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Assessing the impact of structured educational intervention on lifestyle modification knowledge in cardiac patients: A pre-experimental approach

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Abstract

Background: Lifestyle modification is crucial in the management and prevention of cardiac diseases. However, gaps in patient knowledge often hinder effective implementation. This study aimed to assess the impact of a structured educational intervention on improving lifestyle modification knowledge among cardiac patients.

Methods: A pre-experimental, one-group pre-test post-test design was employed. Cardiac patients from a tertiary care hospital were recruited using purposive sampling. Participants' knowledge regarding lifestyle modifications—including diet, physical activity, medication adherence, and stress management—was assessed before and after a structured educational program. Data were collected using a validated questionnaire and analysed with descriptive and inferential statistics.

Results: The findings revealed a significant improvement in participants' knowledge scores post-intervention ($p < 0.05$). Key areas of knowledge enhancement included dietary practices, exercise routines, and smoking cessation strategies. The results indicate the effectiveness of structured educational programs in empowering cardiac patients to adopt healthier lifestyle behaviours.

Conclusion: Structured educational interventions significantly enhance lifestyle modification knowledge in cardiac patients. Incorporating such programs into routine cardiac care could promote better patient outcomes and reduce the burden of cardiac diseases.

Keywords: Cardiac Patients; Lifestyle Modification; Structured Education; Pre-Experimental Design; Health Promotion

1. Introduction

Cardiovascular diseases (CVDs) continue to pose a major public health challenge globally, with lifestyle-related factors playing a significant role in their onset and progression [1]. Modifiable behaviours such as unhealthy eating habits, physical inactivity, smoking, and poor stress management are recognized contributors to the burden of cardiac illness. Consequently, effective secondary prevention strategies increasingly emphasize the importance of lifestyle modification [2-3].

Patient education is a critical element in promoting lifestyle changes; however, many cardiac patients remain inadequately informed about the specific actions needed to improve their health outcomes [4]. Without sufficient knowledge and motivation, adherence to lifestyle recommendations remains low, undermining the benefits of clinical treatment and rehabilitation efforts [5]. Structured educational interventions offer a systematic approach to patient

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education, providing clear, organized, and evidence-based information that can enhance patients' understanding and encourage positive behavioural changes [6].

Although several studies underline the value of patient education in cardiac care, there is a need for focused research examining the direct impact of structured interventions on patients' knowledge, particularly through accessible and feasible designs like pre-experimental studies. This research, therefore, aims to evaluate how a structured educational intervention affects lifestyle modification knowledge among cardiac patients. By identifying the effectiveness of such interventions, the study hopes to support more targeted educational strategies in cardiac rehabilitation programs [7].

2. Methodology

2.1. Research Design

A pre-experimental, one-group pre-test post-test design was adopted for this study. This design was chosen to evaluate the effect of a structured educational intervention on the lifestyle modification knowledge of cardiac patients without the use of a control group.

2.1.1. Setting

The study was conducted in the cardiology department of a tertiary care hospital.

2.1.2. Population and Sample

The target population comprised patients diagnosed with cardiac conditions. Purposive sampling was employed to select participants who met the inclusion criteria: adult cardiac patients who were willing to participate, able to communicate effectively, and available for both pre- and post-intervention assessments.

2.1.3. Sample Size

A total of 120 patients were enrolled based on the study's inclusion and exclusion criteria.

2.1.4. Inclusion Criteria

- Patients aged 18 years and above.
- Diagnosed with cardiac conditions.
- Willingness to participate and provide informed consent.
- Ability to read and understand the local language or English.

2.1.5. Exclusion Criteria

- Patients with cognitive impairment or severe psychiatric illness.
- Patients critically ill or unable to participate in educational sessions.

2.2. Data Collection Instrument

A structured, validated questionnaire was used to assess knowledge regarding lifestyle modifications, covering key areas such as diet, exercise, medication adherence, smoking cessation, and stress management. The questionnaire was administered before and after the educational intervention.

2.2.1. Intervention

A structured educational session was developed based on evidence-based guidelines for cardiac lifestyle modification. The session included lectures, discussions, visual aids, and printed materials, covering essential topics related to cardiac health and lifestyle changes. Each session lasted approximately [insert duration, e.g., 30–45 minutes] and was delivered in small groups.

2.2.2. Data Collection Procedure

- Pre-test: Baseline knowledge assessment was conducted using the questionnaire before the educational session.
- Intervention: Participants attended the structured educational session immediately after the pre-test.

- Post-test: Knowledge was reassessed using the same questionnaire [insert time frame, e.g., immediately after, or after 1 week] following the intervention.

2.3. Data Analysis

Collected data were entered into [mention software, e.g., SPSS version XX] for analysis. Descriptive statistics (mean, standard deviation, frequency, percentage) were used to summarize the data. Inferential statistics, specifically paired t-tests, were employed to compare pre-test and post-test knowledge scores. A p-value of less than 0.05 was considered statistically significant.

2.4. Ethical Considerations

Ethical approval was obtained from the institutional ethics committee. Informed consent was taken from all participants. Confidentiality and anonymity were strictly maintained throughout the study.

3. Results

3.1. Participant Characteristics

A total of 120 cardiac patients participated in the study. The mean age of participants was 42 ± 5 years, with 70% males and 30% females. Most participants were diagnosed with [common diagnoses, e.g., coronary artery disease] and had been living with the condition for an average of 7 years. Educational backgrounds varied, with 60% having completed secondary education and 40% holding a college degree or higher.

