Effects of Psychological Interventions on Immune Parameters and Quality of Life in Cancer Patients

Ata-ul-Mohsin[1] and Sarwat Sultan[2]

Abstract

The present research was conducted to find out the effects of psychological interventions on immune parameters and quality of life in cancer patients. Thirty cancer patients selected from MINAR cancer unit were randomly assign to either an intervention group (n=15) or a control group (n=15). Intervention group patients received weekly group Cognitive Behavior Therapy (CBT) session along with Progressive Muscular Relaxation Training (PMRT) for six weeks. Patients were assessed by Complete blood count test (WBC Differential) and WHOQOL-BREF scale (The WHOQOL Group, 1998) at baseline, after six weeks and one month post study. One way ANOVA and Paired sample t-test were used to analyze the data. Results showed that at base line assessment there were non-significant mean differences in demographics, clinical characteristics, immune parameters and quality of life scores. After six weeks interventions and one month post study there were no significant mean difference found in immune parameter (WBCs, Lymphocytes, Monocytes, Granulocytes and Eosinophils) within group and between groups, however after six weeks interventions and one month post study intervention group patients showed significant greater mean scores in quality of life (Physical Health, Psychological Health, Social relationships and Environment) then control group patients. Findings concludes that psychological interventions are unable to bring any significant change in immune parameters but significantly beneficial for the improvement of quality of life in cancer patients.

Key words: cancer, psychological interventions, immune parameters, quality of life

Introduction

Cancer is a lethal disease and a major cause of death worldwide in year 2008 more than 7.6 million people (about 13% of all deaths) died of cancer (Globocon, 2008). Cancer patients have to cope with physically and emotionally distressing situations during diagnosis, medical treatment side effects, social and psychological problems and the death anxiety (Fawzy, Fawzy, Arndt, Pasnau, 1995). Cancer also effects immune system is different way. Immunity is a fundamental component between health and illness, Cancer and immunity are opposite to each other's. Cancer kills immune cells and immune cells kill cancerous cells. Active immune system prevents a person from these diseases and helps in healing process (Miller, Cohen, & Ritchey, 2001).

Cancer affects a person quality of life because of its symptoms, treatment, and being a lethal disease it severe psychological abnormalities in people's life. There is substantial evidence suggesting that cancer patient suffer from significant distress and long-term psychological abnormalities in various forms of cancer and its treatment (Spijkervan't, Trijsburg, Duivenvoorden, 1997; Fawzy, 1998). Previous researches and evidences about psychological stress hypothesize that psychological stress affects the immune system and quality of life (Segerstrom & Miller, 2004; Lepore, 2003) the hypothesis about the stress has created the subordinate hypothesis that psychotherapies to reduce stress may yield to improve immune functions and cancer patient's Quality of life.

[1] *Department of Applied Psychology, Bahauddin Zakariya University, Multan, Pakistan*
[2] *Department of Applied Psychology, Bahauddin Zakariya University, Multan, Pakistan*

Cognitive and behavioral interventions have been associated with lower level of stress and showed benefit in other nonmedical outcomes. Cognitive behavioral interventions help in improvement of immune system, overall better health and quality of life (Jacobs, 2001). According to a research by Duijts, Saskia, Duijts, Marc van, Beurden, et al, (2011) physical relaxation and behavioral intervention improve psychosocial outcomes and physical health and quality of life in cancer diagnosed with carcinoma of breast. In a Meta-analysis statistically substantial results were found for the consequence of exercises and behavioral interventions on these psychological parameters.

In oncology settings psychological distress also affected by the diagnosis method used and the timing of the diagnosis. A study on this topic assessed that 22% to 66% cancer patients experienced psychological distress during assessment procedure (Breitbart, 1995; Rieker, Fitzgerald, Kalsih, & Robertshaw, 1989). In a study by Moyer, Sohl, & Knapp-Oliver, (2009) an organized research method acknowledged 673 reports including 488 distinctive projects piloted over a 25 year time span. Results indicated that there was some inconsistency between the types of therapeutic interventions and the types of supportive therapies available for the betterment of oncology patients.

Rehse, Pukrop, (2003) investigated the effects of psychological intervention on quality of life in adult cancer patients. In a meta-analysis of 37 controlled trailed studies, results concluded significant improvement in quality of life. Long term psychosocial intervention found more effective in the improvement of quality of life then short term interventions. The findings of this meta-analytical research suggested that these interventions are useful for improving quality of life in the adult patients of cancer. Fawzy, Fawzy, Arndt, Pasnau, (1995) reviewed the literature about psychological therapies in oncology treatment and care. In their study results concluded that the four major types of interventions used in their cancer care, psycho-education, behavioral techniques, individual therapy and group therapy showed significant results in cancer care.

Frischenschlager, Brömmel, Russinger, (1992) assesed effectiveness of psychlogical treatments of cancer patients in results on 31 experimental studies. Results concluded considerable impact on dealing with mood related symptoms and overall quality of life in cancer symptoms. Rosenbloom, Victorson, Hahn, Peterman, & Cella, (2007) reported that in a health related quality of life assessment the patients who undergo psychosocial interventions showed significant improvement then those who did not receive any therapy. McLachlan, Allenby, Matthews, et al., (2001) reported in their study that there was a substantial decrease in level of depression symptoms after using psychological interventions

May, Korstjens, van Weert, et al., (2008) assessed long-term impacts on oncology survivors. In this research patients were assigned randomly to one of two interventions, relaxation training or to relaxation training plus CBT. Results of these interventions concluded that cognitive behavior therapy and relaxation training found durable in producing positive effects in cancer survivors. Arving, Sjödén, Bergh, Lindström, Wasteson, Glimelius, & Brandberg, (2006) reported in their study that Participants were highly pleased with an individual psychotherapy sessions. More over psychosocial support by nurses were found more effective as compared to psychologist. Group psychotherapy sessions were found effective as a therapeutic intervention in cancer patients (Spiegel, 1994).

