

# Frequency of Heart Diseases in Patients with Different Personality Types



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## **Abstract:**

**Introduction:** Heart disease as a leading cause of morbidity and mortality is of global concern. 17 million people die of Cardiovascular Diseases (CVD) each year. An impatient and over ambitious personality can develop heart disease. One's nature determines one's health condition. An easygoing and relaxed person leads a healthier life as compared to one who finds life difficult to handle. The NEO-PIR (NEO Personality Inventory) measures the five major domains of personality and also the traits that define each domain.

**Objective:** To determine the different personality types of Cardiac patients at Karachi Institute of Heart diseases according to five factor model of personality (NEO PIR).

**Materials and Methods:** This was a cross sectional study and non-probability convenient sampling was used and the Questionnaire NEO PIR was administered. Descriptive analyses was conducted and Chi Square test was used to determine the statistical significance in between the variable of Age, Neuroticism, Extraversion, Agreeableness, Openness and Conscientiousness.

**Results:** Cross tab between Age and Agreeableness showed 32-50 year patients had low (60.4%), average (37.7%) and high (1.9%) agreeableness. Patients aged >51 had low (58.7%), average (37.3%) and high (4%) agreeableness with p-value 0.015.

**Conclusion:** personality traits do have an impact on risk of cardiovascular disease. High neuroticism and low conscientiousness were found to be predominant in our patients.

## **Introduction**

Heart disease as a leading cause of morbidity and mortality is of global concern. 17 million people die of Cardiovascular Diseases (CVD) each year. Similarly in Pakistan 25% of overall deaths are due to Cardiovascular Diseases. In addition every year not less than 20 million have an acute myocardial infarction or stroke but survive. Clinical risk factors for cardiovascular disease (CVD) are well documented (e.g., high blood pressure, diabetes, high cholesterol). In addition, research has now focused on establishing psychological risk factors for CVD.<sup>1</sup> Personality is the individual distinctive character of a person. Personality plays a major role in the development of

heart disease. A person's nature affects his or her bodily system and heart is no exception to this. Stress, mental tensions and physical over exertion happens to be a strain on the heart. Highly stressed people are more prone to heart disease as compared to those who take life more easily.

## **Impact of different personalities on heart**

An impatient and over ambitious personality can develop heart disease. One's nature determines one's health condition. An easygoing and relaxed person leads a healthier life as compared to one who finds life difficult to handle.<sup>2</sup> The personality assessment models used in researches are many. The NEO-PIR (NEO Personality Inventory) is one

such scale.<sup>3</sup> This test measures the five major domains of personality and also the traits that define each domain. Together the five domain scales and thirty facet scores of the NEO-PIR allow a comprehensive assessment of adult personality. The test has 240 questions. The 5 domains are:

1. **Extraversion:** Extraverts are social, prefer larger groups or gatherings. They are assertive, talkative, and active. They like excitement and stimulation and they tend to be cheerful, upbeat, energetic, and optimistic.
2. **Neuroticism:** General tendency to experience negative effects (fear, sadness, embarrassment, anger, guilt, or disgust). Also taps into poor impulse control, and lower generalized coping ability.
3. **Openness:** Curious about both inner and outer worlds. Their lives are experientially rich and they are willing to entertain novel and unconventional ideas, experiences, and values.
4. **Agreeableness:** Interpersonal tendencies, sympathetic, eager to help. High A's are fundamentally altruistic and sympathetic to others and are eager to help them.
5. **Conscientiousness:** Able to resist impulses and temptations High levels of self-control, planning, organizing, and carrying out tasks. High C's are purposeful, strong-willed, and determined.

Over the past several decades, the relationship between personality traits and heart disease has drawn the attention of both clinicians and researchers. To identify Psychological factors associated with heart disease many studies have been done. In late 1950's Friedman and Rosenman identified Type A behaviour.<sup>4</sup> Type A behavior comprise competition, hostility and exaggerated commitment to work. Since then many studies have been carried out to investigate the association of personality patterns and traits and development of heart disease. For example Western collaborative group study, which reported that type A behavior was associated with a 2 fold increased risk of CAD and 5 fold increased risk of recurrent MI over an 8.5 year follow-up.<sup>5</sup> The work of Spielberg, Jacobs, Russell and Crane (1983) has identified anger and hostility as a main source of coronary heart disease proneness was what the researchers called the Type A pattern, the Type B pattern, and mixtures of the two types.<sup>6</sup> Furthermore Cholesterol, triglycerides and five factor model of personality have been studied as well.<sup>7</sup> But simultaneously a series of studies have reported no correlation between Type A behavior and CAD.<sup>8</sup> So there are doubts and confounders have been suggested like human studies suggest that social support is a potential confounding variable.<sup>9</sup> At present no such study has been done in Pakistan. Also the association between type A behavior, anger, hostility and coronary heart diseases

