Original Article

Effectiveness of Discharge Education on Self Efficacy among Patients with Coronary Artery Disease

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ABSTRACT

Background: Background: Coronary Artery Disease (CAD) remains a leading cause of morbidity and mortality globally, with effective patient education on self-care post-discharge identified as a crucial component in managing the disease and improving patient outcomes. Despite the recognized importance, there is a gap in understanding the best approaches to discharge education and their impact on patient self-efficacy.

Objective: This study aimed to evaluate the effectiveness of a comprehensive discharge education program on enhancing self-efficacy among patients with CAD, compared to standard care.

Methods: A randomized control trial was conducted at the Multan Institute of Cardiology over a nine-month period, enrolling 70 participants with ST elevation myocardial infarction (STEMI), aged 30 and above. Participants were randomly allocated to either the intervention group, which received a three-day comprehensive discharge education program, or the control group, which received standard care. The Self-Efficacy Questionnaire, with a content validity index of 0.91 and a Cronbach's Alpha of 0.743, was used to measure outcomes. Data were analyzed using SPSS version 25.0, employing paired sample t-tests and independent sample t-tests to assess within-group and between-group differences, respectively.

Results: The intervention group demonstrated a significant increase in self-efficacy post-intervention, with the mean self-efficacy score improving from 31.29 ± 5.571 to 51.69 ± 6.641 (t =-15.197, p < 0.000). In contrast, the control group showed no significant change. The post-intervention self-efficacy scores significantly differed between the intervention and control groups (51.69 ± 6.641 vs. 30.77 ± 4.505, t =-15.42, p < 0.000).

Conclusion: The comprehensive discharge education program significantly improved self-efficacy among CAD patients compared to standard care. This suggests that targeted discharge education should be an integral part of patient care to enhance self-management capabilities post-discharge.

Keywords: Coronary Artery Disease, Self-Efficacy, Discharge Education, Randomized Control Trial, Patient Outcomes.

INTRODUCTION

Cardiovascular disease (CVD) remains a pivotal challenge to global health, with coronary artery disease (CAD) at the forefront as the principal cause of mortality in the United States and the third leading cause globally, as underscored by statistics indicating 18.6 million deaths in 2019 attributable to CVDs (1-3). This prevalence is mirrored in Pakistan, where non-communicable diseases, including CVDs, account for 58% of deaths, highlighting the critical nature of this issue (4). The pathophysiology of CAD, driven by atherosclerosis and the resultant plaque accumulation in coronary arteries, precipitates ischemia, necrosis, and elevates the risk of acute coronary syndromes such as unstable angina and myocardial infarction. The global impact of CVDs is further evidenced by their contribution to 31% of all deaths worldwide, tallying up to 17.9 million annually, with a significant portion resulting from stroke and heart attacks (5). Moreover, the recurrence of cardiovascular events within the first year post-event affects approximately 42% of patients, underscoring the persistent threat posed by this condition (6).

Risk factors for CAD are bifurcated into non-modifiable elements, age, gender, ethnicity, and family history, and modifiable aspects, including lifestyle choices such as poor diet, lack of physical activity, smoking, and medical conditions like obesity, diabetes, hypertension, and hyperlipidaemia (3). A cross-sectional analysis has pinpointed hypertension, smoking, obesity, and elevated low-

density lipoprotein cholesterol levels as predominant global contributors to CAD, affirming the necessity for lifestyle modifications to mitigate these risks (7). Indeed, it is posited that up to 75% of coronary heart disease instances could be preventable through targeted interventions addressing these modifiable risk factors (8), which underscores the value of enhancing psychological well-being and fostering lifestyle changes to decelerate the progression of CHD and diminish the likelihood of subsequent cardiac events (9).

The symptomatic presentation of CAD predominantly includes chest discomfort, often described as a crushing or burning sensation that may radiate to the arms, jaw, or neck, accompanied by symptoms such as weakness, sweating, nausea, vomiting, and difficulty breathing (10). Recommendations from the European Society of Cardiology for managing coronary disorders emphasize the importance of medication, promoting overall well-being, and, where applicable, percutaneous coronary interventions. These guidelines advocate for a personalized and interdisciplinary team approach to patient care, which has been shown to bolster patient support and enhance outcomes (11).

