

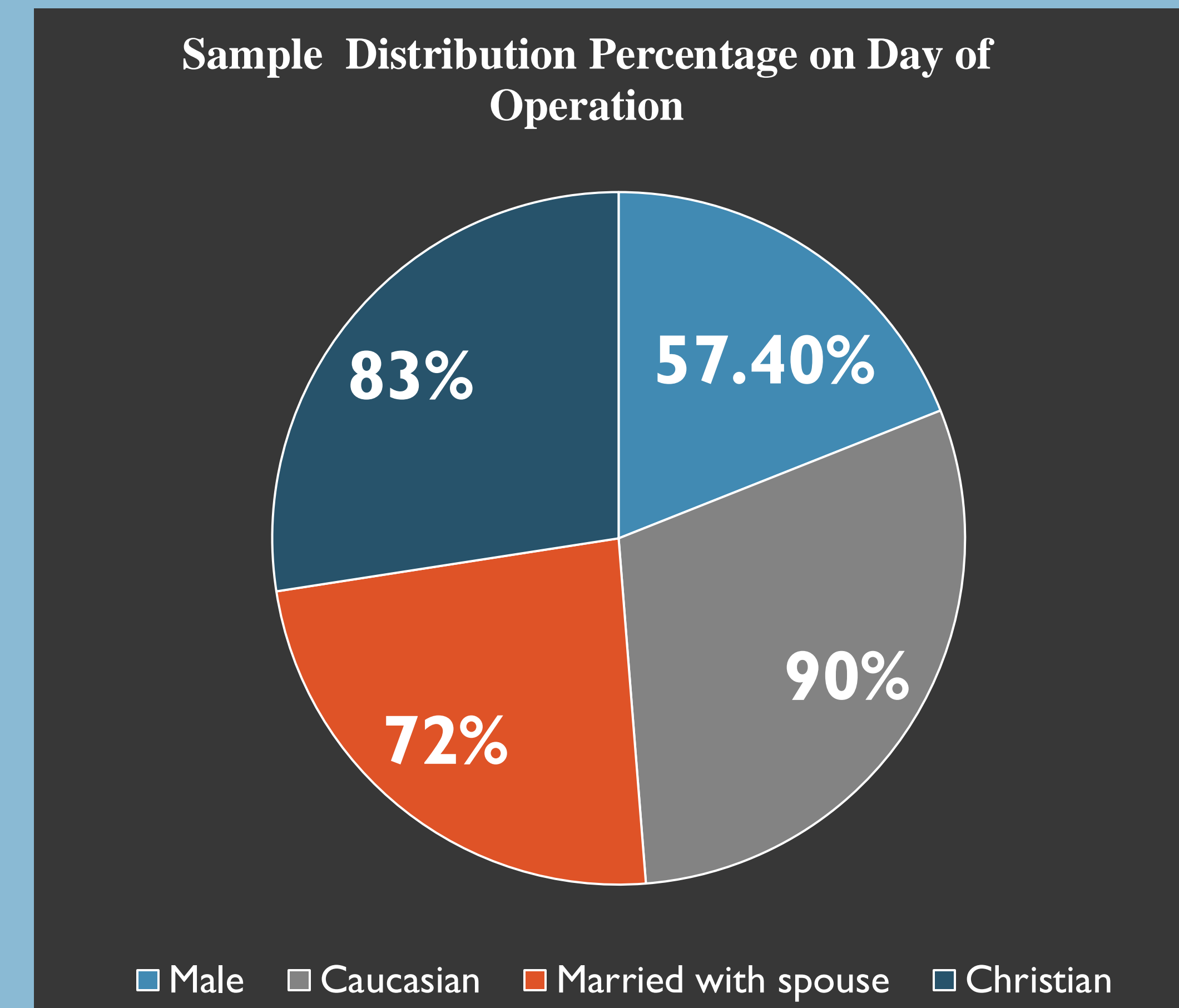
# Does Hope in Cardiac Surgery Patients Improve Their Postoperative Symptoms?

