



## Hypercholesterolemia: Nursing Strategies for Risk Reduction and Lifestyle Modification-An Updated Review

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### Abstract:

**Background:** Hypercholesterolemia, marked by elevated low-density lipoprotein cholesterol (LDL-C), is a significant risk factor for cardiovascular diseases (CVD). It may result from genetic factors like familial hypercholesterolemia (FH) or lifestyle choices, including poor diet and physical inactivity. Nurses play an essential role in patient education, promoting behavior change, and assisting with lifestyle modifications to manage lipid profiles. Despite its prevalence, hypercholesterolemia remains largely undiagnosed, with many individuals unaware of their elevated cholesterol levels and associated risks.

**Aim:** This review aims to explore the role of nursing strategies in managing hypercholesterolemia, focusing on risk reduction, lifestyle modification, and the management of lipid profiles.

**Methods:** The article examines the risk factors and complications associated with hypercholesterolemia, the role of nurses in patient education, and lifestyle modifications. It also discusses medical management, including pharmacological interventions such as statins, cholesterol absorption inhibitors, and novel therapies for patients with familial hypercholesterolemia (FH). The review incorporates data from existing research and guidelines on assessment, diagnosis, and management.

**Results:** Nurses play a pivotal role in educating patients about managing their cholesterol levels through lifestyle changes, such as adhering to a low-fat diet, increasing physical activity, and quitting smoking. Statins are the most commonly prescribed medication for lowering LDL-C levels, with adjunctive therapies like ezetimibe and PCSK9 inhibitors offering additional benefits for patients with familial hypercholesterolemia or those who fail to achieve optimal cholesterol control with statins alone.

**Conclusion:** Hypercholesterolemia remains a prevalent and underdiagnosed condition that significantly increases the risk of cardiovascular diseases. Nurses are key players in helping patients reduce risk factors through education, lifestyle changes, and promoting adherence to treatment plans. A multidisciplinary approach that includes both pharmacological and non-pharmacological strategies is essential to achieving optimal outcomes for patients.

**Keywords:** Hypercholesterolemia, LDL-C, Nursing strategies, Lifestyle modification, Statins, Familial hypercholesterolemia, Cardiovascular diseases

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### **Introduction:**

The assessment, diagnosis, and management of hypercholesterolemia—whether resulting from genetic factors or unhealthy lifestyle choices—are crucial in addressing the rising prevalence of cardiovascular diseases [1]. Nurses play a critical role in educating patients, particularly given that many individuals struggle to fully comprehend their physician's explanations regarding the disease process, pharmacological treatments, and necessary lifestyle modifications to improve their health [2]. This article will explore the risk factors and complications associated with hypercholesterolemia, strategies for managing lipid profiles, and the essential changes patients need to implement to regulate their blood lipids [3][4][5]. The primary nursing diagnoses related to hypercholesterolemia include a knowledge deficit concerning the implications of high cholesterol, a lack of awareness regarding low-fat dietary guidelines, an inability to adapt to changes in health status, self-care deficits, and deficits in self-regulation.

### **Etiology of Hypercholesterolemia:**

The total cholesterol level is composed of low-density lipoprotein (LDL, often referred to as "bad" cholesterol) and high-density lipoprotein (HDL, or "good" cholesterol). However, it is the LDL that is predominantly responsible for the development of atherosclerotic cardiovascular disease (ASCVD). Hypercholesterolemia is diagnosed when LDL levels exceed 190 mg/dL, or are greater than 160 mg/dL in the presence of one major cardiovascular risk factor, or exceed 130 mg/dL with two or more cardiovascular risk factors. Significant risk factors for hypercholesterolemia include age (45 years or older for males, 55 years or older for females), a family history of premature ASCVD (before age 55 for males and before age 65 for females), hypertension, diabetes, smoking, and low HDL levels (below 40 mg/dL for males and below 55 mg/dL for females) [22]. Modifiable causes of high cholesterol include a diet rich in saturated or trans fats, inadequate fiber intake, physical inactivity, obesity, and smoking. Hypercholesterolemia can be both genetically inherited and acquired. Familial hypercholesterolemia (FH) is a well-established genetic disorder, with heterozygotes typically exhibiting LDL-C levels greater than 190 mg/dL and homozygotes experiencing levels exceeding 450 mg/dL. This genetic defect in the LDL receptor accounts for approximately 85% of familial cases [4][5][6].