Central to the management of CAD is the concept of self-efficacy, defined as an individual's belief in their capability to successfully execute actions necessary to achieve desired outcomes. High self-efficacy is associated with the adoption of healthy behaviors, reduced symptomatology in CAD patients, and overall improvements in health status (13). This psychological construct plays a critical role in patients' management of their illness, with those exhibiting higher self-efficacy levels more likely to engage in health-promoting behaviors compared to individuals with lower self-efficacy (10). Furthermore, a positive correlation has been identified between self-efficacy and both quality of life and psychological well-being, suggesting that enhancing self-efficacy could lead to significant improvements in these areas (12).

However, existing research presents a mixed view on the efficacy of nurse-led counseling and education programs in improving self-efficacy among patients with coronary syndromes. Notably, one study with 40 participants showed significant improvements in self-efficacy following pre-discharge education and counseling sessions. Despite these promising results, the study's limited duration and small sample size restrict the ability to fully ascertain the long-term effects and overall effectiveness of such interventions (14). Additionally, the integration of educational programs into nursing care has been hampered by staffing shortages and time constraints, despite patient education being recognized as a fundamental aspect of nursing practice and essential for patient empowerment, self-efficacy, and self-esteem (9).

This research aims to scrutinize the impact of discharge education on enhancing self-efficacy among patients with CAD, acknowledging the critical and potentially life-threatening nature of the condition. The study focuses on mitigating post-discharge complications and facilitating a seamless transition from hospital to home care, emphasizing the importance of self-care practices to prevent further health deteriorations. Through this lens, the research seeks to contribute to the broader discourse on patient care and education within the context of chronic disease management, particularly in relation to coronary artery disease.

MATERIAL AND METHODS

This investigation adopted a Randomized Control Trial framework to assess the impact of discharge education on self-efficacy among coronary artery disease patients. Conducted within the cardiology ward of the Multan Institute of Cardiology over a nine-month span from January to September 2023, the study received approval from the Research Ethical Committee of The University of Lahore, ensuring adherence to ethical standards in line with the Declaration of Helsinki. Aiming for a 95% confidence interval and an 80% power of test, the sample size was meticulously calculated, employing a simple random sampling methodology to ensure the rigor and reliability of the findings.

The cohort for this research encompassed individuals aged 30 and above, diagnosed with ST elevation myocardial infarction (STEMI), and proficient in either Urdu or English. Exclusion criteria were stringently applied to maintain the study's integrity, disqualifying medical professionals, patients with non-ST elevation myocardial infarction (NSTEMI), dementia, psychological impairments, significant hearing loss, or those exhibiting unstable cardiac conditions such as active angina.

Central to the data collection process was the Self-Efficacy Questionnaire, designed to quantify participants' confidence levels across a spectrum of activities pertinent to their condition. This instrument comprised 13 items, with responses captured on a 5-point Likert scale ranging from 1 (not confident) to 5 (very confident). The questionnaire's reliability and validity were substantiated by a content validity index of 0.91 and a Cronbach's Alpha of 0.743, ensuring the measurement's robustness.

Seventy participants were enlisted through a simple random lottery method, evenly distributed into an experimental group and a control group, each comprising 35 individuals. The control group was subjected to standard education protocols, whereas the experimental group benefited from a tailored three-day discharge education regimen. This included extensive one-on-one sessions totaling three hours each day, covering a wide array of topics from cardiovascular disease knowledge to lifestyle guidance, supplemented by informative booklets and followed up with outpatient department visits for ongoing support and motivation.

Data collection encompassed initial recruitment upon hospital admission, where informed consent was secured following an exhaustive explanation of the study's aims and procedures, adhering to ethical principles. Participants' demographic details were gathered via questionnaires, laying the groundwork for a comprehensive evaluation of the educational intervention's efficacy. The intervention itself was executed through detailed discussions, leveraging expertly developed booklets to impart crucial disease management knowledge.
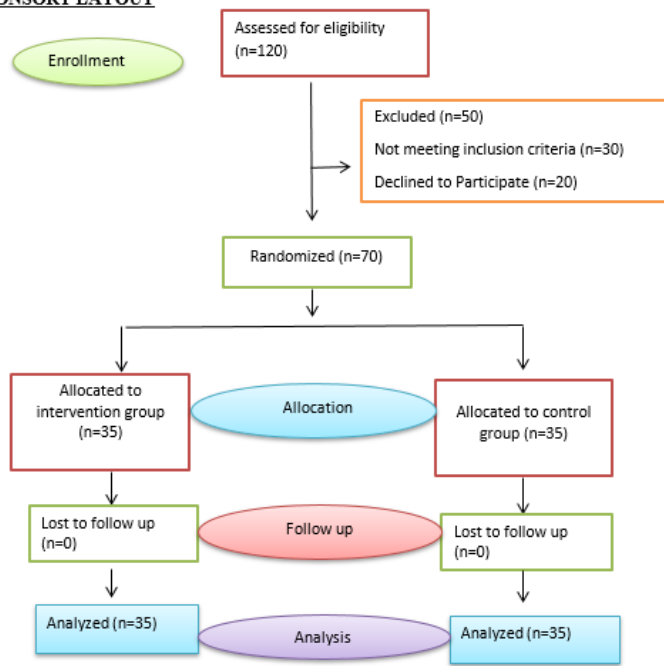