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## Introduction/Background:

The leading cause of death in America, particularly among the elderly, is cardiovascular disease. The importance of paying attention to psychological elements that could be involved in poor mental health and psychological distress associated with CVD is increasing. Along with anxiety, depression has been identified as a risk factor for mortality from all causes and from cardiovascular disease. For some patients with severe cardiac conditions, open-heart surgery (OHS), a cutting-edge intervention, can occasionally save their lives. However, the months leading up to and following major cardiac procedures are extremely stressful, which leads to elevated levels of anxiety and depression. One year after OHS, depression has been associated with poor postoperative adjustment, as evidenced by symptoms of general distress. Even after controlling for potential confounders, high preoperative anxiety was an independent predictor of postoperative mortality or major morbidity within two years after OHS. Anxiety was also found to be a predictor of mortality four years after OHS and OHS patients were more likely to die or have a heart attack (myocardial infarction/MI).

In this study, we regarded optimism as a measure of character strength, even though hope and optimism have long been thought of as separate and quantifiable variables. In the present study, we assessed a theoretical model to calculate the possible contribution of one personal quality, hope, to cardiac patients. In particular, using three indicators that cover the concept of general distress in the Symptom Checklist-90-R, we hoped that optimism, as its indicator, might mitigate the detrimental effects of preoperative depression and anxiety on post-OHS psychological distress. We anticipated that optimism would be negatively correlated with high levels of pre-OHS anxiety and depression symptoms, which would then lead to low levels of post-OHS general distress. Additionally, we calculated the indirect effects of gender and age on post-OHS subjective well-being (SWB) through optimism. In this sense, we anticipate that a higher degree of overall distress will be linked to older age and female gender.



## Results:

### Bivariate correlations

The zero-order correlations between the latent constructs' predictors and indicators are displayed in Table 1. **There was a strong correlation between preoperative anxiety and depression.** Both showed a strong negative correlation with the two optimism indicators, which in turn showed a negative correlation with three postoperative psychological distress indicators. All measures of postoperative symptom levels showed a positive correlation with female gender, as did preoperative anxiety and depression. **Age had a positive correlation with one measure of optimism (i.e., optimism) but a negative correlation with preoperative anxiety and depression.** Additionally, it had an inverse relationship with postoperative somatization, but not with two other measures of the severity of postoperative symptoms.

### SEM regarding constructs of major interests

A satisfactory fit to the data was obtained from the initial estimation of the proposed model (Figure 2) (Chi-square = 47.55, df = 18, and p = 0.000). With a 90% CI between 0.05 and 0.10, CFI = 0.95, TLI = 0.92, and RMSEA = 0.07. All three of the stricter model fit indices satisfied the requirements. The CFI (0.95) and TLI (0.92) both surpassed the benchmark criterion of 0.90, and the RMSEA (.07) fell within the close fit (<0.05) range. According to squared multiple correlations, this model explained 45% of the variation in postoperative SWB. We tested several models to make sure the final solution fit better than the alternatives, but none of them fit better than this model. Only the important paths from the finished model, which were largely in agreement with those from the hypothetical model, are displayed in Figure 2. All of the direct effects that were shown had statistically significant standardized path coefficients (p < .05). As anticipated, both before and after surgery, the latent factor optimism—measured by optimism and pessimism-R—was substantially and negatively correlated with symptom levels. **High levels of symptoms were indicative of significant indirect effects of preoperative anxiety and depression on the preoperative endogenous factor low SWB.** Technically, paths associated with optimism were used to explain the effects of preoperative depression and anxiety, but the modification index indicated that the final model 2 had no additional paths. Lastly, while older age and female gender did not directly affect optimism, they were both positively correlated with low SWB.

## Methods:

### Sample characteristics:

A total of 311 patients finished all three tests. The average age was 62.4 years (range = 33–89 years).

