalized services need to have a relatively clear positioning and cognition of the group portraits of the plateau troops, so that they can be classified from different latitudes, and at they can also take care of all Kangyang population groups as much as possible. In this regard, the customization of personalized plans needs to be carried out for the population. The three perspectives of crowd screening refer

to the different types of people. The screening refers to the different types of officers and soldiers of plateau troops, only by doing a good job of education according to their physical and mental damage and situation. For example, the physical condition involves more serious physical loss, and psychological loss is relatively diverse. On this basis, the environment of the specific job can be further refined. It is possible to further understand the direct causes, indirect causes and impact of the physical and mental loss of military personnel through diversified factors. These preliminary data surveys directly determine the focus of the customization of the personalized plan and the tracking cycle.

4.3. Vigorously recruit and train talent

Forest health care is the new trend and general direction of physiotherapy at present. At the same time, it plays a crucial role in the physical and mental recovery of officers and soldiers of the plateau troops. Compared with the traditional recovery model, forest health care is gentle and can gradually use the natural environment to provide good environmental perception for troop personnel, which is convenient for effective adjustment. The physical and mental development of personnel, therefore, in the process of carrying out the physical and mental recovery of military personnel, relevant practitioners should be fully mobilized to provide personalized services. Forest health care itself is a typical interdisciplinary discipline. The model of plateau troop personnel and forest health care requires practitioners to have strong knowledge application and practical processing ability. Practitioners need to understand the health recovery mode and the latest trends. At the same time, they can actively apply the theoretical knowledge and psychological guidance they have learned to special groups such as plateau officers and soldiers. Therefore, they also need to be more familiar with the plateau living environment. Based on this, in the training and screening of relevant practitioners, they can increase the cultivation of talents in the integration and promotion of schools and enterprises, regular assessment, and other dimensions. First, strengthen the promotion and application of the school-enterprise talent model to ensure that the corresponding students majoring in health and physiotherapy can carry out diversified field operations and practice in combination with the characteristics of the plateau troops and the forest resistance mode, so as to facilitate the transfer of high-quality talent skills for the corresponding links to master multidisciplinary theoretical knowledge, and the relevant knowledge content can also be truly integrated into practice. Secondly, we should vigorously support and train the practitioners who are already on duty. By updating cutting-edge theoretical knowledge and practical experience from time to time, we can provide them with more case treatment analysis, so that practitioners can have a deeper, more comprehensive, and multi-dimensional understanding of the health and recovery of outstanding groups. In summary, strengthening the training and management of talent and providing them with open and transparent promotion channels and welfare treatment can further attract more talent to devote themselves.

5. Application outcomes

Relying on diverse natural sensory stimuli—such as the natural soundscapes of the forest, the visual landscapes of the vegetation and the scents of aromatic plants—forest wellness can enhance parasympathetic nervous system activity and lower levels of stress hormones such as cortisol, thereby creating a psychological buffer zone for service personnel to escape the pressures of duty. In the wellness practices already implemented within the military, forest rest experiences, guided mindfulness in woodland settings and group

interactions with nature have been integrated into the wellness program. Comparative assessment results show that service personnel's scores for negative emotions—such as tension, anxiety, fatigue, lethargy, hostility and anger—have decreased significantly, whilst their subjective levels of energy and vitality have markedly improved. This approach differs from passive psychological therapy in that it facilitates autonomous emotional regulation within a natural setting, offering a more immersive experience and encountering less resistance. It helps to enhance the psychological resilience of service personnel and assists them in developing stable emotional regulation skills. Upon returning to their high-altitude posts, their psychological tolerance for duty-related stress is improved, thereby achieving long-term stability in their mental state.

At present, as a new model of health care, forest health care is applied to all aspects. It not only provides forest health care service models for ordinary people, but also for special groups such as plateau troops that need more personalized customization. Compared with traditional health care treatment services, forest health care can not only follow the needs of human natural body functions, but also, through natural Factors and ecological factors, provide the necessary conditions for the recovery of body functions. At the same time, they can create a softer and more relaxed environment with the help of forest health channels, and truly achieve the harmony between people, nature and space. It can effectively stimulate the recovery of human function and provide a good physical and mental counseling program for the personnel of the plateau troops. At present, forest maintenance has been vigorously applied to people and industries with special rehabilitation needs, and has achieved remarkable results. It can help different types of plateau officers and soldiers with gradual recovery, do a good job in the recovery of physical function, and effectively alleviate the psychological problems caused by their inner anxiety and stress.

6. Conclusion

Forest wellness therapy can effectively improve the physical and mental recovery of personnel in high-altitude military units, whilst fully utilising China's natural and ecological resources. By continuously refining and enriching forest wellness therapy methods and personalised services, it can provide tailored recovery programmes to meet the physical and mental development needs of different personnel within high-altitude military units.

Disclosure statement

The authors declare no conflict of interest.

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