Figure 1 CONSORT FLOWCHART

Statistical analysis was conducted using SPSS version 25.0, where data normality was assessed through the Kolmogorov-Smirnov test, revealing a p-value greater than 0.05, indicating normal distribution. Analytical techniques included the paired sample t-test for within-group comparisons and the independent sample t-test for between-group analyses, with a significance threshold set at a p-value of 0.05 or less. The anticipated self-efficacy score in the experimental group was projected at 18.86 ± 4.55, contrasting with 15.26 ± 5.99 in the control group, highlighting the potential for educational interventions to significantly enhance self-efficacy among CAD patients.

RESULTS

In the conducted study, demographic characteristics of participants were carefully analyzed to ensure a comprehensive understanding of the sample population. The gender distribution within the control group showed a predominance of male participants, accounting for 80%, compared to 77.1% in the intervention group, while female participants comprised 20% and 22.9%, respectively (Table 1). Marital status revealed that a significant majority of participants in both groups were married, with 94.3% in the control group and 91.4% in the intervention group. The intervention group also included a small percentage of unmarried (2.9%) and divorced (5.7%) individuals, indicating a slight variation in marital status distribution between the two groups.

Educational status among participants showed that a majority had received primary education, making up 57.1% in both groups. However, there was a notable difference in the proportions of uneducated participants and those with diploma or higher education, with uneducated individuals accounting for 22.9% in the control group and 28.6% in the intervention group, whereas those with a diploma or higher education represented 20% and 14.3%, respectively. Employment status varied, with employed individuals constituting 40% of the control group and 25.7% of the intervention group. Conversely, the percentage of participants engaging in self-business was higher in the intervention group (34.3%) compared to the control group (28.6%).

The residential area of participants was fairly evenly split between rural and urban settings, with a slight majority residing in urban areas in the intervention group (54.3%) compared to the control group (49.6%) (Table 1).

The functional health status and self-efficacy levels before and after the intervention revealed significant improvements. Initially, low self-efficacy was reported by 5.7% of the control group and 8.6% of the intervention group. Post-intervention, this category saw a reduction to 0% in both groups, indicating the effectiveness of the educational program in enhancing self-efficacy (Table 2). A dramatic shift was observed in the distribution of self-efficacy levels from moderate to high post-intervention within the intervention group, where high self-efficacy surged from 0% to 74.3%, compared to the control group where it remained static at 2.9%.

Table 1 Demographic Characteristics of Participants

Variables	Construct	Control Group Frequency (%)	Intervention Group Frequency (%)
Gender	Male	28 (80%)	27 (77.1%)
	Female	7 (20%)	8 (22.9%)
Marital Status	Unmarried	0 (0.0%)	1 (2.9%)

Variables	Construct	Control Group Frequency (%)	Intervention Group Frequency (%)
	Married	33 (94.3%)	32 (91.4%)
	Widow	1 (2.9%)	0 (0.0%)
	Divorced	1 (2.9%)	2 (5.7%)
Education Status	Uneducated	8 (22.9%)	10 (28.6%)
	Primary education	20 (57.1%)	20 (57.1%)
	Diploma or higher education	7 (20%)	5 (14.3%)
Employment Status	Employed	14 (40%)	9 (25.7%)
	Self-Business	10 (28.6%)	12 (34.3%)
	Unemployed	11 (31.4%)	14 (40%)
Residential Area	Rural	18 (51.4%)	16 (45.7%)
	Urban	17 (49.6%)	19 (54.3%)