### **Prevalence and Risk Factors:**

Hypercholesterolemia is more prevalent globally than previously recognized, with an estimated 90 to 95% of individuals with high cholesterol remaining undiagnosed [1]. According to the Centers for Disease Control and Prevention (CDC), 73.5 million American adults (31.7%) have elevated LDL-C levels, placing them at twice the risk for heart disease compared to those with normal levels. However, only 48.1% of these individuals are undergoing treatment to reduce their LDL-C levels. Recent estimates suggest that familial hypercholesterolemia occurs in approximately 1 in 300,000 individuals as homozygous and 1 in 250 as heterozygous, with higher prevalence rates observed in specific populations such as the French Canadians, Lebanese, and Afrikaners, where the ratio may reach as high as 1 in 100 [6][7][8].

### **Epidemiology of Hypercholesterolemia:**

Hypercholesterolemia is a prevalent global health issue, with a significant proportion of individuals unaware of their condition. It is considered one of the major modifiable risk factors for cardiovascular disease (CVD). According to the Centers for Disease Control and Prevention (CDC), nearly 31.7% of adults

in the United States (approximately 73.5 million individuals) have elevated low-density lipoprotein cholesterol (LDL-C) levels, a key indicator of hypercholesterolemia. Despite this high prevalence, only 48.1% of those affected are receiving appropriate treatment to reduce their cholesterol levels. Globally, the prevalence of hypercholesterolemia has been underestimated, with recent studies indicating that 90 to 95% of individuals with high cholesterol are undiagnosed. The disorder can occur in both developed and developing countries, with its distribution influenced by lifestyle factors such as diet, physical inactivity, and smoking. The prevalence of familial hypercholesterolemia (FH), a genetic disorder characterized by extremely high cholesterol levels, is estimated to be 1 in 250 to 1 in 300,000 individuals, with certain populations (e.g., French Canadians, Lebanese, and Afrikaners) showing higher rates. Age is another critical factor, with males aged 45 years and older and females aged 55 years and older at increased risk. Additionally, risk factors such as hypertension, diabetes, and family history of premature cardiovascular disease further elevate the risk for hypercholesterolemia and associated cardiovascular events.

#### **Assessment of Hypercholesterolemia:**

Both medical history and physical examination are instrumental in diagnosing hypercholesterolemia. A positive family history of premature ASCVD [9], along with an assessment of secondary causes such as smoking, diabetes, dietary habits (total calorie intake, saturated and trans fats), physical activity, and current medications, should be explored. Physical examination should include looking for signs of hypothyroidism (e.g., bradycardia, dry skin, delayed reflexes), nephrotic syndrome (e.g., edema, ascites), and cholestasis (e.g., jaundice, hepatomegaly). In patients with hypercholesterolemia, all pulses should be palpated, and carotid and femoral bruits should be assessed. Further examination for tendon xanthomas (particularly in the Achilles tendon and extensor tendons on the dorsum of the hand), xanthelasma, and arcus senilis is crucial, especially in individuals under 50 years of age. In cases suspected to be familial hypercholesterolemia, careful examination of the heart for supra-valvular aortic stenosis due to atheroma deposition is recommended.

#### **Pathophysiology of Hypercholesterolemia:**

Hypercholesterolemia occurs when there is an imbalance between cholesterol levels and the body's ability to process and remove it from circulation, leading to elevated levels of low-density cholesterol (LDL-C) in the bloodstream. Cholesterol, a lipid molecule, is essential for various bodily functions, including the formation of cell membranes and production of steroid hormones. However, excessive cholesterol, particularly LDL-C, can lead to atherosclerotic plaque formation and contribute to the pathogenesis of cardiovascular disease (CVD). LDL-C is commonly referred to as "bad cholesterol" due to its role in transporting cholesterol from the liver to peripheral tissues. When in excess, LDL-C can deposit cholesterol into the walls of arteries, initiating the process of atherosclerosis. Atherosclerosis is characterized by the accumulation of lipid-laden macrophages, smooth muscle cells, and collagen fibers, which form plaques that can narrow and stiffen the arteries. This reduces blood flow and increases the risk of cardiovascular events such as myocardial infarction (heart attack), stroke, and peripheral artery disease.

