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RELATIONSHIP BETWEEN POSITIVITY, POSITIVE AND NEGATIVE AFFECT AMONG CARDIAC PATIENTS: MEDIATING ROLE OF PERCEIVED STRESS

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ABSTRACT

The number of factors involved in the development of negative affects among patients suffering in cardiovascular disorder. The psycho-social risk factors, including depressive symptoms, anxiety, exhaustion, anger, and negative affect develop negative emotions in cardiovascular patients. A high positive affect independently relates to decreased cardiovascular disease ratio, whereas low positive affect predicts adverse cardiovascular consequences. The current study aimed to explore the relationship between positivity, positive and negative effects by using perceived stress as a mediating factor among cardiac patients. We recruited 519 cardiac patients aged 20-73 years. All participants provided written informed consent. Assessments included the positivity Scale, Perceived Stress Scale, and Negative and Positive Affect Scale. The results indicated that the perceived stress intermediate between positive and negative affect and stress also negatively affects the emotional relationship. Positivity had an opposite relationship with the negative affect and the perceived stress negative relationship with positive affect. Whereas; the negative affect was a significant positive relationship with perceived stress. The positive emotions are helpful for cardiac patients to reduce the negative feelings which cause to enhance the stress factor. Stress factors can be reduced by patient awareness, using stress prevention strategies and well-being interventions.

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1. INTRODUCTION

Life is embedded with the number of stress factors that play essential roles in developing a physical illness such as cardiovascular diseases. Previous reports indicated that unmanageable stress depicted problematic emotional regulations and ended up in germinating cardiac ailments (Begley, 1994). The compelling psychosocial risk factors of cardiovascular diseases are negative emotions which include anger and anxiety. Contrarily, the psychosocial factors that turn out to be the cardio-protective potential factors are positively affecting factors. Positive affect resulted in enhancement of cheerfulness, life activity and joy in mood states (Roest, et al, 2010; Melamed et al, 2006). A high positive affect has been independently related to low cardiovascular disease ratio. Whereas, a low positive affect predicts adverse cardiovascular consequences like death even with percutaneous coronary intervention (Chida and Steptoe, 2008; Heo et al, 2009; Denollet, and Brutsaert, 2001). Different studies have shown that cardiac patients preceding put less positive affect, resulting in inbuilt- anger, hostility, and jealousy ultimately prone to other cardiac complications. These people do not have smart and effective coping strategies to confront life stressors (Low et al., 1998).

Positive psychologists have put great attention to create awareness for optimal well-being in human functioning to fulfill the fundamental element of life including satisfaction, self-esteem, and optimism, which are related to positivity and have a positive affect. Researchers defined positivity as “a capacity of an individual to observe the life with positive way after plenty of experiences” (Miloni, et al., 2016; Alessandri, et al., 2012; Caprara et al., 2017; 2009). Enriched positivity is related to the productive and adequate state of mood and improves positive affect with significantly decreased negative affect (Alessandri et al., 2012; Caprara et al., 2012; 2017). Positivity plays a role to improve the positive affect and reduce the negative affect of risk factors on life, however; the factors that contribute among these relationships still need to be investigated. An impending mediating variable is found to be “perceived stress in cardiac patients”. Lazarus and Folkman's postulate indicated that stress as “psychological and physiological response of people although for such situation they don't have enough resources to toggle” (Lazarus and Folkman, 1984). Perceived stress is the degree at which life situations are evaluated as stressful (Cohen et al., 1983).

Conversely, in cardiac patients, the affect of perceived stress is more adverse with limited stress coping strategies (Low et al., 1998, Ghaffari et al., 2020). Another report has shown that stress is the transactional process between humans and their environment (Gloria & Steinhardt, 2014).

Various research studies are conducted in the perspective of identifying the positive and negative affect among cardiac patient but the relationship of positivity among cardiac patients is in question. However, Spindler et al. (2009) throughout studied the construct of positive and negative affect by studying cardiac patients and made the scale that can be used thoroughly for studying relationship with other indicators that helps in improving health issues.

