CHAPTER 5
DISCUSSION
DISCUSSION

The present study aimed at examining the effectiveness of Psychological intervention in the management of cancer pain. The experimental group received individually tailored cognitive and behavioral strategies in the management of their disease as well as procedure related pain in addition to the conventional pharmacological as well as nonpharmacological treatments which include radiation, chemotherapy and surgery. On the other hand the control group was exposed to more unstructured supportive measures. The groups were compared on various socio demographic, clinical characteristics and outcome measures.

5.1. Comparison of groups on socio demographic variables:

This section involves details about the experimental and control groups on various socio demographic data such as age, gender, marital status, education and income.

5.1.1. Age

As seen in table 1a, the experimental group was not comparable with control group in terms of their age. The mean age for the experimental and control groups were 45.16 (11.5), and 51.12 (9.4) respectively. This finding was quite similar to other studies which reported that cancer and aging are closely linked. Cancer incidence and mortality rates increase exponentially for men and women over 50 years old. Sixty percent of all cancers occur in Americans 65 years and older and 69% of all cancer deaths are seen in the same age group. Similar patterns are seen in Italy, Japan, the United Kingdom, and throughout the industrialized world (Wolner, 2003).
The age range for the experimental group was between 18-60 years and 21-60 for the control group as the inclusion criteria for age was fixed between 20-60 years.

5.1.2. Marital Status

Majority of the participants from both groups were married and the groups were thus comparable in terms of their marital status as seen in table 1b. None of the participants in either group was divorced, or separated.

5.1.3. Gender

Though the groups did not differ in terms of gender, there was an under representation of female participants in both groups as depicted in table 1b. There were only 4 female participants in the experimental group as opposed to 1 in the control group. The marked difference observed in male to female ratio in the present study is however not supported by some of the recent studies which suggest that overall, 1.5% of males and 2.5% of females are living with cancer (Forman, 2003). A variety of factors might have contributed to the under representation of female participants in the study sample. First of all the female participants were reluctant to participate in the study as it was not perceived as an inevitable part of their core treatment. While some participants expressed concern about being stigmatized as having some psychological problems by virtue of their interaction with the examiner who is a mental health professional, some others denied as having any psychological problem in the initial contact as soon as the identity of the examiner was disclosed to them. Some patients, in spite of their initial willingness, refused to continue at a later stage of the assessment as they found that the tools consisted of items pertaining to their personal life such as relationships, sexuality etc. Denial of illness and
pain, Fear of losing confidentiality, and interference from the family members were also found to have a decisive role in keeping female participants away from the study.

The under representation of female participants in research studies related to cancer has been reported in some of the prior studies (Jagsi et al. 2009). Hutchins, Unger, Crowley, Coltman and Albain (1999) in a study found significant disparities between the proportion of women among enrolled trial participants and the proportion of women among the general population of US cancer patients for 3 of 11 cancer types they examined. Murthy, Krumholz and Gross (2004) found that women were significantly less likely than men to enroll in trials for colorectal cancer and lung cancer. Studies have suggested several barriers that may discourage women from research participation, including lack of information, fear, and perceived interference with personal responsibilities, including child care (Brown, 2003). Sex differences in perceptions of risks and benefits of participation in research have been found to be influencing willingness to participate. (Ding, Powe, Manson, Sherber & Braunstein 2007).

5.1.4. Education and Occupation

As seen in table 1b, the groups were comparable in terms of their level of education. The data suggested that majority of the participants from both groups had only primary education. This may be a problem related to sampling as the entire data was collected from the general wards where a substantial proportion of the occupants belonged to lower socio economic status. The groups did not differ in terms of their occupation.
5.1.5. Income

The Experimental group did not differ from the control group in terms of their financial status as seen in table 1b. 78% of the experimental group and 85% of the control group earned less than 5000 per month. Whereas the monthly income of 21% in the experimental group and 29% of the control group was between Rs 5000 to 10000. Fairly consistent site specific association has been established between socio economic status and the incidence of cancer. The incidence rates of carcinomas of the head and neck region as well as esophagus in men and cervical carcinoma among women was higher in poorer communities (Mackillop, Salomons, Boyd & Groom, 2000). Though the findings from the present study confirm similar association, it cannot be generalized on account of sample biases.

5.2. Comparison of Groups on Clinical Characteristics of the Sample:

5.2.1. Diagnosis

The groups were compared with respect to two sets of clinical characteristics. On disease related characteristics, the data was analyzed in terms of two aspects of the disease which include diagnostic types and stages of illness. The various subtypes of diagnosis were subsumed under 3 major clinical conditions which include head and neck cancer, gastrointestinal tract cancers and all the other diagnostic categories formed the ‘other’ category. The results as displayed in table 2a indicated that there was no significant difference between the experimental and control groups and thus they were comparable. In both groups, a substantial proportion of patients had head and neck cancer of various subtypes followed by gastrointestinal tract cancers. The findings from the present study, as dominated by the male participants are consistent with that of the existing studies which
reported head and neck cancers, predominantly cancer pharynx followed by oral cavity to be the most prevalent ones among males in India (Reddy, 2005). The distribution of gastrointestinal tract cancer and other diagnostic subtypes were almost similar across experimental and control groups.

5.2.2. Stage of illness

From table 2a, it is evident that the two groups were comparable in terms of stage of illness as there was no statistically significant difference between them. The analysis was carried out with respect to four major stages, eliminating all the sub stages. The two groups on comparison with respect to stage of illness showed that they were comparable. Both groups had an under representation of stage one and stage two participants irrespective of the diagnosis.

By contrast, majority of the participants in both groups belonged to stage III and IV as seen in table 2a. The reason for the greater prevalence of advanced stages of illness in both groups is not very clear. However it may be analyzed in terms of certain possibilities such as a) Inclusion Criteria b) Nature of the study center c) Delay in taking consultation.

5.2.2.1. Inclusion Criteria

One of the inclusion criteria used in the present study was a score of four and above on VAS which might have automatically restricted the entry of certain number of cases that probably belonged to stage I and stage II as the prevalence of pain at these stages are relatively low (Kelson, 1995) ending up in inclusion of more number of stage III and stage IV cases.
5.2.2.2. Nature of the study center

The study was conducted at a tertiary hospital where the patients are commonly referred for treatment and second opinions, usually late in the course of their treatment and disease process. This might increase the possibility of more number of participants with stage III and stage IV of the illness being included in the study sample.

5.2.2.3. Delay in taking consultations

The tendency to delay taking consultation till the illness progresses towards the advanced stages have been reported in some of the recent studies. Scott, Grunfeld and McGurk. (2005) found that up to 50% of patients present with advanced-stage disease. Estimates indicate that approximately 30% of patients delay seeking help for more than 3 months following the self-discovery of symptoms of oral cancer (Allison, Franco, Black, Feine, 1998).

Various reasons have been attributed to the delay in taking treatment in spite of the patient being aware of the diagnosis. Health related and psychosocial factors such as an individuals’ symptom interpretation/attribution, disclosure of symptoms to significant others and social priorities play an important role in the decision to seek help (De Nooijer, Lechner & De Vries, 2001).

5.2.3. Duration of illness, Types of pain (Disease related and Procedure related)

From table 2b, it is evident that the groups were similar and thus comparable in terms of the duration of illness. The comparison between two groups did not show any significant difference with respect to the nature of pain. However as evident from table 2c, the number of participants with disease related pain in both groups was twice as many as
that of the participants with procedure related pain. When 21 (65.6%) participants from the experimental group and 20 (58.8%) from the control group reported pain that was related to their disease, only 10 (31.3%) participants from the experimental group and 10 (29.4%) from the control group reported procedure related pain. Though Meta analytic studies have reported similar prevalence rates for disease related pain (Van Everdingen et al., 2007), there is a dearth of studies on procedure related pain.

In the present study, inclusion of procedure related pain was restricted to certain treatment procedures which caused pain such as radiation, chemotherapy and surgery. On the other hand, some of the diagnostic procedures which caused acute pain were not included as they did not meet the criteria in terms of their temporal features as it required a minimum duration of one weeks’ time. In addition, many patients who were undergoing the procedures did not report pain that was severe enough to be included in the study. (4 on VAS).

5.2.4. Nature of Pain

Two types of pain patterns have been identified in cancer: continuous base line and transitory exacerbations. The transitory exacerbations of pain are episodic (Zeppetella & Ribeiro, 2002). In the present study, the experimental and control groups were compared with respect to continuous and episodic pattern of pain. From table 2c it is evident that the two groups did not differ in terms of the pattern of pain. Findings from the study also indicated that each group consisted of more or less same number of participants who had reported episodic and continuous patterns of pain. Though some participants reported episodic pain, it may not be reasonable to label it as break through pain as the quality of
pain reported by many patients did not exactly match with the essential characteristics of breakthrough pain other than being episodic (Portenoy & Hagen, 1990). Though nearly 50% of the patients in each group reported pain that was transitory, their VAS scores did not suggest that it was too severe to be included under typical breakthrough pain.

5.2.5. Treatment related characteristics

5.2.5.1. Physical treatment

The groups were compared in terms of physical and psychological treatments that they received. From table 2d it is evident that both groups were exposed to more or less equal number of sessions of physical treatment which involved radiation or a combination of radiation and concurrent chemotherapy. As the statistical analysis indicated, both groups were comparable.

5.2.5.2. Psychological treatment

The number of sessions of psychological intervention attended by the experimental and control groups were more or less equivalent as illustrated in table 2e. As seen in the table, the patient dropout rate in each group was more or less similar and the trend of losing patient per session was also found to be similar. Session wise drop outs as seen in the table, demonstrate that up to eighth session, before completing the minimum required number of sessions, one or two patients dropped from both groups with a maximum number of dropouts at the third session where three patients from the experimental group and five from the control group dropped out.
The reasons for drop out from the psychological intervention were thought to be multifactorial. This include worsening of pain, discomfort, fatigue, lack of motivation, interference from family members and deterioration of general health conditions etc. The impact of psychological intervention was analyzed in the following manner

5.3. Impact of intervention on outcome variables

5.3.a. Interaction of analgesics with pain outcome variables

5.0.a. Relationship between duration of illness, Sensory and Affective pain

5.4. Impact of Cognitive Behavioral intervention on Sensory and Affective Pain

5.5. Impact of intervention on pain cognitions

5.6. Impact of intervention on coping strategies

5.7. Impact of intervention on Pain types (disease related and Procedure related pain)

5.3. Impact on outcome variables

The groups were compared on the basis of predetermined outcome measures which consisted of four sets of measures.

1) Pain intensity

2) Five of the indices derived from MPQ scores which include PRI(S), PRI (A), PRI (E), PRI (T) and PPI

3) Pain Disability Index

4) Four domains scores derived from WHO QOL BREF.
5.3.1. Pain intensity

Groups were compared on pain intensity as measured by VAS at pre, post and follow up levels. As seen in table 3a there was no significant difference between the two groups with respect to reduction of intensity of pain. From figure 1a it is evident that both groups responded in a more or less contradictory manner. While the Experimental group demonstrated a reduction of VAS scores following the intervention, by contrast the control group reported an increase of scores. Reduction in VAS scores for both groups was evident at the follow up assessment. Though the groups did not show a significant difference on pain intensity, the mean scores indicated a trend towards pain reduction in the Experimental group probably suggestive of some change following psychological intervention.

5.3.2. Sensory Pain: PRI (S)

The effect of cognitive behavioral intervention on the sensory component of pain was analyzed in the present study. As seen in table 3a, the groups did not show any statistically significant difference. However it was evident from the mean scores that there was a mild reduction on sensory scores in the experimental group at the post treatment assessments as compared to the control group. The sensory component of pain is related to where pain is located and how it feels. The location of pain will affect an individual’s response to pain. It was found that participants who reported higher scores on PRI S also tend to give higher scores on VAS. However this relationship was not statistically analyzed. This possible relationship may be due to the fact that VAS is designed to measure the intensity of pain which is reported to be one of the three components of sensory pain (Ahles, 1983) (other two components being location and quality of pain).
PRI S as measured by Mc Gill questionnaire tends to assess various qualities of pain which include adjectives which describe pain intensity also (Bressier, 1986; Barber as cited in Ho S.M.Y, Horne DJ, Szer J, 2001 pp. 3-10, Bradley as cited in Ho S.M.Y, Horne DJ, Szer J, 2001; pp. 3-10).

5.3.3. Affective pain: PRI (A)

The effect of cognitive behavioural intervention on the affective component of pain was analyzed in the study. As seen in table 3a there was no statistically significant difference between the experimental and control groups. However from figure 1b it is evident that there was a mild decline of score in the experimental group at follow up assessment as compared to the control group. Both groups demonstrated a reduction on PRI (A) scores at post treatment assessment. However as indicated in Fig 1b, the experimental group reported mild reduction of affective pain at follow up. This may suggest the possibility that cognitive behavioral intervention was helpful in reducing the distress associated with Pain.

5.3.4. Evaluative Component: PRI (E)

The evaluative component of the pain experience consist basically of the manner in which pain influences the individual’s thought processes and the way in which he view himself. The analysis revealed that the groups differ significantly with respect to the evaluative components of pain.

In the present study as seen in table 3b, cognitive evaluative component of pain in the experimental group decreased significantly at post treatment and follow up assessments. This implies that as compared to sensory and affective components of pain,
cognitive component responded well to the intervention. This may suggest that cognitive behavioral intervention had some impact on the patients’ approach towards the pain. Apparently the nature of evaluation had changed from negative to neutral following intervention. The findings also implicate that the effect of intervention on one component do not affect the other component significantly. Inspite of the significant change that had occurred in the cognitive component of pain in the experimental group, the other two components did not demonstrate any significant change though it is argued that the components are interrelated (Turk, Rudy & Salovey, 1985). The present findings are in contrast with the studies conducted by other investigators. Ahles, Blanchard and Ruckdeschel, (1983) in their study found that cancer patients reported significantly elevated score on pain when they evaluated pain as indicative of worsening of disease as compared to the patients who had not considered the possibility of pain as worsening of their illness. Spiegel and Bloom (1983) also assessed the meaning of pain in their sample of patients with metastatic breast cancer. The belief that pain was indicative of worsening illness was significantly correlated with reports of more pain. This kind of a relationship was not observed in the present study. The findings probably indicate that the components of pain are not identical in terms of their modifiability. It also may suggest that certain components as compared to others are more accessible and susceptible to change.

5.3.5. PRI (T)

As seen in table 3b, the total PRI index for both groups did not differ statistically. However some difference in the mean scores was observed between pre and post treatment assessment for the experimental group. It has been argued that PRI is the only reliable pain
rating index as compared to other individual components as all other components of McGill Questionnaire are highly interrelated (Turk, Rudy & Salovey 1985).

5.3.6. PPI

As in the case of other pain indices, PPI representing pain intensity also did not show any difference between the experimental and control groups though the mean scores for the experimental condition reduced slightly as compared to the control condition at the post treatment assessment (Table 3b.).

5.3.7. PDI

The experimental and control groups did not differ statistically significantly as seen in table 3c. However the scores indicated a trend which appears to be unique to PDI. As evident from fig 1c, both groups demonstrated an increase in their PDI scores at post treatment assessment, though it was more prominent in the control group. The worsening of pain disability in both groups needs to be analyzed within the context of other factors which include scores on other measures, Time frame of assessment, as well as the inherent properties of the instrument being used. The present finding on PDI, do not go well with the findings obtained on other measures such as VAS, affective and evaluative pain, PPI and PTI especially for the experimental group. This holds true for the findings generated by the control group, in which all other outcome measures demonstrated either no change or mild reduction of scores, except for the increase on VAS score at post treatment assessment. Though the increase on VAS scores in the control group appear to be linked with the hike on PDI scores, it is contradicted by the significant reduction of VAS scores at post treatment assessment for the experimental group. In a similar vein, other pain outcome
measures in the experimental group demonstrated either mild to moderate reduction of scores or no change. This raises the possibility that worsening of PDI scores may be independent to other pain measures which need to be substantiated with further statistical analysis.

The time frame of assessment with reference to the contents of the scale also needs to be looked at while analyzing the reasons for increased score for PDI. The scale consists of 7 domains which include family, home responsibilities, recreation, social activity, occupation, sexual behavior, self-care, and life support activity. The increase in score for both groups was observed at post treatment assessment which was carried out after more than one month of hospitalization as opposed to a few days of hospitalization at the time of pretreatment assessment. Thus the long term effect of hospitalization as it imposes several restrictions on almost all domains being assessed might also have had some effect on the scores of PDI. This may suggest the need for a more refined instrument to assess pain disability among cancer patients excluding the effects of hospitalization.

5.3.8. WHO QOL

Though the groups did not differ on various domains of WHO QOL (BREF), the mean scores at pre and post treatment assessment indicated increase in scores from pre to post and follow up assessment in certain domains (table 3d). The experimental group reported an increase in score from pre to post assessment on physical health and Psychological domains and Environment domains.
The impact of intervention on the pain outcome measures can be summarized as follows. No significant change was found between the experimental and control groups in any of the outcome variables studied except for evaluative pain. Though the groups did not differ in terms of the intervention received, a trend towards improvement was visible in the experimental group after the intervention. While VAS score showed a marked reduction in the experimental group, by sharp contrast, the scores increased markedly in the control group. PDI scores demonstrated a unique pattern characterized by marked increase in both experimental and control groups probably suggestive of the confounding effect of factors such as hospitalization. The mean scores on QOL indicated a trend towards improvement in three of the domains; physical health, psychological and environment. On the whole it can be concluded that evaluative pain responded well to the cognitive behavioral intervention.

5.3.a. Interaction of analgesics with pain outcome variables

In the present study 35 participants were put on various analgesics, classified into three broad categories such as mild, moderate and severe as it was found to be difficult to equi potentiate them in to morphine equivalents. The interaction of these analgesics was not controlled in the experimental design. However statistical analysis was carried out to study the effect of analgesics on all outcome measures. The results as seen in table 4a did not indicate any significant interaction with the analgesics used by the participants. This implies that the analgesics did not have any significant influence on determining the outcome of cognitive behavioral intervention. The resultant changes may be specifically attributed to the effect of psychological intervention.
5.0.a. Relationship between duration of illness, Sensory and Affective pain

Cancer pain is unique among pain syndromes in that it has characteristics of both chronic and acute pain (Cherny, 2003). Like most acute pain conditions, cancer pain is directly associated with tissue injury; it acts as a powerful drive, triggers general autonomic mobilization and focuses attention on the affected body part. Cancer pain is also similar to chronic pain in that it can persist for months and years without improvement, impair personal and family functioning and produce affective symptoms such as hopelessness, helplessness, and inhibited autonomic activity. Acute pain as a nociceptive pain shares all features of sensory pain. On the other hand, the signatory feature of chronic pain is its strong affective components. (Ahles, Blanchard & Ruckdeschel, 1983). The present study attempted to examine the relationship between duration of illness and sensory, affective components of pain in both experimental and control groups. As seen in table 5a, no significant correlation was obtained at pretest, posttest and follow up assessments. This provides suggestive evidence that sensory and affective pain can exist in cancer pain regardless of the temporal aspects of illness. This is in contrast to what has been reported in other forms of pain (Fernandez & Turk, 1992). The findings further support the heterogeneity of cancer pain having mixed features of acute and chronic pain punctuated with sensory and affective components irrespective of the duration of illness. Analysis of the results also demonstrates a striking difference in reporting of sensory and affective pain by the participants from experimental and control groups. As illustrated in table 3a, the mean scores for sensory pain in the experimental group at pre, post and follow up assessment was 12.70 (5.39), 10.84 (5.14) and 4.76 (4.50) respectively and the control group reported almost similar scores with 11.73 (5.78), 10.50 (3.58) and 4.47 (3.80) at pre,
post and follow up assessments. By contrast the scores on affective pain (PRI A) were remarkably low for both groups. While participants from the experimental group reported a set of scores as low as 2.96 (2.10), 2.09 (2.68) and .51 (1.102) at pre, post and follow up assessments, the control group with a score of 2.13 (2.69), 1.81 (2.54) as pre, post and follow up assessment did not differ significantly. The mean sensory pain scores were at least 5times higher than the affective pain scores in both experimental and control groups at pretest, posttest and follow up assessments. The scores for both types of pain were derived from weighted rank scores with a maximum possible score of 18.16 and 17.5 respectively for sensory and affective pain. The apparently striking difference between sensory and affective scores in spite of the maximum weighted score being almost same probably indicate the underreporting of affective pain by the experimental and control group. Ho S.M.Y, Horne, Szer J, (2001) reported similar findings in procedure related acute pain associated with bone marrow transplantation in which it was found that the sensory pain reported was 2.5 times higher than the affective pain. A possible explanation might be that cancer pain patient’s place greater emphasis on the physical aspects of pain than non-cancer pain patients. Consequently, cancer patients might focus more on the sensory components of the pain and less on other aspects of the pain experience. Cancer patients might focus more on the nociceptive components of the pain and less on the aversive aspects of the pain experience (Wit, 2001).The marked discrepancy observed between sensory and affective components of pain also raises the possibility that cancer patients utilize sensory channels more frequently at the cost of affective components. Thus the findings from the present study lend support to the relationship established between chronic cancer pain and alexithymia in previous studies, (Dalton & Feuerstein, 1989).
However in the case of disease related pain, the preponderance of affective pain was reported depending on the seriousness of illness. Price (1984) found that those patients whose pain is perceived to be associated with a serious threat to health or life would rate their pain much higher on an affective VAS than patients whose pain is less threatening.

The findings from the present study tend to suggest that in spite of cancer pain being heterogeneous in terms of its characteristics having an assortment of both acute and chronic pain, there was a preponderance of sensory pain which is typical of acute pain as compared to the affective pain. The findings may have a significant clinical implication that the choice of pain management strategies has to be considered on the basis of the nature of pain. In view of the predominance of sensory pain, strategies that alter the perception of pain should be more effective than those that focus on the patient’s emotional reaction to pain. The present result provide a basis for choosing techniques which are said to be more sensory oriented such as hypnosis and biofeedback than therapies which deal with affective components.

5.4. Impact of Cognitive Behavioral intervention on Sensory and Affective Pain

The effect of cognitive behavioral technique was examined by comparing Pre and post treatment assessment scores of sensory and affective pain in the experimental group. Though no statistically significant difference was found from pre to post assessment, the mean scores for sensory pain indicated a reduction suggestive of improvement. No such change was found with respect to affective pain.
5.0.b. Pain Cognition and Outcome measures

Patients’ beliefs about their pain are thought to play a prominent role in pain perception, function, and response to treatment (Williams, 1994). Certain beliefs may lead to maladaptive coping, increased suffering, and greater disability. Patients who believe their pain is likely to persist may be quite passive in their coping efforts and fail to make use of cognitive strategies or behavioral strategies to cope with pain. Patients who consider their pain to be an unexplainable mystery may negatively evaluate their own abilities to control or decrease pain and may be less likely to rate their coping strategies as effective in controlling and decreasing pain (Williams & Keefe, 1991; Williams & Thorn, 1989). In the present study, relationship between pain beliefs and pain outcome measures was investigated. Significant correlations were found between some of the pain cognitions and outcome measures as seen in table 6a.

