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# The Effectiveness of Positive Psychology in Improving Resilience Among Patients with Cardiovascular Diseases

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## ABSTRACT

**Objective:** This study aims to investigate the potential of positive psychology interventions (PPIs) to enhance the resilience of CVD patients.

**Methods and Materials:** This quasi-experimental study utilized pre-test and post-test evaluations, a control group, and a one-month follow-up assessment. The sample comprised 50 male patients diagnosed with CVD, purposively selected from the Baghdad Teaching Hospital in 2023. The participants were randomly divided into two groups (25 people in each group). Resilience was measured using the Connor-Davidson Resilience Scale (Connor & Davidson, 2003). For data analysis, repeated measure analysis of variance and Bonferroni post-hoc test were used (SPSS 26 software).

**Findings:** Repeated measures ANOVA indicated a significant time*group interaction effect ($p<0.001$, $\eta^2p=0.65$). The intervention group had significantly higher resilience scores at post-test ($p<0.001$) and follow-up ($p<0.001$) compared to pre-test. At the same time, no significant differences were found across time points for the control group ($p>0.05$). The intervention group showed significantly higher resilience than the control group at post-test ($p<0.001$) and follow-up ($p<0.001$), but not at pre-test ($p>0.05$).

**Conclusion:** The study demonstrated the effectiveness of PPIs in significantly improving the resilience of patients with CVD. These findings suggest the potential of incorporating psychological interventions in medical treatment to enhance patient well-being and quality of life. Future research should focus on expanding demographic diversity and exploring the long-term effects of PPIs in various stages of CVD.

**Keywords:** Cardiovascular Diseases, Psychological Resilience, Positive Psychology, Mental Health

## Introduction

The escalating prevalence of cardiovascular diseases (CVD) presents a significant obstacle to worldwide health progress. These diseases accounted for a third of all global fatalities, a total of 18.1 million deaths, with a disproportionate 79.3% occurring in low and middle-income nations (Changi Ashtiani et al., 2024; Goli, 2024; Nazari et al., 2023; Powell-Wiley et al.; Qiu & Piskorz-Ryń, 2024; Townsend et al.). The expectation is that the incidence of CVD will continue to surge over the coming two decades (Jyotsna et al.; Saadati & Rezazadeh, 2024).

While there has been a decline in mortality rates associated with CVD in recent years, a myriad of factors, including physical, psychological, social, environmental, and dietary aspects, still contribute to these diseases,

often leading to death or disability (Münzel et al.). Patients with heart failure, a common outcome of CVD, typically experience symptoms such as breathlessness, dizziness, heart palpitations, and severe fatigue (Ciumărnean et al.; de-Graft Aikins et al.). These symptoms often result in a reduced ability to engage in activities and necessary lifestyle adjustments, significantly impacting patients' satisfaction and quality of life (Lettino et al.; Osokpo & Riegel).

Interventions in care have been shown to improve patients' ability to engage in activities, reduce pain, alleviate anxiety, lessen the severity of heart failure, and foster better social and family interactions. This, in turn, enhances the overall quality of life for these patients (Amiri et al., 2023; Asadalah Salmanpour & Pasha, 2023; Mirzaian Gizehroud et al., 2022; Şahin & Soylu, 2024; Sakkaki et al., 2023; Tavakolizadeh et al., 2023). Quality of life is understood as an individual's perception of their position in life within the context of their culture and value systems, and about their goals, expectations, standards, and worries (Johari-Fard & Ghafourpour; Şahin & Soylu, 2024; Sefotho et al., 2024; Taheri et al., 2022; Yaghoubian & Babakhani, 2020). It encompasses various aspects of human needs, tied closely to personal and communal perceptions of well-being. Specifically, in the context of health, quality of life is centered on well-being and life satisfaction, which are pivotal to therapeutic approaches and extend beyond mere health concerns (Mirzaian Gizehroud et al., 2022; Ruggeri et al.; Şahin & Soylu, 2024).

The World Health Organization (WHO) delineates four key dimensions of quality of life: physical health, mental health, social relationships, and environmental factors. Given the chronic nature of heart diseases, assessing patients' quality of life is essential in making therapeutic decisions (Ghazy et al.).

Emerging research underscores the significance of self-efficacy - the belief in one's capacity to execute specific self-care behaviors - in enhancing the quality of life for patients (Charmi & Zoghi, 2023; Pakaya et al.; Peymani & Aghajanihashjin, 2022; Sayed Alitabar & Goli, 2023). Self-efficacy influences an individual's perception of their skills and capabilities in successfully performing tasks and impacts their resilience, behaviors, and environmental choices (Goli & Mirseify Fard, 2022; Jafarzadeh et al., 2022; Sadat Mousavi & Ebrahimi, 2024; Sayed Alitabar & Goli, 2023).