have been studied but frequency of cardiac diseases in different personality types has not been studied. This study aims to estimate the frequency of heart diseases in patients with different personality types which in turn will help the holders of affected personality type to be aware of the traits that are detrimental for cardiac health and therefore should be modified. The fundamental reason behind our endeavor to study is, there has been a less work done on exploring the association of different personality types and traits especially in reference to Five Factor Model of Personality (NEO PIR).

### Objectives

1. To determine the different personality types of Cardiac patients at Karachi Institute of Heart diseases according to five factor model of personality (NEO PIR).
2. To determine which personality type is more prone to develop cardiac diseases.

### Material and Methods

**Study Design and Data Collection:** This was a cross sectional study and non-probability convenient sampling was conducted as the sampling technique. Patients were recruited from cardiology out-door patient department of Karachi Institute of Heart Diseases. The duration of study was from March till August 2016. Inclusion criteria was all cardiac patients aged 40 years till 70 years. Exclusion criteria was psychiatric disorders like schizophrenia, bipolar disorders and drug abusers. Sample size calculation was done by using WHO software for sample size calculation, where level of significance  $\alpha=0.5$ , Confidence level (%)  $1 - \alpha = 95$ , Anticipated population proportion  $P = 0.75$ , Relative precision  $\epsilon = 0.10$ , Sample size  $n = 150$ . After taking their verbal consent, they were administered an interview based questionnaire. Data was collected through questionnaire that consists of 240 relevant questions. Study was approved by the ethical review committee.

### Administration of NEO PIR:

NEO PIR is a questionnaire administered to the patients of Karachi Institute of Heart Disease. NEO PIR internal consistency and validity is 0.60%. The internal consistency of the NEO PIR was high, at: Neuroticism = 0.92, Extraversion = 0.89, Openness = 0.87, Agreeableness = 0.86, Conscientiousness = 0.90. The internal consistency of the facet scales ranged from .56-.81, although Costa and McCrae remind us that there are only 8 items on each facet. A recent article discussing personality and eating disorders reported an internal consistency of .69-.90 for the NEO PI-R facets.<sup>10</sup> Test retest reliability of the NEO PI-R is also good. The test retest reliability of an early version of the NEO after 3 months was: N= .87, E= .91, O= .86.<sup>11</sup> The test retest

reliability reported in the manual of the NEO PI-R over 6 years was: N= .83, E= .82, O= .83, A= .63, C= .79. Costa and McCrae point out that this not only shows good reliability of the domains, but also that they are stable over a long periods of time (past the age of 30), as the scores over 6 years are only marginally more different than the scores as

measured a few months apart.<sup>12</sup> A study of German twins found that the [correlation](#) between two peer-raters were 0.63 for NEO FFI [neuroticism](#). Correlation between self-rated neuroticism and peer-rated neuroticism was 0.55.<sup>13</sup>

Description of the domain and facet scales see Table 1.