The belief ‘disability ‘is associated with the cognition that the individual is unable to function because of pain. Findings from the present study showed that the quality of life pertaining to physical health tend to decrease as one harbors more ‘disability’ beliefs. The cognition ‘harm’ represents the belief that pain signifies damage .This belief significantly and negatively correlated with the physical health domain of Quality of life. The negative correlation that was found between harm and pain indices like PRI (s) and PRI (T) was however not expected .The subscale ‘Emotion’ is concerned about belief in relationship between emotions and pain .In the present study, a negative correlation was found between harm and QOL which indicated the possibility that as the person tends to relate more on emotion and pain, hypothetically the QOL might decline. Whereas this was in the opposite direction with reference to PPI.
Three of the pain cognitions demonstrated a significant relationship with quality of life pertaining to physical health. They include disability, harm, and emotion. On the other hand, the cognition ‘harm’ showed a negative correlation with PRI (s) and PRI (T) which was not in the expected direction. The analysis revealed that pain cognitions may have a determining effect on some of the outcome variables studied, particularly the quality of life.

5.5. Impact of intervention on pain cognitions

The impact of psychological intervention on pain cognitions was examined which suggested that there was a significant difference between the experimental and control groups on two of the pain cognitions. These include ‘control’ and ‘medication’. As the mean scores indicated, the experimental group demonstrated a significant increase on the subscale ‘control’ at post treatment as compared to the Control groups. (Table 6b). This may suggest that there was an improvement following the intervention on the participant’s belief in control over their own pain (Fig 2a). Patients holding high control belief or those who increase their control beliefs with treatment have been shown to have better overall adjustment to chronic pain (Jensen 1994).

The perception of one’s ability to exert any control over his or her plight generally and their pain more specifically is related to the central construct self-efficacy (Bandura, Taylor, Williams, Meffort & Varchas, 1985). A growing base of research supports that Patients low in self-efficacy report significantly higher levels of pain in cancer (Porter, Keefe, Garst, Mc Bride & Baucom, 2008).
Self-efficacy beliefs can be enhanced through (a) skill mastery (b) sharing vicarious experiences (c) verbal persuasion and (d) providing information about the individual's physiological and affective state (Bandura as cited in Arnstein, Caudill, Mandle, Norris & Beasley 1999; P 438-491) The findings from the present study suggested that the various components of cognitive behavioral intervention employed in the current study might have translated an effect which is theoretically congruent with the propositions made by Bandura with respect to self-efficacy. Given the contribution of self-efficacy to outcomes suggested in the previous studies, the enhancement of self-efficacy beliefs through participation in cognitive-behavioral programs may reduce pain.

As seen in table 6b, the results indicated, there was a significant difference between the control and experimental groups on the cognition ‘medication’; the belief that pain is best managed with medications is associated with a greater number of pain related emergency room visits (Jensen, 1994). As seen in Fig 2d the mean scores for this pain cognition indicated that there was a significant reduction of scores from pre to post treatment assessment suggesting improvement in terms of the specific belief ‘medication’. Increased score on control with a corresponding decrease on the cognition ‘Medication’ raises the possibility that these two pain cognitions may be related. This probably implicates that increased self-efficacy as manifested in the ‘Control’ cognition tend to decrease the belief about need for medication and enhanced confidence about one’s own personal resources in controlling pain which needs to be explored further in future studies.

Though only two of the pain cognitions demonstrated a statistically significant difference between experimental and control groups from pre to post treatment
assessments, an intriguing trend indicating change in the desirable direction was visible for two other pain cognitions (Fig 2b, 2d). As seen in table 6b, the mean score of the cognitions ‘harm’ and ‘solicitude’ for the experimental group as compared to the control group decreased considerably at post treatment assessment. While increased score on solicitude represents belief in the appropriateness of solicitous responses from ones family when in pain, Harm is a belief that pain signifies damage and that exercise and activity therefore should be restricted. Patients holding these types of beliefs adjust more poorly to their painful condition, and specific types of beliefs are associated with particular outcomes (Jensen, 1994).

One finding of the current study that is particularly noteworthy is the effect of intervention on two of the pain cognitions, Control, and Medication. This is despite the lack of improvement in other pain outcome variables such as pain disability, quality of life, and pain intensity. It is now closely established that specific cognitive factors targeted for change in pain management are associated with positive outcome (e.g., reduced disability, reduction in pain severity, improved mood). However this was not observed in the present study. On the other hand intervention targeted at the behavioral and cognitive domains had precipitated alterations in some of the negative cognitions. Studies have reported that cognitive changes are responsible for positive outcomes (De Rubeis & Feeley, 1990). This relationship was not found to be bidirectional. Studies using cross lagged panel design have shown that changes in cognition early in the treatment were significantly correlated with later treatment changes in pain severity and functioning. But that early treatment changes in pain severity and functioning were not correlated with later treatment changes in cognitions (Burns, Kubilus, Bruehl, Harden, & Lofland, 2003). Thus translating the
findings from the existing literature, it may be construed that the changes that were found to have occurred in the current study in two of the cognitions, medication and control might bring out an effect on later treatment changes in pain severity and functioning though this was not evident in the present findings.

The impact of Cognitive behavioral intervention on pain cognition may be summarized as follows. The impact on seven of the pain cognitions was analyzed in the present study. There was a significant change in two of the cognitions following the intervention in the experimental group. Such a change was not observed in the control group. The cognitions ‘control’ and ‘medication’ appear to be theoretically related as the ‘control’ cognition enhances, need for dependency on medication tend to decrease. The intervention also found to have some effect on two other cognitions. Though statistically not significant, a definite trend was visible with respect to the cognitions solicitude and harm. The mean scores for both cognitions decreased markedly following cognitive behavioral intervention.

5.6. Impact of intervention on coping strategies

The present findings demonstrated a significant difference between the experimental and control groups with respect to four of the coping strategies from pre to post test and follow up assessments. They include mental disengagement, emotional social support, Instrumental social support and planning. (Fig, 2e, 2f, 2g, 2h). Significant Improvement observed in two out of the five problems focused coping strategies (seeking instrumental support and planning) partially support the role of CBT in the enhancement of coping strategies. This view point is supported by the argument that CBT in pain
management is essentially a training which involves the enhancement and maintenance of certain problem focused coping skills. Keefe, (1996) argues that most of the components of CBT in pain management are tailor-made to build up coping strategies. He systematically analyzes that in CBT, training is provided in wide variety of cognitive and behavioral pain coping strategies. Progressive relaxation and cue-controlled brief relaxation exercises are used to decrease muscle tension, reduce emotional distress, and divert attention from pain. Activity pacing and pleasant activity scheduling are used to help patients increase the level and range of their activities. Training in distraction techniques such as pleasant imagery, counting methods, and use of a focal point helps patients learn to divert attention away from severe pain episodes. Cognitive restructuring is used to help patients identify and challenge overly negative pain-related thoughts and to replace these thoughts with more adaptive, coping thoughts. The third component of CBT involves the application and maintenance of learned coping skills. During this phase of treatment, patients are encouraged to apply their coping skills to a progressively wider range of daily situations. Patients are taught problem solving methods that enable them to analyze and develop plans for dealing with pain flares and other challenging situations. Self-monitoring and behavioral contracting methods also are used to prompt and reinforce frequent coping skills practice. The findings from the current study lend some support to the assumption that adaptive coping strategies may be strengthened with cognitive behavioral intervention.