### Measures:

- Postoperative Psychological Distress was assessed with three subscales for somatization, depression, and anxiety from the Symptom Checklist-90-R
- Postoperative Depression was assessed with the 20-item Center for Epidemiologic Studies-Depression Scale (CES-D)
- Postoperative Anxiety was assessed with the 20-item Trait Anxiety Inventory of the original STAI
- Dispositional Optimism was assessed with the 12-item Life Orientation Test (LOT) in the Wave-2 survey

### Procedure:

The study was a component of a broader multidisciplinary project on the long-term survival of OHS patients. Patients were asked for their consent by cardiac nurses. Eligibility requirements for the subjects were as follows:

- (a) They had to be older than 35;
- (b) They had to be scheduled for non-emergency, non-transplant open heart surgery
- (c) They had to be able to communicate in English;
- (d) They had to be able to give their consent both physically and cognitively
- (e) They had to give informed consent
- (f) The surgeon had to give permission

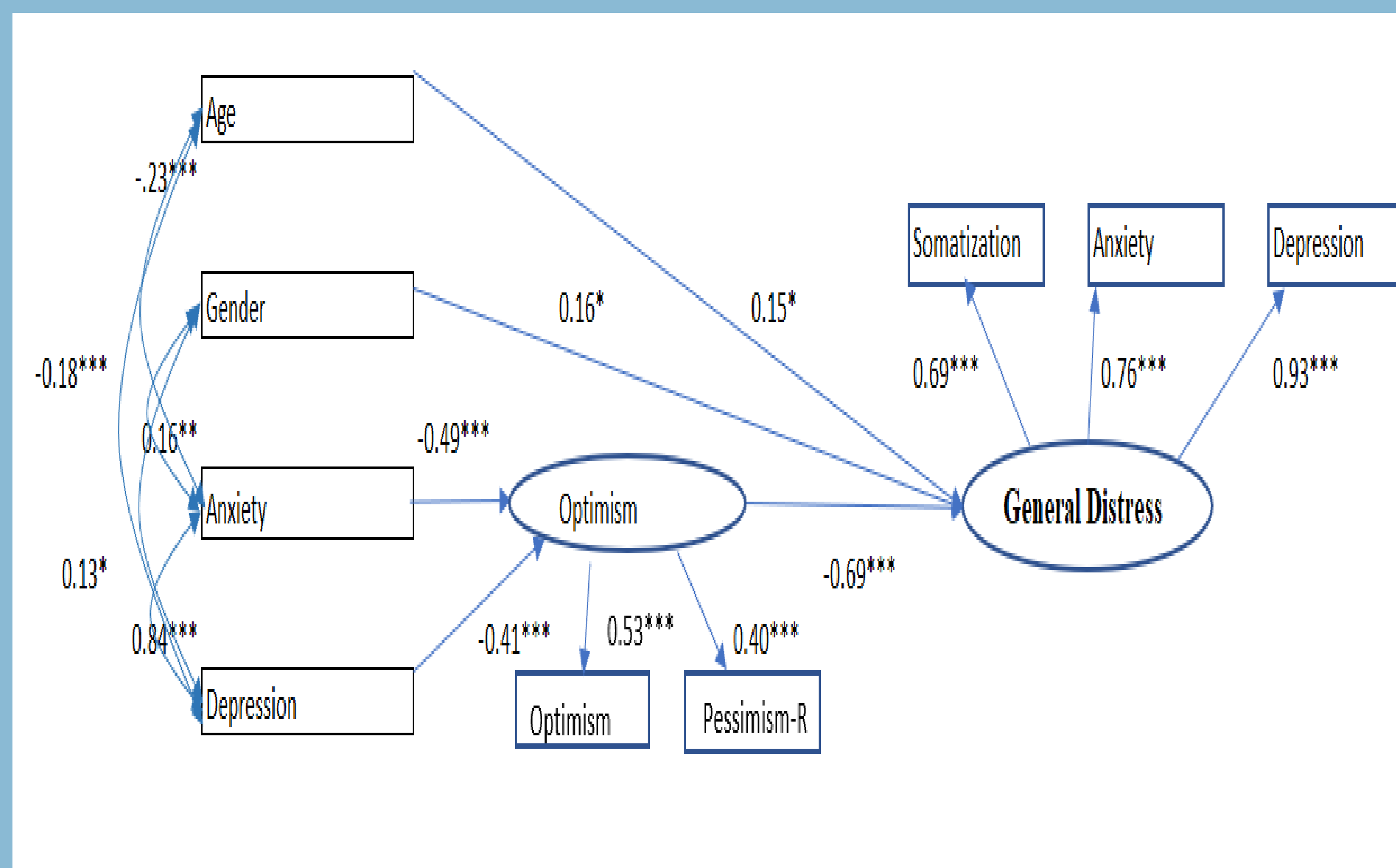
Trained interviewers gathered the preoperative data for the study participants. As part of the Wave-1 survey, preoperative mental health was evaluated during the initial in-person interview at the clinic on the day of the preoperative examination. The Wave-2 survey was conducted over the phone approximately 48 hours prior to surgery. The Wave-3 survey was carried out about a month after OHS.