Individual Cognitive behavior therapy for cancer has been assessed in many studies (Greer S., 1989; Worden & Weisman, 1975) many of these studies concluded positive effects of these therapies on the level of social support (Cella & Yellen, 1994; Cunningham, 1995). Fawzy et al. (1993) used a largely based cognitive and behavioral approaches and educational techniques. Substantial positive effects in the level of anxiety and stress related symptoms were observed after assessment of results. In a pilot research by Cocker, Bell, and Kidman (1994) assessed effects of Cognitive behavioral therapy for 12 week in a group sessions of 6

breast cancer patients. Limited improvements were observed in the level of depression and other psychological symptoms of breast cancer. Cancer patients are often treated by psycho-oncologists. Cognitive behavioral therapy is mostly used for this purpose. A study about these interventions that are being used in cancer care pointed out that social support is also an important factor that can improve psychological health of patients diagnosed with cancer (Cella et al., 1993; Jacobs et al., 1983; Spiegel, Bloom and Yalom, 1981; Spiegel et al., 1989).

In a study where psychological intervention were used in experimental way, participants who were under psychotherapeutic approaches showed more positive health related outcomes then that of control group (Fawzy et al. 2000). In a study by Linda, Carlson et al, (2002) investigated the interactions between mindfulness techniques and immune functions. Significant improvement found after intervention. Participants in experimental group showed improved immune functioning against cancer then in control group. Long term effects of psychosocial interventions were observed in research which is based on psycho-education, stress reduction techniques and coping skills (Glaser & Glaser, 1992).

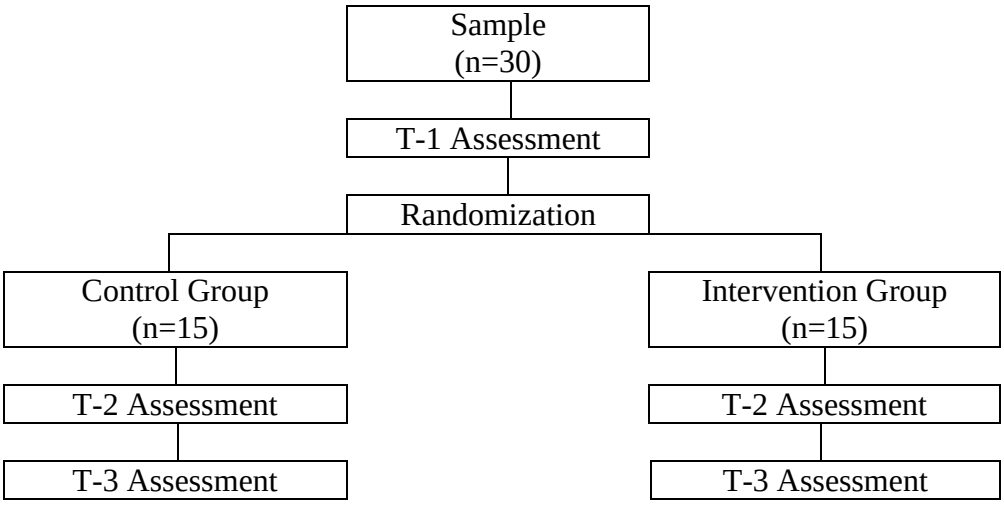
Research supports that coping skills and psychological defenses are effective in dealing with stress associated with cancer. Coping skills are based on an individual ability to deal with a stress. Greater coping ability is associated with improved health related outcomes (Jones, 2003). In a study in the favor of psycho-neuro immunology conducted on women with symptoms of depression and lower physical activity. Depressed women showed lower level of immune functioning as compared to non-depressed women. Immune functions were measured by lymphocytes production. Lower counts of lymphocytes were observed in depressed women and higher count of lymphocytes was observed in non-depressed women (Hendersen, 1999). Psycho-neuro immunologists are working on the relationship of psychotherapies and the immune system especially in those diseases where immune system plays important role. But results have some ambiguity concluding the clear concept that weather psychotherapies infects brings any positive change in immune system or not. The present research was based on psychological interventions in the form of cognitive behavioral therapy and progressive muscular relaxation training in an experimental way to assess their effects on immune parameters, and quality of life in patients suffering from cancer.

Method

Participants

Thirty cancer patients selected from Multan Institute of Nuclear Research and Radiotherapy (MINAR) participated in this research. Participant's age was ranging from 18 to 70 years (Mean age 40.26, SD = 14.96). In Interventions group, 15 patients (8 males, 7 females) were under psychological intervention and in control group, 15 patients (7 males, 8 females) were not under any psychological intervention. Medication, chemotherapy and radiotherapy for both groups remained constant.

Figure 1. Study design



Research Design

T-1= Baseline assessment; T-2= After 6 week intervention; T-3=after one month post study.

The study was based on an experimental research design and it was a pre-test post-test repeated measures randomized control group design for both groups with three assessment time points. Psychological and immunological data was obtained at baseline, after 6-weeks intervention and at 1-month post study. Intervention included weekly group sessions. The entire blood sample for immunological tests was drawn at the same time of day**.**

Instruments

Demographics of participants

Demographic data was obtained from patients medical file, Demographic information was based on age, sex, education, diagnosis, stage of cancer, treatment and socioeconomic status of the patient.

Immune parameters

Complete blood count test (WBC Differential) was used as measure of immune parameters. That includes counts and percentage of WBCs, lymphocytes, monocytes, granulocytes and eosinophils.

WHO Quality of Life Scale

Quality of life was evaluated using The WHOQOL-BREF (The WHOQOL Group, 1998).The WHOQOL-BREF scale comprises twenty six items that measure the four main domains, environmental factors, physical health, social relationships and psychological health. WHO Quality of Life Scale perceived a cross culturally valid, reliable and sound, scale for measurement of quality of life (Skevington, et al. 2004).

Procedures

The present research was conducted in a cancer unit .After filling informed consent thirty cancer patients diagnosed with different types of cancer undergoing medication, chemotherapy and radiotherapy were screened for this study. All of them were hospitalized for treatment. At baseline (T-1 Assessment), participants demographic data was obtain from their medical file. From each participant WHOQOL Scale was filled through interview method and their blood sample was obtained for the assessment of immunity. Then participants were randomly assigned to undergo the intervention group (*n=15*) or placed on control group (control, *n=15*).

Randomization was done firstly by stratified sampling techniques further by males and female Strata's systematic random sampling process done to create two groups with equal number of male and female. After the 6 week intervention (T-2 Assessment), participants completed a second assessment of WHOQOL Scale and another blood sample obtained from them for an immune assay. One month after intervention (T-3 Assessment), participants completed a third assessment of WHOQOL Scale and another blood sample obtained from them for an immune assay. At all three time points of assessment, blood sample was collected from the patients at the same time of day (12:00 AM).

