

THE EFFECT OF HEALTH EDUCATION WITH THE LECTURE METHOD ON PREVENTION OF CKD (*CHRONIC KIDNEY DISEASE*) IN ADOLESCENTS

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Abstract

Chronic kidney disease (CKD) is a global health problem whose prevalence continues to increase and can cause long-term impacts starting from adolescence. Low knowledge and preventive behavior are among the factors contributing to the increased risk of CKD. This study aims to analyze the effect of health education using the lecture method on CKD prevention in adolescents. The study used a pre-experimental design with a one-group pretest-posttest approach. The study population was all 72 grade X students of SMAN 2 Bojonegoro, with a sample of 61 respondents selected using a purposive sampling technique. The research instrument was a questionnaire on CKD prevention knowledge and behavior. Data analysis was performed using the Wilcoxon Signed Rank Test with a significance level of 5%. The results showed that the proportion of respondents with good knowledge increased from 65.5% to 95.1%, while good preventive behavior increased from 45.9% to 59%. The median knowledge score increased from 6.00 to 10.00 and the median behavior increased from 50.00 to 55.00. The Wilcoxon test showed a p-value of 0.000 ($p < 0.05$). In conclusion, health education using the lecture method significantly increased knowledge and behaviors related to CKD prevention in adolescents. Health education can be an effective promotive and preventive strategy for increasing awareness of kidney health from an early age.

Keywords: Chronic Kidney Disease, Health Education, Health Promotion, Prevention Behavior, Teenagers

INTRODUCTION

Chronic kidney disease (CKD) is a growing global health problem and a leading cause of morbidity and mortality in many countries. The increase in CKD cases is associated with the high prevalence of metabolic diseases, lifestyle changes, and low public awareness of kidney health risk factors (GBD CKD Collaborators, 2025; Kalantar-Zadeh *et al.*, 2024). Therefore, CKD prevention is a critical priority in the global health system.

In Indonesia, CKD cases also show an increasing trend year after year. Although the prevalence among adolescents is relatively low, various risk factors such as high-sugar and salt consumption, insufficient water intake, and low physical activity have been found in this age group. Data from Bojonegoro Regency even shows an increase in the number of chronic kidney disease patients in recent years, making prevention from adolescence crucial (Nasution *et al.*, 2020; Keswari *et al.*, 2019).

Various studies have shown that health education plays a crucial role in increasing individual knowledge and awareness regarding the prevention of non-communicable diseases, including CKD. Systematic educational interventions have been shown to improve understanding of risk factors, healthy lifestyles, and the importance of maintaining kidney health from an early age (Langham *et al.*, 2022; Nutbeam & Lloyd, 2021).

However, research findings on the effectiveness of health education methods vary. Some studies suggest that lectures are effective in improving health knowledge and attitudes, while others find that behavioral changes do not always occur after education. Furthermore, most research focuses on adult populations and chronic diseases in general (Benavides *et al.*, 2024; Langham *et al.*, 2022).

Based on a literature review, there remains a gap in research regarding the effect of lecture-based health education on CKD prevention in adolescents, particularly those that simultaneously measure changes in knowledge and behavior. Yet, adolescents are a strategic group for preventive interventions because health behaviors formed at this age can persist into adulthood.

Therefore, this study aims to analyze the effect of health education using the lecture method on CKD prevention in adolescents by measuring knowledge and behavior levels before and after the intervention. This research is expected to provide scientific contributions to the development of health promotion and serve as a basis for developing educational programs for chronic kidney disease prevention in adolescents.

METHOD

This study employed a quantitative approach with a pre-experimental design using a one-group pretest-posttest design. This design was used to measure changes in knowledge and behavior regarding chronic kidney disease (CKD) prevention in adolescents before and after a health education intervention using a lecture method. The quantitative approach was chosen because it allows for objectively testing the intervention's effects through structured measurements (Creswell & Creswell, 2023; Sugiyono, 2022).

The study population consisted of all 72 tenth-grade students of SMA Negeri 2 Bojonegoro. A sample of 61 respondents was determined using purposive sampling based on predetermined inclusion and exclusion criteria. This technique was chosen because it allowed researchers to obtain respondents who align with the research objectives of preventing CKD in adolescents (Sudaryono, 2021; Creswell & Creswell, 2023).

Data were collected using a knowledge questionnaire and a CKD prevention behavior questionnaire that had undergone validity and reliability testing. Data analysis was performed using SPSS version 25 through editing, coding, entry, and cleaning. Univariate analysis was used to describe respondent characteristics, while bivariate analysis used the Wilcoxon Signed Rank Test to determine the effect of the intervention on changes in knowledge and behavior at a 5% significance level (Sugiyono, 2022; Field, 2024).

