

Research on the Role of Psychological Factors in the Onset and Disease Management of Hypertension

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Abstract: Hypertension, as a prevalent global risk factor for cardiovascular disease, poses a severe public health challenge due to its high incidence, disability, and mortality rates. Traditional medical models have primarily focused on physiological and behavioral factors, while insufficient attention has been paid to psychosocial determinants. This paper systematically explores the dual role of psychological factors in both the onset and management of hypertension. It reviews the associations between psychological variables—such as stress, emotional disorders, personality traits, and social support—and hypertension, and elucidates the biological mechanisms through which these factors influence blood pressure, particularly via neuroendocrine pathways. Furthermore, it analyzes how psychological factors interfere with treatment adherence, the effectiveness of lifestyle interventions, and patients' illness perception. On this basis, the necessity and effectiveness of integrating psychological assessment and intervention into comprehensive hypertension management are demonstrated. Finally, future prospects for precision and individualized prevention and treatment strategies from a psychosomatic medicine perspective are proposed. The findings suggest that constructing an integrated intervention system under the bio-psycho-social medical model is essential for improving the effectiveness of hypertension prevention and control.

Keywords: Hypertension; Psychological Factors; Stress; Emotional Disorders; Type A Behavior Pattern; Psychosomatic Medicine

Introduction

Hypertension has been described by the World Health Organization as a “silent killer,” as it often presents without obvious symptoms in its early stages while progressively damaging vital target organs and leading to severe complications.

According to the Global Burden of Disease Study, hypertension affects more than one billion people worldwide and represents the leading preventable cause of premature mortality globally. Although significant progress has been made in the development and application of antihypertensive medications, global



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control rates remain suboptimal, and many patients fail to achieve target blood pressure levels. This reality has prompted the medical community to reconsider the underlying determinants of hypertension beyond established risk factors. Among these, psychological factors have increasingly attracted attention as deep-rooted driving forces. Modern medicine has established the “bio-psycho-social” model, emphasizing that disease results from the interaction of multiple dimensions. Hypertension is a typical psychosomatic disorder, in which psychological factors may act not only as a “trigger” for disease onset but also as a “regulator” influencing therapeutic outcomes. This paper discusses the role of psychological factors from two dimensions: their participation in pathophysiological processes and their critical role in diagnosis, treatment, and long-term management. By proposing integrated psychological intervention strategies, it aims to provide a theoretical basis for clinical practice and promote a transformation in hypertension prevention and control strategies.

1. The Associative Mechanisms Between Psychological Factors and the Onset of Hypertension

The development of hypertension is not attributable to a single cause but results from the interaction of multiple factors. Among them, psychological factors exert direct and profound effects on blood pressure by activating the body’s stress-response systems.

1.1 The Central Role of Psychological Stress

Psychological stress refers to a state of tension that arises when individuals perceive that their internal or external environmental demands exceed their coping resources. Acute stressors, such as public speaking or unexpected events, can rapidly trigger a cascade of physiological responses. Activation of the amygdala within the limbic system stimulates the hypothalamus, which in turn activates the sympathetic–adrenal–medullary (SAM) axis. This leads to the release of catecholamines, resulting in increased heart rate, enhanced myocardial contractility, and peripheral vasoconstriction. Consequently, blood pressure rises sharply within seconds, constituting the adaptive “fight-or-flight” response. In contrast, chronic and recurrent stress activates the hypothalamic–pituitary–adrenal (HPA) axis. The end product of this axis,

glucocorticoids—primarily cortisol—contributes in the short term to maintaining blood pressure stability and energy supply. However, persistently elevated cortisol levels promote sodium and water retention, increase vascular sensitivity to vasoconstrictive substances, and induce insulin resistance and central obesity, thereby establishing a pathophysiological foundation for the development and progression of hypertension^[1]. Meanwhile, chronic stress sustains sympathetic nervous system overactivation, creating a background of “high sympathetic tone” that gradually elevates baseline blood pressure levels. A substantial body of prospective cohort studies, including the Framingham Heart Study, has confirmed that individuals exposed to prolonged occupational stress or marital discord face a significantly increased risk of developing hypertension. In modern society, characterized by rapid pace and intense competition, chronic psychological stress has become an important driving force in the growing prevalence of hypertension.

1.2 Susceptibility Associated with Specific Personality Traits

The Type A behavior pattern (TABP) is one of the most extensively studied personality types associated with cardiovascular disease. Individuals with Type A characteristics typically exhibit a strong sense of time urgency, competitiveness, high levels of hostility, irritability, and impatience. Early research suggested that Type A behavior was an independent risk factor for coronary heart disease; subsequent findings have highlighted that the hostility component is more closely associated with hypertension. Highly hostile individuals tend to experience intense anger and aggressive emotions when confronted with interpersonal conflicts. These emotional reactions strongly activate the sympathetic nervous system, leading to recurrent and pronounced fluctuations in blood pressure. Over time, such fluctuations impair vascular endothelial function and contribute to the development of hypertension. In contrast to the overt reactivity of Type A individuals, those with a repressive coping style tend to suppress negative emotions. Although they may appear calm and compliant externally, they often experience significant internal emotional tension. This state of “internal–external inconsistency” may disrupt autonomic nervous system regulation and undermine blood pressure stability. Individuals who habitually suppress anger

frequently exhibit higher office and ambulatory blood pressure levels.