In familial hypercholesterolemia (FH), a genetic mutation in the LDL receptor gene impairs the liver's ability to clear LDL-C from the blood. This results in extremely high levels of LDL-C, often above 190 mg/dL, and increases the risk of early-onset atherosclerotic cardiovascular disease (ASCVD). FH can be inherited in an autosomal dominant manner, meaning that one mutated gene is sufficient to manifest the condition. The pathophysiology of FH is largely attributed to the dysfunction of the LDL receptor, which normally facilitates the uptake of LDL particles into liver cells for processing and excretion. Without functional receptors, the liver cannot efficiently clear LDL-C, leading to its accumulation in the bloodstream. Additionally, environmental factors such as diet (high intake of saturated and trans fats), physical inactivity, obesity, and smoking can further exacerbate the condition by promoting LDL-C elevation and diminishing high-density lipoprotein cholesterol (HDL-C), the "good cholesterol" that helps reverse cholesterol transport and remove excess cholesterol from the bloodstream. This combination of genetic predisposition and environmental influences accelerates the progression of atherosclerosis and increases the risk of premature cardiovascular events.

### **Diagnostic Evaluation:**

Routine lipid profiling is recommended for all adults over 40 years of age, ideally after a 10 to 12-hour overnight fast. The lipid profile measures total cholesterol, triglycerides, and HDL-C levels, and calculates LDL-C using the Friedewald equation:

$$\text{LDL-C} = \text{Total Cholesterol} - \text{VLDL (Triglycerides/5)} - \text{HDL-C}$$

This equation is reliable when performed on fasting plasma and if triglyceride levels are below 200 mg/dL. If triglyceride levels exceed 400 mg/dL, this formula is inaccurate. In addition, LDL-C can be directly measured using various methods. To exclude secondary causes, tests such as thyroid-stimulating hormone (TSH) for hypothyroidism, glucose for diabetes, urinalysis and serum albumin for nephrotic syndrome, and bilirubin and alkaline phosphatase for cholestasis should be conducted. If an abnormal lipid profile is found, the test should be repeated within two weeks to confirm the diagnosis before initiating long-term treatment [10][11][12].

### **Medical Management of Hypercholesterolemia**

The fundamental approach to managing hypercholesterolemia involves promoting a healthy lifestyle, which includes achieving and maintaining an optimal weight, refraining from smoking, engaging in regular physical activity for at least 150 minutes per week, and consuming a diet that is low in saturated and trans-fatty acids while being rich in fiber, fruits, vegetables, and fatty fish. For individuals with hypercholesterolemia who do not adhere to these lifestyle modifications, behavioral change is imperative. Nurses play a crucial role within the healthcare team in educating patients and fostering positive behavioral changes that can effectively improve lipid profiles. A common strategy employed by nurses to facilitate behavioral modification involves the integration of motivational interviewing with the Stages of Change model. This method allows nurses to assess a patient's readiness for change, offering motivational support tailored to the patient's current stage. Additionally, nurses provide standardized written information outlining the patient's condition and suggesting modifiable changes that can enhance disease management. To further augment education, nurses may leverage technology by providing web-based or mobile applications that offer educational content, followed by quizzes or tests to evaluate patient understanding and retention of the information on adopting healthier behaviors to mitigate the adverse effects of their condition [2][13].

Statins remain the primary pharmacological intervention for hypercholesterolemia, demonstrating the ability to reduce LDL-C levels by 22% to 50%. Furthermore, statins have been shown to significantly decrease cardiovascular events in both primary and secondary prevention contexts. Notable side effects of statins include elevated transaminases, myalgia, myopathy, and new-onset diabetes. If transaminase levels exceed three times the upper limit of normal, statin dosage should be adjusted or an alternative statin with a lower dose should be considered. Myopathy, which may escalate to rhabdomyolysis and acute renal failure, poses a substantial risk, particularly when combined with other medications such as gemfibrozil, macrolide antibiotics, azole antifungals, protease inhibitors, cyclosporine, nefazodone, and other CYP3A4 inhibitors. However, some patients fail to achieve adequate LDL-C control despite high-dose statin therapy and require adjunctive therapies. Cholesterol absorption inhibitors (e.g., ezetimibe) and bile acid sequestrants offer an additional line of treatment, proving to be safe when used in conjunction with statins. Niacin can further lower LDL-C in primary prevention but is not recommended for patients with established atherosclerotic cardiovascular disease (ASCVD). In patients with heterozygous familial hypercholesterolemia (FH) whose LDL-C remains significantly elevated (greater than 200 mg/dL with cardiovascular disease or greater than 300 mg/dL without cardiovascular disease), LDL apheresis becomes an option. This procedure, which selectively removes LDL particles from circulation, is typically performed biweekly. Additionally, PCSK9 inhibitors, a novel class of monoclonal antibodies, have shown the capacity

to reduce LDL-C levels by up to 60% when used in combination with statins. These agents are approved for use in FH and in patients on statin therapy who are not reaching their treatment goals.