The research was conducted through preparation, implementation, and evaluation stages. The preparation phase included obtaining research permits, coordinating with schools, and preparing research instruments. The implementation phase began with a pretest, followed by health education using lectures and leaflets, and concluded with a posttest to measure changes following the intervention. The entire research process adhered to ethical research principles, including informed consent, data confidentiality, and protection of respondents' rights (Creswell & Creswell, 2023; Sudaryono, 2021).

RESULTS AND DISCUSSION

General data

Table 1 Frequency distribution of respondent characteristics based on age at SMAN2 Bojonegoro in March 2025,

Age	Frequency (f)	Percentage (%)
15	18	29.5%
16	41	67.2%
17	2	3.3%
Total	61	100%

Based on Table 1, the majority of respondents from SMAN 2 Bojonegoro were 16 years old (41 people) (67.2%), followed by 18 students aged 15 years (29.5%), and 2 students aged 17 years (3.3%). The total number of respondents in this study was 61 people (100%).

Table 2 Frequency distribution of respondent characteristics based on gender at SMAN2 Bojonegoro in March 2025.

Gender	Frequency (f)	Percentage (%)
L	24	39.3
P	37	60.7
Total	61	100%

Based on gender, the majority of respondents at SMAN 2 Bojonegoro were female (37 people) (60.7%), while 24 were male (39.3%). A total of 61 respondents (100%) participated in this study.

The characteristics of respondents based on education in this study are that the majority of them have a 10th grade high school education. The total number of respondents is 61 people (100%).

Special data

Table 3 Results of the Category of Knowledge Level of Adolescents in Preventing CKD (Chronic Kidney Disease) Before Health Education with the Lecture Method at SMAN2 in Bojonegoro

Category of knowledge level before intervention

Category	Frequency (f)	Percentage (%)
Good knowledge	40	65.5%
Bad knowledge	21	34.4%
Total	61	100%

Based on Table 3, the results of the level of knowledge of adolescents in preventing CKD (chronic kidney disease) before being given health education interventions were less than half, with 21 people (34.4%) in the poor knowledge category. The total number of respondents was 61 people (100%).

Table 4 Category of Results of Adolescents' Knowledge Level in Preventing CKD (Chronic Kidney Disease) After Health Education with the Lecture Method at SMAN2 Bojonegoro

Mean	Median	Mode	Min	Max	Sd	P-value
7.23	7.00	8	4	9	1,098	0.000

After receiving health education, the majority of respondents, 58 (95.1%), had good knowledge, an increase from 40 (65.5%) before the intervention. Conversely, poor knowledge decreased from 21 (34.4%) to 3 (4.9%) out of a total of 61 respondents.

Table 5 Results of the category of CKD (Chronic kidney disease) prevention behavior levels before health education using the lecture method was carried out at SMAN2 Bojonegoro**Behavior level category before intervention**

Category	Frequency (f)	Percentage (%)
Good behavior	28	45.9%
Bad behavior	33	54.1%
Total	61	100%

Before being given health education using the lecture method, the majority of respondents had poor CKD prevention behavior, namely 33 people (54.1%) out of a total of 61 respondents (100%).

Table 5 Results of the Category Level of CKD (Chronic Kidney Disease) Prevention Behavior After Health Education with the Lecture Method at SMAN2 Bojonegoro**Behavior level categories after intervention**

Category	Frequency (f)	Percentage (%)
Good behavior	36	59%
Bad behavior	25	41%
Total	61	100%

After receiving health education using the lecture method, the majority of respondents (36 people) demonstrated positive CKD prevention behaviors, an increase from 28 people (45.9%) before the intervention. Conversely, negative behaviors decreased from 33 people (54.1%) to 25 people (41%) out of a total of 61 respondents.

Table 6 The Influence of Health Education with the Lecture Method on the Prevention of CKD (Chronic Kidney Disease) in Adolescents at SMAN 2 Bojonegoro**The influence of health education using the lecture method on preventing CKD (chronic kidney disease) in adolescents**

	Min	Max	median	A	P value
Knowledge Pre-test	1	10	6.00	0.05	0,000
Post-test knowledge	4	10	10.00	0.05	0,000

Pre-test behavior	38	57	50.00	0.05	0.050
Post-test behavior	48	83	55.00	0.05	0,000

Based on the analysis results, the median level of knowledge increased from 6.00 before the intervention to 10.00 after health education, while the median level of behavior increased from 50.00 to 55.00. The Wilcoxon test results showed a p value = 0.000 (<0.05), which indicated a significant difference between before and after the intervention. Thus, health education using the lecture method has been proven to have an effect on increasing knowledge and behavior in preventing chronic kidney disease (CKD) in adolescents.