The interventions were based on a group-based Cognitive behavior therapy (cognitive restructuring, assertiveness, anger management, coping with anxiety, depression, Sleep disturbance, sexual disorder and pain associated with cancer), progressive muscle relaxation and social support utilization skills (Antoni, 2003). This program consisted of 6 weekly sessions (spectate session for males and females; 8 participants in male group, 8 participants in female group) of approximately 1 hour each. Group sessions was based on the sharing or patient's individual experiences about the disease, coping and management of pain, stress, anxiety & mood disorders, relaxation practice and follow up of homework assignment. Intervention group sessions were conducted by a trained clinical psychologist (the researcher).

Experimental Condition

Cognitive Behavior Therapy:

The participants participated in group based cognitive behavior therapy sessions. One session per week for 6 weeks, approximately 45 mints for each session, separate sessions conducted for males and females, because females (especially with breast cancer) in this area have found hesitant participating in the presence of males.

Progressive muscle relaxation training

The participants practiced PMRT (Bernstein & Borkovec, 1973) for along with CBT session (1 session per week of approximately 15 mints, for 6 weeks).

Control Condition

In control group psychological and immunological data was obtained at baseline, after 6 weeks and at 1-month post study. No psychological intervention was applied on this group. Medication, chemotherapy and radiotherapy for both groups remained constant

Results

Data was analyzed using IBM SPSS Statistics Vol.20. Alpha value was set at 0.05 for all measures. All probability values were two tailed. Mean Scores, One way ANOVA and Paired Sample t-test were used to check the hypotheses of study and to archive the research objectives.

Table. 1
Baseline demographic and clinical characteristics of participants (N=30)

Measure		Interventions Group (n=15)		Control Group (n=15)	
		Mean	S.D	Mean	S.D
Age		36.53	13.80	44	16.13
		N	%	N	%
Gender					
	Male	8	26.66%	7	23.33%
	Female	7	23.33%	8	26.66%
Education					

	Primary (Class 1-5)	5	16.66%	4	13.33%
	Secondary (6-12)	9	30%	11	36.66%
	Tertiary (13-Above)	1	3.33%	0	0%
Diagnosis					
	Carcinoma of Breast	6	20%	5	16.66%
	Carcinoma of Lung	2	6.66%	3	10%
	Others	7	23.33%	7	23.33%
Stage of cancers					
	2^{nd}	7	23.33%	5	16.66%
	3^{rd}	7	23.33%	9	30%
	4^{th}	1	3.33%	1	3.33%
S-E-S					
	Poor	5	16.66%	7	23.33%
	Moderate	10	33.33%	8	26.66%

Table 1 show that there were no significant differences in demographic and clinical characteristics between the two groups at base line assessment.

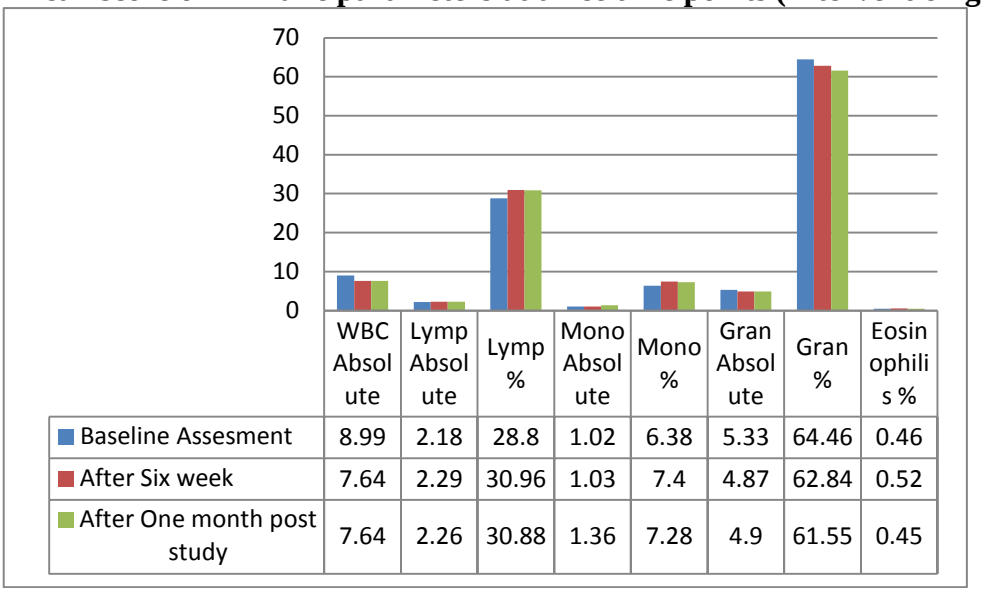
Table. 2

One Way ANOVA to test the equality of averages of immune parameters at Baseline assessment, after Six Week Interventions and One Month Post Study

Measure	Parameter	*F*	*p*-value
Immune Parameters	WBC Absolute	.327	.723
	Lymphocyte Absolute	.022	.978
	Lymphocyte %	.178	.837
	Monocytes Absolute	.126	.882
	Monocytes %	.220	.804
	Granulocytes Absolute	.346	.709
	Granulocytes %	.157	.855
	Eosinophils %	.176	.405

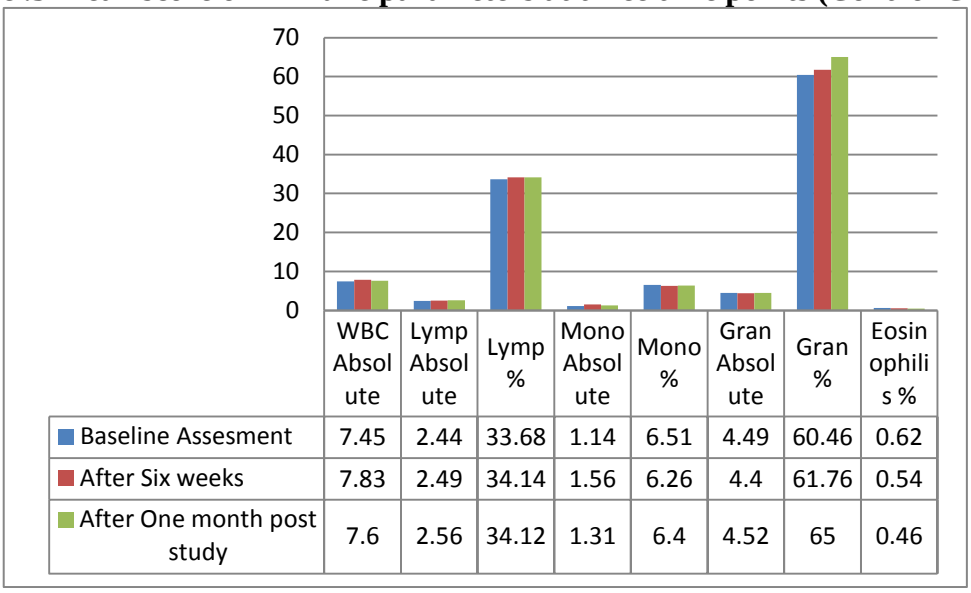
Table 2 indicates the results of one way ANOVA that was computed to test the equality of averages of intervention group cancer patients at base line assessment, after six week interventions session and one month post study. *p*-value indicates that there is no significant difference in the mean scores of immune parameters at three time points. WBC absolute (p=.72), lymphocytes absolute (p=.97), lymphocytes percentage (p=.83), monocytes absolute (p=.88), monocytes percentage (p=.80), expect granulocytes absolute (p=.70) granulocytes percentage (p=.85) and eosinophils percentage (p=.40). Results indicate that there is no significant effect of psychological interventions on immune parameters in cancer patients.

