Effect of Nurse -led lifestyle adaptation training on Emotional Regulation and Resilience among patients with Coronary Artery Disease

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KEYWORDS
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ABSTRACT

Background: Coronary artery disease is asignificantbase of death globally. Patients who have coronary artery disease need to adhere to their new lifestyle practices to reduce mortality and morbidity related to the disease.Resilience and good emotional regulationhelp the patients toadhere to the lifestyle changes and pharmacological therapy. The present study focused on determining the effect of a nurse-led lifestyle adaptation program on improving emotional regulation and resilience.

Methodology: This quasi-intervention study was conducted among 69 patients with coronary artery disease in a tertiary care center in Bhubaneswar. The samples were divided into the study and the control group (34 and 35, respectively).After getting consent from the patients, the pre-assessment was done. Then, the intervention group received the nurse-led lifestyle adaptation training for 20-30 minutes, and the post-assessmentwas done after one month and 15 days.

Results and discussion: The sampleage in the interventionand control groups was 57.7 ± 6.9 years and 57.1 ± 6.4 years, respectively. The resilience was reported as usualby around 20% of participants in the intervention and control groups. The resilience valuedoes not have much difference in the intervention and control groups. Still, the emotional regulation exhibits a significant difference ($P<0.001$) from 18.1±4.5 from the pretest to 15.5±4.6 after six weeks. A five-year follow-up study showed a decrease in unfavorable cardiac events among the patients who obtained relaxation therapy and regular cardiac rehabilitation.

Conclusion: The nurse-led lifestyle adaptation training effectively improvedemotional regulation among patients with coronary artery conditions.

Introduction

Cardiovascular diseases are the group of diseases that affect the heart or blood vessels, which include coronary artery disease (CAD).Cardiovascular disease are the major cause of death globally. [1]The mortality rate of coronary artery disease increased by 19% from 2006 to 2016. [2]ischemic heart disease and Stroke contributed to around 17.7 million deaths worldwide. According to the World Health Organization (WHO), around $1/5^{th}$ of these deaths were reported in India. [3] The mortality rate of Indians due to coronary artery disease was more than that of developed countries. [4] Acute Coronary Syndrome (ACS) is the major type of coronary artery disease, which includes Myocardial Infarction (MI) and Unstable Angina (UA). [5]

Myocardial Infarction may cause severe anxiety, stress, and depression among the patients after the cardiac event. These emotional imbalances may lead to adverse outcomes like repeated episodes of cardiac events, poor adherence to the treatment regimen, and an increased rate of

mortality after the myocardial infarction. [6] Resilience is the capacity of an individual to maintain a healthy life when facing an unfavorable event. [6]Resilience may be a protective factor to reduce the adverse effects [7] and improve the prognosis of the disease condition among the patients.[6]

Nurse-led programs are more effective in improving the health and self-management of patients with coronary artery disease. ACS patients should have self-management skills to adhere to their treatment strategies. [8]This study aimed to assess the effect of nurse-led lifestyle modification training on Emotional Regulation and Resilience among patients with Coronary Artery Disease. Here, the researcher focused on a group of interventions given as a package to the patients after the incidence of ACS to improve their resilience and regulate their emotional fluctuations.

Materials and Methods

This was a quasi-intervention,nonrandomized control group study conducted among the patients admitted with coronary artery disease in a medical care center in Bhubaneswar, India. The study was conducted from July 2022 to March 2023. The participants were selected from the Cardiac Care Unit of the same hospital. The calculated sample size for this study was 70by Open Epi ver 3.0; the final analysis was done with 69 samples (Figure 1), 35 and 34 patients in the control and intervention groups, respectively. The sample size was calculated based on the pilot study analysis. The mean and standard deviation of emotional regulation in the two groups were taken as the reference for calculating the sample size (15.3±2.3 and 16.7±2.5, respectively).

The sample was selected through the purposive sampling method after their informed consent. The study received the Institute's ethical committee permission with reference no: IEC/IMS.SH/SOA/2021/215.

Patients who are admitted with coronary heart disease and under treatment, age greater than 18 years, both male and female and ready to perform the exercise were taken in the study. The patients with psychiatric disorders, any chronic diseases, or any physical problems were eliminated from the study.

