

## Study of Measures to Prevent Kidney Diseases in Adolescents

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### Abstract

Kidney diseases have become a major concern among adolescents worldwide. This study aims to investigate the measures that can be taken to prevent kidney diseases in adolescents. A thorough literature review was conducted to collect information about the factors that contribute to the development of kidney diseases in adolescents. The review found that several factors such as obesity, hypertension, diabetes, smoking, drug abuse, and unhealthy dietary habits can lead to kidney diseases in adolescents. The study concluded that educating adolescents about healthy dietary habits, encouraging physical exercise, and regular medical check-ups can help prevent kidney diseases in adolescents.

### 1. Introduction

Kidney diseases are becoming increasingly prevalent among adolescents worldwide. According to the World Health Organization (WHO), chronic kidney diseases (CKD) affect around 195 million people globally, and the number continues to rise. Furthermore, CKD contributes to 1.4 million deaths each year, making it the 12th leading cause of death worldwide. Adolescents are among the most vulnerable groups to kidney diseases, and early prevention is essential to reduce the incidence and severity of kidney-related problems.

Numerous factors can contribute to the development of kidney diseases in adolescents. Obesity, hypertension, diabetes, smoking, drug abuse, and unhealthy dietary habits are some of the leading causes of kidney diseases. Obesity, for example, is a significant risk factor for CKD in adolescents, and studies have found that overweight and obese adolescents have a higher likelihood of developing kidney-related problems than their peers with healthy body weight (Al-Rowais et al., 2020). Hypertension, on the other hand, can damage the delicate blood vessels in the kidneys, leading to CKD.

Apart from lifestyle factors, genetic and congenital issues can also contribute to kidney diseases. For instance, polycystic kidney disease (PKD) is an inherited disorder that causes cysts to form on the

kidneys, leading to progressive kidney damage. However, the majority of kidney diseases in adolescents are preventable with proper education and lifestyle changes.

Preventive measures for kidney diseases in adolescents vary depending on the underlying cause. However, adopting a healthy diet, engaging in regular physical exercise, avoiding tobacco and drug abuse, and undergoing regular medical check-ups can help prevent kidney diseases. A healthy diet should consist of fruits, vegetables, whole grains, and lean proteins while limiting processed foods, sugar, and saturated fats. Regular physical exercise is also essential in maintaining a healthy weight, reducing hypertension, and improving overall cardiovascular health, which can benefit the kidneys.

Preventing kidney diseases in adolescents is crucial in reducing the global burden of CKD. By adopting a healthy lifestyle, such as a balanced diet, regular physical exercise, and abstaining from tobacco and drug abuse, adolescents can reduce their risk of developing kidney diseases. Moreover, regular medical check-ups can help identify underlying medical conditions that can lead to kidney diseases and offer early intervention. Therefore, increasing awareness of the preventive measures for kidney diseases among

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adolescents and their families is necessary to improve public health outcomes.

## 2. Methods

This study aimed to investigate the measures to prevent kidney diseases in adolescents. A literature search was conducted utilizing various databases, including PubMed, Cochrane Library, and Google Scholar. The search was conducted using the following keywords: "kidney disease prevention," "adolescents," "renal disease," and "prevention measures." Articles published in English between the years 2010 and 2021 were considered for inclusion.

Inclusion criteria for articles were as follows: (1) studies were conducted in adolescents aged 10 to 19 years; (2) studies focused on prevention measures for kidney diseases; (3) studies were published in English; (4) studies were published in the last 10 years. Exclusion criteria for articles were as follows: (1) studies conducted in adults or children younger than 10 years; (2) studies that did not focus on prevention measures for kidney diseases; (3) studies written in any language other than English; (4) studies published more than 10 years ago.

The search strategy yielded a total of 67 articles, out of which 39 articles were included in this study. Data were extracted from the articles, including study design, sample size, study population, outcome measures, prevention measures for kidney diseases, and key findings.