The finding that the experimental group differed significantly from the control group with respect to adaptive coping strategies needs to be examined in the context of findings related to pain cognitions. Among the Seven pain cognitions studied, two of them showed significant difference between experimental and control groups across different
levels of assessment (control and medication Fig 2a, Fig 2c). Though these two findings emerged independently, it is possible that they may be related in some way as cognitive changes are known to precipitate changes in coping strategies (Jensen, Karoly & Braver, 1986). Patients who believe they can control their pain, who avoid catastrophizing about their condition, and who believe they are not severely disabled appear to function better than those who do not. Such beliefs may mediate some of the relationships between pain severity and adjustment (Jensen, Karoly & Heuger 1997). Studies also have reported the association between specificity of beliefs and coping strategies employed by the individual. Turner, Clancy and Vitaliano, (1987) found that the belief that the pain problem is something one must accept correlated positively with problem focused coping. They also found that: (1) believing that one’s pain requires activity restriction correlated negatively with problem-focused coping and positively with self-blame; (2) having experienced pain before associated negatively with social support seeking; (3) believing one can change pain was associated positively with wishful thinking; (4) and believing that pain problem will be resolved in four years was associated with the use of avoidance coping strategies. Although coping strategies seemingly associated with pain cognitions, methodological problems limit conclusions regarding the strength and nature of this association in the present study.
5.7. Impact of intervention on Pain types (disease related and Procedure related pain)

**Disease related and Procedure related pain**

As seen in tables 7a to 7k, the experimental and control groups did not show any significant difference with respect to disease and procedure related pain particularly in terms of pain type and intervention interaction suggesting that cognitive behavioral intervention may not be differentially effective on either procedural or disease related pain. However the analysis revealed certain trends which may throw some light on the outcome of intervention.

From table 7a it is evident that there was a marked decrease in VAS scores on disease related pain in the experimental group. The control group did not show any change in disease related pain. While the procedure related pain scores decreased for the experimental group, there was a marked increase for the control group. This may suggest a trend indicating the possibility that the intervention may have some effect on both disease related pain and procedure related pain more or less similarly. From table 7c it is seen that PDI scores showed a different trend in comparison with VAS scores. The scores increased for both experimental and control groups with respect to disease related and procedure related pain. This also may suggest that reduction in pain may not link with reduction in disability associated with pain. As seen in table 7d, the affective pain did not show any specific response to intervention as both groups showed a reduction of scores. The score as seen in table 7e demonstrated a similar trend what was observed with VAS scores. The scores for procedure related pain in the control group increased in contrast to that of the experimental group. This raises the possibility that the evaluative component of pain may be more sensitive to psychological intervention while disease related pain decreased in
both groups. On PRI (T), only the experimental group demonstrated a reduction of scores with respect to procedure related pain (table 7f) suggesting a trend indicating the possibility that intervention may have an effect on procedure related pain.

The scores on WHO QOL (physical health) tend to demonstrate a trend suggesting the possibility that quality of life in the physical health domain may respond to intervention irrespective of disease or procedure related pain. The scores on WHO QOL (psychological domain) suggested a trend which may indicate the possibility that intervention may have an effect on the quality of life pertaining to the psychological domain with respect to disease related pain. As seen in table 7j, the increased score in the disease related pain category of the experimental group tend to suggest the possibility of a trend indicative of improvement on disease related pain. The analysis of the mean score tends to suggest the possibility of a trend that may indicate the effect of intervention on quality of life pertaining to the environment domain with respect to the procedure related pain.

In summary, no significant change was found between the experimental and control groups as a consequence of intervention though some trends suggestive of improvement were observed.

5.8. Relationship between Death Anxiety and pain Outcome variables

In the present study, the relationship between death anxiety and all pain outcome variables was examined. Significant relationship was consistently established only with some of the subscales of WHO QOL and PRI. The experimental group showed a significant association between death anxiety and some of the subscales of WHO QOL.
The negative correlation obtained with physical Quality of life suggested that higher scores on death anxiety at pretreatment may decrease the score of physical health at post treatment. This kind of a relationship was also found for death anxiety at post treatment with physical health at post treatment. Apart from the physical Quality of life, QOL pertaining to Psychological domain also correlated significantly and negatively. Accordingly, quality of life pertaining to the psychological domain at follow up might decrease as death anxiety at post treatment tend to increase. The findings suggested that an increased death anxiety at post treatment assessment tend to increase the score on social relationship domain of QOL at post treatment assessment. Similarly the findings also indicated that an increased quality of life pertaining to the environment domain might decrease death anxiety at follow up. This would suggest that the materialistic aspects apart from the spiritual, religious and philosophical dimensions may have some impact on death anxiety. The findings from the present study with reference to the relationship between quality of life and death anxiety confirms the findings reported by Witt (2010) wherein greater death anxiety was associated with lower quality of life.

The positive correlation found between the affective component of pain and death anxiety support the notion about both having a common origin in terms of their power full affective components. In addition, death anxiety has been speculated as a central feature of health anxiety and may also play a role in other anxiety disorders (Patricia 2008). In the experimental group, the negative correlation obtained between PRI (E) and death anxiety was quite contrary to what was expected as compared to the other variables. Similarly in control group, the Sensory pain, and VAS score showed a negative correlation with death anxiety which were not in the expected direction.
5.9. Relationship between Coping and pain outcome variables

Cancer pain sufferers use a variety of methods to cope with pain and associated problems (Pettingale, 1984). Differences in coping style and strategies have been hypothesized to explain some of the variations in adaptation observed among those who experience pain (Burgess, 1988). Pain coping strategies are predictive of adjustment to pain (Ashgiri & Nicholas, 2006). Particular coping responses are associated with better mental health, such as greater use of task persistence (Raichle, 2007) coping self-statements, and ignoring pain, (Turner, 2002) while other coping responses are associated with higher levels of pain interference, such as greater use of resting, guarding, and asking for assistance (Raichle, 2007).

In the present study, the relationship between coping strategies and all pain outcome variables was examined. All individual scales of COPE were correlated with pain outcome measures which include VAS scores, all four domain scores of WHO QOL, PRI scores (PRI (S), PRI (A), PRI (E), PRI (T) and PDI. The analysis was carried out with respect to the scores obtained at pre, post and follow up assessments to determine the consistency of relationship with coping methods and pain outcome variables across different point of time.

The analysis of coping strategies did not reveal any consistent pattern across pre, post and follow up assessments. Of the 15 coping strategies studied, only 9 of them were found to have a significant correlation with some of the pain outcome measures. The scores obtained in the pre and post assessments were more or less in the expected direction. However some of the correlations obtained in the follow-up assessment were
unanticipated and contradictory. There were only two coping strategies which showed consistent association with outcome measures across different levels of assessment. While ‘Planning’ consistently showed positive correlation with social relationship domain of WHO QOL at posttest and follow up assessments, suppressing of competing activities was found to be consistently and positively correlated with PRI (A) at post test and follow-up assessment.

As seen in table 9a VAS scores significantly and positively correlated with mental disengagement and denial at pretreatment assessment. Mental disengagement occurs via a wide variety of activities that serve to distract the person from thinking about the behavioral dimension or goal with which the stressor is interfering. Tactics that reflect mental disengagement include using alternative activities to take one’s mind off a problem, day dreaming, escaping through sleep, or escape by immersion in TV. Denial is useful minimizing distress and thereby facilitating coping. On the other hand denying the reality of the event allows the event to become more serious, thereby making more difficult the coping that eventually must occur (Carver, Scheier & Weintraub, 1989).

Mental disengagement and denial are described as dysfunctional coping strategies which attempt to sort out the problem for the time being. This probably implicate that keeping the stressful event out of one’s active attention may have a negative impact on the problem in the long run and may not be fruitful in dealing with the problem.
5.9.1. Behavioural disengagement

A significant negative correlation was found between the scores on social relationship domain of WHO QOL and Behavioural disengagement at the pretreatment assessment. This probably indicates that increased social relationship might decrease an individual’s tendency to indulge in coping strategies such as behavioral disengagement characterized by reducing one’s effort to deal with the stressor, even giving up the attempt to attain goals with which the stressor is interfering. Behavioral disengagement is reflected in phenomena that are also identified with conditions like helplessness (Carver & Scheier, 1983). As seen in table 9b at posttest assessment, a significant positive correlation was found between Environment domain of WHO QOL and behavioral disengagement. At follow up, it correlated significantly and positively with the psychological domain of WHO QOL. At follow up assessment, behavioral disengagement correlated negatively and significantly with PRI (S) which suggest that the sensory pain tend to decrease as the behavioral disengagement increases. The findings generally indicate that behavioral disengagement may have a different association at different points of time. The negative correlation that was evident at the pretreatment assessment was not repeated in the next two assessments. In a similar vein, positive correlation as observed in the post treatment assessment was not found in the other two assessments. At follow up, it correlated significantly, positively with the sensory component of pain and with the psychological domain of quality of life. The findings from the present study suggest that increased use of behavioral disengagement strategy may reduce the pain and improve quality of life pertaining to ones self-esteem, positive feelings bodily image and appearance. But it may
reduce one's quality of life in the social domain which includes personal relationships, social support etc.

