Effectiveness of Cognitive Behaviour Therapy on Reduction of Stress among Caregivers of Patients with Cancer in a Selected Hospital, Bangalore

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Abstract
Back Ground: When a patient diagnosed with cancer it not only affects the patient but also the family and the community. This study concludes that cognitive behaviour therapy helps the caregivers in dealing with their stress and negative thoughts.
Aim: The present study aims to assess the effectiveness of CBT in reduction of stress among care givers of patients with cancer.
Materials and Methods: A true experimental design was adopted for the study. A structured questionnaire was developed based on a survey of 89 caregivers and literature review to assess the baseline variables and the stress level. The validity of the tool was found to be 0.9. The reliability was assessed using the split half method and was found to be 0.8. Samples were selected using simple random sampling technique. Seven to nine sessions of CBT were given to caregivers belonging to the experimental group. The control and experimental groups were statistically analyzed for matching. Pre intervention and post intervention stress scores were compared and statistically analyzed using the paired and independent 't' test. Association was assessed using the Chi square test.
Results: Experimental and control groups were matched as approved by chi square test. The level of stress among caregivers of patients with cancer shows that in experimental group 3.3% of caregivers reported mild stress, 73.3% reported moderate stress and 7% of caregivers reported severe stress pre interventionally. In the control group 3.3% of caregivers reported mild stress, 80% reported moderate stress and 16.7% had severe stress in pretest. Within the group and between the group analysis was done to assess the effectiveness of CBT on stress. The calculated paired 't' value in the experimental group was -4.47 (P- 0.001) hence it was significant at less than 0.05 level. And the calculated independent 't' value was -4.84 (P – 0.001) hence it was significant at less than 0.05 level. Therefore hypothesis H_1 and H_2 were accepted at less than 0.05 level of significance. There was significant association between monthly income (P = 0.003), and pre stress level of care givers. Therefore H_3 was accepted only in terms of monthly income and rejected for all other baseline variables.
Conclusion: This study concludes that cognitive behaviour therapy helps the caregivers in dealing with their stress and negative thoughts.
Keywords: Caregivers of cancer patients, CBT on stress, Cognitive behavioral therapy, Reduction of stress

I.   Introduction

Cancer is one of the leading causes of adult deaths worldwide. In India, the International Agency for Research on Cancer estimated indirectly that about 6,35,000 people died from cancer in 2008, representing about 8% of all estimated global cancer deaths and about 6% of all deaths in India. [1] It has been reported that 30 to 48% of family caregivers will experience significant psychological distress as a result of their role. Cancer creates an instant crisis in the life of family member [2]. The family function is interfered with leaving the care giver in a state of confusion, in terms of not knowing what to do, to whom to explore, whether to tell the patient or not and severe doubt on treatment outcome and relapse. These all things cause distress to and burden the caregiver, resulting in a negative impact on physical, psychological, social, financial, family, future and spiritual wellbeing. Furthermore, caregivers may be at even greater risk for psychological distress than the patients they care for. Cognitive behaviour therapy (CBT) is a type of psychotherapeutic treatment that helps patients understands the thoughts and feelings that influence behaviours.CBT is generally short-term and focused on helping clients deal with a very specific problem. CBT builds a set of skills that enables an individual to be aware of thoughts and emotions; identify how situations, thoughts and behaviour influence emotions; and improve feelings by changing dysfunctional thoughts and behaviour [3]. A study conducted among patients of

HIV, showed that CBT was more helpful than support groups for improving wellbeing and quality of life. Studies have shown that CBT can have a long-term effect on one's ability to cope with stress. [4]

II. Materials And Methods

2.1. Objectives of the study
1. To assess the pre interventional level of stress among caregivers of patients with cancer.
2. To assess the effectiveness of cognitive behaviour therapy on reduction of stress among caregivers of patients with cancer.
3. To identify the association between the pre-interventional level of stress with selected baseline variables.

2.2 Hypotheses
H1: There will be significant reduction of stress among caregivers of patients with cancer following cognitive behaviour therapy at 0.05level of significance.
H2: The mean post interventional stress level score in the experimental group will be significantly lower than the control group at 0.05 level of significance.
H3: There will be an association between selected demographic variables and the pre interventional stress level.