Moreover, Denollet and Vries (2006) also studies the positive and negative affects relationship with perceived behavior and found that perceived stressful situation of cardiac patients affect negatively on the life of cardiac patients and it is necessary to train the cardiac patients to avoid such situation for the betterment of their health. Also, Denollet and Vries (2006) introduced some guidelines to follow in dealing with cardiac patients and their cardio diseases and attacks.

Similarly, Versteeg et al. (2009) study the positive and negative affect to maintain the life of patients and found that negative and positive behavior directly affects the health of the person and there are certain factors that affect positively and negatively depending on upon the influencing actor and situation. Mostly, stress full situations negatively impact on the overall life of patients (Versteeg et al., 2009; Bennett et al., 2001). Furthermore, family-related situations and intervention also negatively impact on the health of cardiac patients (Hilbert, 1994). Seebach et al. (2012) and Heo et al., (2009) studied the positive and negative affects of patients but not in the case of cardiac patients but they studied a general level of patients who are suffering from any diseases or attacks.

These reports provide us the new concept that positivity is an essential factor that reduced the perceived stress by using coping tactics which consequently decrease the positive influence and improve the positive response affect in one's life. So, our study demonstrated the role of positivity on positive and negative affect by using perceived stress as a mediating factor and also has shown the relationship between these factors in cardiac patients.

This study conducts in the context of cardiac patients in Pakistan to explore the relationship of the positivity behavior of the patients on the positive and negative affects. Moreover, this study also explores the mediating role of perceived stress on the relationship between positivity behavior that affects positive or negative. This study helps in guiding the cardiac patients when we able to identify the relationship between the positivity behaviors of the cardiac patient. The doctors play leading roles in guiding and suggesting activities to train their minds and control their positive and negative thinking. Moreover, this study also helps in investigating the mediating role of perceived stress that causes positive and negative affect on the life of cardiac patients. The results will be helpful for doctors in making policies to deal with the cases of cardiac patients. The health-related institution will also use the results for making procedures and guidelines for cardiac patients to deal with perceived stress situations because nowadays cardiac diseases and attacks are common in Pakistan and the only cause behind the cardiac diseases and attacks is stressful events and situations that patients experience in their lives. Therefore, it is the responsibility of doctors and health institutions to guide them related to their stressful situation and cardiac disease and attacks. So that they will care for themselves and their family, relatives, and friends.

2. METHOD

2.1 PARTICIPANTS

Participants were 519 cardiac patients age range 20–73 years from cardiology institute Multan, Pakistan. The data was collected by using a convenience sampling technique. The questionnaire is distributed to cardiac patients to identify the positivity behavior affect is positive or negative on the patient. Moreover, items are also included that helps in identifying the mediating role of perceived stress on the relationship between the positivity behavior and positive or negative affect of cardiac patients. We only approach those patients who came to the hospital for cardiac-related problems and then get data from those patients.

2.2 MEASURING TOOLS

Positivity Scale. Caprara et al (2012) developed the scale of positivity. It is a single scale that included eight items. This scale has used the five points which range strongly disagree too strongly

agree. Cronbach's alpha tested to confirm the reliability of this scale. The addition of all the points obtains the scoring of this scale.

Perceived Stress Scale. Sumi et al. (2006) developed the perceived stress scale, which is the single-factor scale measures purely the degree of stress perceived by the person in the life situation in the past one month (Sumi et al., 2006). This scale contains 14 items. Each item is rated at 5 points Likert scale which ranges from 0 to 4 indicating the rating scales ask from never to very often about the perceived stress. This scale was found to be valid and reliable because its alpha value is above 0.7. The total of the scale is obtained by getting the sum of all items. The scoring method of this scale instructs that higher scores on this scale illustrate higher levels of perceived stress in the individual.

Positive and Negative Affect Scale. Watson et al (1988) developed this scale. This scale is consisting of two subscales namely negative and positive affects. Each subscale has 8 items that are measuring negative and positive affects individually. All the items have a rating scale that ranges from 1 (never) to 6 (very often). The Cronbach's alpha value of the scale is higher than 0.7, which depicts a higher reliability ratio of the scale. The total of each subscale is done first then it is interpreting from the score which subscale score is higher than the other. It shows that if the score is higher in subscale, then an individual has more effect on that factor (Watson et al., 1988).

