

Relationship between Resilience and Quality of Life in Cardiovascular Patients with the Mediating Role of Lifestyle

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Abstract

Introduction: Cardiovascular disease, as a chronic and debilitating physical condition, is one of the most common causes of mortality. This study aimed to investigate the mediating role of lifestyle in the relationship between resilience and quality of life in cardiovascular patients.

Method: The present study was a descriptive-correlational and structural equation. The statistical population of the present study includes all cardiovascular patients referring to cardiovascular hospitals in Tehran in 2019, of which 303 people were selected as the sample by the purposive sampling method. Data collection tools included the quality of life, health-promoting lifestyle profile, and Connor Davidson resilience scale.

Results: The results showed there is a significant positive relationship between lifestyle with quality of life in patients with heart disease. Resilience had a positive relationship with quality of life. Lifestyle also played a mediating role in resilience to quality of life ($P < 0.01$).

Conclusion: Based on this, in the field of designing the necessary measures to improve the quality of life in cardiovascular patients, it is possible to develop programs to strengthen resilience and a healthy lifestyle.

Declaration of Interest: None

Keywords: Cardiovascular disease, Resilience, Lifestyle, Quality of life.

Introduction

Cardiovascular diseases, like chronic diseases, are one of the most common causes of death and account for a significant proportion of disability and premature death (1, 2). People with cardiovascular disease report low levels of quality of life due to physical, mental, and social distress (3, 4). Quality of life is a broad and complex concept that is characterized by various aspects of physical, psychological, personal independence, social relationships, personal beliefs, and environmental factors (5). Some researchers consider the quality of life as an experience of material and psychological well-being in life (6) and others define the quality of life as the comprehensive satisfaction of people with life (7). Studies show that quality of life is lower in patients with heart failure than in the general population and other chronic patients (4). Different aspects of the life of heart patients, including physical, psychological, emotional, familial, and social, are affected by the disease (8, 9) and these deficiencies limit the quality of life by restricting individual and social activities (8). Accordingly, it is necessary to identify the factors that can help compensate for the poor quality of life in heart patients. Resilience is one of the variables that seem to be involved in increasing the quality of life. Psychologists believe that resilience is the main factor that causes patients with similar situations to have different perceptions of their quality of life (10).

Resilience is defined as the process of effectively negotiating, adapting to, or managing significant sources of stress or trauma (10). Assets and resources within the individual, their life and environment

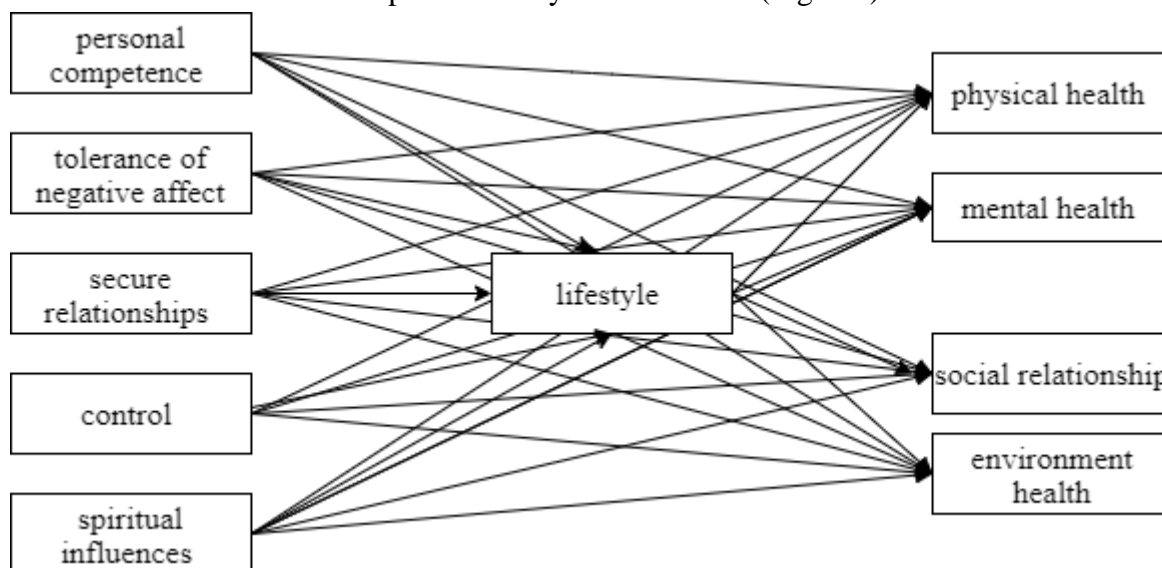
facilitate this capacity for adaptation and bouncing back in the face of adversity (11). Resilient people are aware of situations, their emotional reactions, and the behavior of those around them (12). To manage feelings, it is essential to understand what is causing them and why. By remaining aware, resilient people can maintain control of a situation and think of new ways to tackle problems. The capacity of resilience helps individuals to take a balanced approach in the case of both positive and negative events; and when coupled with optimism, it helps them to overcome the most traumatic developmental events in some cases (13). Thus, resilience plays an important role in maintaining psychological well-being and quality of life in stressful situations by increasing successful resistance to threatening and challenging situations (14, 15, 16, 17). In the meantime, it seems that lifestyle can play a mediating role in the relationship between resilience and quality of life in cardiovascular patients.