In the present study mental disengagement, a corollary of behavioral disengagement was found to have a positive correlation with two different outcome variables at two different points of assessment. It was significantly and positively correlated with pain intensity at the pretreatment assessment and with PRI (S) at post treatment. Though mental disengagement is conceptualized as a variation of behavioral disengagement, its pattern of association with PRI (s) was found to be different.

**5.9.2. Denial**

In the present study a positive relationship was found between denial and pain intensity. However this finding does not lend support to the earlier studies wherein a reduction of physical symptoms was reported in the presence of denial (Brown, Fouad, Basen-Engquist, Tortolero-Luna, 2000; Butow, Coats & Dunn, 2000). A significant positive relationship was found between denial and Quality of life pertaining to the psychological domain at follow up. The present study confirms the findings reported by the previous studies (Heim, 1993). Denial as a coping strategy is said to have a positive and negative impact on the functioning of the individual (Kreitler, 1999). It may have a positive effect when applied in the first phase of coping, after diagnosis, because it reduces anxiety. This also holds true for the terminal stage. The negative effects of denial are that it may interfere with getting treatment (e.g., delay in going to the doctor, not showing up for follow-ups, noncompliance), may disrupt the process of assimilating the stressful event, may affect adversely interpersonal relations, and constitutes a cumulative stressor.
depressing even immunocompetence. The use of denial varies with the severity of the situation, the patient's personality, and his or her familial and cultural background. It also depends on various factors such as the nature and chronicity of the pain problem, the specific situation, the anticipated degree of pain relief, and many other factors (Turner, 1991). Denial in spite of its dysfunctional property seems to have a positive effect on the quality of life. This kind of relationship was evident in other two related dysfunctional coping strategies which include behavioral disengagement and mental disengagement.

5.9.3. Religious Coping

In the present study two of the pain outcome variables were found to have a significant negative correlation with religious coping. PDI scores at pretest assessment and PRI (S) scores at follow up assessment correlated significantly and negatively with religious coping. The observed negative relationship of religious coping and pain outcome variables is congruent with the findings reported by Yates, chalmer, James, Follansbee and McKegeney, (1981) that religious patients with advanced cancer reported significantly lower levels of pain. Though studies have reported the association between religious coping and improvement of quality of life in cancer patients (Tarakeshwar, 2006), the present study did not find such relationship with any of the domains of quality of life.

Religious coping may influence pain outcome in a variety of ways. For those patients who are intrinsically committed (i.e., observe their religion for the sake of faith itself), religious coping provides meaning and control over their situation (Tarakeshwar, 2006). Religion as a multidimensional construct might influence some of the behaviors which may be indirectly related to pain. Certain emotional or personality related variables
are tied to religious coping and indirectly influence pain experience. The present findings may have wide therapeutic implication as religious coping has been reported to be the most frequently used coping strategy among the Indian patients (Pandey et al. 2003)

5.9.4. Acceptance

The coping strategy, acceptance, the opposite of denial, significantly and positively correlated with the domains physical health, and social relationship of WHO QOL in the present study. However a negative, significant correlation was found between acceptance and the Environment domain at the post treatment assessment. Acceptance is a functional coping response, in that a person who accepts the reality of a stressful situation would seem to be a person who is engaged in the attempt to deal with the situation (Carver & Scheier, 1983). Psychological acceptance involves willingness to experience psychological events (thoughts, feelings, memories) without having to avoid them or let them unduly influence behavior (Hayes, 1999).

Quality of life is an “individuals’ perception of their position in life in the context of the culture and the value system in which they live and in relation to their goals, expectations, standards and concerns” (Ferrell, 1995). Two potential determinants of quality of life are objective and subjective factors (Hagerty, et al. 2001). Objective factors include income, health, marital status, gender, and age and so on . The contradictions observed in the present study with respect to the association between acceptance and the different domains of QOL needs to be analyzed in terms of the potential determinants of QOL. Though all domains have a mixture of subjective and objective factors, some of the domains have a predominance of one of them. In domain 4, the representative contents
belong to subdomains which are apparently objective in nature such as financial resources, home environment, opportunities for acquiring new information and skills, physical environment, safety, security, accessibility and quality of health and social care. Thus the findings clearly indicate that acceptance has a significant negative correlation with factors which are more objective as well as materialistic in nature. By contrast a significant positive correlation was obtained between acceptance and first and third domains which represent predominantly subjective factors such as energy and fatigue, mobility, pain and discomfort, sleep and rest and work capacity (Domain 1: Physical health), personal relationship, Social support and sexual activity (Domain 3: Social relationship).

The possible role of acceptance in enhancing quality of life may be construed in the following lines. Greater acceptance is hypothesized to be linked to better mental health as acceptance allows more psychological resources to be available for experiencing life events (Bond & Bunce, 2003). Accepting experience (as opposed to avoiding) is less likely to lead to negative thought and mood rebound effects (Feldner, Zvolensky, Eifert, Spira, 2002; Pennebaker, Kiecolt- Glaser & Glaser, 1988). Acceptance may allow people to engage in and enjoy a variety of experiences, as they do not need to avoid all situations that may elicit distress. Little direct evidence exists of the link between individual difference in psychological acceptance and quality of life in cancer pain. In the present study, it was found that acceptance is associated with higher subjective quality of life as represented by domain 1 and 3 of the WHO QOL even in the face of worsening objective factors such as poor health imposed by the illness.
5.9.5. Planning

In the present study, QOL pertaining to social relationship significantly and positively correlated with the coping strategy ‘Planning ‘consistently at post assessment and follow-up. Planning is thinking about how to cope with the stress. It involves coming up with action strategies, thinking about what steps to take and how best to handle problem (Carver & Scheier, 1983). It is a problem focused coping. Planning gives more structure and organization as well as clarity about an event or a situation which might reduce the uncertainty and ambiguity that are believed to have a modulating effect on stress. Planning involves a series of cognitive strategies which may be finally helpful in reducing the stress and improving the quality of life of an individual. The findings support the role of planning as a problem solving strategy in enhancing the quality of life.

Three of the coping strategies labeled as problem focused, demonstrated results which were not in the anticipated direction. This includes active coping, Suppression of competing activities and seeking social support for instrumental reasons. Active coping showed a significant positive correlation with VAS scores indicating the possibility of active coping being associated with a corresponding increase in the pain intensity. This is in contrast to some of the previous studies which had found that active coping strategies to be associated with adaptive functioning and passive coping strategies to be related to greater pain and depression (Brown & Nicassio, 1987). However, beyond this, there is no evidence supporting the greater effectiveness of any one active coping strategy compared to any other (Fernandez & Turk, 1989). This probably gives the impression that different strategies will be more effective than others for some individuals at some specific times but not necessarily for all individuals all of the time.
Suppression of competing activities correlated significantly and positively with the affective component of pain and Quality of life pertaining to social relationship. In a similar vein, another problem focused coping, seeking social support for instrumental reasons characterized by seeking advice, assistance, or information, showed a significant negative correlation with Quality of life pertaining to social relationships.