2.3 Research design: A true experimental pretest and posttest with control group design was used.

2.4 Research setting: The study was conducted in a five hundred bedded tertiary hospital in Bangalore from which participants were selected from day care, ward and palliative unit

2.5 Variables
1. Independent variable: cognitive behaviour therapy.
2. Dependent variable: stress experienced by caregivers of patients with cancer

2.6 Sample: Sixty caregivers of patients with cancer admitted in selected hospital in Bangalore were selected for the study in which 30 were in experimental group and 30 were in control group.**2.7Development of tool:** The tool was constructed based on the survey report from 89 patients, review of literature, discussion with experts and experience of the investigator.**2.8Content validity and reliability of the tool:** The content validity of the tool was established by giving the tool (baseline data and stress questionnaire) to the experts. The content validity index was 0.9.Reliability of the tool was calculated using the split half method. Pearson's correlation formula was used to find out the reliability. The r value was 0.8.**2.9Description of tool:**The instruments used in this study consisted of two sections.

Section A: Base line data which included
1. Base line data of caregivers such as age, gender, marital status, relationship with patient, co-morbidity of illness, occupation, duration of relationship with patient, type of family and monthly income and education.
2. Baseline data of patients such as age, gender, type of cancer, stage of cancer, duration of illness and number of children.

Section B: It consists of stress assessment questionnaire which was used to assess the stress experienced by caregivers of patients with cancer. Stress assessment questionnaire was researcher prepared Likert scale which had 35 statements. The questionnaire was divided into six domains such as physical, psychological, finance, family, social, spiritual and future.

2.10 Method of data collection
- The researcher had undergone a training programme in CBT.
- Permission to conduct the study was obtained from research and ethical committee of the institution.
- Informed consent was obtained from the participants.
- A structured questionnaire was administered to the caregivers to collect the baseline data.
- The intervention was divided into 6 – 9 sessions. Which included detailed assessment of problems and strengths of caregivers. Helping to solve the problems and teaching relaxation techniques.
- Post test was conducted after the intervention.

III. Results

PART I*: Analysis of baseline characteristics of caregivers and patients

The majority of the caregivers were in the age group of 25-50 years both in experimental (63.3%) and control group (56.6%). About 66.7% in experimental group were females and about 53.3% in control group were males. Majority of caregivers were married in experimental group (96.6%) and in control group (90%). Majority of the caregivers completed pre-university level of education in both experimental (43.3%) and in control (40%) group.

The demographic details of the patients includes about 33.3% age of patients in experimental group were between the age of 19 - 41years and in control group about 33.3 % of patients were between the age group

of 0-18 years. Majority of the patients both in experimental (73.3%) and control (53.3%) group were males. About 80% of patients in experimental group had duration of cancer up to 1 year and in control group about 56.7 % had duration of less than 6month cancer. Chi square was used to determine the association between baseline variable of the experimental and control group. No statistically significant association was found between baseline variable of the experimental and control group. Hence while comparing the baseline variable of the experimental and control group it was found that they matched in all aspects.