Figure. 2 Mean score of Immune parameters at three time points (Intervention group)



	WBC Absolute	Lymp Absolute	Lymp %	Mono Absolute	Mono %	Gran Absolute	Gran %	Eosinophilis %
Baseline Assesment	8.99	2.18	28.8	1.02	6.38	5.33	64.46	0.46
After Six week	7.64	2.29	30.96	1.03	7.4	4.87	62.84	0.52
After One month post study	7.64	2.26	30.88	1.36	7.28	4.9	61.55	0.45

Figure .3 Mean score of Immune parameters at three time points (Control Group)



	WBC Absolute	Lymp Absolute	Lymp %	Mono Absolute	Mono %	Gran Absolute	Gran %	Eosinophilis %
Baseline Assesment	7.45	2.44	33.68	1.14	6.51	4.49	60.46	0.62
After Six weeks	7.83	2.49	34.14	1.56	6.26	4.4	61.76	0.54
After One month post study	7.6	2.56	34.12	1.31	6.4	4.52	65	0.46

Table 3

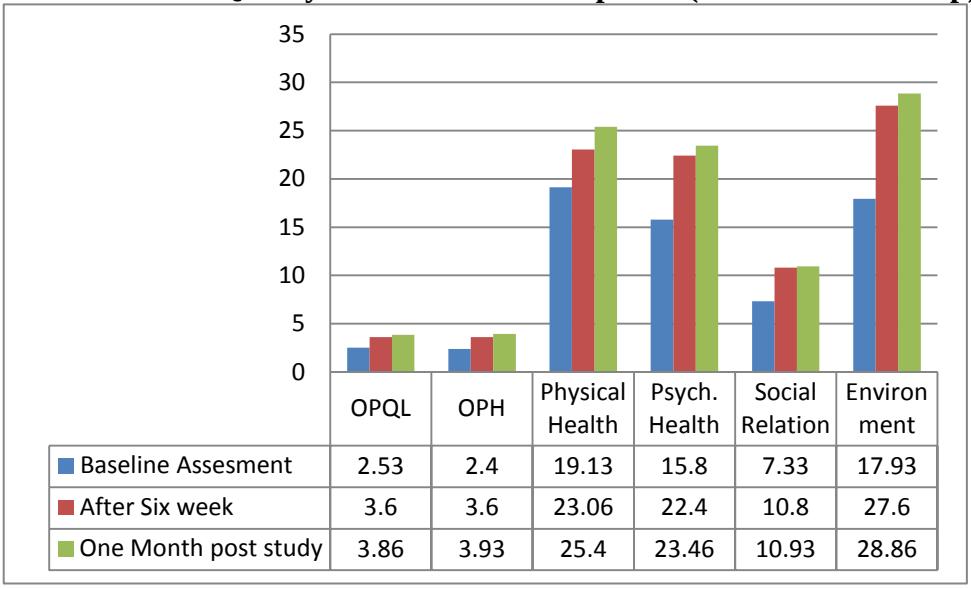
One Way ANOVA to test the equality of averages of Quality of life Scores at three time points

Measure	Parameter	F	p-value
Quality of Life	Overall perception of QOL	16.448	.0000*
	Overall perception of Health	22.596	.0000*
	Physical Health	9.209	.0000*
	Psychological Health	28.314	.0000*
	Social Relationships	17.419	.0000*
	Environment	36.093	.0000*

*$p < 0.05$

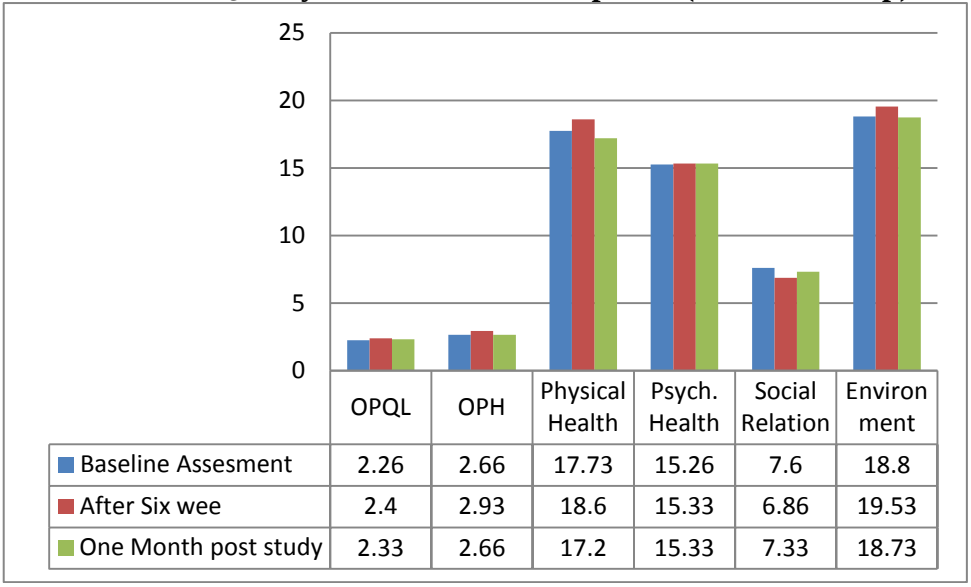
Table 3 indicates the results of one way ANOVA that was computed to test the equality of averages of intervention group cancer patients at base line assessment, after six week interventions session and one month post study. p-value indicates that there is significant difference in the mean scores of quality of life scores at three time points, overall perception of quality of life (p=.0000), overall perception of health (p=.0000), physical health (p=.0000), psychological health (p=.0000), social relationships (p=.0000), and environment (p=.0000). Results indicate that there is significant effect of psychological interventions on quality of life in cancer patients.