For individuals with heterozygous FH, the use of HMG-CoA reductase inhibitors may normalize LDL levels; however, achieving optimal levels often requires combination therapy involving niacin, bile acid sequestrants, and ezetimibe. In some patients, combinations of these agents can reduce LDL cholesterol levels to less than 100 mg/dL. Managing homozygous or combined heterozygous FH presents greater challenges, and while partial control can be attained with medications such as antisense oligonucleotides directed at Apo B-100 synthesis, microsomal triglyceride transfer protein inhibitors, and ezetimibe, more aggressive interventions may be necessary. Statins and monoclonal antibodies targeting proprotein convertase subtilisin/kexin type 9 (PCSK9) can be beneficial if some receptor activity remains, and there is no null mutation. Furthermore, LDL apheresis, in conjunction with pharmacological treatments, has proven to be highly effective. A striking reduction in LDL levels is also seen following liver transplantation, which underscores the crucial role of hepatic receptors in LDL metabolism.

In conclusion, hypercholesterolemia presents a significant and widespread health challenge. As healthcare professionals, it is essential to ensure that more patients receive effective treatments, such as statins, which are cost-effective due to their generic availability. The optimal target for LDL-C in the general population is below 100 mg/dL. For patients with atherosclerotic cardiovascular disease, the goal should be an LDL-C level of less than 70 mg/dL or a 50% reduction in LDL-C. For other patients, the target should be an LDL-C level below 100 mg/dL, with a reduction of 30% to 50% in LDL-C levels [14][15][16].

### **Nursing Management**

In nursing management, patient education plays a pivotal role in the effective treatment of hypercholesterolemia. Nurses should instruct patients on adhering to statin medications as prescribed, becoming physically active, avoiding smoking, controlling blood pressure through home monitoring, managing blood sugar levels, and scheduling regular follow-ups with clinicians. In addition, nurses should encourage patients to work toward achieving and maintaining a healthy body weight, following a low-fat diet, reducing stress, and making lifestyle modifications to support long-term cardiovascular health. These measures are critical in controlling hypercholesterolemia and reducing the risk of cardiovascular complications.

### **When to Seek Help**

Patients should seek immediate medical attention if they experience significantly high blood pressure ( $\geq 180/110$  mmHg), chest pain, dyspnea, elevated cholesterol levels (total cholesterol  $>240$  mg/dL), or altered mental status. These signs may indicate serious cardiovascular or metabolic complications that require urgent intervention.

### **Outcome Identification**

The advent of statins has significantly mitigated the adverse effects associated with hypercholesterolemia. More crucially, when patients adopt healthier lifestyle modifications, substantial improvements are observed in parameters such as body weight, hypertension, and diabetes management. Smoking cessation is equally pivotal in enhancing patient outcomes. A wealth of clinical evidence indicates that when hypercholesterolemia is managed effectively, patient outcomes are markedly improved [6][17].

### **Monitoring**

Ongoing monitoring involves the regular assessment of various key health indicators. A lipid profile blood test is essential to evaluate cholesterol levels. Blood pressure and blood glucose should be closely monitored to ensure they remain within normal ranges. Chest pain should be assessed to rule out any acute cardiovascular events. Furthermore, regular checks of the patient's weight should be conducted to ensure it is within the healthy range. Smoking status should also be verified, ensuring that the patient has either quit or is actively engaged in cessation efforts. The patient's diet and exercise routines should also be reviewed to ensure they are aligned with healthy living goals.

## Coordination of Care

Effective management of hypercholesterolemia requires a collaborative approach involving not only physicians but also pharmacists, nurses, and physical therapists. Nurses play an essential role in educating patients about the significance of lifestyle changes, including adopting a healthier diet and engaging in physical activity. Pharmacists are responsible for ensuring adherence to prescribed statin regimens and aiding with smoking cessation. Moreover, pharmacists must be vigilant regarding the potential side effects of statins, such as muscle pain and liver damage, and ensure that patients undergo regular blood tests to monitor these adverse effects. The patient should be encouraged to participate in a structured exercise program and work toward achieving and maintaining a healthy body weight [18][19][20].