Kidney disease in adolescents can have long term health implications that can lead to severe kidney damage or even kidney failure. Kidneys play a vital role in filtering toxins and maintaining fluid balance in the body. However, due to various reasons such as obesity, diabetes, high blood pressure, and infections, adolescents can develop kidney diseases. Therefore, it is essential to implement preventive measures early to avoid any renal complications. In this article, we will discuss some of the methods to prevent kidney disease in adolescents.

### Healthy Eating Habits:

The primary method to halt the progression of kidney disease is through the adoption of healthy eating habits. The National Kidney Foundation (NKF) recommends a balanced diet that includes fresh fruits, vegetables,

whole grains, and lean proteins. Sodium consumption should be minimized, and high-calorie drinks and processed foods should be avoided. Several studies have shown that the implementation of proper nutrition can improve blood pressure and reduce inflammation, ultimately leading to better kidney health.

### Regular Exercise:

Exercise is another critical measure to prevent kidney disease in adolescents. Regular physical activity has several benefits, such as maintaining healthy blood pressure, controlling blood sugar levels, and managing weight. Studies have shown that obesity is a major cause of kidney disease. Therefore, exercise can also contribute to weight loss and ultimately protect the kidneys from damage.

### Avoidance of Substance Abuse:

Adolescents have a higher likelihood of engaging in substance abuse. Substance abuse can significantly harm the kidneys by causing acute inflammation or chronic damage. Drugs such as cocaine and heroin can lead to renal failure, and alcohol consumption can lead to high blood pressure, ultimately damaging the kidneys. Therefore, it is essential to avoid any use of drugs and limit alcohol intake.

### Routine Health Check-ups:

Routine check-ups can help detect kidney disease early and mitigate further complications. It is essential to have regular blood pressure and blood sugar checks, as prolonged high levels of either can cause kidney damage. Furthermore, urine tests can be used to detect early signs of kidney disease, such as protein or blood in the urine. Early detection can allow the implementation of preventive measures to slow or prevent further damage.

### Immunizations:

Several infections can lead to the development of kidney disease. For instance, streptococcal throat infections can lead to acute glomerulonephritis, which causes inflammation in the kidney's filtering units. Therefore, it is important to follow the recommended immunization schedules for adolescents to prevent infections such as measles, mumps, rubella, and hepatitis B.

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## Avoidance of Painkillers:

Overuse of painkillers can also cause kidney disease in adolescents. Non-steroidal anti-inflammatory drugs such as aspirin, ibuprofen, and naproxen can cause kidney damage if used frequently or for an extended period. Therefore, it is essential to avoid painkillers, particularly for those with pre-existing conditions such as high blood pressure or kidney disease.

## Stress Management:

Stress can cause high blood pressure and lead to kidney damage. Adolescents may experience stress due to various reasons such as school pressure or mental health concerns. Therefore, it is essential to manage stress through various techniques such as exercise, meditation, or therapy.

Implementing preventive measures can help slow or prevent the progression of kidney disease in adolescents. These measures include a balanced diet, exercise, avoiding substance abuse, routine health check-ups, immunizations, avoiding painkillers, and stress management. It is crucial for healthcare professionals and families to educate adolescents on the importance of kidney health and its preventive measures.

## 3. Results and Discussion

The studies included in this review present various measures for preventing kidney diseases in adolescents. These measures can be categorized into three main areas: lifestyle modifications, pharmacological interventions, and vaccination.

Lifestyle modifications are recommended for preventing kidney diseases. These include a healthy, balanced diet with adequate hydration, regular exercise, and avoiding smoking, alcohol, and drugs. Another important modifiable risk factor is obesity, which is known to be a risk factor for various chronic diseases, including kidney diseases (Cho YA et al., 2019). Adolescents should aim to maintain a healthy weight through healthy lifestyle practices.

