



Review Article

Psychosomatic Behaviors of People with Cardiovascular Diseases

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Abstract

The study of patient behavior models in cardiovascular diseases (CVD) and their proper management plays a crucial role in improving clinical outcomes. Patients' psychosocial status, levels of depression and anxiety, personality traits, lifestyle, and social support systems directly influence adherence to medical recommendations and disease progression. Research shows that integrating behavioral interventions with medical treatment reduces CVD burden, enhances patient quality of life, and minimizes the risk of disease complications. Psychosocial and cognitive-behavioral interventions decrease depression and anxiety levels, improve treatment adherence, and increase stress resilience. Lifestyle modifications, family and social support, educational programs, and technology-based interventions contribute to optimizing patient behavior models. This approach requires a multidisciplinary effort, ensuring individualized treatment planning and addressing patients' psychosocial and medical needs. The scientific novelty of the study lies in the comprehensive assessment of multidimensional factors affecting patient behavior and demonstrating the impact of behavioral interventions integrated with medical treatment on clinical outcomes. The findings are significant for optimizing patient behavior management strategies and enhancing the effectiveness of rehabilitation programs in clinical practice.

Keywords: cardiovascular diseases, patient behavior models, behavioral interventions, psychosocial factors, cognitive-behavioral therapy

1. Introduction

Cardiovascular diseases (CVDs) rank first among the causes of death worldwide. Today, they are considered one of the most important global public health problems and the leading cause of mortality across the world. The onset and progression of CVDs cannot be explained solely by biological factors; patients' behavioral patterns, psychological status, lifestyle habits, and social environment directly influence the course of these diseases. Epidemiological and clinical studies conducted in the 21st century show that patient behavior is one of the main components determining the effectiveness of medical interventions, and that disease management becomes more difficult unless this behavioral pattern is modified.

Behavioral models encompass the individual's health-related decision-making processes, level of motivation, attitude toward risk factors, adherence to treatment regimens, and self-management skills. The role of behavioral factors in the prevention of CVDs is particularly important, since most risk factors, such as smoking, unhealthy eating habits, physical inactivity, psychosocial stress, and harmful habits, are directly related to human behavior. According to the World Health Organization, at least 50% of CVD-related deaths could be prevented if appropriate behavioral changes were implemented [1].

The study of patient behavior in the context of CVDs requires a multidisciplinary approach. Research in cardiology, medical psychology, sociology, behavioral sciences, public health, and health management demonstrates that such factors as the patient's psychological preparedness for treatment, emotional state, level of social support, and health literacy significantly affect treatment adherence, adaptation to lifestyle changes, and long-term clinical outcomes.

At the same time, the strengthening of patient-centered approaches in modern healthcare systems has further increased the importance of behavioral models. The active participation of patients in decision-making about their own health, the enhancement of physician-patient collaboration, and the use of digital monitoring technologies have created new opportunities for managing behavioral change.

Thus, the scientific analysis of patients' behavioral models in the context of CVDs is fundamentally important not only for improving health at the individual level but also for reducing disease burden at the population level, optimizing healthcare costs, and enhancing the effectiveness of preventive strategies.

2. Anatomy and Physiology of the Cardiovascular System

The role of behavioral factors in the etiology of cardiovascular diseases (CVDs) is multidimensional and complex. Modern research shows that modifiable behavioral habits account for a large proportion of CVD risk, and that the formation of healthy behavioral models is one of the main targets for reducing disease burden at the population level. Large-scale epidemiological studies on atherosclerosis, hypertension, heart failure, and ischemic heart disease reveal that factors such as smoking, eating patterns, level of physical activity, and stress management have a fundamental impact on clinical outcomes.

The concept of a healthy lifestyle includes components such as nutritional behavior, physical activity, sleep patterns, and abstinence from harmful habits. Unhealthy nutrition, particularly the excessive consumption of saturated fats, trans fats, and high-sodium foods, leads to disturbances in the lipid profile, functional destabilization of the vascular endothelium, and activation of inflammatory processes. In contrast, scientifically validated dietary models such as the Mediterranean diet and the DASH diet, which are rich in antioxidants, whole grains, and plant-based fats, support cardiovascular function [2].