A lifestyle is a way of living that could be considered either healthy or unhealthy depending on personal behavioral choices. According to Walker et al. (18), health-promoting lifestyle has been defined as a multidimensional pattern of self-initiated actions and perceptions that serve to maintain or enhance the level of wellness, self-actualization, and fulfillment of the individual. Health-promoting behaviors include health responsibility, physical activity, nutrition, spiritual growth, interpersonal relations, and stress management (19). A health-promoting lifestyle is an important determinant of health status and is recognized as a major factor for the maintenance and improvement of health (20). Modifiable health behaviors such as eating habits,

physical activity, and smoking are major factors in the development of chronic diseases. The results of various studies indicate that 80% of heart diseases can be directly attributed to risk factors such as high blood pressure, obesity, diabetes, and smoking, which can be changed through lifestyle changes (21). The findings of some studies suggest that lifestyle improvements can lead to increased quality of life (22, 23, 24) and on the other hand, resilience is associated with improved lifestyle (11, 13).

Cardiovascular disease is a chronic condition that often affects a person's daily

activities. After being diagnosed with this chronic disease, the person faces challenging conditions that require them to maintain optimal quality of life by using mental and behavioral capacities such as resilience and a healthy lifestyle. Strengthening one's resilience seems to facilitate the path to lifestyle modification, which in turn can help increase the quality of life. Accordingly, in this study, the researcher intends to investigate the mediating role of lifestyle in the relationship between resilience and quality of life in patients with cardiovascular disease (Figure1).



The model of the mediating role of lifestyle in relationship resilience and quality of life

Figure 1

Method

This cross-sectional study included 303 patients with CVD patients referred to educational and medical centers affiliated to Tehran University of Medical Sciences in 2019. According to the patient's medical record and the diagnosis of a cardiologist and echocardiogram, CVD was diagnosed for these people. To select the sample, a purposeful sampling method based on inclusion and exclusion criteria was used.

The inclusion criteria were suffering from CVD, passing at least 2 months since the diagnosis of the disease. The exclusion criteria were: having medical procedures or conditions that make the participants ineligible for the study, a history of acute psychiatric disorders (such as psychotic, bipolar and major depressive disorders, neurological disorders), Suffering from other medical severe illnesses except for CVD such as cancer, and unwillingness to continue research.

Instruments:

Connor Davidson Resilience Scale (CD-RISC): The CD-RISC contains 25 items, all of which carry a 5-point range of responses, as follows: not true at all (0), rarely true (1), sometimes true (2), often true (3), and true nearly all of the time (4) (25). The scale is rated based on how the subject has felt over the past month. The total score ranges from 0–100, with higher scores reflecting greater resilience. The subscales or factors of the scales included: personal competence, tolerance of negative affect, secure relationships, control, and spiritual influences. Alpha reliability was observed as for personal competence, $\alpha=0.80$, tolerance of negative affect, $\alpha=0.75$, secure relationships, $\alpha=0.74$, spiritual influences, $\alpha=0.69$, and overall $\alpha=0.89$ in a study. Also, the face and content validity of this questionnaire was confirmed (25). A study in Iran showed that maximum likelihood method with an oblique solution resulted in four factors, and all estimates of reliability ($\alpha=0.89$ and test-retest= 0.74) coefficients were sufficiently high (11).