Figure.4 Mean score of Quality of life at three time points (Intervention Group)



	OPQL	OPH	Physical Health	Psych. Health	Social Relation	Environment
Baseline Assesment	2.53	2.4	19.13	15.8	7.33	17.93
After Six week	3.6	3.6	23.06	22.4	10.8	27.6
One Month post study	3.86	3.93	25.4	23.46	10.93	28.86

Figure .5 Mean score of Quality of life at three time points (Control Group)



	OPQL	OPH	Physical Health	Psych. Health	Social Relation	Environment
Baseline Assesment	2.26	2.66	17.73	15.26	7.6	18.8
After Six wee	2.4	2.93	18.6	15.33	6.86	19.53
One Month post study	2.33	2.66	17.2	15.33	7.33	18.73

Table 4

Pared t-test to test the Significance (p-value) of averages of Immune Parameters between Intervention Group and Control Groups at Baseline assessment, after Six Week Interventions and One Month Post Study

Measure	Baseline (T1)		*P*	After Six Week (T2)		*p*	One Month Post Study (T3)		*P*
	I.G M	C.G M		I.G M	C.G M		I.G M	C.G M	
Immunity	117.62	116.79	.610	117.55	114.58	.360	116.32	121.97	.568
WBC Absolute	8.99	7.45	.389	7.64	7.83	.904	7.64	7.60	.974
Lymp Absolute	2.18	2.44	.596	2.29	2.49	.736	2.26	2.56	.595
Lymp %	28.8	33.68	.251	30.96	34.14	.502	30.88	34.12	.501
Mono Absolute	1.02	1.14	.894	1.03	1.56	.613	1.36	1.31	.965
Mono %	6.38	6.51	.902	7.40	6.26	.288	7.28	6.40	.390
Gran Absolute	5.33	4.49	.539	4.87	4.40	.758	4.90	4.52	.795
Gran %	64.46	60.46	.405	62.84	61.76	.824	61.55	65.0	.473
Eosinophilis %	0.46	0.62	.004*	0.52	0.54	.064	0.45	0.46	.709