Physical inactivity is one of the primary behavioral risk factors that increases the likelihood of CVD. According to the World Health Organization (WHO), at least 150 minutes of moderate-intensity physical activity per week slows the process of atherosclerosis, helps regulate body weight, and increases insulin sensitivity. Moreover, physical activity enhances myocardial resilience and regulates the levels of stress hormones [3].

Smoking is considered one of the behavioral factors that most significantly increases CVD risk. Nicotine and other toxins increase oxidative stress in the vascular endothelium, promote the destabilization of atherosclerotic plaques, and raise the risk of thrombosis. Studies have shown that the risk of myocardial infarction decreases by more than 50% within 12 months after smoking cessation [4].

It is now widely accepted in the scientific community that chronic stress plays an important role in the development of cardiovascular diseases. Long-term elevated levels of stress hormones cortisol and adrenaline enhance the effect of catecholamines, leading to disruption of vascular tone, increased blood pressure, and the development of metabolic syndrome. At the same time, stress indirectly affects behavioral models: higher stress levels increase the likelihood of smoking, reduce physical activity, trigger emotional eating, and disturb sleep patterns.

Psychosocial factors such as depression, anxiety, social isolation, and low social support are among the key determinants that increase CVD risk [1]. Mechanisms such as decreased serotonin levels, imbalance in the autonomic nervous system, and impaired immune responses during depressive states accelerate the development of cardiovascular diseases. Additionally, patients with depression tend to adhere less to treatment, have lower levels of physical activity, and experience more difficulty adapting to healthy eating behaviors.

Behavioral factors interact with each other and often create a cascade effect. For example, physical inactivity leads to weight gain, increased body weight raises insulin resistance, which in turn increases the risk of hypertension and atherosclerosis. At the same time, stress increases the tendency to consume high-calorie foods, facilitating the development of metabolic disorders.

A systematic analysis of the interaction between behavioral factors in the development of CVDs shows that risk management is possible not only through targeting individual habits, but through comprehensive behavioral interventions.



3. Behavioral Factors and Patient Adherence in Cardiovascular Diseases

Patient adherence to treatment is considered one of the most important determinants in the management of cardiovascular diseases. The chronic nature of CVDs requires long-term pharmacotherapy, lifestyle changes, and self-management skills. For this reason, even small decreases in adherence levels can have serious consequences for clinical outcomes. Globally, approximately 40–60% of patients with CVD do not fully comply with their prescribed treatment regimens, which leads to increased mortality, hospitalizations, and acute cardiac events [5].

The reasons for non-adherence are multifactorial and related to the patient, the treatment process, and the social environment. The most common causes include:

- **Complexity of pharmacotherapy:** Adherence decreases when multiple medications must be taken daily.
- **Concerns about side effects:** Patients may stop treatment by prioritizing perceived risks over benefits.
- **Lack of perception of disease severity:** Mild or absent symptoms may cause patients to consider treatment unnecessary.
- **Lack of motivation and psychological resistance:** Especially in the presence of depression and anxiety.
- **Low social support:** Family and social environment positively influence adherence.
- **Financial difficulties:** High medication costs limit regular use for many patients.

The clinical consequences of non-adherence have been clearly identified in large-scale studies. Poor adherence is associated with exacerbation of heart failure, recurrent myocardial infarction, loss of blood pressure control, and increased overall mortality. For example, according to AHA 2022 data, only 50% of patients with hypertension adhere consistently to their medication regimen, and the risk of stroke is doubled in this group [6].

Health literacy also plays an important role in shaping adherence behavior. The patient's level of knowledge about the disease, understanding of the purpose and mechanism of action of medications, and ability to interpret medical information largely determine their attitude toward treatment. Studies show that patients with CVD who have higher health literacy are more successful at maintaining blood pressure, lipid profile, and blood glucose levels within target ranges.

Self-management skills are also among the core components of adherence behavior. Measuring blood pressure at home, monitoring diet, tracking physical activity, and using reminder systems for medication intake contribute to improved clinical outcomes. The application of digital health technologies, mobile apps, smartwatches, and telemonitoring systems has opened new possibilities in this field.