1.3 Emotional Disorders: The Dual Impact of Anxiety and Depression

Patients with anxiety disorders tend to exhibit excessive worry and fear regarding potential future threats. Such conditions are often accompanied by symptoms of autonomic dysfunction, including palpitations, sweating, and tremors, which are directly associated with sympathetic nervous system hyperactivation. Persistent anxiety maintains the body in a prolonged state of “hypervigilance,” leading to sustained elevations in baseline blood pressure. Moreover, anxiety frequently drives maladaptive coping behaviors such as smoking, excessive alcohol consumption, and binge eating, thereby indirectly increasing the risk of hypertension. The relationship between depression and hypertension is complex and bidirectional. On the one hand, individuals with depression often present with hyperactivity of the hypothalamic–pituitary–adrenal (HPA) axis, elevated levels of inflammatory markers (such as C-reactive protein and interleukin-6), and autonomic nervous system dysregulation, including reduced heart rate variability. These biological alterations constitute important pathophysiological foundations for hypertension. On the other hand, hypertension itself—along with the lifestyle restrictions and health-related concerns it imposes—may precipitate or exacerbate depressive symptoms. This vicious cycle renders comorbid patients clinically more complex, increases treatment difficulty, and significantly elevates the risk of cardiovascular events compared with patients suffering from a single disorder.

1.4 The Protective Effect of Social Support

In contrast to the aforementioned negative psychological factors, a robust Social Support Network is widely recognized as an important protective factor against hypertension. Social support encompasses emotional support (e.g., care and understanding), instrumental support (e.g., tangible assistance), and informational support (e.g., advice and guidance)^[2]. Individuals with strong social support systems are better equipped to access practical resources and emotional reassurance when facing life stressors, thereby effectively buffering the intensity of stress responses. Such individuals are

also more likely to adopt healthy lifestyles and maintain more positive perceptions and attitudes toward illness. Conversely, Social Isolation and Loneliness have been identified in multiple studies as independent risk factors for the development of hypertension. Individuals lacking meaningful social connections tend to experience more intense and prolonged stress responses and are more vulnerable to negative emotional states, thereby increasing their susceptibility to elevated blood pressure.

2. The Influence of Psychological Factors on the Management of Hypertension

2.1 Constraints on Treatment Adherence

Treatment adherence refers to the extent to which patients follow medical advice regarding pharmacological therapy, lifestyle modification, and regular follow-up. It represents the lifeline of successful hypertension control. However, in reality, medication adherence among hypertensive patients worldwide remains generally low. Psychological factors constitute one of the core reasons for poor adherence. If patients fail to fully recognize the severity of hypertension and the necessity of long-term medication, or if they are excessively concerned about potential side effects, they may develop negative attitudes toward treatment and consequently reduce or discontinue medication on their own initiative. Moreover, depressive symptoms can significantly weaken motivation and executive functioning, leading patients to feel that “nothing will make a difference,” thereby abandoning complex treatment regimens. Chronic hypertension itself may impair cognitive function, and certain antihypertensive medications may produce mild cognitive side effects. These factors can further compromise patients’ ability to take medication consistently and correctly. Additionally, the financial burden associated with long-term pharmacotherapy, as well as persistent anxiety and fear related to the disease, may serve as psychological triggers for treatment interruption. The interplay of these complex psychological determinants severely constrains the effective implementation of therapeutic strategies.

2.2 Barriers to Lifestyle Interventions

Non-pharmacological treatment—namely, lifestyle intervention—constitutes the cornerstone of hypertension management. Nevertheless, modifying

deeply ingrained lifestyle habits is inherently challenging, and psychological factors often represent the greatest obstacles. Anxiety and depression frequently contribute to emotional eating, whereby patients seek temporary comfort through high-calorie and high-sodium foods, directly undermining dietary control efforts. The impatience and perfectionism commonly observed in individuals with Type A personality traits may lead them to perceive that they “lack time” or are “unable to achieve ideal results,” thus discouraging the initiation of exercise programs. In contrast, depression directly diminishes motivation and enjoyment associated with physical activity^[3]. Many patients habitually rely on smoking or alcohol consumption as coping mechanisms for stress, behaviors that are not only ineffective but also exacerbate blood pressure elevation, thereby forming a vicious cycle. More fundamentally, if patients lack confidence in their ability to successfully modify their lifestyle—that is, if they possess low self-efficacy—external intervention measures are unlikely to achieve meaningful outcomes. These psychological barriers render seemingly straightforward lifestyle interventions exceptionally difficult to implement in practice.