P < 0.05

I.G=Intervention Group

C.G=Control Group

Figure 6. Mean score of Immune parameters at base line assessment

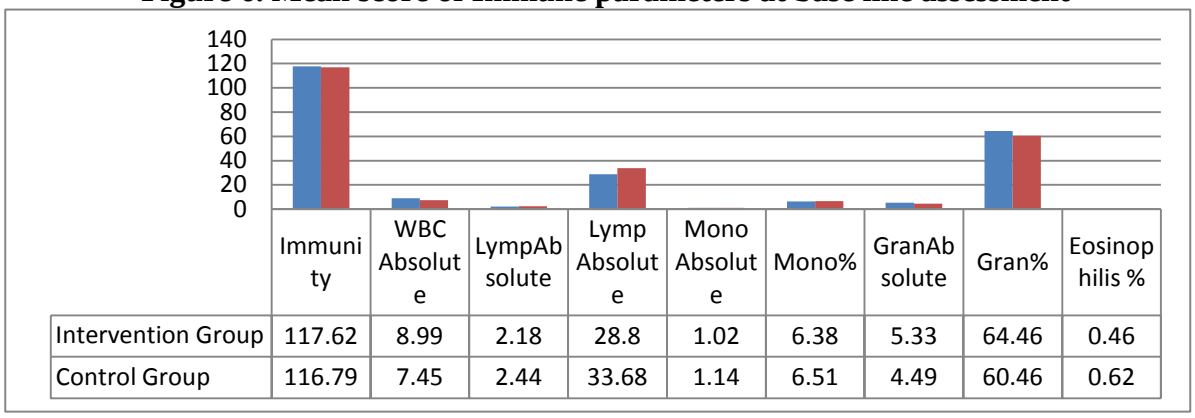


Figure 7. Mean score of Immune parameters after Six weeks

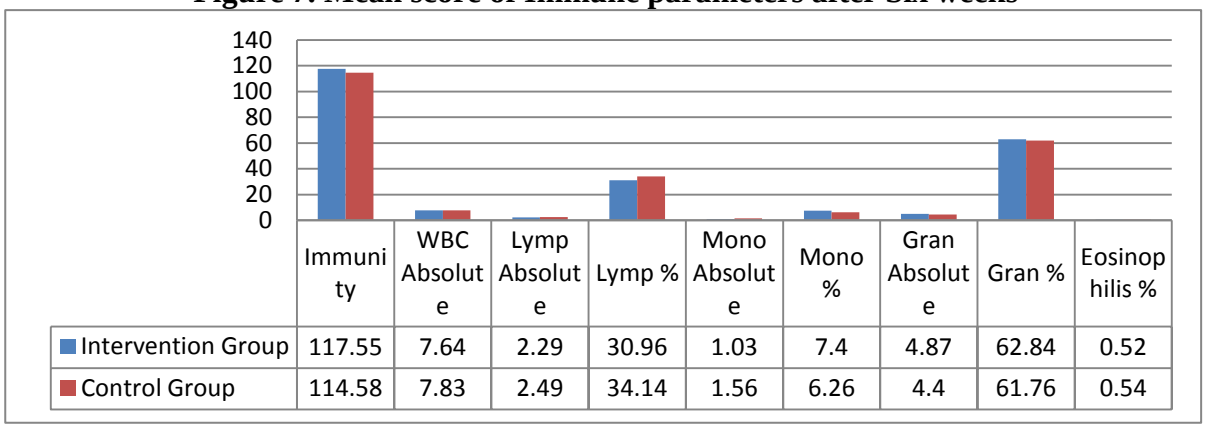


Figure 8. Mean score of Immune parameters one month post study

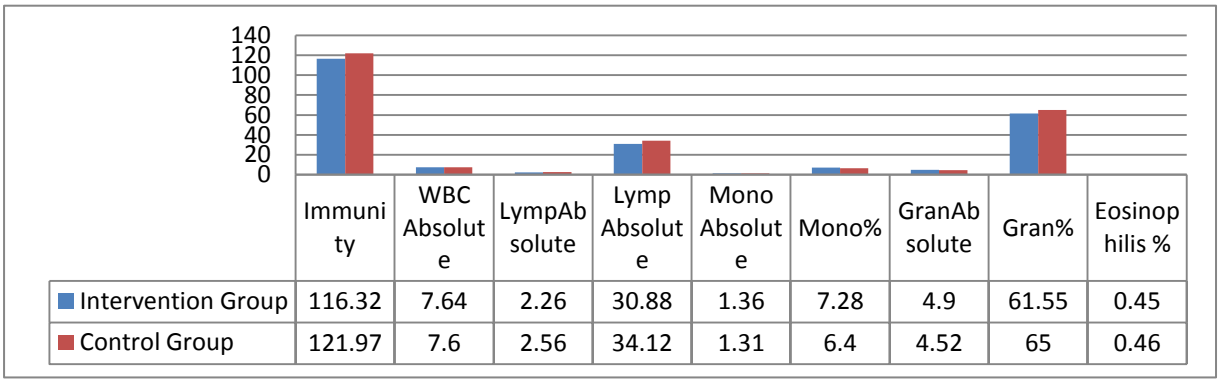


Table 4 indicates the results of Pared t-test to test the Significance (p-value) of averages of Immune Parameters between Intervention Group and Control Groups at Baseline assessment, after Six Week Interventions and One Month Post Study. At base line assessment results show that there is no significant mean difference between Intervention group and control group, Overall Immunity (p=.610) WBC absolute (p=.389) lymphocytes absolute (p=.596) lymphocytes percentage (p=.251) monocytes absolute (p=.894) monocytes percentage (p=.902) granulocytes absolute (p=.539) granulocytes percentage (p=.405) eosinophils percentage (p=.004*).

After six week intervention results show that there is no significant mean difference between Intervention group and control group, Overall Immunity (p=.360) WBC absolute (p=904) lymphocytes absolute (p=.736) lymphocytes percentage (p=.502) monocytes absolute (p=.613) monocytes percentage (p=.288) granulocytes absolute (p=.758) granulocytes percentage (p=.824) eosinophils percentage (p=.064).

After one month post study results show that there is no significant mean difference between Intervention group and control group, Overall Immunity (p=.568) WBC absolute (p=.974) lymphocytes absolute (p=.595) lymphocytes percentage (p=.501) monocytes absolute (p=.965) monocytes percentage (p=.390) granulocytes absolute (p=.795) granulocytes percentage (p=.473) eosinophils percentage (p=.709).

Results indicate that there is no significant effect of psychological intervention on immune parameters between two groups. Psychological interventions are unable to bring any significant improvement in immune parameters.

Table 5

Pared t-test to test the Significance (p-value) of averages of Quality of Life scores between Intervention Group and Control Groups at Baseline assessment, after Six Week Interventions and One Month Post Study

Measure	Baseline (T1)		*p*	After Six Week (T2)		*p*	One Month Post Study (T3)		*p*
	I.G	C.G		I.G	C.G		I.G	C.G	
Quality of Life	M 65.12	M 64.31	.693	M 91.06	M 65.65	.018*	M 96.44	M 63.58	.017*
OPQL	2.53	2.26	.610	3.60	2.40	.065	3.86	2.33	.001*
OPH	2.40	2.66	.610	3.60	2.93	.000*	3.93	2.66	.000*
Physical Health	19.13	17.73	.310	23.06	18.60	.001*	25.40	17.20	.000*

Psych. Health	15.80	15.26	.615	22.40	15.33	.000*	23.46	15.33	.000*
Social Relation	7.33	7.60	.741	10.80	6.86	.000*	10.93	7.33	.000*
Environment	17.93	18.80	.678	27.60	19.53	.002*	28.86	18.73	.000*

*$P < 0.5$
I.G=Intervention Group
C.G=Control Group
Higher scores represent higher Quality of life