Discussion

1. The level of knowledge and behavior of adolescents in preventing CKD (chronic kidney disease) before health education using the lecture method.

Based on table 3, the category of results of adolescents' knowledge level in preventing CKD (chronic kidney disease) before being given health education intervention was less than partially in the poor knowledge category, there were 21 people (34.4%). And respondents who were in the good knowledge category were more than partially were 40 people (65.5%). The total of all respondents was the majority of 61 people (100%). Based on table 5.5, the results of the category of behavior level of preventing CKD (chronic kidney disease) before being given health education with the lecture method were more than partially in the poor behavior category, there were 33 people (54.1%). And respondents who were in the good behavior category were less than partially were 28 people (45.9%). The total majority of all respondents was 61 people (100%).

The counseling method was carried out to determine the level of knowledge of respondents. Various factors causing a lack of knowledge are due to a lack of exposure to information about chronic kidney failure. With this activity, teenagers become aware and aware of the need to maintain kidney health from an early age to avoid the dangers of deadly kidney disease. This activity needs to be carried out more frequently, especially for all elements of society, so that they become more intelligent and understand more about kidney health, especially how to prevent kidney disease as early as possible. The counseling activity was carried out at the Uluta Eco Sanctuary in Deli Serdang Regency, attended by the Sadakata youth group. A pre-test was given before the counseling, followed by the provision of material on the prevention of chronic kidney failure using poster media. The activity concluded with a post-test given to respondents. Results: All members of the Sadakata youth group experienced an increase in knowledge based on the results of the pre-test and post-test, with the average post-test score being higher than the average pre-test score of the participants. Conclusion: There was an increase in knowledge about the prevention of chronic kidney failure in the Sadakata youth group. (Taresya, 2022)

According to researchers, this chronic kidney disease prevention counseling program aims to prevent chronic kidney disease in adolescents at SMAN 2 Bojonegoro. Non-communicable diseases (NCDs) are chronic diseases that cannot be transmitted from one individual to another. Kidney disease is included in the list of non-communicable diseases that are the focus of the government to control. The kidneys are important organs in the body that function to remove metabolic waste in the body. In addition, the kidneys also play a role in maintaining the balance of body fluids and electrolytes and the production of hormones and enzymes that control blood pressure. According to researchers, it is very important for adolescents to have a high level of knowledge or understanding about kidney failure. This is so that adolescents can prevent CKD (chronic kidney disease) from an early age.

2. Level of knowledge and level of behavior in preventing CKD (Chronic kidney disease) after health education using the lecture method.

Based on table 4, the results of the category of adolescents' knowledge level in preventing CKD (chronic kidney disease) after being given health education intervention, the majority experienced an increase to the good knowledge category, namely 58 people (95.1%). And respondents in the poor knowledge category before being given the intervention of less than some were 21 people (34.4%), but after being given the health education intervention of less than some became 3 people (4.9%). Based on table 5.6, the results of the category of behavior level of CKD (Chronic kidney disease) prevention after being given health education with the lecture method of more than some were in the good behavior category, there were 36 people (59%). Before being given the intervention, the category of good behavior level of less than some was 28 people (45.9%). And respondents in the bad behavior category before being given the intervention of more than some were 33 people (54.1%). But after being given the health education intervention of less than some decreased to 25 people (41%). The total number of respondents was 61 people (100%).

The results of previous research showed that most respondents had good knowledge and good behavior, namely 26 people or 43.33% and a small number of respondents had poor knowledge and bad behavior, namely 5 people or 8.33%, almost half of respondents had good knowledge and bad behavior, namely 26 people or 43.33%, and a small number of others had poor knowledge and good behavior, namely 3 people or 5%. This shows that the formation of behavior is not only influenced by knowledge, but also by experience and information. (Riska, 2022).

According to researchers, providing education to adolescents is very influential in preventing CKD (chronic kidney disease) in adolescents. This education aims to increase awareness from an early age, helping adolescents understand the role of the kidneys in the body and the dangers if not cared for, thereby reducing the possibility of developing chronic kidney disease in the future. This education is expected to help create a generation that is more health conscious and able to make good decisions for their well-being.

3. The influence of health education using the lecture method on preventing CKD (chronic kidney disease) in adolescents at SMAN2 Bojonegoro.