### Data Analysis:

- Analyses used:
- M-PLUS used for the maximum-likelihood estimation
  - Chi-square statistic

**Table 1.** The zero-order correlations between the variables used in the analysis.

	Age	Gender	Pre ANX	Pre DEP	Optimism	Pessimism Reversed	Post Soma	Post ANX
Gender	0.01							
Pre ANX	-0.23***	0.16**						
Pre DEP	-0.18***	0.13*	0.84***					
Optimism	0.21***	0.02	-0.43***	-0.43***				
Pessimism Reversed	0.07	-0.03	-0.37***	-0.31***	0.29***			
Post Soma	-0.15**	0.16**	0.31***	0.37***	-0.19***	-0.18***		
Post ANX	-0.05	0.19***	0.41***	0.41***	-0.15**	-0.17***	0.58***	
Post DEP	-0.05	0.13*	0.55***	0.56***	-0.30***	-0.25***	0.63***	0.70***



## Discussion

During the challenging post-OHS recovery month, the current study estimates the protective effect of optimism against the negative effects of preoperative poor mental health on general distress in cardiac patients using a conceptual model. The relationships between the main factors of interest and their respective directions generally align with the anticipated paths in the final solution. In particular, optimism, as a measure of hope and character strength in positive psychology (Peterson & Seligman, 2004), seems to have a positive impact on overall postoperative distress or a protective effect against the harm caused by preoperative poor mental health. Additionally, the model shows that female patients are at a disadvantage when compared to their male counterparts in terms of this endpoint.

The following factors make the favorable function of optimism's main finding important for the population under investigation:

1. Supports a number of previous findings from multidisciplinary OHS studies by providing fresh data on the unfavorable contribution of poor mental health to poor postoperative recovery. Since the literature has highlighted how OHS patients' health-related quality of life is compromised by distress, the finding is significant for patient-centered preoperative preparation. The surgical recovery of patients with untreated comorbid mental disorders will suffer if cardiac health providers fail to sufficiently anticipate and address the negative effects of poor mental health and postoperative distress.
2. Depression and anxiety have emerged as recognized comorbid mortality risks, while cardiovascular disease (CVD) continues to be the leading cause of death for all U.S. subgroup populations and those in all developed nations. Patients with OHS also exhibit this fact. The protective role of patients' inner strengths, which could offset the poor mental health of elderly patients having a life-altering operation, is not well understood. Therefore, our findings may offer timely information to help cardiac and behavioral health providers improve postoperative rehabilitation.
3. Studies have shown that optimism predicts a lower death rate for heart patients. Although a long-term perspective study is required to support the assumption, the study's finding that optimism and postoperative general distress are inversely related may provide a mechanism for this survival benefit. Future multidisciplinary research into the unknown mechanisms underlying these findings is also necessary.

Finally, older and female patients may have had more challenging experiences than their male counterparts, as evidenced by higher symptom levels of all general distress indicators. They might not have as many physical resources available to them to deal with the challenges brought on by a major operation during the crucial postoperative recovery period. The results support the body of research on the disadvantages faced by women and older patients with regard to heart conditions and OHS. Preoperative character strength optimism and hope are positively correlated with post-OHS symptoms, although older and female patients have higher levels of these symptoms. Therefore, these internal resources might be more crucial for them to deal with post-OHS distress. With the new data from a sample of OHS patients, the study supports the body of research on the protective effects of this inner strength factor for older and female populations.

### References:

