Health Research Journal, 33-37
Volume 3 Number 2 August 2025
URL: https://jurnal.cakrabirawamedia.com/index.php/hrj/

ISSN 2988-5469 (Print) 2988-3075 (Online)

Prevention of High-Risk Acute Coronary Syndrome (ACS) via Health Education

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ABSTRACT

The high incidence of Acute Coronary Syndrome (ACS) is largely associated with poor preventive behaviors. Preventive efforts are crucial for individuals at high risk of ACS, including lifestyle modification, regular health check-ups, and adequate physical activity. This study employed a pre-experimental design with a total of 82 respondents selected through simple random sampling from a population of 103. Data were collected using questionnaires, and statistical analysis was performed using the Wilcoxon signed-rank test. The results showed a significant effect of health education on the prevention of high-risk ACS. The Wilcoxon signed-rank test revealed Asymp. Sig. (2-tailed) = 0.005 (<0.05), indicating a significant difference between pre-test and post-test scores. Health education significantly improved knowledge and preventive behaviors among respondents at high risk of ACS. It is recommended that routine health education be implemented to foster long-term behavioral changes.

Keywords: Acute Coronary Syndrome, Health Education, Prevention

BACKGROUND

Acute Coronary Syndrome (ACS) is a clinical emergency characterized by sudden reduction of coronary blood flow, usually caused by atherosclerotic plaque rupture with or without vasoconstriction (Griffin & Menon, 2018). ACS is one of the leading causes of death worldwide. According to the World Health Organization (WHO, 2021), cardiovascular diseases account for approximately 31% of global deaths, with ACS contributing to 7.4 million fatalities annually.

In Indonesia, the prevalence of cardiovascular disease remains high. The Basic Health Research (Riskesdas, 2018) reported that 1.5% of the Indonesian population has been diagnosed with heart disease, equivalent to 4.2 million individuals. In East Java Province, ACS was diagnosed in 375,127 people (1.3%) in 2013. Local data from in 2021 revealed that ACS cases averaged 25 per year and ranked among the top ten diseases in the area.

Risk factors for ACS are classified into modifiable and non-modifiable categories (Tiksnadi, Rien, & Yulia, 2018). Non-modifiable factors include age, sex, family history, and ethnicity, while modifiable risk factors include hypertension, smoking, diabetes mellitus, obesity, hyperlipidemia, sedentary lifestyle, and poor diet. Since most ACS risk factors are related to unhealthy lifestyles, preventive health education is essential to reduce disease burden and improve quality of life.

This study aimed to determine the effect of health education on the prevention of high-risk ACS.

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METHODS

The present study utilized a pre-experimental design with a one-group pre-test and post-test approach. This design was selected to measure the effect of the intervention by comparing participants' knowledge and behaviors before and after health education was provided. The design also allowed the researchers to evaluate changes directly within the same group without introducing a control group.

The study population comprised 103 individuals, with a total of 82 respondents selected through simple random sampling. This sampling technique was chosen to ensure that every member of the population had an equal opportunity to be included, thereby minimizing bias and enhancing the representativeness of the sample. The selected respondents were then enrolled to participate in the intervention and subsequent data collection process.

The independent variable in this study was health education, while the dependent variable was the prevention of high-risk Acute Coronary Syndrome (ACS). The focus was to assess how structured educational sessions could influence knowledge and preventive behaviors related to ACS among the respondents. This framework provided a clear pathway to identify the relationship between the educational intervention and the outcomes measured.

The data collection instrument consisted of a structured questionnaire designed to evaluate both knowledge and preventive behaviors regarding ACS. The questionnaire was developed to capture baseline data during the pre-test stage and to measure changes after the intervention. The instrument was considered appropriate as it provided a standardized way to assess respondents' understanding and their engagement in preventive practices.

To analyze the data, the Wilcoxon signed-rank test was employed with a significance level of $\alpha = 0.05$. This non-parametric statistical test was chosen due to its suitability for comparing paired data from the same group, particularly when assessing differences between pre-test and post-test scores. The test provided a robust method for determining whether the observed changes in knowledge and behaviors were statistically significant.

The intervention consisted of structured health education sessions lasting approximately 20 minutes. These sessions were designed to be concise yet comprehensive, focusing on key aspects of ACS prevention. One week after the educational session, a post-test was conducted to assess the retention of knowledge and behavioral changes among the participants. This interval was intended to allow time for participants to internalize and apply the information provided during the health education sessions.

RESULTS

Characteristics of Respondents

The demographic characteristics of the respondents revealed that most participants were aged between 46 and 55 years. The gender distribution was balanced, with nearly equal numbers of male and female respondents. In terms of educational background, the participants demonstrated varied levels of education, though a significant proportion had completed secondary education. These characteristics provided a diverse basis for analyzing the impact of health education on preventive behaviors related to high-risk Acute Coronary Syndrome (ACS).