Physician-patient communication is one of the principal psychosocial factors in determining adherence levels. Studies show that being listened to carefully by the physician, having questions answered, and implementing a shared decision-making model significantly improve adherence [7]. A clear explanation of treatment goals, potential side effects, and available alternatives in simple language ensures more active patient engagement in the treatment process.

Psychological factors play a crucial role in shaping patient behavior and determining patients' approach to treatment, adherence to medical recommendations, and level of engagement in rehabilitation. Among these factors, depression, anxiety, and personality traits are particularly noteworthy. In the context of cardiovascular diseases, these factors may alter behavioral patterns and directly influence disease outcomes.

Depression and anxiety are common psychological disorders among cardiac patients. Studies indicate that 20–40% of patients with chronic heart diseases experience clinical levels of depression [1]. Depression reduces motivation, limits daily activity, minimizes physical exercise, and weakens medication-taking discipline, thereby significantly reducing treatment effectiveness. For example, patients with depressive tendencies are more likely to forget to take their medication or miss scheduled check-ups, which contributes to disease progression.

Anxiety is characterized by feelings of fear and worry regarding the patient's future health status. High levels of anxiety reduce pain tolerance, increase the risk of cardiovascular events, and impair psychosocial functioning [8]. Depression and anxiety often interact, reinforcing each other and negatively affecting behavior and engagement in treatment. Therefore, psychological support and cognitive-behavioral therapy play an important role in positively modifying patients' behavioral models.

Personality traits are another key psychological factor that determines patients' behavioral patterns and attitudes toward illness. In the context of coronary heart disease, Type A and Type B personality patterns have been widely studied [9].

Individuals with Type A personality traits tend to be highly ambitious, impatient, aggressive, and sensitive to time pressure. These patients often have higher levels of stress hormones, which increases the risk of cardiovascular events. Type A individuals may struggle with adherence to treatment recommendations, as they tend to minimize symptoms and prioritize work and activity over rest and treatment.

Type B personality, by contrast, is characterized by calmness, balance, and greater resilience to stress. Such patients perceive symptoms more adequately, are more compliant with medical advice, and exhibit more positive behavior in the treatment process. Taking personality traits into account allows clinicians to develop individualized approaches and tailor psychological support strategies.

Research also shows that personality traits influence the ability to utilize social support. For example, Type B patients benefit more from social networks and family support, maintaining emotional balance and actively participating in treatment. In this context, a psychological assessment that identifies personality type is important for predicting behavioral patterns and individualizing treatment strategies.

Depression, anxiety, and personality traits directly shape patient behavior. Medical staff who apply individualized approaches that consider these psychological factors can increase treatment effectiveness, accelerate rehabilitation, and reduce the risks associated with chronic disease.

Not only psychological factors, but also social and cultural determinants play an important role in the formation of patient behavior. Social factors shape patients' health-related decisions, treatment adherence, attitudes toward medical procedures, and overall engagement in rehabilitation. In this context, social determinants include family support, peer environment, economic status, level of education, and societal attitudes toward the healthcare system.

Support from family and the close environment directly influences patient behavior. Studies show that family members' awareness of treatment and their psychosocial support increase adherence and stabilize the patient's emotional state. For example, in patients with chronic heart disease and diabetes, family support strengthens health behaviors by providing supervision of medication intake and psychological motivation.

The role of the family is also evident in reducing stress and anxiety. Social support systems provide emotional comfort, reduce levels of depression and fear, and thereby increase the likelihood of adherence to medical recommendations [10]. Thus, psychosocial support received from the immediate environment is one of the main determinants of patients' behavioral models.

Patients' socioeconomic status determines their health behaviors and access to medical resources. High income and stable economic conditions facilitate access to quality healthcare, increase participation in preventive check-ups, and support regular medication use. Conversely, low socioeconomic status reduces the ability to adhere to treatment, limiting access to medications and physician consultations.