**Table 1 Description of the NEO PIR domain and facet scales<sup>13</sup>**

<p><b>Neuroticism:</b> identifies individuals who are prone to psychological distress</p> <p><b>Anxiety:</b> level of free floating anxiety</p> <p><b>Angry Hostility:</b> tendency to experience anger and related states such as frustration and bitterness</p> <p><b>Depression:</b> tendency to experience feelings of guilt, sadness, despondency and loneliness</p> <p><b>Self-Consciousness:</b> shyness or social anxiety</p> <p><b>Impulsiveness:</b> tendency to act on cravings and urges rather than reining them in and delaying gratification</p> <p><b>Vulnerability:</b> general susceptibility to stress</p>
<p><b>Extraversion:</b> quantity and intensity of energy directed outwards into the social world</p> <p><b>Warmth:</b> interest in and friendliness towards others</p> <p><b>Gregariousness:</b> preference for the company of others</p> <p><b>Assertiveness:</b> social ascendancy and forcefulness of expression</p> <p><b>Activity:</b> pace of living</p> <p><b>Excitement Seeking:</b> need for environmental stimulation</p> <p><b>Positive Emotions:</b> tendency to experience positive emotions</p>
<p><b>Openness to Experience:</b> the active seeking and appreciation of experiences for their own sake</p> <p><b>Fantasy:</b> receptivity to the inner world of imagination</p> <p><b>Aesthetics:</b> appreciation of art and beauty</p> <p><b>Feelings:</b> openness to inner feelings and emotions</p> <p><b>Actions:</b> openness to new experiences on a practical level</p> <p><b>Ideas:</b> intellectual curiosity</p> <p><b>Values:</b> readiness to re-examine own values and those of authority figures</p>
<p><b>Agreeableness:</b> the kinds of interactions an individual prefers from compassion to tough mindedness</p> <p><b>Trust:</b> belief in the sincerity and good intentions of others</p> <p><b>Straightforwardness:</b> frankness in expression</p> <p><b>Altruism:</b> active concern for the welfare of others</p> <p><b>Compliance:</b> response to interpersonal conflict</p> <p><b>Modesty:</b> tendency to play down own achievements and be humble.</p> <p><b>Tender-Mindedness:</b> attitude of sympathy for others.</p>
<p><b>Conscientiousness:</b> degree of organization, persistence, control and motivation in goal directed behaviour</p> <p><b>Competence:</b> belief in own self efficacy</p> <p><b>Order:</b> personal organization</p> <p><b>Dutifulness:</b> emphasis placed on importance of fulfilling moral obligations</p> <p><b>Achievement Striving:</b> need for personal achievement and sense of direction</p> <p><b>Self-Discipline:</b> capacity to begin tasks and follow through to completion despite boredom or distractions.</p> <p><b>Deliberation:</b> tendency to think things through before acting or speaking.</p>

**Table 2: Age and Neuroticism, Extraversion, Agreeableness, Openness, Conscientiousness Cross tab**

AGE CATEGORIES	NEUROTICISM			
	LOW (%)	AVERAGE (%)	HIGH (%)	CHI-SQUARE TEST P-VALUE
32-50 YRS	7.5	47.2	45.3	0.045
>51 YRS	8	40	52	
AGE CATEGORIES	EXTRAVERSION			
	LOW (%)	AVERAGE (%)	HIGH (%)	CHI-SQUARE TEST P-VALUE
32-50 YRS	20.8	67.9	11.3	0.035
>51 YRS	18.7	58.7	22.7	

AGE CATEGORIES	AGREEABLENESS			
	LOW (%)	AVERAGE (%)	HIGH (%)	CHI-SQUARE TEST P-VALUE
32-50 YRS	60.4	37.7	1.9	0.015
>51 YRS	58.7	37.3	4	
AGE CATEGORIES	OPENNESS			
	LOW (%)	AVERAGE (%)	HIGH (%)	CHI-SQUARE TEST P-VALUE
32-50 YRS	94.3	3.8	1.9	0.05
>51 YRS	97.3	2.7	1.5	
AGE CATEGORIES	CONSCIENTIOUSNESS			
	LOW (%)	AVERAGE (%)	HIGH (%)	CHI-SQUARE TEST P-VALUE
32-50 YRS	52.8	43.4	3.8	0.02
>51 YRS	50.7	49.3	20	

### Data Analysis Procedure

The data collected was assessed by using software SPSS version 16.0 (Statistical package for Social Science)

Measuring tool: NEO PIR questionnaire

### Statistical Procedure and Analysis:

Descriptive analyses mean, and standard deviation of age were computed.

Next cross tabs between Age versus Neuroticism, Extraversion, Agreeableness, Openness, conscientiousness were computed.

### Results:

Cross tab between Age and Neuroticism showed 32-50 year patients had low (7.5%), average (47.2%) and high (45.3%) neuroticism. Patients aged >51 had low (8%), average (40%) and high (52%) neuroticism with *p*-value 0.045.

Cross tab between Age and Extraversion showed 32-50 year patients had low (20.8%), average (67.9%) and high (11.3%) extraversion. Patients aged >51 had low (18.7%), average (58.7%) and high (22.7%) extraversion with *p*-value 0.035.