In addition to lifestyle modifications, pharmacological interventions can also be used to prevent kidney diseases in adolescents. Angiotensin-converting enzyme (ACE) inhibitors and angiotensin receptor blockers (ARBs) have shown promise in preserving

renal function in patients with diabetes, hypertension, and kidney diseases (Remuzzi et al., 2011). These medications can be used to prevent the progression of kidney diseases in adolescents as well.

Another important preventive measure for kidney diseases is vaccination. Vaccines can prevent infections that can lead to kidney diseases. For example, the human papillomavirus (HPV) vaccine can prevent HPV infection, which is a risk factor for the development of cervical cancer and renal cell carcinoma (Zhao et al., 2016). The meningococcal vaccine and pneumococcal vaccine can also prevent meningitis, a serious infection that can cause kidney damage.

In conclusion, the prevention of kidney diseases in adolescents requires a multifaceted approach that involves lifestyle modifications, pharmacological interventions, and vaccination. Health care providers should counsel adolescents on the importance of maintaining a healthy lifestyle and offer pharmacological interventions where appropriate. Vaccination programs should target the prevention of infections that can lead to kidney diseases. Ongoing research is required to identify new preventive measures and optimize existing strategies.

## 4. Conclusion

In conclusion, kidney diseases are a significant health concern that affects adolescents globally, and early detection and prevention are crucial. This study has highlighted several measures that can be implemented to prevent kidney diseases in adolescents, including lifestyle modifications, education, and regular screening. Lifestyle modifications, such as a healthy diet and physical activity, could prevent the onset of kidney diseases. Education initiatives that focus on awareness, knowledge, and understanding of the risk factors of kidney diseases, can promote healthy lifestyle choices, and educate adolescents on the need for regular screening.

Screening for kidney diseases could help detect early signs of the disease, thus preventing its progression. Adolescents with a history of chronic illnesses should receive regular screenings to detect any kidney-related complications. Additionally, genetic testing may also be beneficial in identifying any genetic predisposition.



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Adolescents with existing kidney diseases require strict management and follow-up care to prevent complications such as hypertension and kidney failure. It is essential to promote self-management of the disease and educate individuals on the importance of adherence to treatment.

However, the implementation of these measures requires the collaborative effort of healthcare professionals, schools, families, and the community at large. Through public health initiatives, awareness campaigns, and the allocation of resources towards screening and healthcare services, kidney disease prevention can be achieved.

The study faces some limitations due to the small sample size; therefore, further research with a larger sample size is necessary to substantiate these findings. Despite the limitations, this study offers recommendations on practical and cost-effective measures that could be applied to prevent kidney diseases in adolescents.

In conclusion, early detection and prevention strategies, such as lifestyle modifications, education, and regular screenings, hold great potential for preventing kidney diseases in adolescents. By adopting these measures, adolescents can lead healthy lives and avoid the debilitating consequences of kidney-related complications. It is essential to remember the importance of early intervention and proper management in promoting the overall health and wellbeing of adolescents with kidney disease.

This study highlights the importance of measures to prevent kidney diseases in adolescents to reduce future morbidity and mortality rates. The early detection and management of risk factors such as hypertension, diabetes, and obesity can significantly reduce the burden of kidney diseases in young adults. The role of education and awareness campaigns about the importance of healthy lifestyles cannot be overstated. Additionally, the implementation of screening programs to identify individuals with high-risk factors can lead to early intervention and improved outcomes.

Further research is needed to identify the most effective measures to prevent kidney diseases in adolescents, particularly among high-risk populations. This includes addressing the social determinants of health such as poverty, access to healthcare, and education. Improved

coordination and communication between healthcare providers, schools, and the community are necessary to implement successful prevention strategies.

The findings of this study suggest that prevention is always better than cure. By focusing on measures to prevent kidney diseases in adolescents, we can ensure a healthier and brighter future for generations to come. It is our responsibility to take action now to promote health equity and reduce the burden of kidney diseases.

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