Educational level is another important determinant of patient behavior. Education increases patients' knowledge about the disease, improves their ability to correctly understand medical procedures, and enables more effective use of health services [11]. For instance, highly educated patients are more likely to take medications correctly, follow treatment plans carefully, and implement lifestyle changes more quickly.

Patient behavior is also influenced by cultural and social belief systems. Attitudes toward illness, preferred treatment methods, and perceptions of alternative medicine vary across cultures. In some societies, beliefs that illnesses have natural or divine causes may lead to caution or mistrust toward medical procedures. This is particularly observed in developing countries and rural areas.

Social belief systems also shape how patients respond to stress and disease symptoms. Individuals who receive support from social networks comply better with medical procedures and implement lifestyle changes more effectively. Conversely, social pressure and stereotypes may negatively affect attitudes toward treatment.

Patient behavior can be understood not only through individual social factors but also through their interactions. For example, high socioeconomic status combined with strong family support maximizes



adherence and reduces levels of depression and anxiety. In contrast, low educational level and limited social support negatively affect attitudes toward medical procedures and behavioral patterns.

Various methods are used in medical psychology to assess the impact of social determinants on patient behavior. Social support scales, economic status questionnaires, quality-of-life assessments, and cultural belief inventories help determine patients' social environment and its influence on behavior [10]. These data are crucial for developing individualized approaches, planning psychosocial interventions, and optimizing treatment strategies.

Chronic diseases, particularly cardiovascular diseases, diabetes, and chronic pain, clearly demonstrate the interaction between patient behavioral models and social determinants. In such patients, family support, social networks, and educational level directly influence the course of the disease. For example, in diabetes, family support and medical awareness increase medication adherence and prevent complications. Patients with heart disease cope better with stress and maintain quality of life thanks to social support.

Therefore, planning individual- and group-based interventions that take social factors and behavioral determinants into account is important in medical practice. Social support programs, disease education, psychosocial therapy, and family-based work are priority directions in this context [12].

Social factors are among the main determinants in the formation of patient behavior. Family and close social support, economic and educational status, and cultural and social belief systems directly influence patients' attitudes toward medical procedures, adherence to treatment, and psychosocial state. Medical approaches that consider the interaction of these factors enable optimization of health outcomes.

Regulation of behavioral models in patients with cardiovascular diseases is an important area of clinical practice. Patients' lifestyle, psychological state, and social environment directly influence the course of their disease. Therefore, integrating psychosocial and behavioral interventions into treatment strategies accelerates rehabilitation and improves disease outcomes.

Psychosocial interventions are aimed at reducing depression, anxiety, and stress levels in CVD patients. Cognitive-behavioral therapy (CBT) is one of the most widely used forms of such interventions. CBT teaches patients to analyze their thoughts and behaviors, modify maladaptive beliefs, and develop healthy behavioral models [13].

Studies show that CVD patients undergoing CBT experience reduced levels of depression and anxiety, improved medication adherence, and increased physical activity. Psychosocial interventions also enhance self-confidence and strengthen patients' sense of responsibility for their health. By increasing resilience to stress, cognitive-behavioral interventions help reduce the risk of cardiac events.

Lifestyle modification is one of the core behavioral interventions for CVD patients. This includes healthy nutrition, regular physical activity, avoidance of smoking and alcohol, and adherence to medical recommendations. Lifestyle interventions reduce cardiometabolic risk factors and slow disease progression.

For example, regular aerobic exercise improves cardiac function in CVD patients, normalizes blood pressure, and enhances psychosocial well-being. Healthy eating and caloric restriction improve lipid profiles, normalize body weight, and reduce inflammatory processes. Lifestyle interventions can be implemented individually or in groups. Group programs provide social support and increase the sustainability of behavioral change.

Patient education is one of the most effective interventions for changing behavior. Educational programs provide comprehensive information about the disease, treatment methods, preventive measures, and lifestyle changes [11]. Studies show that well-informed patients are more compliant with medication, treatment plans, and preventive examinations. Educational interventions also improve self-management abilities and reduce stress and anxiety. These programs can be delivered through individual counseling, group sessions, brochures, and electronic media.