## Health Teaching and Health Promotion

Patients should be provided with comprehensive education covering several key health areas to promote effective disease management and overall well-being. This includes taking statin medications exactly as prescribed, engaging in regular physical activity, and refraining from smoking. Additionally, patients should be taught to monitor and control their blood pressure and blood sugar levels, ensuring they maintain these within recommended ranges. Regular follow-up visits with a healthcare provider are crucial, and patients should be advised to monitor their blood pressure at home. Lifestyle modifications, including weight reduction and adherence to a low-fat diet, should also be emphasized to further support long-term health outcomes.

## Risk Management

For patients who fail to lower their cholesterol through lifestyle modifications alone, statin therapy should be initiated. Numerous clinical trials have demonstrated the efficacy of statins in reducing cholesterol levels. However, it is equally important to address concurrent risk factors, such as controlling blood pressure and managing diabetes, to reduce overall cardiovascular risk.

## Discharge Planning for Hypercholesterolemia Management

Hypercholesterolemia is a prevalent condition linked to significant morbidity and mortality, contributing to high healthcare costs. Effective management requires a coordinated effort from an interprofessional team focused on preventing heart disease. In addition to physicians, the roles of pharmacists, nurses, dietitians, and physical therapists are vital in managing hypercholesterolemia.

- **Nurse's Role:** The nurse plays a critical role in educating patients about lifestyle changes, promoting a healthy diet, and encouraging physical activity. Patient education should focus on understanding the importance of these changes in managing cholesterol levels.
- **Pharmacist's Role:** The pharmacist ensures patient adherence to prescribed statin medications and offers support for smoking cessation. Additionally, pharmacists should be vigilant about potential side effects of statins, such as muscle pain and liver damage, and ensure that patients undergo regular blood tests to monitor for adverse effects.
- **Dietitian's Role:** The dietitian provides guidance on healthy eating, emphasizing the importance of reducing fatty food intake and making dietary modifications to help control cholesterol levels.
- **Physical Activity:** Patients should be encouraged to participate in a structured exercise program and work towards achieving a healthy body weight. Regular physical activity is essential for lowering cholesterol and improving overall cardiovascular health.
- **Bariatric Surgery:** If lifestyle changes and medications fail to sufficiently lower cholesterol, patients may need to be referred to a bariatric surgeon for further intervention, particularly if obesity is a contributing factor.

- **Mental Health Support:** In patients with low self-esteem or morale, a mental health nurse should offer counseling and support to address psychological barriers that may impede successful management.

Effective communication among all members of the interprofessional team is essential to ensure that patients receive comprehensive care and adhere to the recommended treatment plan. By working collaboratively, the team can provide the patient with the highest standard of care [18][19] [20].

### **Conclusion:**

Hypercholesterolemia, defined by high levels of LDL-C in the blood, is a critical risk factor for cardiovascular diseases. While this condition can be caused by genetic factors like familial hypercholesterolemia (FH), lifestyle choices such as poor diet, smoking, and inactivity are significant contributors. Nurses play a fundamental role in educating patients about the dangers of high cholesterol, particularly in terms of its long-term impact on cardiovascular health. They are instrumental in fostering behavior change, especially when it comes to implementing lifestyle modifications like improving diet, increasing physical activity, and ceasing tobacco use. The medical management of hypercholesterolemia typically starts with statins, which have proven efficacy in reducing LDL-C levels and decreasing the risk of cardiovascular events. However, for some individuals, especially those with familial hypercholesterolemia, statins alone are insufficient to achieve target cholesterol levels. In these cases, combination therapy, including the use of cholesterol absorption inhibitors like ezetimibe, bile acid sequestrants, and novel PCSK9 inhibitors, may be required. Statins remain the cornerstone of treatment, but these adjunctive therapies provide additional benefits, especially for individuals who experience inadequate results from statins alone. Moreover, familial hypercholesterolemia (FH) requires special attention, as this genetic disorder leads to extremely high levels of LDL-C, posing a significant challenge in early-onset atherosclerotic cardiovascular disease (ASCVD). In these patients, interventions like LDL apheresis and PCSK9 inhibitors may be necessary, particularly for those who do not respond to conventional treatments. Nurses are vital in promoting awareness and guiding patients toward effective management strategies. Incorporating motivational interviewing and leveraging technology, such as mobile health applications, can enhance patient education and improve adherence to treatment plans. The integration of these nursing strategies into clinical practice is essential for reducing the risk of cardiovascular disease associated with hypercholesterolemia and improving patient outcomes. Ultimately, managing hypercholesterolemia requires a multidisciplinary approach that combines pharmacological therapies with lifestyle modifications. By addressing both the genetic and environmental aspects of the disease, healthcare providers can offer more effective interventions and empower patients to make lasting health changes. This comprehensive approach is critical in reducing the burden of cardiovascular disease worldwide and ensuring better long-term health outcomes for individuals with hypercholesterolemia.

