CHAPTER 5

DISCUSSION

The primary objective of the present study was to explore some Bio-psycho-social factors that distinguished individuals with Non-cardiac chest pain, cardiac chest pain. To predict if any of the Bio-psychosocial factors could indicate in developing NCCP or CCP among healthy normal groups. To develop an NCCP focused intervention program for patients with Non-cardiac chest pain.

The present study was conducted on a sample of 210 participants between the age group of 20 to 60 years. The sample was collected from different hospitals in Bangalore. The aim of the study was to explore socio demographic details and psychogenic factors among Cardiac chest pain patients, Non cardiac chest pain patients and normal group. An extensive review of literature was carried out on the identified topic. Based on related literature and the objectives, scope of the study was identified and an initiative to help the psychogenic NCCP patients with chest pain, NCCP focused supportive intervention program was developed.

Socio-demographic profile consisting of various informative details required for the study was administered to all the three groups. The profile helped in gathering information like age, gender, type of family, smoking and alcohol habits, food habits, geographical region, marital status and socioeconomic status, their blood pressure variation and diabetes were also measured.

The psychogenic factors were measured with the help of psychological scales. The Perceived stress scale by Sheldon Cohen, Type A behavior pattern scale by Dhar, Hamilton rating scale for anxiety and Hamilton rating scale for depression by M. Hamilton was administered to all the three groups to see if they were responsible for pain symptoms in CCP and NCCP patients, and also it was administered to normal healthy individuals to see if any of the Bio-psychosocial factors were present which in turn could lead to health NCCP or CCP.

An intervention was initiated to ease the pain related symptoms in NCCP patients. A pre and post intervention scores helped in seeing the effect of intervention. A pain
assessment scale was administered pre and post intervention to study the intensity of pain before and after intervention program.

The data obtained from the sample which consisted of 210 participants was assessed by means of a series of statistical tests. The procedure followed and the results obtained were presented in the previous chapter. This chapter goes a step further and attempts at explaining the results obtained.

**The discussion is divided into three sections**

Section 1a: Bio-social factors in Cardiac and Non-cardiac chest pain patients

1b: Psychogenic factors in Cardiac and Non-cardiac chest pain patients

Section 2a: Impact of Bio-psychosocial factors for Non-cardiac chest pain

2b: Impact of Bio-psychosocial factors for cardiac chest pain

Section 3a: The influence of NCCP focused supportive intervention program for NCCP

3b: The influence of intervention in pain management among NCCP patients.

5.1: Section 1

1a: Bio-social factors in Cardiac and Non-cardiac chest pain patients

The demographic profile consisted of various Bio-social factors; this was developed by the researcher to have details regarding age, gender, family type, marital status, socio-economic status, geographic region, habits like smoking and alcohol, food habits, blood pressure and diabetes. This profile sheet helped in obtaining the details at baseline level to check on various factors among NCCP and CCP patients.

The present study shows that NCCP patients differed from CCP patients in several aspects. It is seen that age plays a very crucial role in the chest pain experienced among individuals. Several studies have shown that the prevalence of NCCP decreases with age (Chiocca & Olmos, 2005). In this study it is observed that NCCP was more prominent less than 40 years and CCP is prominent above 40 years. The younger adults suffer from NCCP and as age increases the CCP is seen more commonly. (Eslick et al., 2003) Some of the previous studies show that patients
presenting with chest pain complaints showed a relevance of age factor and their health condition with chest pain complaints. The present study shows that p value of the difference in age is highly significant among NCCP and CCP group was < 0.001.

Gender in the present study shows that NCC and CCP affects both sexes equally, studies also show that it is equal among both men and women, although women with NCCP tend to consult health care providers more than men (Locke et al., 1997, Eslick et al 2004) women are more under the CCP, and men present to hospital emergency departments with NCCP more than women (Kennedy, 1982) The present study shows that women have more CCP, and NCCP is more among men. According to a study ECG showed CVD among women more than men (Chaturvedi et al, 2008). Gender does play very crucial role depending on various factors for NCCP and CCP.

Family type in this study clearly indicates that both joint and nuclear types of family suffer from chest pain symptoms, It is seen that CCP is more among nuclear families and NCCP is more among joint families. Though there are no relevant studies previously done, certain studies related to heart disease and chest pain complaints show that pressure on the families depending on number of dependents increases the responsibilities and could lead to chest pain complaints of both NCCP and CCP origin. The results in this study indicate that the lifestyle changes, the responsibilities and various other factors like adjustment issues, frustration and competitiveness could be the influencing factors among family types. The results indicate that p value of the difference in family type is moderately significant among NCCP and CCP group was at 0.05 level .