Figure 10. Mean Score of quality of life after six weeks

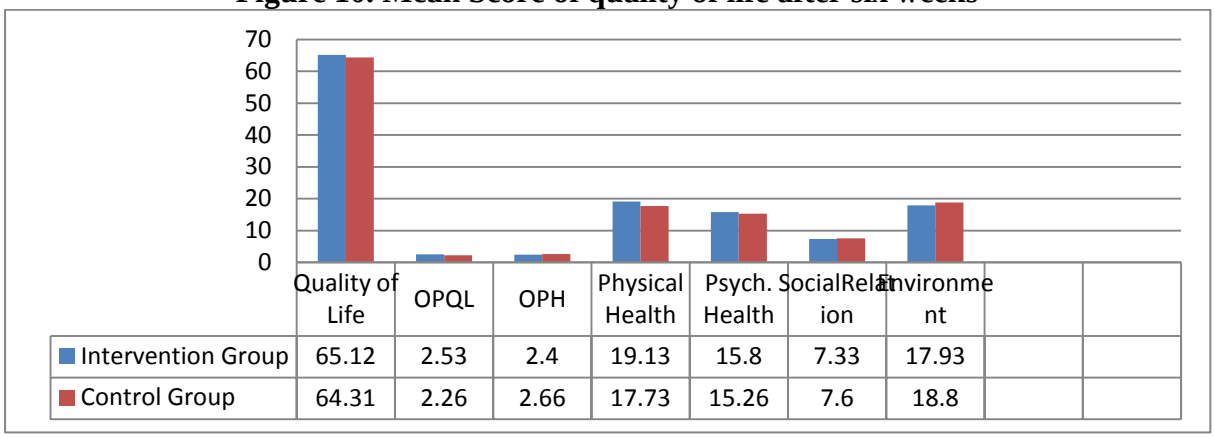


Figure 11. Mean Score of quality of life after one month post study

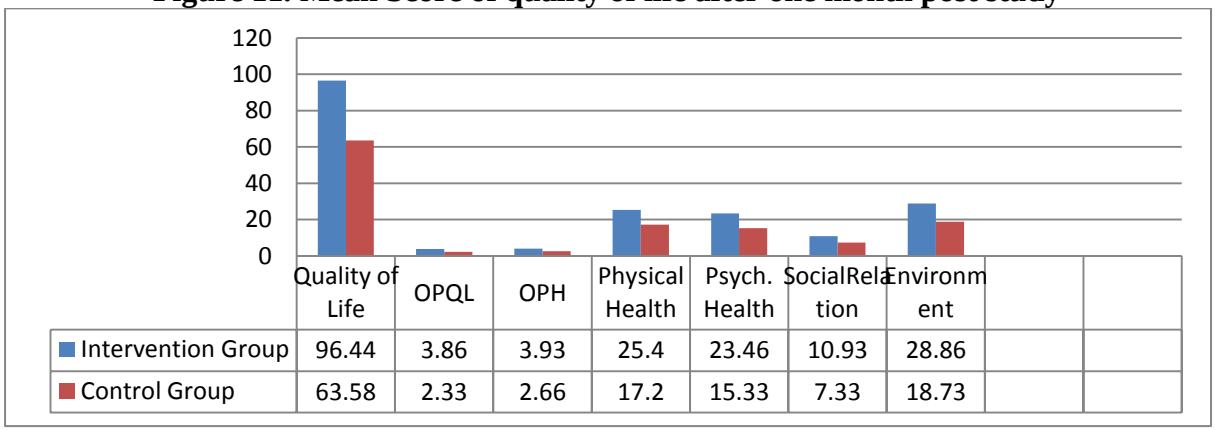


Table 5 indicates the results of pared sample t-test to test the Significance difference (p-value) of averages of Quality of Life scores between Intervention Group and Control Groups at Baseline assessment, after Six Week Interventions and One Month Post Study. At base line assessment results show that there is no significant mean difference between intervention group and control group, Overall Quality of Life (p=.693), OPQOL (p=.610), OPH (p=.610), physical health (p=.310), psychological health (p=.615), social relationships (p=.741) and environment (p=.678).

After six week intervention results show that there is significant mean difference between Intervention group and control group, Intervention group patients show higher levels of Overall Quality of Life scores. (p=.018), OPQOL (p=.065), OPH (p=.001), physical health (p=.000), psychological health (p=.000), social relationships (p=.000) and environment (p=.002).

After one month post study results show that there is significant mean difference between intervention group and control group, Intervention group patients show higher levels of Overall Quality of Life scores. Overall Quality of Life (p=.017), OPQOL (p=.001), OPH (p=.000), physical health (p=.000), psychological health (p=.000), social relationships (p=.000) and environment (p=.000).

Results indicate that there is significant effect of psychological intervention on overall quality of life in cancer patients. Intervention group showed higher mean scores as compared to control group this indicates that psychological intervention bring improvement in quality of life and it all 4 domains (Physical health, psychological health, Social relationships and Environment) after six week intervention and one month post study.

Discussions

The present research was aimed to find out the effectiveness of psychological interventions in the form of group cognitive behavior therapy sessions combined with progressive muscular training session in an experimental way. To assess the effect of psychological intervention on immune parameters one way ANOVA test was used result indicated that there was no significant difference in the mean scores of immune parameters at three time points. Further results indicated that there was no significant effect of psychological intervention on immune parameters between two groups mean score.

Results of present research objectives sported by Miller and Cohen, (2001) they investigated the effect of different psychological intervention on immune parameters in their meta-analysis of 59 trails on 2135 patients, results of their meta-analysis showed that psychological intervention did not produce any significance positive effect on immune parameters. Finding of present research conclude that Psychological interventions are unable to bring any significant improvement in immune parameters.

To assess the effect of psychological intervention on quality of life in cancer patients results of one way ANOVA that was computed to test the equality of averages of intervention group cancer patients at base line assessment, after six week interventions session and one month post study. p-value indicates that there was significant difference in the mean scores of quality of life scores at three time points, overall perception of quality of life (p=.0000), overall perception of health (p=.0000), physical health (p=.0000), psychological health (p=.0000), social relationships (p=.0000), and environment (p=.0000).

Pared sample t-test showed that Mean score of physical health (p=.004, p=.000), psychological health (p=.000, p=.000), social relationships (p=.001, p=.000) and environmental factors (p=.000, p=.000) were significantly different at T1-T2 and T1-T3 in intervention group but no significance mean difference found in control group. Further results indicated that there was significant effect of psychological interventions on quality of life in cancer patients. Intervention group showed higher mean scores as compared to control group this indicates that psychological intervention bring improvement in quality of life and it all 4 domains (Physical health, psychological health, Social relationships and Environment) after six week intervention and one month post study.

Results of present research were sported by different previous researches on this topic (Andersen R et al 2007; Duijts, SFA; et al 2011; Jacobs, 2001; Rosenbloom et al. 2007 & Uitterhoeve et al 2004). Psychological interventions bring improvement in overall quality of life as well as physical, psychological social and environmental factors were also improved by the help of group based session of cognitive behavior therapy and progressive muscular relaxation training.

Limitations

The present research was based on was a pretest posttest repeated measures randomized control group design which is conceded a good research design with limited biasedness and having good internal and external validity. Besides this the present research was having some limitations.

- Immune parameters are complex to understand. Immune system can be affected by many others factors such as disease status, chemotherapy and radiotherapy results can be modified by the effect of these factors.
- Immune parameters are functional and quantitative. In present research only quantitative immune measures were included but functional assessment of immune response was not included.
- CBT and PMRT were administered collectively. No information found that which therapy produce effect and how much CBT or PMRT contribute in the improvement of quality of life in cancer.

Conclusion

The finding of present research concludes that, psychological interventions found failed to bring any significant change or improvement in immune parameters. There was no or limited effect of psychological intervention on WBC absolute, lymphocytes absolute & percentage, monocytes absolute & percentage, granulocytes absolute & percentage and eosinophil percentage in cancer patients. Psychological intervention found effective to improve the overall quality of life, over all perception about quality of life, over all perception about health, physical health, psychological health, social relationships and environmental factors in cancer patients.