PART 11: Analysis of level of stress of caregivers
  A. Figure 1: Comparison of pre and post intervention stress level among experimental and control group
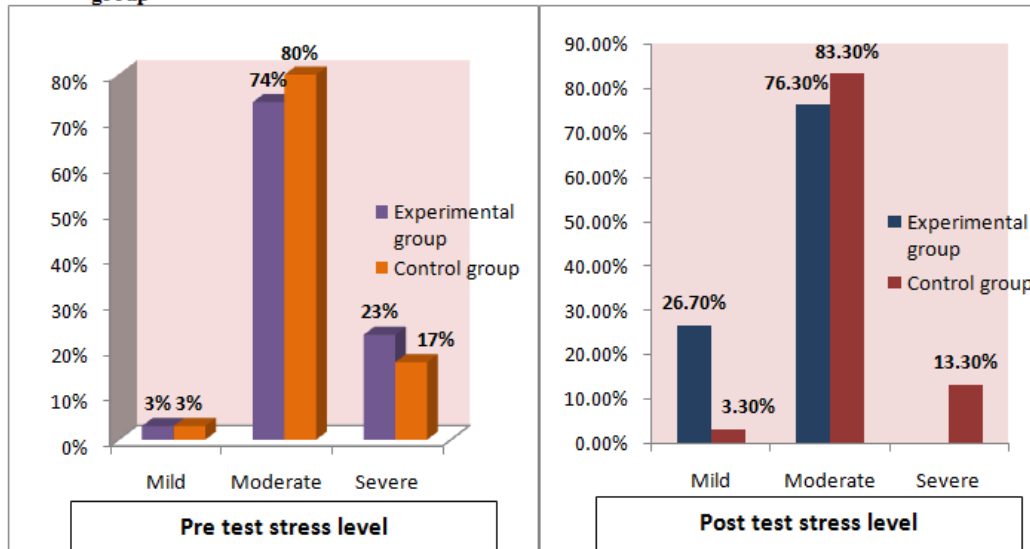

Figure 1 depicts that preinterventionally in experimental group and in control group majority of them had moderate (74%, 80%) and severe (23%, 17%) stress level. Post interventionally in experimental group 76.3% have moderate & 26.7% have mild stress level, where as in control group 83.3% have moderate stress and 13.3% have severe stress level. .

B. Analysis of stress level among caregivers of patients with cancer belongs to both experimental and control group.

Table 2: Pre interventional stress experienced by caregivers   (N=60)

Group	Pre intervention		Mean %	't' value	P - value
	Mean	Standard Deviation			
Experimental	114.5	18.6	65.43	1.44	0.156
Control	107.3	20.1	61.3		

        The above table 2 depicts that pre interventional mean and SD of the experimental group was 114.5 ± 18.6 where as in control group mean and SD was 107.3 ± 20. Independent't' test was done to check the matching between the groups and it was found the groups were matching (p ₌ 0.05).

PART111: Analysis of effectiveness of cognitive behaviour therapy on stress
        Table 3: Comparison of pre with post intervention stress score of the experimental group.

Pre and post intervention stress (N= 30)		t- valuedf = 29	P – value
	Mean ± SD	-4.47	0.001**–Significant
Pre intervention stress	114.5 ± 18.6		
Post intervention stress	89 ± 12.9		

The above table 3 depicts that the pre intervention stress mean ± SD of the experimental group was 114 ± 18.6 whereas post interventional test mean ± SD was 89 ± 12.9 and the calculated paired 't' value was -4.47. Hence it was significant at less than 0.05 levels.
A. Comparison of post test scores between the experimental group and control group.
        Table 4: Comparison of stress scores between the control and experimental group

	Post interventional stress	t- value	P - value

Group		df = 58	
	Mean ± SD		
Experimental (N = 30)	89 ± 12.9		
Control (N = 30)	107.9 ± 17.2	-4.842	0.001*

* - significant

The above table 4 depicts that post interventional mean and SD of experimental group was 89 ± 12.9 and post interventional mean and SD of control group was 107.9±17.2 and the calculated independent 't' value was -4.842. Hence it was significant at less than 0.05 levels.

B. Comparison of domain wise pre intervention stress scores with post intervention scores of the caregivers of patients with cancer belonging to the experimental group.

Table 5: Comparison of domain wise pre and post interventional stress scores of experimental group

Area of stress	Experimental group (N = 30)				Difference between pre and post intervention mean %	't' value	p- value
	Pre intervention stress		Post intervention stress				
	Mean ±SD	Mean %	Mean ± SD	Mean %			
Physical	33.5±6.25	67	25.6 ±4.49	51.2	15.8	8.03	0.000*
Psychological	36.7±6.65	61	28.5 ± 4.72	47.8	13.88	8.68	0.000*
Family	13.4±3.03	67	10.7 ±1.85	53.5	13.5	5.7	0.000*
Financial	11.4±2.81	76	9.37 ± 2.48	62.4	13.53	4.03	0.00*
Future	6.4 ±1.61	64	4.8 ± 1.60	48	16	3.46	0.000*
Social	7.4±2.14	73	6.17 ± 1.59	61.7	12	2.54	0.002*
Spiritual	4.0 ±1.11	40	4.0 ± 1.11	40	0	-	-