The samples in the interventionand control groupsunderwent the pre-assessment. A structured set of questionnaires was used to get the data from the patients. This includes three sections. Thefirst section is the sociodemographic Performa. Emotional regulation is measured by the Emotional Regulation Questionnaire (ERQ)[9]. It is a 10-item,seven-point Likert scale. Here, the researcher looks into the patient's cognitive reappraisal and expressive suppression. The resilience is assessed by the Brief Resilience Scale (BRS)[10].It is a five-point Likert scale with six items. Questions 2, 4, and 6 have the reverse scoring. The final scoring is estimated by the total score divided by the number of answers. Resilience can be grouped intoless resilient (1-2.99), normal resilience (3-4.30), and more resilient (4.31- 5).The post-test evaluation was done after six weeks of intervention. The control group did not receive the intervention and underwent routine care from the hospital.

The final data descriptive statistics were checked using frequency, percentage, average, and standard deviation. The inferential statistics were obtained using independent and paired t-tests, chi-square tests, and the Karl Pearson correlation coefficient using SPSS Ver 25.0.

Nurse-led lifestyle adaptation training

This training session starts with an education session regarding the need for lifestyle adaptation and dietary changes that mustbe implemented in their routine diet plan. A pre-designed dietary schedule was provided to them, and they were informed of the importance of adhering to that. The next session is on the exercise training program, whichincludes Benson's relaxation technique [11]and mental fitness exercise [12]. The total time needed for this training program is

20 to 30 minutes. The Benson relaxation is a complementary therapy method that helps reduce stress and anxiety and can balance the individual's emotions. The individual must sit comfortably and relax their muscles after closing their eyes. It is considered to be the easiest method and a routine for all. The mental fitness exercise starts with drinking a glass of water. This exercise never causes anyone any pain or discomfort. It improves the brain functioning. It is designed for five minutes, and it helps to function our brain and physical stretching. After the training session, the participants were followed up on the phone, and a post-intervention assessment was done after six weeks of intervention.

