

Research Paper

The Effectiveness of Health-promoting Lifestyle Training on Health-related Hardiness and Hope in Patients With Cardiovascular Diseases



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ABSTRACT

Background: In addition to physical problems, patients with cardiovascular diseases face psychological problems that reduce their control over the disease. The present study aimed to investigate the effectiveness of health-promoting lifestyle (HPL) training on health-related hardiness and hope of patients with cardiovascular diseases in Ahvaz, Iran.

Methods: This was a quasi-experiment study with a pre-test-post-test control group design. The statistical population included all patients with cardiovascular disease who were referred to Golestan Educational and Therapeutic Hospital affiliated with the Ahvaz Jundishapur University of Medical Sciences, Iran, in the winter of 2021-2022. The research sample included 40 participants who were selected after examining the inclusion criteria of the research through convenience sampling. The subjects were randomly assigned into the experimental and control groups (n=20). The experimental group underwent eight 90-minute sessions of HPL training. During this time, the control group received no training. The research instruments included the demographic information form, the Revised Health Hardiness Inventory (RHHI-24), and the Adult Hope Scale (AHS). The data were analyzed using the multivariable analysis of covariance (MANCOVA) by SPSS software, version 19 at a significance level of 0.05.

Results: The Mean±SD of the post-test scores of health-related hardiness and hope in the experimental group were 54.45±6.68 and 23.40±3.63, respectively, which was significantly different from the pre-test scores (P<0.001). The experimental and control group had a significant difference regarding health-related hardiness and hope (P<0.001).

Conclusion: Health specialists are recommended to utilize HPL training together with other training methods to improve health-related hardiness and hope of patients with cardiovascular diseases.

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Highlights

- Patients with cardiovascular diseases may experience emotional problems that lead to despair and a lack of control over their health status.
- Hope and health-related hardiness are believed to increase one's resistance to illness.
- Health-promoting lifestyle training improved health-related hardiness in cardiovascular patients.
- Health-promoting lifestyle training increased hope in cardiovascular patients.

Plain Language Summary

Patients with cardiovascular diseases may face emotional problems. Therefore, appropriate therapeutic and educational methods are required to enable them to deal with these problems. In this study, the effectiveness of health-promoting lifestyle training on health-related hardiness and hope in cardiovascular patients was investigated. The results showed that health-promoting lifestyle training is effective in improving hope and health-related hardiness in these patients. Health specialists and therapists can employ the method of health-promoting lifestyle training together with other training methods to improve health-related hardiness and hope in patients with cardiovascular diseases.

1. Introduction

Nowadays, substantial social and industrial development has increased the morbidity rate of chronic diseases (Patel et al., 2020). These diseases cause numerous problems concerning physical and mental health. Cardiovascular disease as a chronic and prevalent disorder has a high mortality rate and causes defects and constraints in life over time (Wang et al., 2021; Jafari-Diziche et al., 2021). As a chronic and progressive disease, cardiovascular disease is a class of diseases that involve the heart or blood vessels (Thiriet, 2019). Cardiovascular diseases are among the most important causes of death in the world. It is estimated that 17.9 million people in the world die every year due to cardiovascular diseases, which constitutes 32% of all deaths (World Health Organization, 2022). According to available statistics, 45.45% of all annual deaths in Iran are related to cardiovascular diseases (Alipour et al., 2021). In addition to spending exorbitant costs, pharmacotherapy and following long-term diets are required to manage this disease (Imran et al., 2019).