Geographic region for NCCP and CCP in this study clearly indicates that the urban population is suffering from NCCP more than CCP, whereas CCP is more in rural areas. The population based data for NCCP in Asia is lacking and literature found is not population based too among region (Locke et al., 1997) and it is observed that CCP more in rural areas. This is possible in the present day life styles among people, the rush and responsibilities and life adjustments to be made with time frame and expectations could lead to NCCP among the urban population. Whereas in rural areas, the non-availability of tertiary care and health care facility is very minimum (Wong et al., 2004) The results indicate that type of family in this study does show major chest pain complaints.
Marital status has a great role to play when it comes to health conditions in both physical and psychological origins. The present study shows that NCCP is more among married people and CCP is more among unmarried people. Then the widowed and divorces are not many in the sample and in this there are possibilities to be under either of the group. A study previously done shows that marital status with psychiatric comorbidity in patients does influence chest pain without cardiac etiology (Cicel et al., 2008) For NCCP it is seen that the factors like family adjustments, responsibilities and lifestyle demands influences a person to get stressed and thereby causing fatigue and health complaints become common. Chest pain complaints are often heard with consultations at a hospital among married people. Unmarried people do have anxiety and depressive indications along with restlessness and uncertainties of life events and this could be the reason for CCP.

Socioeconomic condition also influences for psychological and physical health conditions. CCP complaints are observed more among the high income group and NCCP among low income groups. Depending upon various factors, it indicates that health care is either neglected or due to time constraints. The CCP complaints could be due to lack of exercise, food habits and other habits like smoking, diabetes and blood pressure variations (Prakash et al., 2009). In this study it is seen that middle income group there are possibilities for developing either NCCP or CCP. Health care facilities are an economic burden for low income group. If not addressed at the right time they can lead to various life threatening illness of both cardiac and non-cardiac origin. In this study it is seen that p value of the difference in socioeconomic status is significant among NCCP and CCP group at 0.01 level.

Smoking and chest pain complaints are usually seen commonly among various age groups. In this present study it is seen that both the groups showed the smoking behavior minimum, still there are studies which support that smoking behavior influences chest pain complaints (Wong at al., 2004) The prevalence of smoking habits and correlates of psychological outcomes in patients with acute NCCP is common (Guthrie et al., 1995) . It is alarming to see that certain habits though do not show immediate effect, might influence negative impact on health condition (Ron et al., 2007). So the study shows that smoking behavior though not prevalent still NCCP and CCP complaints are present in the population.
Alcoholism factor in the present study shows its prevalence among NCCP patients. And CCP patients do not consume much compared to NCCP group. Studies have shown that a comparison of chest pain patients NCCP and CCP, the NCCP patients is younger, who consume alcohol and smoke more often (Tew et al., 1995). Long term associations with alcoholism with a minimum intake does help heart mechanism and it could be the reason that CCP patients show minimum than NCCP patients in the alcohol consumption. Studies do support that reduction in CVD with moderate consumption of alcohol (Thomas, 1996) in this study we see that there is a significant difference in alcohol consumption among NCCP and CCP group.

Blood pressure variation is a very common and frightening symptom of chest pain complaints. In this study we see that variation in the blood pressure is more among NCCP patients compared to CCP patients. Though it is observed that CCP patients do not have much variation, studies do show that hypertension can lead to various cardiac ailments (Rozanski, 2005). It is associated with anxiety and stress with which they rush to the emergency room. The variations in the systolic and diastolic pressure have a tendency for cardiac related issues and NCCP is a common outcome with variations in the blood pressure, (Prakash, 2009). This present study shows the variation as one of the factors for NCCP complaint.

Diabetes in NCCP and CCP patients if unattended could be speculated with serious health conditions difficult to manage at later stages. In this study it is observed that diabetes is prevalent among CCP patients, it could be overlapped with other risk factors for NCCP and CCP. Studies previously done show that diabetes mellitus along with smoking and obesity could be very dangerous for both NCCP and also CCP, (Leise, 2010). The previously done study shows that diabetes is seen among patients with other clinical conditions like anxiety and depression could lead to NCCP (Prakash, 2009).

Food habits and its influence on NCCP and CCP are not researched much in specific to vegetarian and non-vegetarian category. In this study it was observed that the consumption of non-vegetarian food showed more CCP and vegetarians were more among NCCP. Regarding the type of food intake, there are not many studies related to NCCP and CCP but there are studies much in detail related to general chest pain complaints. Though certain clinical studies show depending upon the quantity and
how often people consume, it can be observed that to a certain extent non-vegetarian food does support good heart mechanism. But when consumed in excess, and lack of exercise and other medical conditions like diabetes and hypertension, can lead to various CVD (American Heart Association, 2005). In this study it clearly indicates that CCP is more among people who consume non-vegetarian food, and NCCP is more among vegetarians.