Table 2 Functional Health Status and Self-Efficacy at Pre and Post Intervention

Variables	Control Group Pre (%)	Control Group Post (%)	Intervention Group Pre (%)	Intervention Group Post (%)
Low Self-Efficacy	2 (5.7)	0 (0)	3 (8.6)	0 (0)
Moderate Self-Efficacy	32 (91.4)	34 (97.1)	32 (91.4)	9 (27.9)
High Self-Efficacy	1 (2.9)	1 (2.9)	0 (0)	26 (74.3)

Table 3 Paired Sample t-test for Within-Group Analysis

Variables	Pre-intervention Mean ± SD	Post-intervention Mean ± SD	t	P
Self-Efficacy	31.29 ± 5.571	51.69 ± 6.641	-15.197	0.000

Table 4 Independent Sample t-test for Inter-Group Analysis

Variables	Scoring Period	Control Group (mean ± SD)	Intervention Group (mean ± SD)	T	P
Self-Efficacy	Pre-Assessment	30.31 ± 5.454	31.29 ± 5.571	-0.74	0.46
	Post-Assessment	30.77 ± 4.505	51.69 ± 6.641	-15.42	0.00

Statistical analysis further corroborated these findings. The paired sample t-test for within-group analysis showed a significant increase in mean self-efficacy scores from 31.29 ± 5.571 to 51.69 ± 6.641 in the intervention group, with a t-value of -15.197 and a p-value of 0.000, highlighting a substantial improvement post-intervention (Table 3). The independent sample t-test for inter-group analysis before the intervention did not show a significant difference between the groups (p=0.46). However, post-intervention, a significant difference was evident with mean scores of 30.77 ± 4.505 for the control group and 51.69 ± 6.641 for the intervention group, yielding a t-value of -15.42 and a p-value of 0.00, indicating that the intervention had a statistically significant effect on improving self-efficacy levels among participants (Table 4).

DISCUSSION

In this study, demographic characteristics revealed an average age of 55.66 years in the control group and 54.69 years in the intervention group, closely aligning with prior research indicating mean ages of 57.03 and 59.28 years for intervention and control groups, respectively (15). The majority of participants were married, mirroring findings from previous studies that reported high marriage rates among patients with coronary artery disease (16, 17). Educational levels varied, with a significant proportion having received only primary education, which is somewhat consistent with earlier findings, although contrasts exist with studies reporting higher levels of education among participants (16, 18).

Employment status showed diversity, with a notable percentage of participants engaged in self-business or unemployed, reflecting variations in socio-economic status among the sample (19). Residential patterns indicated a balanced distribution between rural and urban settings, differing from studies where the majority were urban dwellers (18), suggesting geographic diversity among participants.

The intervention group demonstrated a significant shift in self-efficacy levels post-intervention, with a notable increase in high self-efficacy, which is supported by previous research underscoring the effectiveness of discharge education in improving self-efficacy among patients with acute coronary artery disease (18, 20). Statistical analyses further confirmed the positive impact of the educational program on self-efficacy scores, presenting a significant difference between pre- and post-intervention scores within the intervention group compared to the control (21).

Comparative analysis with existing literature indicates that while discharge education consistently improves self-efficacy, outcomes can vary based on the study design, population, and educational content delivered (19, 22). This study's findings reinforce the notion that structured discharge education significantly enhances self-efficacy, corroborating earlier research emphasizing the role of comprehensive educational strategies in patient care post-discharge (15, 20).

The study's strengths include its rigorous methodological approach and the clear demonstration of the educational program's effectiveness. However, limitations such as the small sample size and the short-term follow-up period restrict the generalizability of the findings and the ability to ascertain long-term effects. These limitations highlight the need for future research with larger sample sizes and extended follow-up periods to better understand the sustained impact of discharge education on patient outcomes.

Recommendations for future practice include providing patients with informative leaflets to aid memory retention at home and establishing hospital departments dedicated to ongoing home care services and discharge education. Further research should explore the long-term benefits of the intervention and its efficacy on other clinical and psychosocial parameters in patients with CAD and comorbid conditions. Conducting similar studies in multiple hospitals with larger sample sizes would enhance the generalizability of the findings and contribute to a more comprehensive understanding of the benefits of discharge education in patient care.

CONCLUSION

In conclusion, effective discharge education, beginning at admission and reinforced throughout the hospital stay, is crucial for enhancing cardiac self-efficacy and patient knowledge post-discharge. This study underscores the importance of early and comprehensive education, supplemented by informative materials like booklets, to bolster patient and family confidence in managing care post-hospitalization. Addressing both physical and psychological needs through targeted education and support is essential for optimizing patient outcomes.

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