The most important cause of the cardiovascular disease is arteriosclerosis. Chest pain, shortness of breath, and swelling or edema are the most important symptoms of cardiovascular diseases (Barnett et al., 2017). Cardiovascular diseases, in addition to physical problems, also bring a series of psychological discomforts to the patient (Dar et al., 2019). One of the main problems that patients with cardiovascular diseases encounter is the lack of psychological hardiness (Bartone, et al., 2016). Hardiness is a personal-

ity trait, which operates as a source to enable coping with stressful and challenging events (Dymecka et al., 2020). It is just like a hard structure and constitutes three components, i.e., commitment, control, and challenge. Individuals with high levels of health-related hardiness utilize the above-mentioned three components to adjust to problems caused by a disease (Xu et al., 2019). Health hardiness or health-related hardiness demonstrates the level of commitment of an individual to engage in health-oriented activities, be capable of managing health, and perceive stressful events as an opportunity to grow (Gebhardt et al., 2001). Individuals with high levels of health-related hardiness enjoy a more optimistic view of life and utilize appropriate coping strategies to cope with health-related challenges. In addition, they have a more desirable quality of life and health, consider themselves to be more capable of managing health-related challenges, and devote their maximum energy to dealing with stressful situations (Ercis, 2018).

Another problem that patients with cardiovascular diseases face is a decrease in hope, which is the dynamic driving force of life that boosts the ability to pursue goals and routine activities in life (Mehta et al., 2020; Chesney et al., 2021). Hope is a process, due to which individuals set their goals, discover or create strategies to accomplish them, generate motivation to execute the strategies, and maintain their motivations in the course of implementing the strategies (Jayatilleke et al., 2017). This structure promotes health and positive thinking regarding the future, enhances tolerance concerning problems and distresses, controls and manages emotions and challenges, and improves hardiness and resilience (Kessing et al., 2021).

Health-promoting lifestyle (HPL) training is a sustained effort toward individual and social empowerment regarding preserving and promoting health through responsibility regarding health, physical activity, nutrition, spiritual growth, interpersonal relationships, and stress management (Gladback & Oprinovich, 2021; Saadati et al., 2019). Modifying the lifestyle is the foundation of health management programs and can pave the ground for the improvement of the quality of life and health of individuals (Chen Zhang & Fu 2018). A healthy lifestyle is an invaluable source to promote health, adjust to stressful factors in life, and reduce the prevalence of problems related to risky behaviors, such as smoking, lack of physical mobility, etc. (Barmak et al., 2021). The HPL is a multidimensional training method, which is a beneficial source to reduce stressful factors in life. In addition, it has a considerable impact on reducing health expenses and increasing hope (Xue et al., 2021).

Very few studies have been conducted regarding the effectiveness of HPL training, especially on health-related hardiness and hope. Kazemi Rezaei, et al. (2019) concluded that lifestyle interventions improve the health-related quality of life and its dimensions including physical performance, physical health, emotional problems, energy, emotional well-being, social performance, and general health in patients with type 2 diabetes. In their research on middle-aged people, Jung-In et al. reported that self-efficacy, health-related hardiness, and HPL had a positive and significant correlation (Jung-In, et al., 2007) Homaei and Pooyanmehr (2017) concluded that HPL had a positive and significant relationship with hope for life in the elderly. Meri and Ghodsi (2017) reported that lifestyle has a positive and significant relationship with hope for life in multiple sclerosis (MS) patients.

Very few studies have been carried out regarding the effectiveness of HPL training, especially in health-related hardiness and hope. No studies were found in this field on patients with cardiovascular diseases; accordingly, and also, considering the importance of these variables in improving the health of patients with chronic diseases, this study was conducted with the aim of investigating the effectiveness of HPL education on the health-related hardiness and hope of patients with cardiovascular diseases.

2. Materials and Methods

Design, setting, and sample

It was a quasi-experiment study with a pre-test-post-test control group design. The statistical population consisted of all patients with cardiovascular diseases who were referred to Golestan educational-therapeutic hospital affiliated with

the Ahvaz Jundishapur University of Medical Sciences, Iran, in the winter of 2021-2022.

The sample size was determined based on G-Power software ($\alpha=0.05$ and test power=0.90) and included 40 subjects who were selected by convenience sampling considering the inclusion criteria. The subjects were allocated to the experimental ($n=20$) and control groups ($n=20$).

