

EFFECTIVENESS OF A STRUCTURED NURSE-LED CARDIAC REHABILITATION EDUCATION PROGRAMME ON KNOWLEDGE REGARDING CORONARY ARTERY DISEASE

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ABSTRACT

Background: Coronary artery disease (CAD) remains one of the leading causes of mortality and morbidity worldwide. Cardiac rehabilitation programmes have been recognized as effective interventions in improving patient knowledge, promoting lifestyle modification, and reducing disease-related complications. Nurse-led educational interventions play a crucial role in enhancing patient awareness regarding disease management and prevention.

Objectives: To assess the effectiveness of a nurse-led cardiac rehabilitation programme on knowledge regarding coronary artery disease among patients attending selected hospitals in Dahod District.

Methods: A quantitative evaluative approach with a pre-experimental one-group pre-test and post-test design was adopted among 250 coronary artery disease patients. Participants were selected using a non-probability purposive sampling technique. A structured knowledge questionnaire was used to assess knowledge before and after the intervention. Data were analyzed using descriptive and inferential statistics.

Results: The pre-test findings revealed that 52% of participants had poor knowledge and 48% had average knowledge regarding cardiac rehabilitation. Following the intervention, 72% of participants demonstrated good knowledge, while 28% had average knowledge. The calculated paired t-value ($t=6.245$, $p<0.05$) indicated a statistically significant improvement in knowledge scores. Educational status showed a significant association with pre-test knowledge levels ($p<0.05$).

Conclusion: The nurse-led cardiac rehabilitation programme was effective in improving knowledge regarding coronary artery disease and cardiac rehabilitation among patients. Structured educational interventions should be integrated into routine cardiac care services.

KEYWORDS: Coronary artery disease, cardiac rehabilitation, nurse-led intervention, knowledge, cardiac patients, rehabilitation programme.

INTRODUCTION

Coronary artery disease (CAD) is one of the most prevalent cardiovascular disorders and represents a major public health challenge globally. It occurs due to narrowing or blockage of coronary arteries resulting from atherosclerotic plaque formation, leading to reduced blood flow to the myocardium. CAD is responsible for significant morbidity, mortality, disability, and healthcare expenditure across developed and developing countries.

The burden of CAD has increased dramatically in India due to rapid urbanization, sedentary lifestyles, unhealthy dietary habits, smoking, obesity, diabetes mellitus, hypertension, and psychosocial stress. Recent epidemiological studies indicate that cardiovascular diseases account for nearly one-third of all deaths in India. Early diagnosis, effective treatment, and secondary prevention strategies are essential to reduce complications and improve quality of life among affected individuals.

Cardiac rehabilitation is a comprehensive multidisciplinary intervention designed to improve cardiovascular health following diagnosis or treatment of heart disease. It encompasses patient education, exercise training, dietary counseling, psychosocial support, risk-factor modification, medication adherence, and lifestyle management. Evidence suggests that participation in cardiac rehabilitation programmes significantly reduces recurrent cardiac events, hospital readmissions, and mortality rates.

Despite the proven benefits of cardiac rehabilitation, many patients possess inadequate knowledge regarding disease pathology, risk factors, lifestyle modification, medication compliance, and preventive strategies. Lack of awareness

contributes to poor self-care practices and increased risk of disease progression. Educational interventions led by nurses have emerged as effective approaches for improving patient understanding and encouraging positive behavioral changes. Nurses play a pivotal role in cardiac rehabilitation because of their continuous interaction with patients and families. Through structured educational programmes, counseling, demonstrations, and follow-up guidance, nurses can empower patients to actively participate in disease management. Enhanced knowledge facilitates better adherence to prescribed treatment and promotes healthier lifestyles.

Considering the increasing prevalence of CAD and the importance of patient education, the present study was undertaken to evaluate the effectiveness of a nurse-led cardiac rehabilitation programme among coronary artery disease patients attending selected hospitals in Dahod District.