2.3 PROCEDURE

A consent form was signed from all the cardiac patients before the study and questionnaire were provided to them to fill. The questionnaire included Positivity Scale, Perceived Stress Scale, and Negative and Positive Affect Scale. It was made sure to the participants that their results would remain confidential, and it is up to them whether they want to participate or not.

The participants were asked to complete the questionnaire at their own risk. Before taking the participants, they were briefed about the nature of the study and its usefulness to society. Data was collected and analyzed by using SPSS software to evaluate the results.

In the mediation analysis, we calculate paths a, b, c and c'. The path a denotes the association positivity with perceived stress, path b association of perceived stress with positive and negative affect, path c associations of positivity with positive and negative affect and path c' is the association of positivity with positive and negative affect after adding perceived stress as a mediator.

2.4 ETHICAL CONSIDERATIONS

Various ethics were taken into consideration to carry out the study. An authority letter was presented to the authority of the relevant university explaining the nature of the study and requested permission for the data collection. The written consent form was taken from all the participants. The participants were also ensured regarding the confidentiality and anonymity of all the data collected from them. It was ensured that no physical or psychological distress was given to the participants.

3. RESULTS

Table 1 shows that positivity has a significant negative relationship with perceived stress ($r = -0.704$, $p < 0.05$) and has a significant positive relationship with positive affect ($r = 0.112$, $p < 0.05$). Positivity has a significant negative relationship with negative affects ($r = -.359$, $p < .05$). Perceived stress also has a significant negative relationship with positive affect ($r = -.238$, $p < .05$) whereas negative affect has a positive significant relationship with perceived stress ($r = .637$, $p < .05$).

Table 2, indicated the perceived stress as a mediator and positive affects as an outcome. Perceived stress explained the relationship between positive affect and positivity. Results depicted the significant association between positive affects estimated by perceived stress. The significant negative association of positivity with positive affects was observed among both male and female cardiac patients (from path a). The significant negative association of positivity was observed among both male and female cardiac patients (from path b). From path 'c' positive significant association of positivity was determined among male cardiac patients but no significant positive association observed in female patients.

Table 1: Correlation analysis among positivity, perceived stress, positive affect, and negative affect.

	Positivity	Perceived Stress	Positive affect	Negative affect
Positivity	--	-.704**	.112*	-.359**
Perceived Stress		--	-.238**	.637**
Positive Affect			--	-.436**
Negative Affect				--
<i>M</i>	24.15	28.42	27.9	28.0
<i>SD</i>	3.88	5.22	4.74	4.88

Note. *M*-Mean, *SD*= Standard Deviation; ** $p < 0.01$, * $p < 0.05$

Table 2: Mediating analysis results, with positive affect as the outcome and perceived stress as a mediator.

Predictors	Path Coefficients				axb (BC _a 95% CI)	R ²	F
	A	B	C	C'			
Male							
Positivity	-.858***	-.272***	.120*	-.113	.233 (.160, .27)	.086	12.864
Female							
Positivity	-1.152***	-.283*	.119	-.207	.326 (.368, 1.638)	.024	2.898

Thus, perceived stress fully mediates the relationship between positivity and positive affects among male cardiac patients because when perceived stress was involved in the model as a mediator, the direct pathway between positivity and positive affects did not statistically significant (from path c'). To evaluate the affect size of the mediating pathway, the proportion of the total effect of the independent variable on the dependent variable (c) that was mediated by perceived stress was calculated using the formula $(a \times b)/c$ by following (Li et al., 2015). For male patients, the proportions of perceived stress mediation were 86% for positivity for males.

Table 3: Mediating analysis results, with negative affect as the outcome and perceived stress as mediator.