The inclusion criteria were suffering from cardiovascular diseases, the age range of 40 to 60 years, having at least a high school diploma, having no addiction, no use of psychiatric drugs, attending no concurrent training or other treatment methods, and not receiving psychological services in the last three months. The exclusion criteria consisted of unwillingness to continue the study and being absent for more than two sessions.

Procedure

Permission to conduct the study was obtained from the hospital authorities. Sampling was done from December 26, 2021, to January 30, 2022, to obtain the required sample size. After random allocation, the experimental group underwent eight 90-minute sessions of HPL training. During this time, the control group received no training. The intervention in the experimental group was performed as group training by a health psychologist, holding certificates for training HPL in one of the psychological services clinics in Ahvaz city. Both groups responded to research tools during the pre-test and post-test stages. No attrition occurred in the samples of either group.

Research tools

Demographic information form

This questionnaire included questions about gender, age, education level, and duration of cardiovascular diseases.

The revised health hardiness inventory (RHII-24)

The revised health hardiness inventory was designed by Gebhardt et al. (2001) to measure health-related hardiness. It consists of 24 items and four stable and reliable scales, including (1) health value, (2) internal health locus of control, (3) external health locus of control, and (4) perceived health competence. The items are scored on a 5-point Likert scale ranging from totally disagree=1 to totally agree=5. Eleven items (i.e., items 12 to 22) are scored in reverse and the total score ranges from 24-

120. Higher scores indicate higher health-related hardiness (total score was used in this study). In the study by Gebhardt et al. (2001), the convergent validity of the RHHI-24 was confirmed and the Cronbach's alpha of the tool was reported as 0.79. In the present study, the translated version of this inventory by Dasht Bozorgi and Shamshirgaran (2018) was used. The reliability of the Persian version of this inventory was reported as 89 using Cronbach's alpha (Dasht Bozorgi & Shamshirgaran, 2018).

The adult hope scale (AHS)

The AHS was used to measure hope in the participants. The AHS was designed by Snyder et al. (1991) and includes 12 items. This scale includes two subscales of agency thinking (goal-directed energy; items 2, 9, 10, and 12) and pathway thinking (planning to meet goals; items 1, 4, 6, and 8). In this inventory, four items are fillers (items 3, 5, 6, and 11), and are not included in the final scoring. Other items are scored on an 8-point Likert scale ranging from definitely false to definitely true. The total score will be calculated on the basis of the total score of items. Thus, the minimum score is eight and the maximum score is 64. A higher score is indicative of higher hope. Snyder et al. (1991) confirmed the validity of the scale, and also reported its reliability equal to 0.70 using Cronbach's alpha. The validity of the Persian version of this scale was confirmed by Vakili et al. (2022). The authors reported the reliability of this questionnaire equal to 0.75 based on Cronbach's alpha coefficient (Vakili et al., 2022)

Intervention

For HPL training, the cognitive-behavioral procedure by Zeraatkar et al. (2016), which is designed for eight 90-minute sessions (one session a week) was utilized. The core of this intervention is based on motivation and self-efficacy. Also, in this intervention, programs for healthy behavior and social support are provided. The intervention was performed as group training by a health psychologist, a nutritionist, a physical education expert, and a cardiology assistant upon observing the health protocols regarding COVID-19. Motivational videos and slides were used in the training sessions and in each session, assignments were given to the subjects to better understand the material. Table 1 shows the most crucial content of the HPL training method separated per session. One month after the last training session, a post-test was administered to the subjects.

Statistical analysis

In this research, descriptive statistics, including mean and standard deviation were used for data analysis. The Chi-square test and t-test were used to compare the demographic characteristics of the subjects in the experimental and control groups. Moreover, the data were analyzed using the multivariate analysis of covariance (MANCOVA) by SPSS software, version 19. The Kolmogorov-Smirnov test, Shapiro-Wilk test, Levene's test, and Box's M test were used to check the assumptions of the MANCOVA. The significance level was set at $P \leq 0.05$.