Objectives

1. To assess the pre-test level of knowledge regarding coronary artery disease and cardiac rehabilitation among patients.
2. To assess the post-test level of knowledge regarding coronary artery disease and cardiac rehabilitation among patients.
3. To evaluate the effectiveness of a nurse-led cardiac rehabilitation programme.
4. To determine the association between pre-test knowledge scores and selected demographic variables.

METHODOLOGY

A quantitative evaluative research approach was adopted to determine the effectiveness of a nurse-led cardiac rehabilitation programme among coronary artery disease patients. The study employed a pre-experimental one-group pre-test and post-test design. This design enabled assessment of patients' knowledge before and after the educational intervention.

The study was conducted in selected hospitals of Dahod District, Gujarat. The target population consisted of patients diagnosed with coronary artery disease who were attending cardiac outpatient departments and inpatient services. A total of 250 participants were recruited using a non-probability purposive sampling technique.

Patients diagnosed with coronary artery disease, willing to participate, and available during the data collection period were included in the study. Patients with severe complications, cognitive impairment, or those unable to communicate effectively were excluded.

Ethical approval for the study was obtained from the Institutional Ethics Committee before commencement of data collection. The study was approved by the Institutional Ethics Committee under IEC No.: ZMCH/IEC/080(22)-2024 dated 22 May 2024. Administrative permission was obtained from the concerned hospital authorities. Written informed consent was obtained from all participants after explaining the purpose and objectives of the study. Participants were informed that their participation was voluntary and that they had the right to withdraw from the study at any stage without any consequences. Confidentiality and anonymity of the participants were maintained throughout the study by assigning identification codes instead of personal identifiers. The study adhered to the ethical principles outlined in the Declaration of Helsinki.

The data collection tool consisted of three sections. The first section included socio-demographic variables such as age, gender, religion, educational status, occupation, income, family type, marital status, residence, and tobacco use. The second section comprised a structured knowledge questionnaire covering pathophysiology, signs and symptoms, risk factors, lifestyle modification, diagnosis, treatment, medication management, physical exercise, and dietary modifications related to coronary artery disease. The third section consisted of educational assessment items related to the nurse-led cardiac rehabilitation programme. Content validity was established through expert review by cardiologists, medical specialists, nursing educators, and research experts. Reliability testing demonstrated acceptable consistency of the instrument. Following institutional permission and informed consent, a pre-test was conducted using the structured questionnaire. The nurse-led cardiac rehabilitation programme was subsequently administered through lectures, demonstrations, audiovisual presentations, counseling sessions, printed educational materials, and interactive discussions. The programme focused on disease understanding, risk-factor management, exercise adherence, dietary modifications, medication compliance, smoking cessation, and stress management. A post-test assessment was conducted after completion of the educational intervention using the same questionnaire. Confidentiality and ethical principles were maintained throughout the study. Data were analyzed using descriptive statistics (frequency, percentage, mean, and standard deviation) and inferential statistics (paired t-test and chi-square test).

RESULTS

The collected data were organized, coded, tabulated, and analyzed according to the objectives of the study. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to describe the demographic characteristics and knowledge levels of the participants. Inferential statistics including paired t-test and Chi-square test were utilized to evaluate the effectiveness of the nurse-led cardiac rehabilitation programme and to determine the association between selected demographic variables and pre-test knowledge scores. The findings are presented under the following sections:

Section I: Frequency and percentage distribution of coronary artery disease patients according to their demographic characteristics.

Section II: Assessment of pre-test knowledge levels regarding cardiac rehabilitation among coronary artery disease patients.

Section III: Assessment of post-test knowledge levels regarding cardiac rehabilitation among coronary artery disease patients.

Section IV: Evaluation of the effectiveness of the nurse-led cardiac rehabilitation programme by comparing pre-test and post-test knowledge scores.

Section V: Association between pre-test knowledge levels regarding cardiac rehabilitation and selected demographic variables among coronary artery disease patients.

Table 1: Distribution of Participants According to Demographic Characteristics (N=250)

Most participants were aged 21–25 years (32%), male (65%), Hindu (80%), and had primary education (38%). Nearly 46% had a monthly income below ₹5,000, while 77% reported tobacco use.