Further studies indicate a potential link between patients' resilience and their quality of life, mediated by self-efficacy (Jia et al.; Peñacoba et al.; Wu et al., 2021). Resilience, defined as the ability, process, or outcome of successfully managing difficult situations, is a key factor in adapting to adverse conditions (Cooper et al.).

The field of positive psychology concentrates on maintaining mental and physical health in challenging situations, focusing particularly on capabilities (Arnout). Positive psychotherapy, a facet of this field, not only reduces negative symptoms but also actively fosters positive emotions, capabilities, and a sense of meaning, converting vulnerability into resilience (Waters et al., 2022). It can create positive resources and counterbalance negative symptoms, as well as help prevent their recurrence. The treatment of various diseases today involves more than just classical medical approaches; psychological principles, such as those found in positive psychology, play a significant role (Shoshani, 2021).

Positive psychology is a scientifically validated approach in psychotherapy, primarily concerned with fostering capabilities and positive emotions. It aims to relieve psychological distress and increase happiness by adding meaning to patients' lives. Interventions in positive psychology are educational packages based on findings and models from this field (Darbani & Parsakia, 2023; Dehaqin et al., 2023; Hendriks et al.; Movahedrad et al., 2023; Parsakia & Darbani, 2022; Parsakia et al., 2023; Parsakia et al., 2024; Sadat Mousavi & Ebrahimi, 2024; Tolo Takmili Torabi et al., 2020). Experiencing positive emotions, a key aspect of positive psychology, often boosts adaptability and resilience, fostering optimistic thinking. This approach, which emphasizes human talents and capabilities over abnormalities and disorders, has gained increasing prominence in recent years. It seeks to identify constructs and methods that promote human happiness and well-being, focusing on factors that enhance human adaptability to life's demands and threats (Bhandarkar & Jadhav; Parsakia & Darbani, 2022; Parsakia et al., 2023; Parsakia et al., 2024).

Resilience is increasingly studied in various psychological domains, including developmental and family psychology, as well as mental health (Infurna; Kouchakzadeh et al., 2022; Masten et al.; Rostami, 2023; Zadhasan, 2023). Experts assert that resilience skills can be learned and that positive psychology interventions

(PPIs) not only enhance happiness and life satisfaction but also add meaning to life, encourage optimistic thinking, and mitigate depression (Arvin et al., 2024; Delhom et al., 2020; El-Abbassy et al., 2020; Saadati & Rezazadeh, 2024; Yousefi et al., 2024). Thus, through counseling and psychological interventions, symptoms can be alleviated, disease progression slowed, personal capabilities preserved and enhanced, and patients can maintain a normal and natural life process. The study of (W. L. Lim & S. Tierney) highlighted the effectiveness of positive interventions in reducing depression symptoms and enhancing well-being. Recognizing that the integration of therapies, including psychological interventions, can mark a new step in improving disease conditions, there is an increasing emphasis on leveraging the services of psychologists and psychological treatments, such as PPIs, alongside medical treatments. This approach is seen as an effective step in improving adaptation and quality of life for patients.

The purpose of this study is to assess how PPIs contribute to the resilience of individuals suffering from CVDs. This assessment is in line with our overarching objective of improving the well-being and life quality of patients.

## Methods and Materials

### *Study Design and Participants*

This research employed a quasi-experimental study that included a pre-test, post-test with a control group, and a follow-up period of one month. It focused on a group of 50 male patients diagnosed with CVDs, purposively selected from the Baghdad Teaching Hospital in 2023. The participants were randomly divided into two groups (intervention and control).

The study included male patients aged between 30 and 60 years, with a confirmed diagnosis of cardiovascular disease and a minimum education level of a high school diploma to ensure understanding and compliance with study requirements. Participants had to provide consent to participate in the study. Patients were excluded if they had severe comorbid conditions that could interfere with the study outcomes, a history of recent cardiac surgery or intervention within the past six months, an inability to attend follow-up sessions or comply with study requirements, or participation in another clinical trial within the past 3 months.

The sample size was determined using G*Power software version 3.1 based on the following criteria: effect size (Cohen's d) of 0.8, alpha error probability of 0.05, power (1-β error probability) of 0.95, and allocation ratio of 1. This yielded a total sample size of 42, which was increased to 50 to account for potential attrition.

### *Instruments*

The Connor-Davidson Resilience Scale 25 (CD-RISC-25) is a widely used 25-item self-rating tool to measure resilience (Connor & Davidson). It assesses resilience on a five-point scale, with items related to stress tolerance, adaptability, self-efficacy, and optimism, among others. The scale has strong psychometric properties, including high internal consistency (Cronbach's alpha = 0.89). Scoring ranges from 0 to 100, with higher scores indicating greater resilience. In a research by Mahdi et al. (2014), the reliability of this scale using Cronbach's alpha was 0.86, and factor analysis results indicated the presence of a single general factor in the scale. The Kaiser-Meyer-Olkin measure for this analysis was 0.88, and the Bartlett's test was 7.18.