Table 1. Content of HPL training separated per session (adapted from Zeraatkar et al., 2016)

Sessions	Contents
1 st	Introducing the intervention, introducing the participants to each other to establish a relationship between the members, and explaining the necessity of having an HPL.
2 nd	Training and understanding lifestyle and its components, explaining factors affecting lifestyle, training self-management
3 rd	Training the impact of nutrition on health with the cooperation of a nutritionist, introducing the food pyramid, training regarding calories in food and its impact on health, describing meals and mid-day snacks
4 th	Training exercises influential on health with the cooperation of a physical education expert, explaining the importance of sports in preventing various diseases and even treatment of diseases
5 th	Introducing the role of adequate sleep and rest in health and explaining correct patterns of sleep hygiene
6 th	Training relaxation, concentration, and positive imagery for recovery
7 th	Training time management, the impact of praying on life pressures, the role of humor on social relations and its impact on health, describing and training how to employ coping strategies
8 th	Reviewing previous sessions, examining the constructive changes that occurred in the course of the training program, training how to stabilize the learned subject matters, and how to use them in life

3. Results

Table 2 shows the demographic characteristics of the subjects in experimental and control groups. The results showed no significant difference in terms of sex, education, age, and duration of suffering from cardiovascular diseases ($P>0.05$).

Table 3 provided the pre-test and post-test scores of health-related hardiness and hope of patients with cardiovascular diseases, according to their groups. Compared to the pre-test results, the mean scores of post-test of health-related hardiness and hope of the subjects in the experimental group increased in comparison to the control group.

The assumptions of normality based on the Kolmogorov-Smirnov and Shapiro-Wilk tests, homogeneity of variances based on Levene's test, variance convergence based on Box's M test, and homogeneity of regression slope based on the interactive effect of the independent variable and the pre-test were not rejected ($P>0.05$). Therefore, the conditions to use MANCOVA were met. Table 4 shows the results of multivariable tests to determine the effectiveness of HPL training on health-related hardiness and hope of the subjects. The HPL training method at least caused a significant change in one of the health-related hardiness and hope variables in the subjects. Taking into

account the effect size, 94% of the changes were caused by the intervention method, i.e., HPL training ($P<0.001$).

Table 5 shows the results of the analysis of covariance (ANCOVA) to determine the effectiveness of HPL training on health-related hardiness and hope. HPL training caused a significant change in both health-related hardiness and hope variables. Taking into account the mean scores, the aforesaid intervention method increased the health-related hardiness and hope in the experimental group ($P<0.001$).

4. Discussion

This study aimed to investigate the effectiveness of HPL training on health-related hardiness and hope of patients with cardiovascular diseases in Ahvaz (Iran). The findings suggested that HPL training boosted the subjects' health-related hardiness and hope. Even though no studies were found regarding the effectiveness of HPL training on health-related hardiness, the aforesaid finding is congruent with the findings of a study by Kumari et al. (2018) on the impact of lifestyle on improving the health-related quality of life and its dimensions, including physical and general health in patients with type 2 diabetes. In addition, our result is in line with the results of research by Jung-In et al. (2007), which argued that self-efficacy, health-related hardiness, and HPL had a positive and significant correlation in middle-aged individuals.

Table 2. Demographic characteristics of the subjects

Groups	Mean±SD		No. (%)			
			Education		Gender	
	Age (y)	Duration of Disease (y)	High school Education	College Education	Female	Male
Experimental	52.77±8.42	8.36±2.39	5(25)	15(75)	11 (55)	9 (45)
Control	54.21±6.37	7.68±3.12	5(25)	15(75)	10 (50)	10 (50)
P	0.545	0.443	0.999		0.754	

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Table 3. The mean scores of health-related hardiness and hope in the pre-test and post-test stages in both groups

Variables	Groups	Mean±SD	
		Pre-test	Post-test
Health-related hardiness	Experimental	47.30±7.21	54.45±6.68
	Control	46.20±8.62	45.60±8.70
Hope	Experimental	18.20±3.42	23.40±3.63
	Control	17.70±3.94	17.55±3.60