The above discussion clearly indicates that the Bio-social factors do play a very important role for NCCP and CCP. Factors like age, marital status, economic background and habits like alcohol and clinical condition like blood pressure variation and diabetes also contribute for NCCP and CCP complaints from patients.

Section 1a) Summary: In the present study, the age of patients with NCCP was younger and with CCP it was higher than those of NCCP group. As age increases the CCP issues also increased, and as an observed age group of NCCP was less than 40 years. However the diagnosis of chest pain is based on complete clinical grounds with a history of various other details required for drawing conclusions for NCCP and CCP. In this study, family type, CCP is more prevalent in nuclear families and NCCP is prevalent among joint families according to the present studies. Lifestyle changes, life events, and various other factors like stress and anxiety could also lead to NCCP and CCP. In the present study, it is observed that marital status matters for health conditions with the NCCP and CCP issues. NCCP is more among married people and CCP is more among unmarried people. Divorcee’s and widowed might have the probability of both NCCP and CCP, but it cannot be ruled out as the sample here was very minimum. Various factors like family responsibilities, time constrains for regular health care, and their health conditions can contribute for NCCP and CCP conditions. The present study shows that economic condition of an individual plays a very important role related to a health condition with the NCCP and CCP. As observed in this study, CCP is more among the high income group and NCCP more among low income groups. The middle income is almost half the actual percentage in both the groups, that indicates that the middle income group also suffers from both NCCP and CCP. Health care utilities play a crucial role in the low income group to obtain facilities, if health demands are ignored then it can affect their health in various ways. For high income group, the health matter might be mere negligence; lifestyle can affect their health. The middle income group also should take measures for health
management. In the present study alcoholism shows prevalence of NCCP group, there are various conditions that can affect health due to alcoholism. Whereas certain studies shows that a minimum intake of alcohol could prevent cardiac related ailments. For NCCP it could be a factor that could harm if not treated, as it can worsen the chest pain related issues.

In this study gender, geographic region, smoking habit, blood pressure variability, diabetes and food, though show a great significant difference for NCCP and CCP, still their effect is prevalent and can affect the conditions with chest pain complaints. So it is concluded that the patients with NCCP were younger, belonged to lower income group and the majority of them were married and they belonged to joint families. But conclusions cannot be drawn on a sample of just 140 patients. As Bio-social factors alone cannot be taken as a indication for NCCP and CCP, other factors under these can be measured to rule out its prevalence for NCCP and CCP.

1b) The Psychological factors among NCCP and CCP patients

Non-cardiac chest pain is very common complaint in the general population; however a patient’s condition with chest pain is very important when it is due to psychogenic factors. As it requires step-up support along with medical attention. The sample where we have two groups NCCP and CCP, it was observed that various psychological factors had an influence on their physical health condition and pain symptoms compared between two groups. Factors like perceived stress, Type ‘A’ behavioral pattern, anxiety and depression when measured showed a difference between NCCP and CCP group.

Psychological co-morbidities, such as panic disorder, anxiety and depression are common among Non-cardiac chest pain, and affects nearly 75% of the patients (Eslick GD et al., 2003) Anxiety and depression influence reports of pain and thus contribute to the pathophysiology of NCCP. In this study anxiety is observed as a influencing factor for cardiac and Non cardiac chest pain. Studies also show that there is a relationship between the mind, (unresolved psychological conflicts, maladaptive cognitions) and feelings of tension. Whenever there is tension in the thoracic muscles elicited by anxiety might explain the mechanism of chest pain, (American psychosomatic society, 2005) Another study showed that psychological factors may interact with chest pain through the cognitive pathway, which is monitoring perceptual style.
The present study showed that anxious behavior might be a reason for chest pain complaints under cardiac and Non cardiac conditions. In this study it was observed that NCCP patients showed greater anxiety than CCP patients. In CCP the health condition of an individual usually increases the anxiety in them, and their coping strategies may fail to help them in health management.

Perceived stress is another alarming factor among individuals which conquers both their physical and mental health. In this study it was observed that PSS is more among NCCP patients than CCP patients. Stress increases cardiac related ailments and also chest pain symptoms worsen under stress. Studies have shown that when individuals are engaged with stressful situations they tend to perceive worse outcomes and thus their health gets affected. In NCCP patients, it was seen that perceived stress could lead to risk factors associated with heart disease. Studies have shown that Psychological condition like perceived stress might disturb everyday activity of an individual, and also brings in uncertainty and discomfort on everyday basis (Eslick GD, 2002). Thus perceived stress has emerged as one of the psychological variables which is associated with the NCCP.