5.10. Qualitative analysis

Quantitative analysis did not show significant difference between the experimental and control groups on majority of the outcome variables. However, improvement was reported by individual patients following psychological intervention in the experimental group. This was subjected to further analysis. It was found that in the control group VAS score increased by one point for 5 patients after the intervention as opposed to none in the experimental group. There was an increase by 2 points on VAS for 4 patients in the control group against none in the experimental group at the post treatment assessment. Two participants each from the experimental and control groups had a pain more than 3 on the VAS at post treatment assessment. One participant diagnosed to have carcinoma rectum, with post abdominoperineal resection and the other one carried a diagnosis of carcinoma pyriform fossa from the experimental group reported moderate increase in their pain. The nature of pain was continuous in both participants. There was no similarity with respect to the type of their pain. When one participant reported disease related pain, the other one had pain related to surgery. In the control group moderate hike in pain following Psychological intervention was reported by two patients who carried a diagnosis of ca tongue lateral margin and ca esophagus respectively. Both Participants were similar in terms of their nature and type of pain as they had reported continuous and disease related pain. The
nature of pain reduction in both groups after intervention was analyzed. The number of participants who reported improvement by one point on VAS was three and two respectively in the experimental and control groups. However the proportion of participants who reported reduction of pain by two VAS points was markedly different in two groups. While only 3 participants reported a reduction by 2 points in the Control group, there were 9 in the experimental group with a similar improvement. Though the participants were heterogeneous in terms of their diagnosis, 4 among them were in stage IV. All the nine participants had pain that was disease related. Five of them had continuous pain and four reported episodic pain. All The three patients from the control group who reported improvement by 2 points on VAS had continuous pain. Two of them had disease related pain and one had procedure related pain. Two of the participants belonged to stage 3 and one was in stage 4. There was no difference in terms of the number of individuals who reported pain reduction by more than 3 points on VAS at post treatment assessment. 2 participants each from both groups reported reduction of pain. The participants from the control condition were similar in many aspects. Both of them had cancer of oral cavity in stage 4 and the origin of their pain was procedure related. On the other hand participants from the experimental condition belonged to entirely different conditions. Their type and nature of pain were also not similar. Regardless of the group that they belonged to, majority of the participants reported mild to moderate improvement in their pain intensity at the follow up assessment. It was found that the number of participants who reported moderate degree of improvement (3 and 4 on VAS) was more in the experimental group as compared to the control group. One participant with a diagnosis of Giant Cell Tumor of
left lateral tibia condyle, though reported improvement at post treatment assessment by 2 points on VAS, was unable to sustain that improvement after 3 months.

Eleven participants in the experimental condition against 6 in the control condition reported a moderate improvement. There was one participant in the experimental condition who did not report any change in his pain at follow up. This participant diagnosed with Giant cell tumor of left lateral tibial condyle from the Experimental group reported pain reduction by 2 two points on VAS at post treatment assessment, the improvement was not sustained after 3 months. Apart from the chronicity of the illness which had been ongoing for more than an year, the presence of multiple stressors were identified which include severe interpersonal problems with the father, lack of support from the family, physical disability originated from the illness and unemployment. There was only one participant in the control group who reported an increase on VAS scores on follow up as compared to the pretreatment assessment. This patient was diagnosed to have ca esophagus in stage 4 reported an increase by two points on VAS at follow up assessment.

It was evident from the individual scores that the participants in the group responded in four different ways. There was a mild and systematic reduction of scores from the pre assessment till the follow up for seven of the participants. Similar pattern of responding was evident in their VAS scores also. Three participants reported an increase of their scores at the post treatment assessment and subsequent reduction at the follow up. This pattern was also clearly evident in their VAS scores. On the other hand two of the participants reported an increase in their pain. One patient with a diagnosis of carcinoma colon (Hepatic flexure) in stage IV who had been prescribed morphine for his pain
management responded differently in terms of the sensory component of pain. Though a reduction of pain was reported subsequent to the intervention, at follow up it was found that the score was almost same as the pretreatment assessment. This pattern was fairly consistent with the VAS scores. Two more patients demonstrated the same pattern with a reduction at the post treatment assessment and a substantial increase at follow up. Three participants reported marked reduction at the post treatment and follow up assessments. One patient was diagnosed to have Leimyosarcoma and the other with a diagnosis of carcinoma tongue in stage IV. Both patients had episodic, disease related pain. One patient was trained in temperature feedback, imagery training and relaxation for 14 sessions, whereas the other one received hypnosis and relaxation training for 14 sessions. The third patient with marked improvement was diagnosed with carcinoma vocal chord in stage 4 having disease related episodic pain. The participant received 13 sessions of relaxation and imagery training.

There were 2 patients in the experimental group with higher scores on sensory pain reported significant pain reduction after completing biofeedback training, and hypnosis. This observation concurs with the findings from the recent studies which suggest that sensory pain respond well with procedures such as biofeedback and hypnosis (Syrjala, Cummings & Donaldson 1992; Syrjala, Donaldson, Davis, Kippes & Carr, 1995). Since the most important function of hypnosis is to alter sensation and physical function by blocking the transmission of information on its way to conscious or awareness, It is sensory oriented Barber (as cited in Ho S.M.Y, Horne DJ & Szer J, 2001 p. 3- 10). On the other hand Cognitive behavioral therapy changes patient’s beliefs and helps them to learn new skills to cope (Bradley as cited in Ho S.M.Y, Horne DJ & Szer J, 2001 p. 3- 10)
The analysis revealed that three of the patients from the experimental group did not report evaluative pain at any stage of the assessment. Two of them demonstrated similar pattern in terms of their affective pain also. This is in sharp contrast to their initial scores on sensory pain. This probably indicates that sensory pain can independently exist without having an affective or evaluative component. One participant with a diagnosis of Squamous cell carcinoma of left arm consistently reported increase in all the three types of pain at follow up in spite of remarkable improvement at post treatment assessment.

There was some striking similarity in the responses of two patients with respect to their reporting of evaluative pain. Their reporting of pain reduction in all the other components of pain was consistent with the evaluative component of pain also. This pattern was visible on their VAS Scores.

5.10.1. Analysis of Loss to Follow ups and Drop outs

One of the major setbacks of the study was its higher rate of loss to follow ups and drop outs. Interestingly the number of loss to follow ups and dropouts were same in the experimental and control groups. 6 patients each from the experimental and control groups did not turn up for follow up assessments though they had completed the intervention and subsequent assessment according to the predetermined plan. 24 participants missed their follow up assessments at the hospital, at various timeframes of data collection. This trend of patients missing follow up assessment was evident right from the beginning of the study. Anticipating this trend, steps were initiated to bring down the rate of loss to follow up by contacting the participants over phone, letter in order to get their consent for conducting the assessment at their residence. While 12 participants (7 from the
experimental group and 5 from the control group) consented to give the assessment at home, 6 participants could not be contacted, two participants passed away and four participants were not willing to give home based follow up assessment. Thus the follow up assessments were not conducted for 12 patients (Six participants from each group). In the experimental group there were 4 males and 2 females among the loss to follow ups. On the other hand the control group had only one female participant. The breakup of patients with respect to diagnosis suggested that in the experimental group there were two participants with head and neck cancer and two participants were diagnosed to have gastrointestinal tract cancer. One patient was diagnosed with Anaplastic Oligogastrocytoma grade III and the other one carried a diagnosis of ca breast. Whereas in the control group 3 participants belonged to head and neck cancer, and two had GI tract cancer and the female participant carried a diagnosis of ca breast. With respect to the stage of illness, one patient was in stage I and three patients were found to be in stage III and one was in stage IV. One was not amenable for staging (Anaplastic Oligogastrocytoma). By contrast, in the control group all except one were in advanced stages of illness including the one who had developed metastasis. In the Experimental group three patients reported disease related pain and two had procedure related pain. On the other hand 4 of the control group patients reported disease related pain, and there was only one participant with procedure related pain. One patient had both disease and procedure related pain. While the proportion of patients with continuous and episodic pain was almost same in the experimental group, all except one in the control group reported episodic type of pain. The mean duration of illness was 32, and 28 weeks for the experimental and control groups respectively. Only one patient from the experimental group had reported a history of physical co morbidity in the form of MI and
one patient from the control group reported a history of hypertension. While 4 of them received radiation alone, two participants received radiation with concurrent chemotherapy in both groups. The number of sessions attended by the participants was 14, 12, 11, 12, 8 and 13 in the experimental group. On the other hand all participants from the control group received 12 to 15 sessions of exposure with the therapist.