*- significant

The above table 5 depicts that domain wise mean percentage of stress score in experimental group pre and post interventionally. Domain wise analysis of stress experienced by caregivers in experimental group after the intervention found to be significant in the domains related to physical (t = 8.68), psychological (t = 8.68), family (t = 5.7), financial (t = 4), future (t = 3.46), and social (t = 2.54). CBT was found to be not effective in domain related to spirituality. 't' test was done to check the effectiveness of CBT domain wise and it was found to be significant in physical, psychological, family, financial, future and social domain. CBT was found to be not effective in domain related to spirituality.

PART1V: Analysis of association between pre-test stress and selected baseline variables
There is significant association between monthly income (P = 0.003) and pre stress level of care givers. Therefore H$_3$ was accepted only in terms of income and rejected for all other baseline variables.

IV. Discussion
The present study was conducted to evaluate the effectiveness of cognitive behaviour therapy on reduction of stress among caregivers of patients with cancer in a selected hospital. Although every disease has its patients, to be a cancer patient has a very specific meaning, both to the patients and their relatives and the general public. Cancer is equally distressing for the family as well. It could greatly affect both the family's daily functioning and economic situation. In order to achieve the objectives of the study, a true experimental pretest and posttest with control group design was adopted. The data was collected from 60 (30 - experimental and 30 - control) caregivers. The findings of the study are discussed under four sections.

Part I: Description of Baseline variables of caregivers of patients with cancer.
The majority of the caregivers were in the age group of 25-50 years both in experimental (63.3%) and control group (56.6%). About 66.7% in experimental group were females and about 53.3% in control group were males. Majority of caregivers were married in experimental group (96.6%) and in control group (90%). About 33.3% age of patients in experimental group was between the age of 19-41years and in control group about 33.3 % of patients were between the age group of 0-18 years. Majority of the patients both in experimental (73.3%) and control (53.3%) group were males. On comparing the baseline variable of the experimental and control group it was found that they matched in all aspects. Therefore the experimental and control group matched in all aspects of the baseline variables of both the caregivers and the patients. A meta-analytic study was conducted on stress and coping of family caregivers of cancer patients, 23 studies were taken for analysis and the characteristics of the demographic variables were as follows, the age of the caregivers ranged from 14 to 79 years of age, with a mean age of 42.91. Most of them were females (66.83%), and married (74.09%). In the 17 studies that reported the relationship between family caregiver and cancer patients, most of them (48.87%) were spouses, and 21.18% were adult children. [5]

The present study findings correlate with this meta-analysis study. In the present study majority of caregivers were females (63.3% in experimental and 56.6% in control group). About 96.6% in experimental group and 90% in control group were married. In meta-analysis study also majority of caregivers were females (66.83%), and were married (74.09%). In the present study age of caregivers ranged from 25 – 75 years where as in meta-analysis study age of caregivers ranged from 14 – 79 years.

Part II: Analysis of level of stress among caregivers of patients with cancer.
Objective 1: To assess the pre-interventional level of stress among caregivers of patients with cancer.
Analysis of level of stress among caregivers of patients with cancer shows that, in experimental group 3.3% of caregivers reported mild stress, 73.3% reported moderate stress and 7% of caregivers reported severe stress pre interventional and in the control group 3.3% of caregivers reported mild stress, 80% reported moderate stress and 16.7% had severe stress in pre test score. 't' test was used to check if the groups matched in terms of the stress experienced(t=1.44) and it was found the groups were matching (p $>$ 0.05). After the intervention the experimental group 26.7% reported mild stress 73.3% reported moderate level of stress. In the control group 3.3% of caregivers reported mild stress, 83.3% reported moderate stress and 13.3% reported severe stress.