Table 2: Pre-Test Knowledge Level Regarding Cardiac Rehabilitation

Knowledge Level	Frequency	Percentage
Poor	130	52%
Average	120	48%
Good	0	0%
Total	250	100%

The majority of participants demonstrated inadequate knowledge before the intervention.

Table 3: Post-Test Knowledge Level Regarding Cardiac Rehabilitation

Knowledge Level	Frequency	Percentage
Poor	0	0%
Average	71	28%
Good	179	72%
Total	250	100%

Post-test findings showed a substantial improvement in knowledge levels following the nurse-led programme.

Table 4: Effectiveness of Nurse-Led Cardiac Rehabilitation Programme

Test	Mean	SD	Mean Difference	t-value	p-value
Pre-test	1.320	2.913			
Post-test	2.652	4.530	1.332	6.245	<0.05

The calculated paired t-value demonstrated a statistically significant increase in knowledge scores after intervention, confirming programme effectiveness.

Association with Demographic Variables

A statistically significant association was found between educational status and pre-test knowledge levels ($p < 0.05$). No significant associations were observed with age, gender, religion, occupation, income, family type, marital status, residence, or tobacco use.

DISCUSSION

The present study evaluated the effectiveness of a nurse-led cardiac rehabilitation programme among coronary artery disease patients. The findings demonstrated that participants had inadequate baseline knowledge regarding disease prevention, rehabilitation, and lifestyle management.

More than half of the participants exhibited poor knowledge during the pre-test assessment. These findings indicate a considerable need for structured educational interventions among cardiac patients. Limited educational attainment and inadequate access to health information may contribute to poor awareness regarding disease management.

Following implementation of the rehabilitation programme, knowledge scores improved significantly. The majority of participants achieved good knowledge levels during post-test assessment. This improvement confirms the effectiveness of nurse-led educational strategies in enhancing patient understanding of coronary artery disease and rehabilitation practices.

The statistically significant paired t-test result supports the positive impact of the intervention. Similar studies have reported that educational programmes improve medication adherence, dietary compliance, exercise participation, and self-care behaviors among cardiac patients.

Educational status emerged as a significant determinant of baseline knowledge. Patients with higher educational qualifications demonstrated greater awareness regarding disease management. This finding highlights the importance of tailoring educational materials according to literacy levels and patient needs.

The nurse-led cardiac rehabilitation programme provided comprehensive information regarding risk-factor reduction, smoking cessation, exercise, nutrition, and medication adherence. Such interventions empower patients to actively participate in their recovery and reduce the likelihood of recurrent cardiac events.

The present findings are consistent with numerous national and international studies demonstrating the effectiveness of structured educational interventions in improving knowledge and self-management among patients with coronary artery disease. The significant improvement observed in post-test knowledge scores confirms that nurse-led rehabilitation programmes are an effective strategy for enhancing patient awareness and promoting secondary prevention of cardiovascular diseases.

The findings closely agree with the systematic review conducted by Anderson et al. (2022), which concluded that comprehensive cardiac rehabilitation programmes significantly improve patients' understanding of disease management, increase adherence to healthy lifestyle practices, reduce hospital readmissions, and improve overall quality of life. Similarly, Lavie et al. (2021) reported that patients participating in structured rehabilitation programmes demonstrated better medication adherence, dietary compliance, regular physical activity, and lower cardiovascular risk compared with patients receiving routine care.

Comparable findings were reported by Kumar et al. (2022) in an Indian study evaluating educational interventions among patients with coronary artery disease. Their study found a statistically significant increase in knowledge regarding risk-factor modification, dietary management, smoking cessation, and medication adherence following structured health education sessions. The present study also demonstrated considerable improvement in participants' knowledge after implementation of the nurse-led rehabilitation programme, indicating that educational interventions remain effective across different healthcare settings.