Health- Promoting Lifestyle Profile (HPLP): HPLP questionnaire was developed by Walker et al (18). The HPLP tool consists of 52 health-promoting behavior items that are categorized into six subscales: health responsibility (nine items), spiritual growth (nine items), physical activity (eight items), interpersonal relationships (nine items), nutrition (nine items), and stress management (eight items). A Likert-type scale was used to measure each behavior, with ranges of never (1), sometimes (2), frequently (3), and regularly (4). The total score of the HPLP ranges from 52 to 208 and is measured by the mean score of the responses to all 52 HPLP items. The total

HPLP score is further classified into four levels: poor for the range 52–90, moderate for the range 91–129, good for the range 130–168, and excellent for the range 169–208. High scores in every subscale mean more frequent health-promoting behaviors. The overall scale of the original version of the HPLP II reported a Cronbach's alpha of 0.94, and for the six subscales, it ranged from 0.79 to 0.87 (18). A study in the Iranian Elderly showed that the CVI for the revised HPLP and all its subscales was higher than 0.82. Pearson correlation coefficients between the revised HPLP and their items were in range of 0.27–0.65. Cronbach's alpha of the revised HPLP was obtained as 0.78 and for their subscales were in the range of 0.67–0.84 (5).

The World Health Organization Quality of Life (WHOQOL): The World Health Organization (WHO) initiated a cross-cultural project to develop the standard 100-item World Health Organization Quality of Life instrument (WHOQOL-100) in 1991 (26). Then, the WHOQOL research group simplified the WHOQOL-100 into a brief version called the WHOQOL-BREF [15]. The WHOQOL-BREF includes 2 general items and 24 items that represent 24 specific facets of the WHOQOL-100. The 24 items are categorized into four domains: physical, psychological, social relationships, and environmental. Each facet is scored from 1 to 5 points, with a higher score indicating a better QOL. Each domain score ranges from 4 to 20 and is calculated by multiplying the average score of all facets of the respective domain by 4. The internal consistency (Cronbach's α) coefficients ranged from 0.70 to 0.77 for the four domains. A study showed that the test-retest reliability coefficients with intervals of 2 to 4 weeks ranged from 0.41 to 0.79 at

item/facet level and 0.76 to 0.80 at the domain level (all $p < 0.01$). Content validity coefficients were in the range of 0.53 to 0.78 for item–domain correlations and 0.51 to 0.64 for inter-domain correlations (all $p < 0.01$) (27). Evaluate the Iranian version of the WHOQOL show Cronbach's $\alpha = 0.55$). In study, since 83% of the questions show maximum correlation with their original domain, the factorial structure of the questionnaire was regarded as acceptable. Also, the questionnaire has the ability to discriminate different groups after

adjustment for confounding factors in regression analysis (6).

Results

151 (124 women and 179 men, $M = 61.06$ years \pm $SD = 8.13$) cardiovascular patients participated in this study. The mean duration of the disease was 4.19 years \pm 5.11. The results of the correlation coefficients of lifestyle, resilience and quality of life are shown in Table 1.

Table 1. The correlation coefficient among variables

Variable	1	2	3	4	5	6	7	8	9	10
1- Personal competence	1									
2- Tolerance of negative affect	0.34**	1								
3- Secure relationships	0.04	0.66**	1							
4- Control	0.45**	0.16	0.13	1						
5- Spiritual influences	0.47**	0.29**	0.36**	0.52**	1					
6- Physical health	0.51**	0.11	0.48**	0.23**	0.12	1				
7- Psychological health	0.27**	0.63**	0.10	.49**	0.58**	0.33**	1			
8- Social relationship	0.24**	0.06	0.12	0.67**	0.53**	0.21**	0.08	1		
9- Environment health	0.14	0.19*	0.11	0.44**	0.17*	0.05	0.58**	0.10	1	
10- Lifestyle	0.41**	0.67**	0.11	0.04	0.44**	0.47**	0.29**	0.21	0.0	1

Before analyzing the data, the assumptions of the structural equation model were examined. Examining the Z scores of the variables showed that the scores of the 6 subjects had a standard deviation higher or lower than the mean, and therefore the outliers were removed. The Skewness and kurtosis values and the results of the Kolmogorov–Smirnov test also indicated that the distribution of the variables was normal ($P < 0.05$). Structural equation modeling was used to test the mediating role of lifestyle in relationship resilience and quality of life dimensions in cardiovascular patients. Before testing the fitness of the theoretical model,

confirmatory factor analysis was conducted on the variables involved in the model to develop evidence that the indicator variables were measuring the underlying constructs of interest, and that the measurement model demonstrated an acceptable fit to the data. Fit indices for the measurement model are shown in Table 2. Although the chi-square value for the model was significant, ($\chi^2 = 14.27$ with $df = 5$, $p < 0.01$), other fit indices, such as GFI, AGFI, CFI, were all above 0.90, and RMSEA was 0.04, indicating that the model had a good fit to the data. It has been recommended that the model chi-square statistic be used as a goodness of fit

index, with smaller chi-square values indicative of a better model fit. However, the chi-square statistic is very sensitive to sample size and departures from