Predictors	Path Coefficients				axb (BC _a 95% CI)	R ²	F
	A	b	C	c'			
Male							
Positivity	-.858***	.510***	-.126*	.312	-.438 (-.550, -.339)	.248	45.275
Female							
Positivity	-1.152***	1.081***	-1.201***	.044	-1.245 (-2.082, -.816)	.959	2766.794

Path coefficients, $a \times b$ products, and BC_a 95% CI for these products are presented in this table.

Table 3 shows the perceived stress as a mediator variable with a negative affect as the outcome variable. Table 3 explained the negative association of positivity with a negative affect between both male and female cardiac patients (from path a). From the 'b' path a positive association of

perceived stress and negative affect from both male and female patients.

From a 'c' path negative association between positivity and negative affect was observed. Hence, perceived stress fully mediates the relationship between positivity and negative affects among both male and female patients because when perceived stress was involved in the model as a mediator, the direct pathway between positivity and negative affects did not statistically significant (from path c').

To evaluate the affect size of the mediating pathway, we have calculated the proportion of the total effect of the independent variable on the dependent variable (c) that was mediated by perceived stress using the formula $(a \times b)/c$ by following (Li et al., 2015). For male patients, the proportions of perceived stress mediation were 24.8% for negativity for males and 95.9% for female patients.

4. DISCUSSION

Previous studies have demonstrated the effect of different physiological factors on cardiac patients' health status but the direct relationship of positivity, positive and negative affects with cardiac patients are indicated in our study. The objective of the present study was to determine the nature of the relationship that exists between perceived stress, positivity, positive affects and negative affects in cardiac patients. Our results indicated the role of different physiological factors in patients who suffered from cardiac disorders.

Correlation analysis showed positivity has a significant negative relationship with perceived stress ($r = -.704, p < .05$) and has a significant positive relationship with positive affect ($r = 0.112, p < .05$). The results also indicate that the positivity has a negative relationship with negative affect. The perceived stress is also found to have a negative relationship with positive affect and the negative affect as a positive relationship with perceived stress. Our findings show that in cardiac patients, positivity has a negative influence on the perceived stress and a significant positive relationship. Our data also reveals that perceived stress is the significant factor of negative affect in cardiac patients.

Begley (1994) shown that physiological factors and life situations directly related to the cardiovascular system. Different studies have demonstrated that cardiac patients are more prone to stress which ultimately increases the negative affect factor. As our results showing that the total affect of positivity and perceived stress was .112, which is significant and predicted the level and affect the perceived stress on health status. However, positivity directly connected with perceived stress which increases the positive affect value up to -.315. These results suggested that perceived stress might be the mediator between positivity and positive affect.

Many recent reports have shown that a good mood with stress relieving strategies could be beneficial for cardiac patients. Lockwood and colleague's results have shown that using strategies like humor to tackle the stress factors resulted in less blood vessel blockage, fewer angioplasties, fewer heart assaults, and a more prominent life span at the point (Lockwood, 2011). It has been shown that the experience of "charming" or mirthful feelings balances the pernicious, long haul physical impacts of troubling feelings (Sultanoff, 1998). Consequently, these inquire about further recommend that an entertaining way of life expands a person's capacity to additionally successfully oversee enthusiastic misery, accordingly diminishing the harming physical effect of these conceivably unsafe feelings.

Our study also revealed the positive affect and negative affect based on positivity and perceived stress in relation to gender. The results indicated that positivity decreases the perceived stress by increasing the positive affect and lowering the negative affect on male cardiac patients. Our results are consistent with previous studies on the normal population that positivity reduces the level of negative affect which further affects the perceived stress (Rosenbaum et al., 2012).

Taken together, our data provide compelling evidence that positivity is directly related to perceived stress which increases the positive affect and reduces the negative affect among cardiac patients.

Different factors influence the disease status including stress that has been considered as the main factor in cardiac patients. The number of other factors like smoking and diet could be the main disease promoter. All these factors together increase the risk of heart diseases in humans. So, it is suggested that in order to minimize the threat of chronic heart diseases in our society, it is important to spread awareness in the people about the causes and consequences of heart diseases. The heart is the main organ in our body that works 24/7 without any rest. Hence, any defect in that organ may lead to death. Creating awareness about such factors among cardiac patients could be beneficial to reduce the burden of disease and increase the chances of recovery.