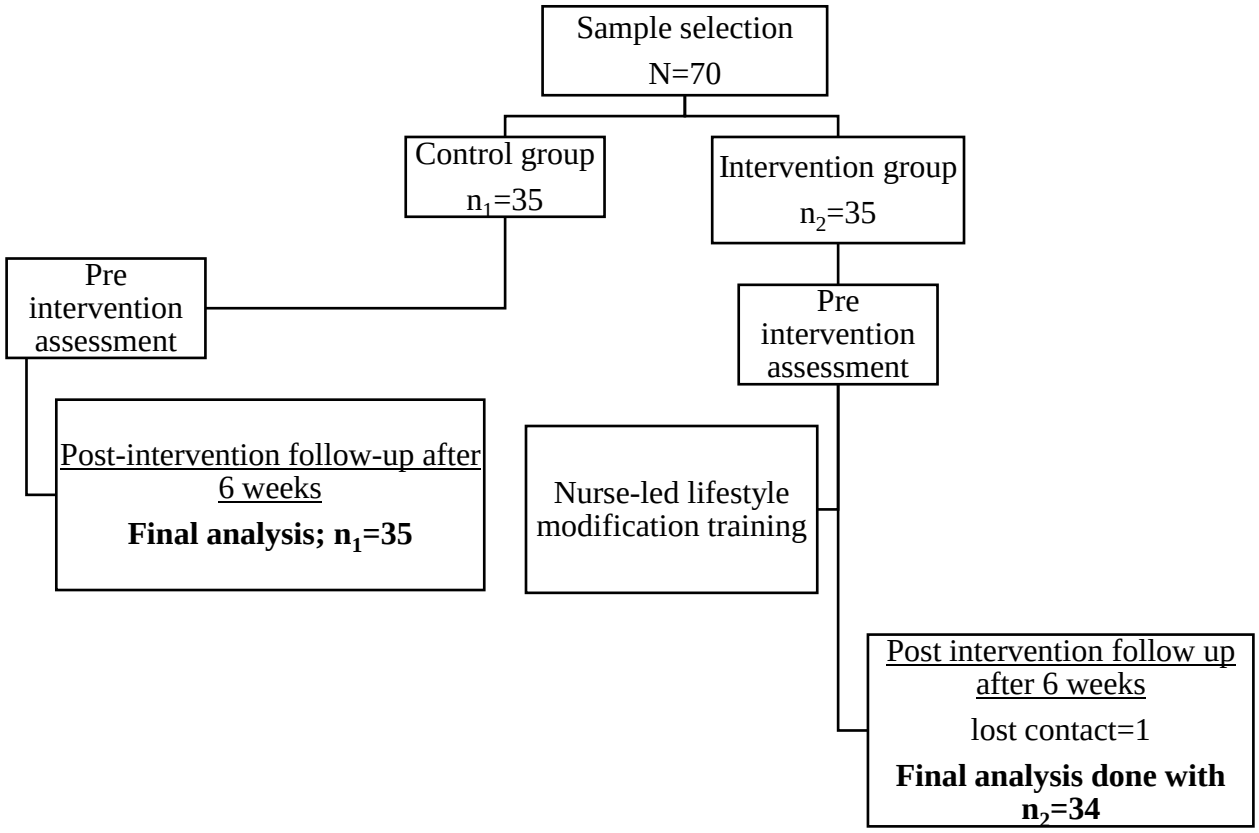

Figure 1: Schematic representation of the study procedure

Results

Table 1:Distribution of patients in intervention and control groups based on their socio-demographic data

n_1=35, n_2=34

Variables	**Control F (%)**	**Intervention F (%)**	**χ^2 (P)**

Gender	**Female**	8(22.9)	8(23.5)	0.95(0.59)
	Male	27(77.1)	26(76.5)	
Marital status	**Married**	35(100)	34(100)	
Education	**Primary**	13(37.1)	13(38.2)	2.55(0.64)
	Senior secondary	13(37.1)	9(26.5)	
	Intermediate	4(11.4)	3(8.8)	
	Degree level	5(14.3)	8(23.5)	
	Post-graduation	-	1(2.9)	
Family members have hypertension	**Yes**	23(65.7)	16(47.1)	2.44(0.09)
	No	12(34.3)	18(52.9)	
Occupation	**Not working**	3(8.6)	4(11.8)	5.29(0.62)
	Housewife	8(22.9)	7(20.6)	
	Government job	-	4(11.8)	
	Private	8(22.9)	6(17.6)	
	Business	7(20)	7(20.6)	
	Labor	4(11.4)	3(8.8)	
	Farmer	4(11.4)	2(5.9)	
	Driver	1(2.9)	1(2.9)	
Smoking history	**Non-smoker**	24(68.6)	18(52.9)	1.77(0.14)
	Smoker	11(31.4)	16(47.1)	
Alcohol use	**No**	28(80)	23(67.6)	2.08(0.35)

	Occasionally	3(8.6)	7(20.6)	
	Yes	4(11.4)	4(11.8)	
Sleeping hour	**<6hours**	9(25.7)	7(20.6)	0.25(0.88)
	6-8 hours	25(71.4)	26(76.5)	
	>8 hours	1(2.9)	1(2.9)	

χ^2 Chi square test, *P<0.05

In the interventionand control groups, the participants were57.7 ± 6.9 years and 57.1 ± 6.4 years, respectively.More than 70% of patients (77.10% in the control group and 76.50% in the intervention group) were male (Table 1). Most of the intervention group (52.9%) had no family history of hypertension. In the intervention group, around 53% of participants did not smoke, 68% did not drink, and 76% slept six to eight hours per day regularly. About 37.1% in the control group were primarily educated, and 37.1% had an education till matriculation. In the parallel group, around 65.7% had a family history of hypertension, 68.6% were nonsmokers, 80% were non-alcoholic, and 71.4% had routine sleep hours of 6-8.

Resilience levels in the intervention group are comparable at baseline (Figure 2) and six weeks post-intervention (20.6%). Both before and after the intervention, 79.4% of the patients in the intervention group had low resilience.However, in the control group, 20% of the participants had normal resilience, and 80% had a low level of resilience at baseline record. After 6 weeks, the level of resilience converted to 40%, who had a normal level of resilience, and 60% had a low level of resilience.

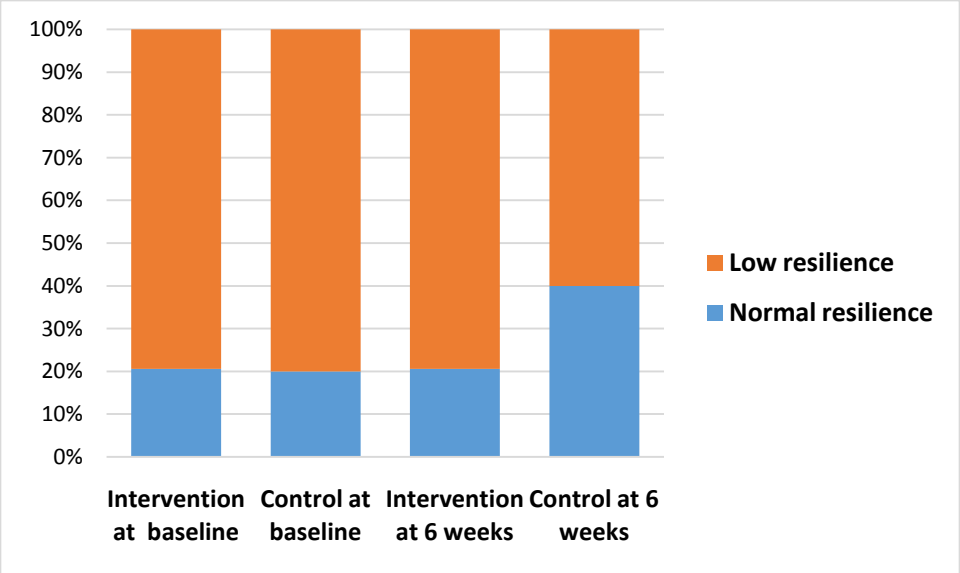

Figure 2: Distribution of participants based on the resilience level at baseline and at 6 weeks after the intervention

Table2:Comparison of Emotional regulation and resilience before and after the intervention

n_1=35, n_2=34

Variable		Pre-assessment Mean± SD	Post-Assessment Mean± SD	t	P
Emotional Regulation-Cognitive Reappraisal	**Intervention**	24.7± 5.9	21.7± 5.9	8.68	<0.001*
	Control	26.4± 6.6	26.8± 5.8	-0.62	0.53
Emotional Regulation-Expressive Suppression	**Intervention**	18.1± 4.5	15.5± 4.6	5.97	<0.001*
	Control	15.1± 5.5	16.3± 5.5	-1.9	0.06
Resilience	**Intervention**	2.5± 0.5	2.4± 0.6	1.59	0.12
	Control	2.4± 0.4	2.5± 0.9	-0.70	0.49

Paired t value, *P<0.05

There is a significant change (<0.05) in the emotional control (Cognitive reappraisal) before and after the intervention in the intervention group. However, there is a non-significant change (>0.05) in Emotional regulation (emotional suppression) and resilience (Table 2) in both the interventionand control groups.

Table 3: Comparison of Emotional control and resilience between intervention and control group

n_1=35, n_2=34

Variable	Pre-test t (P)	Post-test t (P)
Emotional Regulation-Cognitive Reappraisal	1.12(0.26)	3.64(0.001)*
Emotional Regulation-Expressive Suppression	-2.43(0.02) *	0.63(0.53)
Resilience	-0.82(0.41)	0.65(0.52)

Independent t-test value, *P<0.05

The comparison of emotional regulation and resilience between the intervention and control group showed that emotional control (cognitive reappraisal) had a significant difference (<0.05) at the post-test and Emotional Regulation (Expressive Suppression) had (Table 3) a significant difference (<0.05) at the pretest.

Table 4: Relationship between resilience and emotional control in intervention and control group

n_1=35, n_2=34

Variables	**Intervention r(P)**	**Control r(P)**
Resilience and emotional regulation- Cognitive Reappraisal	0.42(0.01) *	0.12(0.48)
Resilience and Emotional Regulation- Expressive Suppression	-0.07(0.68)	-0.05(0.76)

r = Karl Pearson correlation coefficient, *P<0.05

The resilience and emotional control-cognitive Reappraisal shows anaverage positiverelation (r=0.42, P= 0.01) in the intervention group (Table 4) and a weak relation in the parallel group (r=0.12, P=0.48). There is a negative relation between resilience and emotional regulation-expressive suppression.