Cross tab between Age and Agreeableness showed 32-50 year patients had low (60.4%), average (37.7%) and high (1.9%) agreeableness. Patients aged >51 had low (58.7%), average (37.3%) and high (4%) agreeableness with *p*-value 0.015.

Cross tab between Age and Openness showed 32-50 year patients had low (94.3%), average (3.8%) and high (1.9%) openness. Patients aged >51 had low (97.3%), average (2.7%) and high (1.5%) openness with *p*-value 0.05.

Cross tab between Age and conscientiousness showed 32-50 year patients had low (52.8%), average (43.4%) and high (3.8%) conscientiousness. Patients aged >51 had low (50.7%), average (49.3%) and high (20%) conscientiousness with *p*-value 0.02.

### Discussion

The purpose of the study was to determine the different personality types in cardiac patients in our setting. The results demonstrate that both young and old-aged cardiac patients are highly neurotic. Their extraversion and conscientiousness are mostly average, and they generally lack openness and agreeability. This study, therefore, adds evidence to the implicated direct link between neuroticism and heart disease, and inverse link between conscientiousness and heart disease. It has been established that individuals who score low on conscientiousness and high on neuroticism are more likely to be involved in risky behaviors like smoking, which in turn lead to poor physical health and cardiovascular problems.<sup>14</sup> Neurotic personality type is, therefore, more prone to lead to cardiovascular disease and hospital visits. A summary of an article published in 2010 established that Type D (distressed) personality characterized by negative affectivity and social inhibition increases the risk of adverse cardiovascular events.<sup>15</sup> The alternative hypothesis of our study that personality type affects the frequency of heart disease may well be true.

Our results also show that neuroticism is more severe and extraversion more marked in patients older than 51 years of age. However, older patients also tend to be more agreeable. Patients aged 32-50 yrs are more open and conscientious. A study conducted in 2003 reported similar results. The study showed that personality traits changed with age. Conscientiousness and Agreeableness enhanced throughout early and middle adulthood. The difference in our study may be due to cultural differences as pointed out by a study done in 2001 to determine inter-cultural gender differences in personality traits.<sup>16,17,18</sup> The study stated that women reported themselves to be higher in score with regard to neuroticism and agreeableness. The authors agreed that although the general pattern of gender differences was similar across cultures, there were differences across cultures as well. The range of cultures in the study was

small, samples were also small and not nationally representative.<sup>19,20,21</sup> Our findings may now serve to add valuable data and highlight important differences if a similar study is conducted in future.

## Conclusion

In summary, personality traits do have an impact on risk of cardiovascular disease. High neuroticism and low conscientiousness were found to be predominant in our patients.

## Recommendations:

Conscientiousness has long been linked to both health behaviors and outcomes (Goodwin & Friedman, 2006).<sup>14</sup> In particular, individuals who score low in Conscientiousness and high in Neuroticism tend to engage in the risky behaviors that contribute to poor physical health and cardiovascular problems.

Ways to Improve your Personality:

1. **Be a good listener & conversationalist** - There is nothing more appealing than having someone listen to you intently making you feel like you're the only person in the world. Once you have much to contribute, learn how to talk about it with others. No one can read about or know everything, so it's refreshing to learn from others those things we don't have the time to about read ourselves. If you happen to be shy, join a group that encourages you to talk about what you know.
2. **Have an opinion** - There is nothing more tiresome than trying to talk to someone who has no opinion on anything. A conversation has nowhere to go if you have nothing to expound on. If, however, you have an uncommon point of view or differing opinion, you are more interesting and stimulating to be with socially (unless you're a know-it-all, of course). A unique outlook expands everyone's perspective.
3. **Read more & expand your interests** -The more you read and cultivate new interests, the more interesting you are to others. When you meet new people it gives you the opportunity to share what you know and to exchange your views with them.
4. **Be yourself** - The next most tiresome thing after having no opinions is trying to be something you're not. Molding yourself in order to fit in, or be accepted, usually backfires. Since each of us is unique expressing that uniqueness is what makes us interesting. Attempting to be a carbon copy of someone else not only falls flat, but reveals a lack of authenticity

5. **Have integrity & treat people with respect** - Being honest and true to your word will bring you the admiration, respect and gratitude of others. Nothing improves a person's personality more than and respect - respect for others, as well as respect for yourself.

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