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Table 4. Results of MANCOVA concerning the scores of research variables in the experimental and control groups

Variables	Values	df	Error df	F	P	η^2	Power
Pillai's Trace	0.94	2	35	292.52	0.001	0.94	1.00
Wilks Lambda	0.05	2	35	292.52	0.001	0.94	1.00
Hottelling's Trace	16.71	2	35	292.52	0.001	0.94	1.00
Roy's Largest Root	196.71	2	35	292.52	0.001	0.94	1.00

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HPL training seems to lead to maintaining responsibility for physical, emotional, social, and psychological health. In addition, it shapes and improves health-oriented behaviors and habits that play an important role in improving life satisfaction and resistance to physical and mental disorders. When people learn and practice the positive effects of healthy behaviors during the HPL intervention, they understand their role in creating happiness. In other words, this intervention provides the context for performing health-promoting behaviors (Chen, Zhang & Fu, 2018). Lifestyle modification is one of the pillars of health management programs, providing the opportunity to promote health and quality of life. Therefore, by involving patients with cardiovascular diseases in self-care behaviors, HPL is expected to play an effective role in boosting health-related hardiness in patients with cardiovascular diseases.

Also, HPL training increased hope in patients with cardiovascular diseases. This finding corresponds to the research by Homaei and Pooyanmehr (2017) indicating the positive and significant relationship between HPL and hope for life in the elderly. It is also in line with the study by Meri and Ghodsi (2017) on the positive and significant relationship between lifestyle and hope in patients with MS. It can be claimed that HPL through improving life, learning self-management, understanding the role of nutrition and exercise in the prevention and

treatment of diseases, understanding the role of adequate sleep and rest in health, teaching meditation and positive imagery, and understanding the role of praying in reducing life stress improves the health of cardiovascular patients and increases their hope.

Among the limitations of this study we can point to not using valid methods of sample allocation, not investigating the durability of HPL training, and limiting the research environment to Golestan Educational and Therapeutic Hospital affiliated with the Jundishapur University of Medical Sciences in Ahvaz. Therefore, generalizing the results to other communities should be done with caution. It is suggested to conduct similar studies on larger samples and other vulnerable groups like people with diabetes.

5. Conclusion

The results of this study indicated the effectiveness of HPL training in improving health-related hardiness and increasing hope in cardiovascular patients. Health officials can use the results of this study to design educational and treatment policies for cardiovascular patients. Also, health professionals and therapists can use HPL training in combination with other training methods to improve health-related hardiness and hope in patients with cardiovascular disease.

Table 5. Results of ANCOVA to determine the effectiveness of HPL training on the research variables

Variables	Source	SS	df	MS	F	P	η^2
Health-related hardiness	Pre-test	1893.61	1	1893.61	1774.10	<0.001	0.97
	Group	602.24	1	602.24	373.41	<0.001	0.92
	Error	58.06	36	1.61			
Hope	Pre-test	390.01	1	390.01	437.52	<0.001	0.92
	Group	286.35	1	286.35	321.24	<0.001	0.89
	Error	32.09	36	0.89			

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Ethical Considerations

Compliance with ethical guidelines

The study was approved by the Ethical Committee of Islamic Azad University, Ahvaz Branch (Code: IR.IAU.AHVAZ.REC.1401.035). The importance and objectives of the research were explained to the subjects and they were assured about the confidentiality of their information. Signed informed consent was obtained from all subjects.

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Authors' contributions

Conceptualization and supervision: Zahra Dasht Bozorgi and Marjan Alizadeh; Data collection: Mitra Hasanehzadeh Kiani; Data analysis: Zahra Dasht Bozorgi and Marjan Alizadeh; Writing-original draft and Writing-review & editing: Mitra Hasanehzadeh Kiani and Zahra Dasht Bozorgi; Final approval: All authors.

Conflict of interest

The authors declared no conflict of interest.

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