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## الملخص:

الخلفية: يُعتبر فرط كوليسترول الدم، الذي يتمثل في ارتفاع مستويات الكوليسترول منخفض الكثافة (LDL-C)، عاملاً مهماً لزيادة خطر الإصابة بأمراض القلب والأوعية الدموية (CVD). قد ينجم عن عوامل وراثية مثل فرط كوليسترول الدم العائلي (FH) أو العوامل المتعلقة بنمط الحياة، بما في ذلك النظام الغذائي غير الصحي وعدم ممارسة النشاط البدني. يلعب الممرضون دوراً أساسياً في تعليم المرضى، وتعزيز تغيير السلوك، ومساعدة المرضى على تعديل نمط حياتهم لإدارة مستويات الدهون في الدم. وعلى الرغم من انتشاره، يظل فرط كوليسترول الدم غير مكتشف إلى حد كبير، حيث أن العديد من الأفراد لا يدركون مستويات الكوليسترول المرتفعة لديهم والمخاطر المرتبطة بها.

الهدف: يهدف هذه المراجعة إلى استكشاف دور استراتيجيات التمريض في إدارة فرط كوليسترول الدم، مع التركيز على تقليل المخاطر، تعديل نمط الحياة، وإدارة مستويات الدهون في الدم.

الطرق: تستعرض المقالة العوامل والمضاعفات المرتبطة بفرط كوليسترول الدم، ودور الممرضين في تعليم المرضى، وتعديل نمط الحياة. كما تناقش الإدارة الطبية، بما في ذلك التدخلات الدوائية مثل الستاتينات، مثبتات امتصاص الكوليسترول، والعلاجات الجديدة للمرضى الذين يعانون من فرط كوليسترول الدم العائلي (FH). تتضمن المراجعة بيانات من الأبحاث الحالية والإرشادات المتعلقة بالتقييم، والتشخيص، والإدارة.

النتائج: يلعب الممرضون دوراً حيوياً في تعليم المرضى كيفية إدارة مستويات الكوليسترول من خلال تغييرات في نمط الحياة، مثل الالتزام بنظام غذائي منخفض الدهون، وزيادة النشاط البدني، والإقلاع عن التدخين. تُعد الستاتينات أكثر الأدوية الموصوفة لتقليل مستويات LDL-C، مع تقديم العلاجات المساعدة مثل الإيزيميبي ومثبطات PCSK9 فوائد إضافية للمرضى الذين يعانون من فرط كوليسترول الدم العائلي أو الذين يفشلون في تحقيق السيطرة المثلى على الكوليسترول باستخدام الستاتينات فقط.

الاستنتاج: يظل فرط كوليسترول الدم حالة شائعة وغير مكتشفة تساهم بشكل كبير في زيادة خطر الإصابة بأمراض القلب والأوعية الدموية. يعد الممرضون من اللاعبين الرئيسيين في مساعدة المرضى على تقليل عوامل الخطر من خلال التعليم، وتغيير نمط الحياة، وتعزيز الالتزام بخطة العلاج. يُعد النهج متعدد التخصصات الذي يشمل الاستراتيجيات الدوائية وغير الدوائية ضرورياً لتحقيق أفضل النتائج للمرضى.

الكلمات المفتاحية: فرط كوليسترول الدم، LDL-C، استراتيجيات التمريض، تعديل نمط الحياة، الستاتينات، فرط كوليسترول الدم العائلي، أمراض القلب والأوعية الدموية