Discussion

Participants in the intervention and control groups were aged 57.7 ± 6.9 years and 57.1 ± 6.4 years, respectively.70% of the study samples were men in two groups. Almost 20.6% of the samples in the study group had a normal level, and 79.4% had a low level of resilience at baseline evaluation. A cross-sectional study conducted among Jordanian coronary heart disease patients showed moderate resilience [13] and similar resilience with a mean value of 65.5 ± 1.58 among the coronary patients in Iran [14]. However,the ischemic cardiomyopathy group patients are highly resilient[15].

The mean value of emotional regulation-cognitive reappraisal at baseline in this study was 24.7± 5.9 in the intervention group and 26.4± 6.6 in the control group. The mean of suppression, which expresses emotion regulation, was 18.1 ± 4.5 in the intervention group and 15.1 ± 5.5 in the control group at baseline. In a case-control study, the emotional regulation-cognitive reappraisal among cardiac patients was less than that of the controls in positive reappraisal and refocusing[16]. A similar study finding was found among the patients with coronary heart disease that they had more frequent episodes of maladaptive emotional regulation and less frequent adaptive emotional regulation [17].

The present study revealed that nurse-led lifestyle adaptation training improvesemotional regulation statistically significantly. However, resilience did not reveal a statistically significant augmentation among the patients after the intervention. A significant moderate relation exists between emotional regulation – cognitive reappraisal and resilience.In a quasi-intervention study, the researcher compared the effects of two different relaxation techniques (relaxation and prayer), and the result showed that relaxation techniques significantly influence the reduction of anxiety[18]. Yoga practice significantly improves emotional regulation among adolescent girls [19]. A recent systematic review showed a significant effect of nonpharmacological therapy on improving sleep quality among patients with coronary artery disease. [20] Patients with recent myocardial infarction after the percutaneous intervention show a significant (P<0.01) negative relation with psychological resilience, depression (r=-0.83), stress (r=-0.87), and anxiety (r= -0.81)[7].

The present study is limited to a single follow-up visit after the intervention and limited to a single-center study. The primaryrecommendation for further study is that a multicentric study be conducted to determine the effect of nurse-led training programs on improving patients' emotional well-being with coronary artery disease and can be incorporated into their daily treatment plan.

Conclusion

Globally, coronary artery disease has become a major chronic health issue and leads to an increase in the incidence of mortality and morbidity. Resilience and good emotional regulationallow the patients to maintain a healthy life, face problems, and adhere to modified lifestyle practices. The present study reveals that the nurse-led combined training program is effective among patients with coronary artery disease in improving their emotional regulation and making them more resilient. Coronary artery disease patients need better emotional control and should adhere to their modified lifestyle practices. So, they need a lifelong emotional regulation practice and resilience to cope with their modified life practice. This program can be incorporated into the coronary intensive care units along with cardiac rehabilitation and reduce the patients' recurrent unfavorable events.

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Reference

1. Luque B, Castillo-Mayén R, Cuadrado E, Gutiérrez-Domingo T, Rubio SJ, Arenas A, et al. The Role of Emotional Regulation and Affective Balance on Health Perception in Cardiovascular Disease Patients According to Sex Differences. Journal of Clinical Medicine. 2020; 9(10):3165. https://doi.org/10.3390/jcm9103165

2. Al Afik, Nursalam NA. Sufyanti Y, Fikriana R. Effect of Nurse-led Program in Coronary Heart Diseases Patients: A Systematic Review. Macedonian Journal of Medical Sciences. 2022; 9(T5):109-114.

3. WHO. World Health Organization; Geneva: 2016. Global Health Estimates 2015: Deaths by Cause, Age, Sex, by Country and by Region, 2000–2015.