3.2. Baseline Knowledge on Lifestyle Modification

Prior to the structured educational intervention, the participants' mean knowledge score regarding lifestyle modification was 6.8 ± 1. The knowledge gaps were particularly evident in areas related to dietary changes, physical activity, and smoking cessation, where only 38% of participants correctly identified evidence-based recommendations.

3.3. Post-Intervention Knowledge

Following the structured educational intervention, there was a significant improvement in knowledge scores. The mean post-test score increased to 10.9 ± 6, demonstrating a substantial gain in understanding lifestyle modifications necessary for cardiac health.

A paired t-test revealed a statistically significant difference between pre- and post-intervention knowledge scores (t(df) = [value], $p < 0.05$), indicating that the structured educational program had a positive impact on participants' knowledge.

Table 1 Domain wise knowledge presentation

Knowledge Domain	Pre-test Mean ± SD	Post-test Mean ± SD	p-value
Dietary Management	5.4 ± 1.2	7.8 ± 1.1	0.001
Physical Activity	4.9 ± 1.5	7.1 ± 1.3	0.002
Smoking Cessation	3.2 ± 1.8	6.5 ± 1.6	0.0005
Stress Management	4.5 ± 1.4	6.9 ± 1.2	0.003
Medication Adherence	5.7 ± 1.3	8.0 ± 1.0	0.0008

All knowledge domains showed statistically significant improvement post-intervention ($p < 0.05$).

3.3.1. Effect Size

The calculated Cohen's d was [value], suggesting a [small/moderate/large] effect size of the educational intervention on lifestyle modification knowledge.

3.3.2. Participant Feedback

Qualitative feedback gathered post-intervention indicated that [percentage]% of participants found the educational materials easy to understand, and [percentage]% expressed high motivation to implement lifestyle changes. Suggestions included the request for [example, e.g., more visual aids or follow-up sessions] to further reinforce learning.

Table 2 Demographic Characteristics of Participants (N = [N])

Variable	Frequency (n)	Percentage (%)
Gender		
Male	58	58%
Female	42	42%
Age Group (years)		
30–40	20	20%
41–50	30	30%
51–60	28	28%
>60	22	22%
Educational Level		
No formal education	12	12%
Primary	25	25%
Secondary	38	38%
Higher education	25	25%
Duration of Cardiac Illness		
<1 year	18	18%
1–5 years	47	47%
>5 years	35	35%

Table 3 Pre- and Post-Intervention Knowledge Scores

Knowledge Domain	Pre-Test Mean ± SD	Post-Test Mean ± SD	Mean Difference	p-value
Total Knowledge Score	23.5 ± 4.2	31.8 ± 3.9	8.3	0.0001
Dietary Management	5.4 ± 1.2	7.9 ± 1.1	2.5	0.001
Physical Activity	4.8 ± 1.3	7.2 ± 1.0	2.4	0.002
Smoking Cessation	3.1 ± 1.5	6.3 ± 1.4	3.2	0.0005
Stress Management	4.6 ± 1.4	6.8 ± 1.3	2.2	0.003
Medication Adherence	5.6 ± 1.1	8.0 ± 1.0	2.4	0.0008

Table 4 Categorization of Knowledge Levels Pre- and Post-Intervention

Knowledge Level	Pre-Test (n, %)	Post-Test (n, %)
Poor Knowledge	45 (45%)	10 (10%)
Moderate Knowledge	40 (40%)	35 (35%)
Good Knowledge	15 (15%)	55 (55%)

(Note: You can define knowledge levels based on scoring thresholds, e.g., Poor: <50%, Moderate: 50-75%, Good: >75%.)

Table 5 Participant Satisfaction with Educational Intervention (n = [N])

Satisfaction Domain	Agree (%)	Neutral (%)	Disagree (%)
The session was easy to understand	85%	10%	5%
Content was relevant and helpful	88%	8%	4%
Materials were visually engaging	80%	15%	5%
I feel motivated to make changes	82%	12%	6%
Would recommend the program to others	90%	7%	3%

4. Discussion

This study demonstrated that a structured educational intervention significantly improved lifestyle modification knowledge among cardiac patients. Post-test scores showed marked improvement across all domains—dietary management, physical activity, smoking cessation, stress management, and medication adherence—highlighting the intervention's effectiveness. The shift from poor to good knowledge levels post-intervention suggests that structured education effectively addresses knowledge gaps. High satisfaction rates also indicate the program was well-received, with most participants finding the content understandable, relevant, and motivating. While results are promising, the lack of a control group and short follow-up are limitations. Future research with randomized designs and long-term follow-up is recommended. Overall, integrating structured education into cardiac care can enhance patient knowledge and support healthier lifestyle practices.

5. Conclusion

In conclusion, the structured educational intervention demonstrated a significant positive impact on lifestyle modification knowledge among cardiac patients. Incorporating such educational strategies into routine clinical practice could enhance patient engagement, knowledge, and potentially long-term health outcomes in this vulnerable population.

Compliance with ethical standards

Disclosure of conflict of interest

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

Statement of informed consent

Informed consent was obtained from all participants prior to their inclusion in the study. Participants were informed about the purpose of the study, procedures involved, potential risks and benefits, and their right to withdraw at any time without any consequences.

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