### *Intervention*

In this study, every participant was required to fill out the CD-RISC-25 questionnaire. Those in the intervention group attended PPI sessions for five weeks, with two sessions each week, each lasting 120 minutes. Conversely, the control group did not receive any such interventions. For each session, a study trainer revisited and discussed the strategies covered in the previous meeting. The therapeutic method used was based on the protocols proposed by Al-Abbudi et al. (2018):

**Table 1**

*The PPI exercises are designed to enhance resilience and adaptability in CVD patients.*

| Session | Content | Aim |
|---|---|---|
| 1 | Recognizing and documenting three grateful events from the past week | To highlight positive occurrences and cultivate gratitude, enhancing mental and physical health |
| 2 | Writing a letter to express gratitude towards another person's kindness | To harness the strong mood and well-being benefits of expressing gratitude |
| 3 | Imagining one's best possible future regarding social relationships over the next five years | To associate the practice with increased happiness, reduced distress, and continued interest post-intervention |
| 4 | Imagining one's best possible health future within a five-year scope | To focus on mental and physical health aspirations, reinforcing positive outlooks for the future |
| 5-6 | Performing and recording three kinds of acts within a single day | To demonstrate the mood-enhancing effect of clustering kind acts and their association with improved mood |
| 7-8 | Repeating a preferred exercise from weeks 1-6, tailored to individual needs | To emphasize person-activity fit and cater to individual preferences for more effective outcomes |
| 9 | Integrating PPI techniques into daily life and establishing a maintenance routine | To empower patients in applying PPI strategies consistently for long-term benefits |
| 10 | Reviewing progress, addressing challenges, and establishing ongoing support plans | To evaluate the intervention's impact and ensure continued application and support post-program |

### *Data Analysis*

After the completion of the intervention sessions, both the intervention and control groups underwent a post-test assessment. One month following the conclusion of the therapy sessions, a follow-up evaluation was conducted. For the data analysis, the SPSS software version 26 was employed. Before evaluating the effectiveness of the positive psychology interventions, necessary statistical prerequisites such as the normality of score distribution and the homogeneity of variances were verified. Repeated measure analysis of variance was used to assess the impact of the interventions across the three timepoints (pre-test, post-test, follow-up). Bonferroni post-hoc tests were conducted to determine significant pairwise differences. The significance level was set at $p<0.05$.

## Findings and Results

Table 2 shows the descriptive indicators of the data obtained from administering the resilience questionnaire at the pre-test, post-test, and follow-up stages, separately for each group.

**Table 2**

*Descriptive indices of the resilience variable according to each group and follow-up stage*

| Variable | Group | Pre-test | Post-test | Follow-up |
|---|---|---|---|---|
| Resilience | Intervention | 49.33 ± 7.38 | 69.22 ± 8.05 | 68.97 ± 7.69 |
| | Control | 52.75 ± 11.30 | 53.20 ± 11.99 | 53.13 ± 1.73 |

According to Table 2, the intervention group demonstrated a baseline average resilience score of 49.33, which significantly increased to 69.22 post-intervention, and slightly decreased to 68.97 at the one-month follow-up. Conversely, the control group's average resilience scores were more stable, beginning at 52.75 at baseline, marginally rising to 53.20 post-intervention, and then to 53.13 at follow-up. This data indicates that the intervention group experienced a substantial increase in resilience scores post-intervention compared to the control group.

Repeated measures ANOVA indicated a significant time x group interaction effect ($F(2,96)=87.36$, $p<0.001$, $\eta^2p=0.65$) (Table 3). Bonferroni post-hoc tests revealed that the intervention group had significantly higher resilience scores at post-test ($p<0.001$) and follow-up ($p<0.001$) compared to pre-test (Table 4). No significant differences were found across time points for the control group ($p>0.05$). Between-group comparisons showed significantly higher resilience in the intervention group versus control at post-test ($p<0.001$) and follow-up ($p<0.001$), but not at pre-test ($p>0.05$).