References

- Antoni, M. H. (2003). *Stress management intervention for women with breast cancer.* Washington, DC: American Psychological Association.
- Arving, C. Sjödén P. O, Bergh J, Lindström A. T, Wasteson E, Glimelius B, & Brandberg Y. (2006). Satisfaction, utilization and perceived benefit of individual psychosocial support for breast cancer patients a randomized study of nurse versus psychologist interventions. *Education Corns 62*(2):235-43.
- Breitban, W. (1995).Identifying patients at risk for and treatment *of* major psychiatric complaints of cancer.*Supporfive Care in Cancer, 3*(I), 45-60.
- Cclla. D. F. &Yellen, S. B. (1994). Cancer support groups: The state of the art. *Cancer Practice,* (I), 56-61.
- Cockcr, C., Bell. R. & Kidman A. (1994). Cognitive behavior therapy with advanced breast cancer patients: A brief report of a pilot study, *Psycho-Oncology-003*,233-237.
- Cunningham, A. J. (1995). Croup psychotherapy for cancer patients: A brief discussion of its use and range of interventions. *Supportive Care in Cancer, 3,244*-247.
- Fawzy, F. & Fawzy, N. (1998) Group therapy in the cancer setting. *Journal of Psychosomatic Research, 45:*191–200.
- Fawzy, F. I., Fawzy, N. W., Hyun, C. *S.*, Elashoff, R., Monon. D., Cousins, N., & Fahey, L., (1993). Malignant melanoma: Effects *of* an early structured psychiatric intervention, coping and affective state on recurrence and survival six years later. *Archive* of *General Psychiatry, 50,* 681-689.
- Fawzy, I. F, Fawzy, N. W, Arndt, L. A, Pasnau, R. O. (1995). Critical review of psychosocial interventions in cancer care, *Arch Gen Psychiatry 52:* 100–113.

- Frischenschlager O, Brömmel B, Russinger U.(1992). Effectiveness of psychosocial management of cancer patients--a critical review of empirical studies *Psychosom Med Psychol, 42*(6):206-13.
- Glaser, R., Kiecolt-Glaser, J. K., & Andersen, B. L. (1994).A bio behavioral model of cancer, stress, and disease course. *American Psychologist, 49,* 389-404.
- Globocan. (2008). *Section of Cancer Information,* Retrieved February 5 2012 from http://globocan.iarc.fr/factsheets/cancers/breast.asp
- Greer, S. (1989). *Psychological therapy for patients with cancer: A new approach.* Oxford, UK.
- Henderson, D. (1999). Self-hypnosis and exam stress: comparing immune and relaxation-related imagery for influences on immunity, health and mood. *Contemp. Hypnosis, 18*: 73–86. doi: 10.1002/ch.221.
- Jacobs, C., Ross, R., Walker, 1. M. & Stockdale, F. E. (1983). Behavior of cancer patients: A randomized study of the effects of education and peer support groups *American Journal of Clinical Oncology 17*(14), 1-23.
- Jacobs, G.D. (2001). Clinical applications of the relaxation response and Mind-body interventions.*The Journal of Alternative and Complementary Medicine, 7,* S93-S101.
- Jones, J. (2003). Stress responses, pressure ulcer development and adaptation. *British Journal of Nursing, 12,* 17-23.
- Linda E, Carlson, Michael Speca, Kamala D. Patel, Eileen Goodey. (2002). Interaction between mindfulness techniques and psychological outcomes. The Department Psychosocial Resources, Tom Baker Cancer Centre (L.E.C., M.S., E.G.), Calgary, Alberta, Canada.
- May, A. M, Korstjens, I, van Weert, E. et al (2008). Support Care Cancer. Quality of life after self-management cancer rehabilitation: a randomized controlled trial comparing physical and cognitive-behavioral training versus physical training, *Department of Health Education and Promotion*, Maastricht University, Netherlands.
- McLachlan, S. A, Allenby, A, Matthews, J, et al. (2001). Randomized trial of coordinated psychosocial interventions based on patient self-assessments versus standard care to improve the psychosocial functioning of patients with cancer, *Journal of Clinical Oncology* ; *19* (21): 4117-4125.
- Miller, G. E. (2001). Psychological stress and the human immune system: A meta-analytic study of 30 years of inquiry. Psychological Bulletin, 130:601–630.
- Miller, G. E., & Cohen, S. (2001). Psychological interventions and the immune system: A meta-analytic review and critique. *Health Psychology, 20,* 47–63.
- Moyer, A., Sohl, S. J., Knapp-Oliver, S. K, et al. (2009). Characteristics and methodological quality of 25 years of research investigating psychosocial interventions for cancer patients Treatment Reviews Volume: 35 Issue: 5 Pages: 475-484.
- Rehse, B, Pukrop, R. (2003). Effects of psychosocial interventions on quality of life in adult cancer patients: Meta-analysis of 37 published controlled outcome studies. *Patient Education and Counseling,* 50*:*179–186.
- Rieker, P., Fitzgerald, E., Kalish, L., & Robertshaw, R (1989). Psychological factors, curative therapies and behavioral outcomes: A comparison of testis cancer survivors and a control group of healthy men. Cancer, *Journal of Clinical Oncology* 64, 2399-240
- Rosenbloom, S.K, Victorson, D.E, Hahn, E.A, Peterman, & A.H, Cella. (2007). Assessment is not enough: a randomized controlled trial of the effects of HRQL assessment on quality of life and satisfaction in oncology clinical practice.
- Skevington, S. M, Lotfy, M. & O'Connell, K. A, (2004). *Quality of Life Research*, 13: 299–310. Kluwer Academic Publishers, Printed in the Netherlands

- Saskia, F.A. Duijts, Marc van Beurden, Hester, S.A. Oldenburg, et al. (2011). Effectiveness of behavioral techniques and physical exercise on psychosocial functioning and health-related quality of life in breast cancer patients and survivors a meta-analysis. *Psycho-Oncology, Volume 20, Issue 2*, Pages: 115-126.
- Segerstrom, S. C, Miller, G. E. (2004). Psychological stress and the human immune system: A meta-analytic study of 30 years of inquiry. Psychological Bulletin, 130:601–630.
- Spiegel, D. (1994).Health caring: Psychosocial support for patients with cancer,1453-1457, *44*, 370-37 I.
- Spiegel, U., Bloom, J.R &Yalom, 1.(1981). Group therapy and hypnosis reduced metastatic breast cancer pain,*Psycho-somatic Medicine. 45*, 333-339.
- Spijkervan't, A, Trijsburg, R. W, Duivenvoorden, H. J. (1997). Psychological squeal of cancer diagnosis: a Meta-analytical review of 58 studies after 1980. *Psychosomatic Med*, 280–93.
- The WHOQOL Group (1998). The World Health Organization WHOQOL-100: Tests of the Universality of Quality of Life in Fifteen Different Cultural Groups World-wide.
- Uitterhoeve, R. J.,Vernooy, M., LitjensM., et al.(2004). Psychosocial interventions for patients with advanced cancer—a systematic review of the literature. *Britosh Journal of Cancer*, 91:1050–1062.
- Weisman, A.D., Worden, J.W. (1975). Psychological analysis of cancer deaths.*Omega*.6, 61-75.