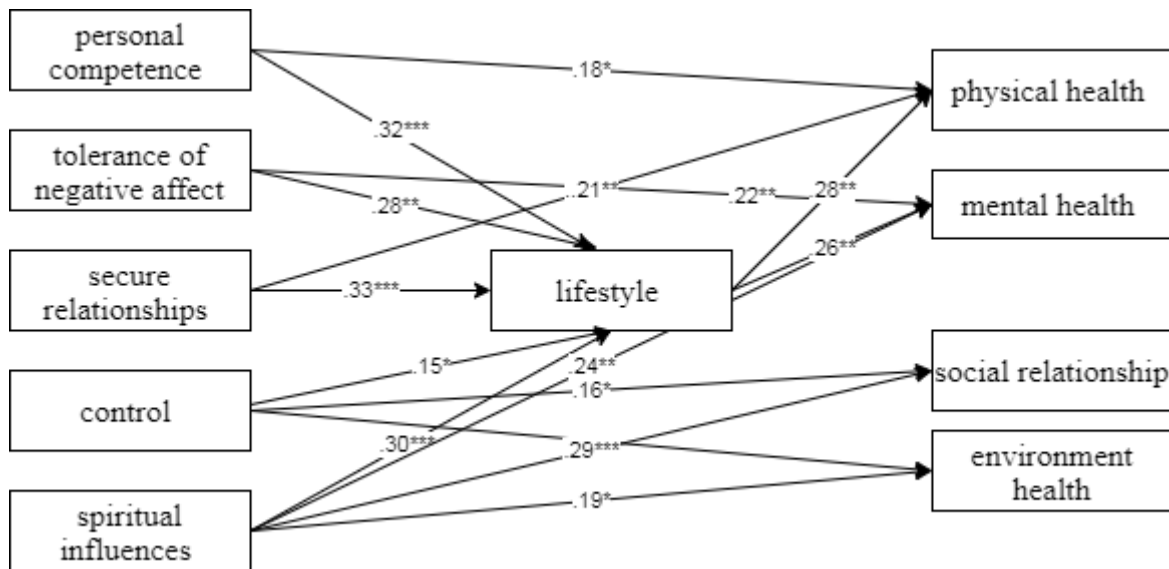
multivariate normality. Thus, additional goodness of fit indices was also used to demonstrate the model fit.

Table2. Fit indices of the model

X ²	df	P	X ² /df	RMSEA	GFI	AGFI	CFI	TLI	IFI	NFI
14.27	5	0<.01	2.85	0.04	0.94	0.91	0.90	0.88	0.93	0.94

In the conceptual model, it is assumed that resilience through lifestyle is related to the dimensions of quality of life. Figure 1 shows the paths for the hypothetical model. In this hypothetical model, because some path coefficients did not make sense,

these paths were removed to better fit the model with the data. Figure 2 shows the pathways of the hypothetical model of the mediating role of lifestyle in relationship resilience with dimensions of quality of life after improvement.



The modified model of the mediating role of lifestyle in relationship resilience and quality of life

Figure 2

Table 3: Standard and non-standard regression coefficients of direct paths of the hypothetical model

Path	B	β	Standard error	Critical ratio	P
Direct effect personal competence on lifestyle	0.77	0.32	0.032	4.12	0.001
Direct effect personal competence on physical health	0.69	0.18	0.041	2.03	0.010
Direct effect tolerance of negative affect on lifestyle	1.27	0.22	0.033	2.38	0.005
Direct effect tolerance of negative affect on mental health	0.84	0.21	0.037	2.16	0.009

Direct effect secure relationships on physical health	0.37	0.16	0.048	1.99	0.050
Direct effect secure relationships on lifestyle	1.45	0.29	0.016	3.34	0.001
Direct effect control on social relationship	1.12	0.24	0.025	2.76	0.003
Direct effect control on lifestyle	0.97	0.19	0.036	2.20	0.006
Direct effect control on environment health	0.73	0.21	0.041	2.19	0.006
Direct effect spiritual influences on mental health	0.94	0.33	0.049	4.49	0.001
Direct effect spiritual influences on environment health	0.54	0.15	0.026	1.97	0.050
Direct effect spiritual influences on social relationship	0.58	0.29	0.044	3.37	0.001
Direct effect spiritual influences on lifestyle	1.07	0.30	0.019	4.31	0.001
Direct effect lifestyle on physical health	1.37	0.34	0.036	4.46	0.007
Direct effect lifestyle on mental health	0.83	0.17	0.044	1.16	0.072

Based on the significance level of 0.05, the critical ratio > 1.96 or < -1.96 indicates a significant difference for regression

weights. Therefore, all of the paths reported in Table 4 are significant at least at 0.05, except direct effect lifestyle on mental health.