4. Krishnan, M.N., Zachariah, G., Venugopal, K. et al. Prevalence of coronary artery disease and its risk factors in Kerala, South India: a community-based cross-sectional study. BMC Cardiovasc Disord. 2016; 16: 12. https://doi.org/10.1186/s12872-016-0189-3

5. Shahjehan RD, Bhutta BS. Coronary Artery Disease. 2023. StatPearls. Treasure Island (FL): StatPearls Publishing. Available from: https://www.ncbi.nlm.nih.gov/books/NBK564304/

6. Arabadjian M, Duberstein ZT, Sperber SH, Kaur K, Kalinowski J, Xia Y, et al. Role of Resilience in the Psychological Recovery of Women With Acute Myocardial Infarction. J Am Heart Assoc. 2023; 12(8):e027092. doi: 10.1161/JAHA.122.027092. Epub 2023 Apr 7. Erratum in: J Am Heart Assoc. 2023 Oct 17;12(20):e027741.

7. Liu N, Liu S, Yu N, Peng Y, Wen Y, Tang J, Kong L. Correlations among Psychological Resilience, Self-Efficacy, and Negative Emotion in Acute Myocardial Infarction Patients after Percutaneous Coronary Intervention. Front Psychiatry. 2018; 9:1. doi: 10.3389/fpsyt.2018.00001.

8. Afik A, Nursalam N, Sufyanti AY, Fikriana R. Effect of Nurse-led Program in Coronary Heart Diseases Patients: A Systematic Review. Open Access Maced J Med Sci. 2022; 9(T5):109-114. https://doi.org/10.3889/
9. Gross JJ, John OP. Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. J Pers Soc Psychol. 2003; 8: 348-362
10. Smith BW, Dalen J, Wiggins K, Tooley E, Christopher P, Bernard J. The brief resilience scale: assessing the ability to bounce back. International journal of behavioral medicine. 2008; 15(3): 194-200
11. Ibrahim A, Koyuncu G, Koyuncu N, Ergun NS, Durmus OC, Karcioglu O. The effect of Benson relaxation method on anxiety in the emergency care. Medicine. 2019; 98:21
12. Neuro-Linguistic Kinesiology Mental Fitness for Professionals. Marion Miller and Wendy Bennett. Published Auckland New Zealand. 2011.
13. M Al Ali N, Al Ramamneh IS. Resilience of patients with coronary heart diseases in Jordan: A cross-sectional study. Int J Nurs Sci. 2021;9(1):86-91. doi: 10.1016/j.ijnss.2021.12.003.
14. Nouri-Saeed A., Salari A., Nouri-Saeed A., Rouhi-Balasi L., Moaddab F. Resilience and the associated factors in patients with coronary artery disease. J Nursing Midwifery Sci. 2015;2(2):23–28. doi: 10.7508/jnms.2015.02.003.
15. de Lemos CM, Moraes DW, Pellanda LC. Resilience in Patients with Ischemic Heart Disease. Arq Bras Cardiol. 2016; 106(2):130-5. doi: 10.5935/abc.20160012.
16. Bahremand M, Alikhani M, Zakiei A, Janjani P, Aghei A. Emotion Risk-Factor in Patients with Cardiac Diseases: The Role of Cognitive Emotion Regulation Strategies, Positive Affect and Negative Affect (A Case-Control Study). Glob J Health Sci. 2015;8(1):173-9. doi: 10.5539/gjhs.v8n1p173.
17. Cheng M, Zhang R, Wang M, Chang M. Relationship between cognitive emotion regulation strategies and coronary heart disease: an empirical examination of heart rate variability and coronary stenosis. Psychol Health. 2022; 37: 230–45.
18. Sadeghimoghaddam S, Alavi M, Mehrabi T, Bankpoor-Fard A. The Effect of Two Methods of Relaxation and Prayer Therapy on Anxiety and Hope in Patients with Coronary Artery Disease: A Quasi-Intervention Study. Iran J Nurs Midwifery Res. 2019; 24(2): 102-107. doi: 10.4103/ijnmr.IJNMR_60_18.
19. Janjhua Y, Chaudhary R, Sharma N, Kumar K. A study on effect of yoga on emotional regulation, self-esteem, and feelings of adolescents. J Family Med Prim Care. 2020; 9(7):3381-3386. doi: 10.4103/jfmpc.
20. Park G, Lee H, Lee DE. Non-pharmacological interventions for improving sleep outcomes among patients with a diagnosis of coronary artery disease: a systematic review and meta-analysis. Eur J Cardiovasc Nurs. 2024;23(1):1-10. doi: 10.1093/eurjcn/zvad039.