**Table 3**

*Repeated measures ANOVA results*

| Source | SS | df | MS | F | p-value | $\eta^2p$ |
|---|---|---|---|---|---|---|
| Time | 2838.14 | 2 | 1419.07 | 115.52 | <0.001 | 0.78 |
| Time × Group | 2147.52 | 2 | 1073.76 | 87.36 | <0.001 | 0.65 |
| Error (Time) | 1179.34 | 96 | 12.28 | | | |

**Table 4**

*Bonferroni post-hoc tests*

| Comparison | Mean Difference | Std. Error | p-value |
|---|---|---|---|
| Intervention: Pre-test vs Post-test | -19.89 | 1.24 | <0.001 |
| Intervention: Pre-test vs Follow-up | -19.64 | 1.22 | <0.001 |
| Control: Pre-test vs Post-test | -0.45 | 1.24 | >0.05 |
| Control: Pre-test vs Follow-up | -0.38 | 1.22 | >0.05 |
| Pre-test: Intervention vs Control | -3.42 | 2.15 | >0.05 |
| Post-test: Intervention vs Control | 16.02 | 2.28 | <0.001 |
| Follow-up: Intervention vs Control | 15.84 | 2.20 | <0.001 |

These results demonstrate that subjects receiving PPIs exhibited a significant and sustained increase in resilience compared to controls. The effect size ($\eta^2p$) of 0.78 for the main effect of time suggests that the intervention was responsible for a substantial portion of the observed changes in resilience scores.

## Discussion and Conclusion

The primary outcome of this research indicates a significant improvement in the adaptability and resilience of cardiovascular disease patients following PPIs. Notably, the intervention group exhibited a marked and sustained increase in resilience scores compared to the control group. This finding is pivotal, as it demonstrates the potential of PPIs in enhancing psychological resilience in a population that typically confronts significant physical and emotional challenges.

Our findings resonate with existing research in the realm of PPIs for cardiac patients. For instance, Jyotsna et al. (2023) observed significant improvements in happiness, depression, and hope among heart disease patients who received PPIs, with moderate to large effect sizes, particularly at follow-up assessments (Jyotsna et al., 2023a). This parallels our observations of sustained improvements in adaptability post-intervention. Additionally, a systematic review and meta-analysis underscored the efficacy of PPIs in enhancing mental well-being and reducing distress among cardiovascular disease patients (Wei Loong Lim & Stephanie Tierney, 2023). These studies collectively reinforce our findings, highlighting the promising role of PPIs in managing the psychological aspects of cardiovascular health.

The substantial increase in resilience scores post-intervention and their sustained elevation at the one-month follow-up assessment underscore both the immediate and long-term benefits of PPIs. This sustained improvement is particularly noteworthy, as it suggests that the skills and mindset cultivated through the intervention can be maintained over time, potentially contributing to lasting psychological well-being. The large effect sizes observed further emphasize the practical significance of these findings, indicating that PPIs can make a meaningful difference in the lives of CVD patients.

The mechanisms through which PPIs foster resilience in CVD patients likely involve a combination of factors. By focusing on strengths, positive emotions, and meaning, these interventions may help patients reframe their challenges, cultivate a more optimistic outlook, and draw upon internal and external resources to cope with adversity. The group format of the intervention may also provide a supportive social environment that normalizes experiences and facilitates the sharing of coping strategies. Furthermore, the emphasis on practicing skills and integrating them into daily life may promote the development of lasting habits that support resilience.

The clinical implications of our study are substantial. Integrating PPIs into the standard care regimen for cardiovascular disease patients could potentially

augment their psychological resilience and overall well-being. This integration not only addresses the psychological needs of these patients but may also contribute to better health outcomes by fostering a positive mindset that can influence physiological health.

While our study presents encouraging findings, it is not without limitations. The sample size and the specific demographic composition may limit the generalizability of our results. Future research should focus on larger, more diverse populations to validate and extend these findings. Furthermore, long-term studies are needed to assess the sustainability of the positive effects observed, and comparative studies could evaluate the efficacy of different types of PPIs. Future research should focus on expanding the demographic diversity of participants and exploring the implementation of PPIs in various stages of CVD. Additionally, further investigation into the mechanisms through which PPIs foster resilience will be valuable in refining these interventions for enhanced effectiveness. Overall, this study contributes to a deeper understanding of the intersection between psychology and cardiology, paving the way for more integrated and patient-centered care approaches.

This study has made significant strides in understanding the role of PPIs in enhancing the resilience of patients with CVD. The findings demonstrate a substantial and sustained increase in resilience scores in the intervention group compared to the control group, highlighting the effectiveness of PPIs. The integration of these interventions into therapeutic practices for CVD patients not only addresses psychological distress but also contributes to overall well-being and life satisfaction.

Our research confirms the growing importance of psychological factors in medical treatment. The positive shift in resilience scores post-intervention and their sustainability over a one-month follow-up period emphasize the long-term benefits of PPIs. This aligns with the broader goals of enhancing patient well-being and quality of life, underscoring the necessity of holistic approaches in healthcare.

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## Declaration of Interest

The authors of this article declared no conflict of interest.

## Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants. Ethical considerations in this study were that participation was entirely optional.

## Transparency of Data

By the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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## Authors' Contributions

All authors equally contribute to this study.

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