Based on the data from table 3 before the health education intervention with the lecture method, less than half in the poor knowledge category were 21 people (34.4%) and more than half in the good knowledge category were 40 people (65.5%). Based on table 4 after the health education intervention with the lecture method, the results were obtained that less than half in the poor knowledge category were 3 people (4.9%), while after the intervention, the majority experienced an increase to the good knowledge category, namely 58 people (95.1%).

Based on table 5 before the health education intervention with the lecture method, the results obtained were more than half in the category of bad behavior, there were 33 people (54.1%) and less than half in the category of good behavior, there were 28 people (45.9%). Based on table 5.6 after the health education intervention with the lecture method, the results obtained were more than half in the category of good behavior, namely 36 people (59%) and less than half in the category of bad behavior, namely 25 people (41%).

Before data analysis was carried out, a Wilcoxon rank test was conducted with the value of the level of knowledge and level of behavior before being given a health education intervention with a lecture method on preventing CKD (chronic kidney disease) was 0.000 and the value of the level of knowledge and level of behavior after being given a health education intervention was 0.000. So it was concluded that the value of the level of knowledge before was $0.000 < 0.05$ and the value of the level of knowledge after was $0.000 < 0.05$. For the results of the level of behavior before being given a health

education intervention was $0.000 < 0.05$. After being given an intervention was $0.000 < 0.05$. So the conclusion was stated that the data before and after being given an intervention had changed. The Wilcoxon results obtained $p = 0.000 < \alpha = 0.05$. Which means H_a is accepted meaning there is a difference between variables. In these results, it was found that there was an effect of health education with a lecture method on preventing CKD (chronic kidney disease) in adolescents at SMAN2 Bojonegoro.

Chronic kidney disease (CKD) is a progressive and irreversible loss of kidney function. It occurs when the body fails to maintain metabolism and fluid and electrolyte balance in the blood. Chronic kidney disease can be prevented and slowed through early detection, treatment, and a healthy lifestyle. Lack of public awareness of chronic kidney disease and unhealthy lifestyles can contribute to metabolic diseases, one of which is chronic kidney disease. The purpose of this study was to determine whether there is a relationship between adolescents' knowledge about chronic kidney disease and their behaviors to prevent chronic kidney disease.

The research design in this study was correlative. The population in this study were all visitors to Markum Singodimejo Park in Ponorogo. This study used accidental sampling with a sample size of 60 respondents. The measurement tool used was a closed questionnaire. Based on the results of the Fisher Exact Test, it was found that there was no relationship between adolescents' knowledge about chronic kidney failure and their behavior in preventing chronic kidney failure. The results of this study showed that the majority of respondents had good knowledge and good behavior (26 people or 43.33%), and a small portion of respondents had poor knowledge and bad behavior (5 people or 8.33%). Almost half of the respondents had good knowledge and bad behavior (26 people or 43.33%), and another small portion had poor knowledge and good behavior (3 people or 5%). This shows that behavior formation is not only influenced by knowledge, but also by experience and information. Based on the results of this study, it is hoped that adolescents and the community will be aware of habits or behaviors that can threaten health and avoid chronic kidney failure. (reaginta, 2022)

According to researchers, the kidneys are vital organs in the body, functioning to remove metabolic waste. They also play a role in maintaining fluid and electrolyte balance in the body and producing hormones and enzymes that control blood pressure. Researchers believe it is crucial for adolescents to have a high level of knowledge and understanding of kidney failure so they can prevent CKD early.

CONCLUSION

This study shows that health education using the lecture method has a significant effect on the prevention of chronic kidney disease (CKD) in adolescents at SMAN 2 Bojonegoro. The results showed an increase in adolescents' knowledge levels after the intervention, indicated by an increase in the proportion of respondents with good knowledge from 65.5% to 95.1%. In addition, CKD prevention behavior also improved, with the category of good behavior increasing from 45.9% to 59%. The Wilcoxon test results showed a p value = $0.000 (< 0.05)$, which confirmed a significant difference between conditions before and after the education was provided. These findings indicate that the lecture method supported by educational media can increase understanding and encourage changes in adolescent behavior in efforts to prevent chronic kidney disease early.

However, this study has several limitations, including the use of a one-group pretest-posttest design without a control group, a sample size limited to one school, and the reliance on self-reported behavior measurement by respondents. Therefore, future research is recommended to use a more robust experimental design with a control group, involve a larger sample, and conduct long-term evaluations to assess the

sustainability of behavior change. Practically, the results of this study can serve as a basis for schools, health workers, and related agencies to develop kidney health promotion programs integrated into adolescent health education activities. Routine implementation of health education in schools is expected to increase awareness, foster healthy lifestyles, and reduce the risk of CKD in young people.

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