These finding of the study correlate with finding of another study conducted on level of stress among caregivers of patients with brain tumour. Sixty caregivers were taken as samples in which Seventy-two percent (*n*=43) of caregivers reported experiencing elevated levels of stress. Thirty-five percent (*n*=21) of the sample scored at least one standard deviation above the mean. A statistical trend [F (1, 57) =3.12, *p*=0.08] exists between caregiver stress and tumour grade of patients for which they are providing care.[6]A similar study was conducted in the same setting of the current study to assess the stress level of caregivers of patients with cancer. The results of the study revealed that 46% of care givers had severe stress level, 34% had moderate stress level and 18% had severe stress level. [9]

Part III: Analysis of effectiveness of cognitive behaviour therapy on stress.
Objective 2: To assess the effectiveness of cognitive behaviour therapy on reduction of stress among caregivers of patients with cancer.
This part is subdivided into 2 parts based on the hypothesis as follows
H$_1$: There will be significant reduction of stress among caregivers of patients with cancer following cognitive behaviour therapy at 0.05 level of significance. In the present study the researcher found that in experimental group pre intervention stress mean ± SD was 114.5 ± 18.6 whereas post intervention stress mean ± SD was 89 ± 12.9. The calculated paired 't' value was 4.47 hence it was significant at less than 0.05 level. Therefore the alternate hypothesis H $_1$ was accepted and the null hypothesis was rejected. Hence it is concluded that mean post intervention stress score was lower than the mean pre intervention stress score of caregivers of patients with cancer in the experimental group.
H$_2$: The mean post interventional stress level score in the experimental group will be significantly lower than the control group at 0.05 level of significance. In the present study post interventional mean and SD of experimental group was 89 ± 12.9 and post interventional mean and SD of control group was 107.9 ± 17.2 and the calculated t value was 4.842. Hence it was significant at less than 0.05 levels. Therefore, the alternate hypothesis H$_2$ was accepted and null hypothesis was rejected. Hence it is concluded that there is significant reduction of stress among the caregivers in the experimental group compared to the control group. These findings correlate with the findings of study conducted on cognitive behaviour therapy on reduction of stress among caregivers of dementia patients. The study sample consists of 184 individuals. Results showed greater improvement from pre to post intervention than those in the control on measures of depressive symptoms, overall life stress, and care giving specific stress.[7] In the present study domain wise analysis of stress experienced by caregivers in experimental group after the intervention found to be significant in the domains related to physical (t = 8.68), psychological (t = 8.68), family (t = 5.7), financial (t = 4), future (t = 3.46), and social (t = 2.54). CBT was found to be not effective in domain related to spirituality.

Part IV: Association between pre intervention stress and selected baseline variables. Objective3: To find the association between the pre-interventional level of stress with selected socio-demographic variables.
H$_3$: There will be significant association between pre-test stress among care givers and selected baseline variables.
Chi square test was used to determine the association between the pre intervention stress scores and selected baseline variables. There was a statistically significant association was found between pretest stress and monthly income and there was no significant association between pre stress level and other demographic variables such as age, gender, education, occupational status, type of family, co-morbidity of any illness and number of children. Therefore H$_3$ was accepted only in terms of income and rejected for all other baseline variables. A similar study was conducted to assess the stress among 130 family caregivers of patients with

breast cancer. This study reported an association in terms of duration of caregiving, sharing of caregiving burden, patients' age and patients' functionality[8] whereas this study revealed an association between monthly income and level of stress. This may be attributed to supportive families in the Indian context as expressed by the participants (83%). As in India most of the financial burden falls on the family Indian caregivers experience stress related to this aspect.

Implications
The results of this study have following implications
- Health personnel can be given training in cognitive behaviour therapy so that they can help patients and their care givers with stress.
- Health personnel may be able to use CBT to help the family members cope with their stress.
- Super-specialization courses in cognitive behaviour therapy for health personnel can be started.
- Health personnel should take initiation in formulating protocols to incorporate cognitive behaviour therapy for stress management of patients and their caregivers and the nurses themselves.
- Till now very little attention to caregivers is given. Therefore more studies can be conducted on caregivers.
- The psychological experiences and intervention vary according to the individual need so the interventional protocol varied from caregiver to caregiver.

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