To improve the psychosocial well-being of the patient suffering from cardiac problems are used to counsel and support the patient. Interventions are implemented to manage stress and negative affects. It is recommended that different indicators are used to determine positivity related to personality traits. Patients are not only treated therapeutically but counseling is also required for patient fast recovery. Complete medication makes the patient with negative outcomes and failure of incomplete recovery. Educating the patients on how to control stress and negative emotions might be beneficial for cardiac patients. In this way, the mortality rate of the patient might be reduced.

5. CONCLUSION

Positive emotions are supportive for the cardiac patients to lowering the negative feelings that increase the stress factor. Stress factors can be decreased by patient awareness, using stress prevention strategies and well-being interventions. Perceived stress is intermediate among the positive and negative affects. The perceived stress also intermediates between the positivity and positive affect. Positivity was found to be associated with negative affect and positive affect via perceived stress. The positive affects are associated with the happiness, successful outcomes and positive behavior of the cardiac patients. Positive affect is associated with good health behaviors, including physical exercise, dietary and adherence to medical advice. While negative affect includes unpleasant emotional experiences like distress, depression, hostility, etc. The stress and negative affects are also affected by the emotional relationship. It is also concluded that perceived stress has a negative relationship with positive affects. The psychological, biological and cognitive responses to stress, affect cardiac diseases regarding cardiac outcomes. Daily life stress causes psychosis and depression for cardiac patients. The models of adaptations towards illness play an important role in cardiac disease treatment. The strong relationships among positive affect and well-being found to be important for the evolving intervention programs, that will promote the development of adaptive illness models and coping behaviors, not only by focusing the negative aspects of illness and life but

also by emphasizing positive emotions and positive life encounters. Our data suggest that perceived stress plays an essential role to facilitate the positivity with negative affect and positive affect could improve the health status of people associated with management. The increased level of positivity is beneficial to reduce the perceived stress, which ultimately decreasing negative affects and promoting positive affect.

Therefore, patient awareness and positive psychological interventions that pay attention to positivity might be beneficial to lowering the negative affect and increasing the level of positive affect. Our data also provide different strategies' to manage the stress level in cardiac patients which might be beneficial.

6. AVAILABILITY OF DATA AND MATERIAL

Information can be made available by contacting the corresponding author.

7. REFERENCES

- Alessandri G, Caprara GV, Tisak J. (2012). Further explorations on the unique contribution of positive orientation to optimal functioning. *Eur Psychol*. 17(1):44–54.
- Begley, T. (1994). Expressed and suppressed anger as predictors of health complaints. *Journal of Organizational Behavior*, 15(6), pp.503-516.
- Bennett, P., Conway, M., Clatworthy, J., Brooke, S., & Owen, R. (2001). Predicting post-traumatic symptoms in cardiac patients. *Heart & lung*, 30(6), 458-465.
- Caprara GV, Alessandri G, Eisenberg N. (2012). The positivity scale. *Psychol Assess*. 24(3):701–712
- Caprara GV, Eisenberg N, Alessandri G. (2017). Positivity: the dispositional basis of happiness. *J Happiness Stud*. 18(2):353–371.
- Caprara GV, Fagnani C, Alessandri G, et al. (2009). Human optimal functioning: the genetics of positive orientation towards self, life, and the future. *Behav Genet*. 39(3):277–284.
- Chida Y and Steptoe A. (2008). The association of anger and hostility with future coronary heart disease: A metaanalytic review of prospective evidence. *J Am CollCardiol*. 17: 936–946
- Cohen S, Kamarck T, Mermelstein R. (1983). A global measure of perceived stress. *J Health SocBehav*. 24(3):385–396.
- Denollet, J., & Brutsaert, D. (2001). Reducing Emotional Distress Improves Prognosis in Coronary Heart Disease. *Circulation*, 104(17), 2018-2023.
- Denollet, J., & De Vries, J. (2006). Positive and negative affect within the realm of depression, stress and fatigue: The two-factor distress model of the Global Mood Scale (GMS). *Journal of affective disorders*, 91(2-3), 171-180.
- Ghaffari, A.S., Bajwa, R.S., Hussain, M., Tahir, M., Bibi, S., Khalid, A. (2020). Hospital Anxiety and Depression of Patients with Heart Failure in South Punjab Pakistan: A Sectional Survey Study. *International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies*. 11(6), 11A06C: 1-10.
- Gloria, C., & Steinhardt, M. (2014). Relationships Among Positive Emotions, Coping, Resilience and Mental Health. *Stress And Health*, 32(2), 145-156. doi: 10.1002/smi.2589.