Type ‘A’ behavior is a psychological abnormality in people, this is a behavior pattern where they are competitive, productive, goal oriented and ambitious. Such people are always in a hurry and thus are supposed to be more vulnerable to cardiovascular disease and chest pain or cramps are usual outcome complaints in NCCP patients with Type ‘A’ behavior pattern. In this study it is seen that it was almost same for NCCP and CCP patients. The very Type ‘A’ behavioral type is so prominent in influencing the clinical complaints associated chest pain. According one of the study it is seen that Type ‘A’ behavioral traits usually lead cardiac related diseases and at times heart attacks are common among these people, (Friedman & Roseman, 1974) In another study it was observed that in women CAD was more common with Type ‘A’ behavior compared to men (Jafar et al., 2008) This study indicates that Type ‘A’ behavior causes psychological distress and leads to various chest pain complaints both in NCCP and CCP patients. Comparatively it was observed to be more among NCCP patients than CCP patients.

Depression is characterized by a combination of symptoms that interfere with a person’s ability to work, sleep, or get involved in activities. When these episodes get
more often affecting an individual it may start showing some physical ailments and also begins to affect their everyday activity. A study indicates that depression is one of the major psychological variables for chest pain complaints (Atoosheh et al., 2011) Depressive illness may show NCCP and CCP complaints at emergency departments at a hospital. In this study it was observed that it is almost seen equally affecting both NCCP and CCP patients. Though we see more of the patients under NCCP, some of the studies show that depression is an illness and is a psychological abnormality which is common among the population, (Eslick GD et al., 2003) It can contribute for chest pain and associated discomfort. Prevalence estimates depression symptoms in the study almost the same in NCCP and CCP. Depression and anxiety influence reports of pain and thus contribute to the pathophysiology of NCCP (Ronnie & Sami, 2011). Psychological conditions if ignored can lead to various illnesses especially NCCP that affects an individual’s health condition. Thus the present study indicates that depression which is prevalent among both NCCP and CCP is a psychological variable to be attended to with at most care at emergency departments, when patients come with chest pain complaints.

Section 1b) Summary: Psychological co-morbidities such as perceived stress, Type ‘A’ behavior pattern, anxiety and depression are common among NCCP and CCP patients. And it affects NCCP patients more. It is a very crucial condition to manage health conditions with physical health demands when psychologically patients are disturbed. Various studies show the prevalence of anxiety as a major psychological condition among NCCP patients (Annika et al., 2008). But the other psychological abnormalities also affect the patients. The study shows that uncertainty about health conditions related to CCP usually worsens the physical health condition of the patients. NCCP could be a manifestation of Psychological conditions like anxiety and depression along with physiological disorders like GI or GERD (Achem & Fass, 2011) Perceived stress is seen as one of the psychiatric conditions commonly dealt at the physician’s clinic with patients rushing with chest pain complaints. It has to be treated accordingly to avoid conditions related to health concerns. Type ‘A’ behavior pattern does affect the physical health conditions among NCCP and CCP, though by nature people have a tendency of being restless and impulsive, it is essential to manage their behavioral patterns, or else it could lead to various health ailments, especially CCP and some of the NCCP problems. Thus, this study shows that anxiety
is a psychological factor that is prevalent among NCCP patients. Other factors like perceived stress, depression and Type ‘A’ behavior also shows that the etiology of NCCP with associated chest pain complaints in the patients.

5.2: Section 2

2a) Impact of Bio-psychosocial factors for NCCP

In this study the impact of Bio-psycho social factors were observed with NCCP group and normal group to predict the probability of the healthy people developing NCCP. Though the literature reviews do not show much of the studies conducted to observe the prediction of these various Bio-psychosocial factors, in this study we see that factors like urban population, anxiety and blood pressure as the predictive factors for NCCP. The logistic regression analysis performed with the NCCP and NG as dependent and independent variable group. 140 samples were analyzed and the full model significantly predicted NCCP status. This model accounted for 53.6% to 71% of the variance with overall of 85% of prediction were accurate. This shows those coefficients and the Wald statistics and the associated degree of freedom and the probability values for each of the predictor variables. Thus the factors anxiety, urban population and blood pressure were seen as the predictive factors for developing NCCP.