2.3 Shaping Disease Experience and Quality of Life

Hypertension is not merely an abnormal physiological indicator but a chronic condition that profoundly affects patients’ subjective experiences. Psychological factors directly shape patients’ illness perceptions and overall quality of life. Fear of cardiovascular and cerebrovascular events, as well as concerns about long-term medication dependence, often place patients in a persistent state of anxiety. This form of “illness anxiety” may itself become a new source of stress, thereby adversely affecting blood pressure control. Some patients may develop feelings of inferiority or internalize the “sick role” after being diagnosed, leading them to reduce social interactions. This withdrawal weakens social support and further deteriorates psychological well-being. Additionally, individuals with anxiety or hypochondriacal tendencies may excessively monitor minor bodily sensations—such as occasional headaches or palpitations—and catastrophize them as signs of disease progression. Such misinterpretations can generate unnecessary panic and excessive healthcare utilization. Therefore, successful hypertension management should not focus

solely on numerical reductions in blood pressure. Equal attention must be given to improving patients’ psychological well-being and quality of life, as these outcomes constitute equally important indicators of therapeutic success.

3. An Integrated Management Model for Hypertension Incorporating Psychological Interventions

3.1 Psychological Assessment: Identifying High-Risk Populations

During the initial diagnosis and follow-up of hypertension, brief psychological screening should be routinely conducted. Validated instruments may be employed, such as the Hospital Anxiety and Depression Scale (HADS) for rapid screening of anxiety and depressive symptoms, the Perceived Stress Scale (PSS) to assess individuals’ perceived stress levels, and the Brief Symptom Inventory-18 (BSI-18) to evaluate broader domains including somatization, anxiety, and depression.

Through systematic psychological assessment, clinicians can promptly identify high-risk patients who are vulnerable to poor blood pressure control, low treatment adherence, or diminished quality of life due to psychological distress. This approach enables the development of targeted and individualized intervention plans, thereby facilitating early warning and precision management within a comprehensive bio-psycho-social framework.

3.2 Core Psychological Intervention Strategies

In response to different psychological problems, a variety of evidence-based psychological interventions may be employed. Cognitive Behavioral Therapy (CBT), regarded as the gold standard for treating anxiety, depression, and improving chronic disease management, aims to help patients identify and modify negative automatic thoughts and core beliefs that contribute to emotional distress and maladaptive behaviors. By restructuring dysfunctional cognitions, CBT can improve patients’ treatment attitudes and health-related behaviors. For example, patients may be guided to establish adaptive beliefs such as “regular medication enables a better quality of life,” while learning to replace maladaptive coping strategies with healthier alternatives^[4]. Mindfulness-Based Stress Reduction (MBSR), through practices

such as meditation and body scanning, cultivates nonjudgmental awareness of present-moment experiences. This approach has been shown to effectively reduce chronic stress levels and enhance emotional regulation, thereby contributing to significant reductions in blood pressure. Motivational Interviewing (MI) is a patient-centered counseling method designed to explore and resolve ambivalence, thereby strengthening intrinsic motivation for behavioral change. It is particularly effective for patients who remain hesitant about lifestyle modification. In addition, relaxation techniques—including progressive muscle relaxation and diaphragmatic breathing—can directly counteract sympathetic nervous system overactivation, producing immediate antihypertensive effects. Encouraging patients to participate in peer support groups or involving family members in health management can further enhance social support, improve treatment adherence, and strengthen patients' commitment to behavioral change.

3.3 Multidisciplinary Collaborative Integrated Care

An ideal hypertension management model should transcend traditional disciplinary boundaries and establish a multidisciplinary team composed of cardiologists, general practitioners, clinical psychologists or counselors, dietitians, and rehabilitation therapists. Within this framework, physicians are responsible for pharmacological adjustments and overall treatment planning; psychologists conduct assessments and implement professional psychological interventions; and dietitians and rehabilitation specialists provide scientifically grounded lifestyle guidance. Regular communication and information sharing among team members ensure seamless and comprehensive care delivery. This collaborative model integrates biomedical interventions with psychosocial support, genuinely achieving patient-centered holistic health management. By harmonizing biological, psychological, and social dimensions of care, such an approach maximizes the effectiveness of hypertension prevention and control.

Conclusion

Psychological factors constitute one of the core driving forces in both the onset and management of hypertension. Psychosocial variables such as chronic stress and emotional disorders influence blood pressure

homeostasis through neuroendocrine and related biological pathways, while simultaneously acting as barriers to achieving target blood pressure levels during disease management. Traditional hypertension management models that focus exclusively on biological indicators have demonstrated clear limitations. It is therefore imperative to embrace the “bio-psycho-social” medical model, attach greater importance to the psychological dimension, implement routine psychological assessments in clinical practice, introduce evidence-based psychological interventions, and establish multidisciplinary collaborative systems to achieve holistic, “whole-person” management.

Future research on hypertension prevention and treatment should further explore precision-based pathways for psychological intervention. Stratified and individualized management strategies should be developed according to patients' genetic–psychological–behavioral profiles. In addition, digital psychological intervention tools should be developed to address the shortage of professional mental health resources. Through these efforts, more effective blood pressure control can be achieved, ultimately enabling patients to attain long-term, high-quality lives.

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