Before the health education intervention, the assessment of preventive measures among respondents showed varied outcomes. A total of 21 respondents (26%) demonstrated poor preventive practices, while 31 respondents (38%) were categorized as fair. Meanwhile, 30 respondents (36%) exhibited good preventive behaviors. These findings suggested that although

some respondents had adopted positive health practices, a notable proportion still lacked adequate preventive measures against high-risk ACS.

After the health education sessions, there was a substantial improvement in preventive measures reported by the participants. Only 3 respondents (4%) remained in the poor category, while 29 respondents (35%) demonstrated fair preventive behaviors. Remarkably, 50 respondents (61%) achieved good preventive behaviors following the intervention. This significant shift highlights the effectiveness of structured health education in enhancing awareness and promoting healthier lifestyle practices among the respondents.

Table 1. Distribution of Preventive Measures Before and After Health Education

Preventive Measures	**Before Health Education n (%)**	**After Health Education n (%)**	**Change**
Poor	21 (26%)	3 (4%)	↓ 18 respondents (-22%)
Fair	31 (38%)	29 (35%)	↓ 2 respondents (-3%)
Good	30 (36%)	50 (61%)	↑ 20 respondents (+25%)
Total	**82 (100%)**	**82 (100%)**	—

Based on Table 1, the distribution of preventive measures showed a positive shift after health education, where the proportion of respondents in the poor category decreased from 21 (26%) to 3 (4%), the fair category slightly declined from 31 (38%) to 29 (35%), and the good category increased significantly from 30 (36%) to 50 (61%), indicating that health education effectively improved preventive behaviors toward reducing the risk of ACS.

The comparative results between pre-test and post-test further emphasized the positive impact of health education. The marked decrease in the proportion of respondents with poor preventive behaviors, along with the considerable increase in those categorized as good, reflected a clear improvement in health-related practices. This change also demonstrated the potential of educational interventions as a practical approach to reducing the risk of ACS in at-risk populations.

Statistical analysis using the Wilcoxon signed-rank test was conducted to confirm the observed differences between pre-test and post-test outcomes. The test result yielded a Z value of -2.813 with an Asymp. Sig. (2-tailed) of 0.005. Since the p-value was less than the significance threshold of 0.05, the analysis indicated a statistically significant difference between pre-intervention and post-intervention results.

Table 2. Statistical Test of Preventive Measures (Wilcoxon Signed-Rank Test)

Test	**Value**	**p-value**	**Interpretation**
Z statistic	-2.813	0.005	Significant ($p < 0.05$)
Asymp. Sig. (2-tailed)	—	0.005	There is a significant difference between pre-test and post-test

Based on Table 2, the results of the Wilcoxon signed-rank test showed a Z statistic of -2.813 with a p-value of 0.005. Since the p-value was smaller than the significance threshold of 0.05, it indicates a statistically significant difference between pre-test and post-test scores. This finding

confirms that the health education intervention effectively improved preventive behaviors among respondents, demonstrating its role as an impactful strategy in reducing the risk of high-risk ACS. These statistical findings confirmed that health education played a crucial role in improving preventive behaviors against high-risk ACS. The intervention was not only effective in raising knowledge but also in translating this knowledge into practical, preventive lifestyle changes. Overall, the study supports the importance of health education as a cost-effective and impactful strategy in reducing cardiovascular risks within the community.

DISCUSSION

Before receiving health education, many respondents demonstrated insufficient knowledge and poor preventive behaviors, such as smoking, unhealthy diet, irregular health check-ups, and lack of physical activity. These factors align with findings from previous studies that identified modifiable risk factors as major contributors to ACS (Rajamani & Fisher, 2017).

After health education, respondents showed significant improvement in adopting preventive behaviors, including healthier dietary choices, reduced smoking, routine blood pressure and cholesterol monitoring, and increased physical activity. This finding supports the study by Diyono (2017), which highlighted the role of knowledge in influencing coronary heart disease prevention behaviors.

Health education interventions are effective because they not only increase awareness but also encourage lifestyle modifications that can reduce cardiovascular risk factors (American Heart Association, 2018).

CONCLUSION

The study concluded that before health education, most respondents demonstrated fair (38%) and poor (26%) preventive behaviors toward ACS, while after the intervention preventive behaviors improved significantly, with 61% categorized as good, and statistical analysis confirmed that health education had a significant effect on preventing high-risk ACS ($p = 0.005$). Based on these findings, it is recommended that health services implement routine health education programs to promote healthy lifestyles and reduce ACS risk in the community, educational institutions use this study as a reference for developing community health education modules, future researchers investigate the long-term impacts of health education with larger populations, and community members adopt healthier lifestyles, undergo regular medical check-ups, and engage in adequate physical activity.

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