Table 4: Standard and non-standard regression coefficients of indirect paths of the hypothetical model

Path	B	β	LLCI	ULCI
Indirect effect personal competence on physical health	0.28	0.13	0.16	0.34
Indirect effect personal competence on mental health	0.32	0.11	0.09	0.44
Indirect effect tolerance of negative affect on physical health	0.27	0.14	-0.24	-0.48
Indirect effect tolerance of negative affect on mental health	0.37	0.17	-0.04	-0.24
Indirect effect secure relationships on physical limitation	0.22	0.12	0.36	0.52
Indirect effect secure relationships on mental health	0.15	0.05	-0.11	0.02
Indirect effect control on physical health	0.17	0.09	-0.09	-0.18
Indirect effect control on mental health	0.39	0.12	-0.73	-0.91
Indirect effect spiritual influences on physical health	0.10	0.05	-0.06	0.14
Indirect effect spiritual influences on mental health	0.13	0.06	-0.18	0.25

To determine the significance of intermediate relationships and the indirect effect of the independent variable on the dependent variables through the mediating variable, the bootstrap method was used, the results of which are shown in Table 4. Evaluation of indirect effects using the bootstrap method shows that except the indirect effect of secure relationships on mental health, the indirect effect of spirituality on physical health, and the

indirect effect of spirituality on mental health, other resilience effects on quality of life are significant. Because the upper limit and the lower limit in them do not include zero, they are mediated by lifestyle; therefore, the indirect relationship between resilience and quality of life is significant through lifestyle.

Discussion

The results showed that lifestyle with quality of life in patients with heart disease had a significant positive relationship. This finding is consistent with the results of studies by Päivärinne et al. (22); Grimmett et al. (23) and Rakhshani et al. (24). The World Health Organization considers a healthy lifestyle as an attempt to achieve complete physical, mental, and social well-being and, consequently, quality of life (24). Health promoting behaviors, including self-initiated actions, behaviors, and health perceptions may have an impact on individual happiness and well-being. Health-promoting behaviors comprise of six-dimensions including health responsibility, physical activity, nutrition, interpersonal relations, spiritual growth, and stress management. (20). Therefore, the choice of lifestyle and related behaviors not only play an essential role in health, but will also have consequences that can affect performance, well-being, and physical, mental, and social health and ultimately their quality of life (21). A healthy lifestyle with a combination of behavioral patterns and individual habits throughout life includes nutrition, mobility, behavioral habits, a valuable resource to reduce the prevalence of health problems, promote health, adapt to life-threatening stressors, and improve quality of life (22). In contrast, poor lifestyle choices, such as smoking, overuse of alcohol, poor diet, lack of physical activity, and inadequate relief of chronic stress are key contributors to the development and progression of preventable chronic diseases, including cardiovascular disease (23).

The results of the present study showed that the components of resilience are positively related to the dimensions of quality of life. This finding is consistent

with the results of previous research (14, 15, 16, 17). Lifestyle also played a mediating role in the relationship between resilience and quality of life. Resilience refers to an individual's capacity to maintain their psychological and physical well-being in the face of adversity (12). In recent years, the role of resilience in the process of chronic disease treatment has been given increasing attention (13). The influence of resilience on mental health status has a chain effect, so mental health status appears to influence resilience, while resilience further affects mental health status (14). Increased opportunities for exposure to adversity and life experience may be an important factor affecting the relationship between trait resilience and mental health (16). Resilience can be viewed as a defense mechanism that enables one to thrive amid distress. Therefore, improving resilience may be an important target for disease treatment and prophylaxis (17). Patients with cardiovascular disease can show high levels of functioning in physical domains of quality of life, but not in others, suggesting that an individual's capacity to adjust and cope will influence their quality of life (16). Resilience is required in response to different adversities, ranging from ongoing daily hassles to major life events. Individual differences in resilience cause patients to have different coping styles and adjustment capacities (14). Therefore, it is necessary to introduce the concept of resilience into studies of the quality of life of cancer patients. Studies have found that resilience can powerfully predict patients' fatigue from treatment, good resilience can help patients reduce treatment-induced damage to bodily functions and shorten the time of bodily function recovery, and patients with good

resilience can treat their disease correctly and maintain a relatively good psychological state, thereby resulting in a better quality of life (15). Quality of life is an indicator of a patient's social, psychological, and physiological status, as well as their well-being (6). In theory, resilience affects the psychological aspect of quality of life, and thus should have a direct effect on quality of life.

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