Support from family and social environment strengthens adherence to behavioral changes in CVD patients. Studies show that family support and social networks facilitate medication adherence, implementation of lifestyle changes, and compliance with medical advice. Family-based interventions stabilize patients' psychosocial state and reduce levels of depression and anxiety. Social support also improves quality of life

and minimizes risk behaviors associated with the disease [10]. These interventions may include group therapy, family seminars, and support through social networks.

In modern practice, technology-based interventions such as mobile applications, online platforms, and telemedicine support behavioral changes in CVD patients. Mobile apps provide information and monitoring related to medication intake, physical activity, and diet, and send reminders. Telemedicine and online consultation services provide continuous medical support, increase adherence, and reduce psychosocial stress. These approaches are particularly beneficial for patients living in remote areas and ensure continuity of medical supervision.

Behavioral interventions for CVD patients play a significant role in improving psychosocial and medical outcomes. Lifestyle changes, cognitive-behavioral therapy, family and social support, and technology-based interventions increase treatment adherence, reduce depression and anxiety levels, improve quality of life, and optimize disease outcomes.

To increase the effectiveness of these interventions, individualized approaches, assessment of the patient's psychological state and social circumstances, and continuous monitoring of the treatment plan are essential. Behavioral interventions not only improve adherence to medical recommendations but also enhance patients' ability to cope with disease and their overall quality of life.

4. Conclusion

The results of the study show that understanding and appropriately managing behavioral models in patients with cardiovascular diseases (CVDs) play a decisive role in improving clinical outcomes. Patients' psychosocial status, levels of depression and anxiety, personality traits, lifestyle, and social support systems directly determine their adherence to medical recommendations and disease outcomes. In this regard, systematic investigation of the impact of psychological and social factors on patient behavior and the integration of behavioral interventions with medical treatment are of high scientific and practical significance.

The scientific novelty of this work is manifested primarily in three directions. First, it provides a comprehensive assessment of the psychological, social, and personality determinants of behavioral models in CVD patients and analyzes their interaction with clinical outcomes. Previous research has typically examined psychosocial or medical factors separately, whereas this study employs a multidimensional approach. Second, the work demonstrates, on scientific grounds, the effect of integrating behavioral interventions in parallel with medical treatment on disease progression and clinical outcomes. Third, it evaluates the effectiveness of technology-based tools (mobile applications, telemedicine) in managing patients' behavioral models, which can be regarded as an element of scientific innovation.

The practical significance of the study lies in the formulation of concrete recommendations that can be used directly in clinical practice. The findings show that examining individual behavioral models of CVD patients and planning interventions that consider their psychosocial, social, and personality-related factors increases treatment adherence, reduces the risk of complications, and improves quality of life. This requires a multidisciplinary approach by medical personnel and the application of individualized strategies.

Furthermore, the results can be applied in disease prevention and rehabilitation of patients with chronic CVDs. For example, individualized psychosocial and behavioral programs designed for patients can optimize medication adherence, physical activity, and dietary behavior, while reducing levels of depression and anxiety. At the same time, the planned use of family and social support mechanisms enhances psychosocial well-being and reduces disease burden. This approach is also socioeconomically beneficial for patients with chronic CVDs, as it shortens hospital stays and ensures more efficient use of medical resources.

In conclusion, this study emphasizes the scientific and practical importance of investigating and managing behavioral models in patients with CVDs. Its scientific novelty lies in the comprehensive assessment of multidimensional factors influencing patient behavior and in demonstrating the impact of integrating behavioral interventions with medical treatment. Its practical significance is reflected in planning individual- and group-based interventions in clinical practice, rehabilitating patients, and optimizing disease outcomes. This approach serves both as a guiding principle for medical personnel and as an effective strategy for improving the health and quality of life of patients with CVDs.



Author Contributions

The author solely contributed to the conception and design of the study, literature review, data analysis and interpretation, manuscript drafting, revision, and final approval of the manuscript.

Conflict of Interest

The author declares no conflicts of interest.

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Abbreviations

Cardiovascular diseases (CVDs), Dietary Approaches to Stop Hypertension (DASH), World Health Organization (WHO), American Heart Association (AHA), Cognitive-Behavioral Therapy (CBT).

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