2b) In this study the impact of Bio-psycho social factors were observed by CCP group and normal group to predict the probability of the healthy people developing CCP. Though the literature reviews do not show much of the studies conducted to observe the prediction of these various Bio-psychosocial factors, in this study we see that factors like age, family type (nuclear) economic status (high income) smoking and anxiety as the predictive factors for CCP. The logistic regression analysis performed with CCP and NG as dependent and independent variable group. 140 samples were analyzed and the full model significantly predicted CCP status. This model accounted for 25% to 34% of the variance with overall of 72.9% of prediction were accurate. This shows those coefficients and the Wald statistics and the associated degree of freedom and the probability values for each of the predictor variables. Thus the factors age, family type (Nuclear) economic status, alcohol consumption was observed as the predictive factors for developing CCP.
Summary 2a and 2b: The results indicate some of the factors like anxiety, urban population and blood pressure as the predicted variables for developing NCCP. And the results also indicate that factors like age, family type (nuclear) alcohol consumption and anxiety are the predicted variables for developing CCP. This study has facilitated for a better understanding of some of the Bio-psychosocial factors that could lead NCCP and CCP among normal/healthy individuals. If prevented with awareness and guidance, it can lead to good physical and mental health management.

5.3: SECTION 3

The goals of psychological and psychosocial interventions in the treatment of a person with NCCP are numerous. Particular treatments may be intended to improve one or more of the following outcomes: to decrease the person’s vulnerability; reduce the impact of stressful events and situations; decrease distress and disability; minimize symptoms; improve their living condition; reduce risk; improve communication and coping skills; and/or enhance treatment adherence. Psychotherapies are effective and these therapies seek to fulfill the demands of the clients through common forms of therapeutic intervention, (Arnold JF et al., 1984) Psychological intervention is one of the methods to manage and treat various psychological issues either in an individual or a group. Interventions facilitate for improvement and also enhance one’s psychological health. Many psychological factors like anxiety, depression, perceived stress and Type ‘A’ behavioral issues can be managed with an intervention program. This intervention program was developed for psychogenic NCCP patients in particular to manage their health conditions and for pain management.

3a) In this study, an initiative was taken to support psychogenic NCCP patients suffering from chest pain symptoms due to psychological conditions. A pre and post intervention results obtained in understanding the effectiveness of the intervention program. Intervention program involved various stages like Orientation on NCCP, Awareness on Psychogenic condition, Thought modification, Supportive intervention, Pain management and health literacy. The four psychological variables perceived stress, Type ‘A’ behavior, anxiety and depression results along with the severity of pain assessment scale were all recorded before started the intervention program. 18 patients were involved in this NCCP focused intervention program. In between the
intervention, severity of pain was recorded and post intervention, all the four psychological variables along with pain severity assessment scale was recorded. The results later showed a significant difference between pre and post intervention among NCCP patients. Anxiety and perceived stress were highly significant at p< 0.001** and Type ‘A’ and depression were significant at p> 0.05*. Pain severity also showed a significant difference at p< 0.001**. The results indicated that the intervention model developed specifically for Psychogenic NCCP patients has facilitated in improving their psychological health, thereby the pain symptoms could have also reduced. This was just done for a focus group without a control group, case series method was followed for this intervention program. Studies have shown that psychological interventions can improve both physical and psychological health, (Kernberg O. 1984).

2b) The psychogenic NCCP supportive intervention program for NCCP patients helped the patients in reducing their pain symptoms, it was observed through the recording of pain severity at three intervals. As the intervention progressed the patients discussed about the relief they are finding with pain symptoms. The changes were discussed to facilitate the patient to recover and give assurance regarding the improvement in their health condition. Studies have suggested that psychological therapies, enlarging on characteristics of the therapist and patient, the use of specific model and a process of therapy usually helps in the management and improvement in psychological conditions.( Pelton CL,1985)

Summary: The study tried to explore the Bio-psychosocial factors affecting people with chest pain either due to cardiac or Non-cardiac origin. The results obtained indicate certain factors like age, economic status, type of family, marital status, alcoholism, blood pressure, anxiety and stress contribute significantly for chest pain ailments of both cardiac and Non cardiac origin. It is also seen that the predictive factors of NCCP and CCP can facilitate in taking preventive measures to take care of Bio-psychosocial factors that affect both physical and psychological health.

Finally, it can be mentioned that intervention model is a distinct treatment with definite goals and techniques. It has shown results for the focus group of NCCP patients with psychological conditions which had caused chest pain symptoms. It is observed in the study that patient’s awareness about their health condition is essential
for improvement in their health. And also the psychological factors play a very important role and hence it should not be neglected and immediate care should be taken to avoid any further damage to health and wellbeing. The results have also indicated for further research to see if it can be combined with other approaches to see its effectiveness in health management.