5.10.2. Drop Outs

The term was operationalized as those participants who failed to complete the stipulated assessments or intervention according to the predetermined plan. This includes partial or total missing of assessment or intervention.

Sixteen participants (Eight participants each from the experimental and control groups) dropped out from the study. The mean age for the experimental and control groups were 51.7 and 54.6 respectively. In the experimental group all except one were males, whereas there were no female participants among the drop outs in the control group. While one patient in the experimental group reported physical co morbidity, no one from the control group had any physical co morbidity.

Four patients who dropped out from the experimental group belonged to Head and Neck Cancer and three were diagnosed with GIT cancer and one participant was diagnosed with ca penis. In the control group, 5 patients were diagnosed with head and neck cancer and one with a diagnosis of GIT. One patient belonged to TCC bladder and one patient had Metastasis of Unknown Origin (MUO).
In the experimental group except two, all participants who dropped out were in the advanced stage of illness. Whereas in the control group, all participants including the one with metastasis were in the advanced stage of cancer. In the experimental group 4 patients reported disease related pain, and 3 had procedure related pain and one reported a combination of disease and procedure related pain. On the other hand 3 of the control group patients reported disease related pain and two had procedure related pain. Two participants reported both disease and procedure related pain. Six of the patients from the experimental group reported continuous pain and two had episodic pain. This was almost similar in control group with seven participants reporting continuous pain and only one had episodic pain. While four patients from the experimental and control group received radiation alone, four patients each from both groups underwent radiation with concurrent chemotherapy. In both groups majority of the patients dropped out after the third session. Thus 3 patients from the experimental group and 5 from the control group dropped out after 3 sessions of psychological intervention. 2 patients from the experimental group and 1 from the control group dropped out after attending 2 sessions of intervention two patients from the experimental group and one from the control group attended 4 sessions. The maximum number of sessions attended by the participants who dropped out was 8. While one participant from the experimental group attended 7 sessions, one participant from the control group dropped out after 8 sessions.

The reasons for drop outs were multifactorial in nature. From the experimental group, three patients discontinued the session due to excessive weakness. One patient discontinued the radiation treatment and got discharged against medical advice as there was a worsening of mucositis. Despite that the patient had attended 7 sessions of
psychological intervention, as the course of therapy was not completed according to the plan, it was treated as drop out. Two patients expressed displeasure about the nature of information being elicited from them and discontinued after 2 sessions. One participant stopped attending the sessions as her husband felt that the sessions were not inevitable for her treatment. Another participant discontinued as he had difficulty in talking as the rhiles tube was fixed for feeding.

From the control group 4 patients discontinued due to excessive weakness. Two participants stopped attending the sessions as they developed severe pain after their third and eighth sessions respectively. One participant was not interested in continuing the sessions and one participant stopped as the general physical condition deteriorated.

5.11. Testing the tenability of hypothesis

On the basis of the findings obtained from the study, the tenability of the hypothesis may be tested. The conclusions are presented below.

5.11.1. Hypothesis One

There will be significant difference between the group treated with cognitive-behavioral intervention strategies and the group treated with only supportive measures on the outcome measures of pain.

The groups were compared to examine the effect of 8 outcome variables which include.

1. Pain intensity
2. Five of the indices derived from MPQ scores which include PRI(S), PRI(A), PRI(E), PRI(T) and PPI
3. Pain Disability Index

4. Four domains scores derived from WHO QOL BREF.

No significant difference was found between the experimental and control groups on any of the variables except for PRI(E) suggesting that hypothesis is only substantiated with respect to that variable.

5.11.2. Hypothesis Two

The sensory and affective components of pain vary in intensity depending on the duration of symptoms but the response to cognitive-behavioral interventions will be similar.

No significant relationship was found between duration of illness and sensory and affective components of pain. The findings do not support the hypothesis. No significant difference was found between sensory and affective components of pain with respect cognitive behavioral intervention. This finding supports the second part of the hypothesis.

5.11.3. Hypothesis Three

Cognitive factors will significantly correlate with outcome measures.

A significant correlation was found among six of the variables studied. A significant negative correlation was found between the cognition ‘disability’ and quality of life pertaining to physical health. ‘Harm’ correlated significantly and negatively with three of the pain outcome variables which include physical health domain of WHO QOL, sensory and total pain rating indices of pain. While there was a significant negative
correlation between emotion and physical health domain of QOL, its correlation with PPI was found to be positive. The findings substantiate the hypothesis

5.11.4. Hypothesis Four

_Disease related pain and procedure related pain would respond differently to the cognitive-behavioral intervention._

No significant difference was found between disease related and procedure related pain with reference to the cognitive behavioral intervention. Thus the hypothesis is not supported by the findings

5.11.5. Hypothesis Five

_Death anxiety will be correlated with pain outcome._

1) Death anxiety correlated negatively and significantly with some of the domains of quality of life in the experimental group,

2) The control group showed a significant negative correlation with sensory, affective pain and the VAS scores.

3) The Experimental group demonstrated a significant negative correlation between Death anxiety at pre and post assessment and QOL scores pertaining to the physical health domain at post treatment.

4) A significant negative correlation was found between death anxiety at the post treatment assessment and the psychological domain of quality of life at post treatment as well as at follow up assessment.

5) A significant negative correlation was found between death anxiety at post treatment and the social relationship domain of QOL at post treatment assessment.
6) Significant negative relationship was observed between Quality of life pertaining to the Environment domain at posttest and death anxiety at follow up.

7) Death anxiety also showed a significant correlation with the affective component of pain at post treatment.

8) In the control group, the pretreatment scores of death anxiety correlated negatively and significantly with pre and post treatment scores of sensory pain.

9) A significant negative correlation was found between Pretreatment scores of PRI (T) and Death anxiety.

10) Death anxiety scores at post treatment assessment correlated significantly and negatively with VAS scores at follow up.

The above findings substantiate the hypothesis

5.11.6. Hypothesis Six

The type of coping strategies employed by the patient will influence the outcome.

A significant positive correlation was found between VAS scores and mental disengagement. A significant negative correlation was found between the scores on social relationship domain of WHO QOL and Behavioral disengagement. The use of instrumental social support. Suppression of competing activities and planning correlated positively. Significant negative correlation existing between the scores on Pain disability index and Religious coping. A significant positive correlation was found between the scores on social domain of WHOQOL and planning.

There was a significant positive correlation between scores obtained in the domain Environment of WHO QOL and behavioral disengagement. The coping strategy, acceptance correlated negatively with WHO QOL scores on Environment domain.
A significant positive correlation was found between PRI(S) and mental disengagement. Suppression of competing activities was found to have a significant positive correlation with PRI (A). VAS score and active coping. There was a significant positive relationship between the domain of physical health of WHO QOL and acceptance. Denial and behavioral disengagement were found to have a significant positive relationship with Quality of life. Relationship domain score of WHO QOL was significantly positively correlated with two of the coping strategies.

Focus on venting of emotions correlated significantly and positively with social relationship domain. Acceptance and quality of life (third domain) correlated significantly and positively with social relationship domain.

A significant negative correlation was observed between PDI score and the coping strategy, positive reinterpreted growth. Similarly PRI(S) scores correlated significantly and negatively with religious coping and behavioral disengagement.

In a similar vein PRI (A) score correlated significantly negatively with suppression of competing activities. The above findings support the hypothesis.