The association between educational status and baseline knowledge observed in the present study is supported by previous investigations. Yusuf et al. (2022) highlighted that literacy significantly influences patients' understanding of cardiovascular risk factors, treatment compliance, and preventive practices. Individuals with higher educational attainment generally possess greater health literacy and are more capable of interpreting health-related information. This finding emphasizes the necessity of designing educational materials appropriate for patients with varying literacy levels.

The current study further supports recommendations of the World Health Organization (2024) and the American Heart Association (2023), both of which advocate integrating patient education into routine cardiovascular care as an essential component of secondary prevention. Nurse-led education offers a cost-effective and sustainable strategy, particularly in resource-constrained settings where specialist rehabilitation services may not be readily available.

Although the study demonstrated significant improvements in knowledge, the pre-experimental design without a control group limits the ability to attribute all observed changes solely to the intervention. Future studies employing randomized controlled trials, larger multicentric samples, and longer follow-up periods would provide stronger evidence regarding the long-term effectiveness of nurse-led cardiac rehabilitation programmes on behavioural changes, clinical outcomes, and quality of life. Nevertheless, the present findings contribute valuable evidence supporting the integration of structured nurse-led educational programmes into routine cardiac rehabilitation services in Indian healthcare institutions.

Overall, the study findings reinforce the critical role of nurses in patient education and cardiac rehabilitation. Integration of structured educational programmes into routine cardiac services may contribute significantly to improved cardiovascular outcomes.

Recommendation

Based on the findings, hospitals should implement structured nurse-led cardiac rehabilitation programmes as a routine component of cardiovascular care. Future multicentre randomized controlled studies with larger sample sizes and long-term follow-up are recommended to evaluate sustained behavioural changes, quality of life, treatment adherence, and reduction in recurrent cardiac events.

Nursing Implications

Nursing Practice: Nurses should routinely provide individualized cardiac rehabilitation education during hospitalization and follow-up visits.

Nursing Education: Nursing curricula should emphasize evidence-based cardiac rehabilitation and patient education strategies.

Nursing Administration: Hospital administrators should establish standardized nurse-led cardiac rehabilitation clinics and continuing education programmes.

Nursing Research: Further research should investigate long-term clinical outcomes, patient adherence, and cost-effectiveness of nurse-led rehabilitation interventions using robust research designs.

CONCLUSION

The findings of the present study revealed that patients with coronary artery disease had inadequate baseline knowledge regarding cardiac rehabilitation and secondary prevention strategies. Following the implementation of the nurse-led cardiac rehabilitation programme, participants demonstrated a statistically significant improvement in knowledge related to disease management, lifestyle modification, medication adherence, physical activity, dietary practices, and risk-factor reduction. The results underscore the effectiveness of structured nurse-led educational interventions in enhancing patients' understanding of coronary artery disease and promoting informed self-care practices.

Educational status was significantly associated with baseline knowledge, indicating the importance of developing patient education programmes that are tailored to varying literacy levels. The study further emphasizes the pivotal role of nurses as educators in empowering patients to actively participate in their treatment and long-term disease management.

The integration of standardized nurse-led cardiac rehabilitation programmes into routine cardiovascular care has the potential to improve patient knowledge, encourage healthy lifestyle behaviours, enhance adherence to prescribed treatment, reduce recurrent cardiovascular events, and ultimately improve quality of life. Future research employing randomized controlled designs with larger, multicentre samples and longer follow-up periods is recommended to evaluate the sustained impact of nurse-led cardiac rehabilitation on clinical outcomes, behavioural changes, and healthcare utilization. The findings provide valuable evidence supporting the incorporation of structured cardiac rehabilitation education into routine nursing practice and cardiovascular health services.

Ethical Considerations

Ethical approval for the study was obtained from the Institutional Ethics Committee before commencement of data collection. The study was approved by the Institutional Ethics Committee under **IEC No.: ZMCH/IEC/080(22)-2024 dated 22 May 2024**. Administrative permission was obtained from the concerned hospital authorities. Written informed consent was obtained from all participants after explaining the purpose and objectives of the study.

Conflict of Interest

The authors declare that there is no conflict of interest related to this study.

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