- Heo, S., Lennie, T. A., Okoli, C., & Moser, D. K. (2009). Quality of life in patients with heart failure: ask the patients. *Heart & Lung*, 38(2), 100-108.
- Hilbert, G. A. (1994). Cardiac patients and spouses: family functioning and emotions. *Clinical Nursing Research*, 3(3), 243-252.
- Lazarus R, Folkman S. (1984). *Stress, Appraisal, and Coping*. New York:Springer; 1984.
- Li, X., Kan, D., Liu, L., Shi, M., Wang, Y., Yang, X., ...& Wu, H. (2015). The mediating role of psychological capital on the association between occupational stress and job burnout among bank employees in China. *International journal of environmental research and public health*, 12(3), 2984-3001.
- Lockwood, N. (2011). The heart of the matter: The functional and relational effects of humor for cardiovascular patients. Retrieved from <http://www.myheartsisters.org>
- Low K. G, Fleisher C, Colman R, Dionne A, Casey G, Legendre S. (1998). Psychosocial variables, age, and angiographically-determined coronary artery disease in women. *Annals of behavioral medicine*. 20(3): 221-226. DOI: 10.1007/BF02884964
- Melamed S, Shirom A, Toker S, et al. (2006). Burnout and risk of cardiovascular disease: Evidence, possible causal paths, and promising research directions. *Psychol Bull*. 132: 327–353
- Milioni M, Alessandri G, Eisenberg N, Caprara GV. (2016). The role of positivity as a predictor of ego-resiliency from adolescence to young adulthood. *Pers Individ Differ*. 101:306–311.
- Roest, A.M. , Martens, E. J, Denollet, J., et al. (2010). Prognostic association of anxiety post myocardial infarction with mortality and new cardiac events: A meta-analysis. *Psychosom Med*; 72: 563–569.
- Rosenbaum, D. L., White, K. S., &Gervino, E. V. (2012). The impact of perceived stress and perceived control on anxiety and mood disorders in noncardiac chest pain. *Journal of Health Psychology*, 17(8), 1183–1192. DOI: 10.1177/1359105311433906
- Seebach, C. L., Kirkhart, M., Lating, J. M., Wegener, S. T., Song, Y., Riley III, L. H., & Archer, K. R. (2012). Examining the role of positive and negative affect in recovery from spine surgery. *Pain*, 153(3), 518-525.
- Spindler, H., Denollet, J., Kruse, C., & Pedersen, S. S. (2009). Positive affect and negative affect correlate differently with distress and health-related quality of life in patients with cardiac conditions: Validation of the Danish Global Mood Scale. *Journal of Psychosomatic Research*, 67(1), 57-65.
- Sultanoff, S. M. (1998). The health benefits of humor unfold, humor reduces the risk of heart disease, therapeutic humor. *The Newsletter of the American Association for Therapeutic Humor*.
- Sumi K. (2006). Reliability and validity of the Japanese version of the Perceived Stress Scale. *Jpn J Health Psychol*. 19(2):44–53.
- Versteeg, H., Pedersen, S. S., Erdman, R. A., van Nierop, J. W., de Jaegere, P., & van Domburg, R. T. (2009). Negative and positive affect are independently associated with patient-reported health status following percutaneous coronary intervention. *Quality of Life Research*, 18(8), 953-960.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measure of positive and negative affect: The PANAS scales. *Journal of Personality and Social*



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