

Stress and Quality of Life in Cancer Patients: Medical and Psychological Intervention

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ABSTRACT


Background: Cancer pervades many dimensions of an individual's life – demanding a holistic treatment approach. However, studies with combined medical and psychological interventions (MPIs) are sparse. High-level stress and poor quality of life (QoL) can hinder patients' prognosis. The study thus aimed to analyze the impact of combined medical and psychological (psychoeducation, relaxation technique-guided imagery, and cognitive therapy) interventions on stress and QoL of cancer patients – head and neck, breast, and lung cancers. **Methods:** The study was conducted in cancer hospitals employing one-group pretest-posttest-preexperimental design. Descriptive statistics, paired *t*-test, Cohen's *d*, and bar graphs were used to analyze the data. **Results:** Findings showed high impact of the combined MPIs in reducing both the overall stress as well as the various components of the stress scale-fear, psychosomatic complaints, information deficit, and everyday life restrictions. Significant changes were also seen in QoL and its domains – global health status, besides functional and symptom scales. Results showed a significant improvement in physical, role and emotional functioning scale, while decrement in fatigue, pain, insomnia, appetite loss, diarrhea, and constipation of symptoms scales. **Conclusions:** It can be concluded that combined MPI has a positive impact – decreasing stress and improving QoL in cancer patients, which can further enhance their prognosis.

Key words: Cancer, quality of life, stress

INTRODUCTION

The ever-growing researches in cancer care both medical and psychological either in beating the cancer cell or coping with the stresses along the trajectory of the illness indicates the perpetual humans' attempts in understanding and dealing with this disease. Despite

the massive medical advancement in cancer treatment, the evidence from psychological research yet again establishes the fact that cancer affects a patient not only just physiologically but also psychosocially.^[1] This implicates the need for a holistic approach to cancer treatment, one that encompasses both medical and

Access this article online	
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DOI: 10.4103/IJPSYM.IJPSYM_512_17	

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How to cite this article: Barre PV, Padmaja G, Rana S, Tiamongla. Stress and quality of life in cancer patients: Medical and psychological intervention. Indian J Psychol Med 2018;40:232-8.

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psychological interventions (MPIs). A previous study^[2] has well established the need for the psychological interventions in cancer treatment, especially in dealing with the various stresses that a cancer patient faces. The present study is one such attempt to see the impact of holistic treatment – MPI in cancer patients.

Stress is considered a major precipitating psychological issue in cancer patients from diagnosis, through treatment and prognosis, even after the disease is long gone.^[3] Cancer patients are often stressed with the uncertainty, disease severity, physical difficulties, medical treatments, psychological state, and family issues.^[4] The various negative impact of stress in cancer patients – either in compounding to psychiatric comorbidity such as anxiety, depression, posttraumatic stress disorder, etc. or in deteriorating their quality of life (QoL), indicates the need for a holistic approach – MPI.^[3-6]

QoL is another majorly explored variable in cancer care today, in fact, a parameter of quality care.^[7] It is a multidimensional construct, determined by both objective factors and individual's subjective assessment such as their personal goals, expectations, standards, concerns, and experiences, in relation to their own culture and value systems.^[6,7] Of the various medical, sociodemographic, and psychological factors, stress remains a significant factor in deteriorating the QoL in cancer patients, which further impedes their disease prognosis, indicating again, the need for MPI.^[3,4,6]

Studies in different types of cancer have shown that medical treatment though effective has inherent negative physiological and psychological impact.^[1,8] This, in turn, prolongs their hospital stay and hinders their compliance to the treatment regime.^[8] Various psychosocial interventions in cancer care such as psychoeducation, rational emotive behavioral Therapy, social support therapy, cognitive behavioral therapy (CBT), and relaxation therapy (guided imagery) are shown to have bring down the level of pain, insomnia, fatigue, loss of appetite, nausea, stress, anxiety, and depression; and improved physical functioning and QoL.^[8-11] When it comes to improving patients' QoL, psychological intervention is suggested to be one practical and cost-effective approach. However, the study showed that out of a 41% of patients who needed psycho-oncological support, a mere 10% were referred.^[8] These interventions not only help patients cope during their treatment phase and hospital stay but also help in the "reentry" phase, i.e., when the patients get back to their normal life after their treatment.^[12,13]

The present study was conceptualized to examine the impact of MPI on the stress and QoL of three types of cancer patients – head and neck, breast, and lung. A package of three psychological therapies,

namely, CBT, psychoeducation, and relaxation therapy (guided imagery) was used, with the aim of inducing a tripartite impact – cognition, affect, and behavior, in helping the patients cope with stress and improve their QoL.

The objective of the study was to analyze the impact of MPI on the stress and QoL of cancer patients.

METHODS

Participants

The present study employed one-group pretest-posttest-preexperimental design. Approval was obtained from the Institutional Ethics Committee. Thirty cancer patients (19 men, 11 women) under three cancer types – head and neck, breast, and lung cancers (10 in each type) were selected through purposive sampling from different cancer hospitals. Their age group ranged within 27–65 years ($M = 52$). Participants were recruited based on the following inclusion criteria: newly diagnosed men and women of head and neck, breast, and lung cancers, with no psychiatric illness, and within the age group of 25–65 years, with no restrictions to their occupation, socioeconomic status, or place of living. Those cancer patients who were either below 25 or above 65 years of age and those with either psychiatric or physical comorbidity were not considered in the study.

Research instruments

Stress was measured using the Stress in Cancer Patients-Revised Version (QSC-R23) (Herschbach *et al.*, 2004).^[14] The questionnaire consisted of 23 items with five domains, namely, psychosomatic complaints (PSC), fears (FR), information deficits (ID), everyday life restrictions (ELR), and social strains (SS). Responses were rated on 0 (the problem does not apply to me) to 5 (the problem applies to me and is very big problem), within a score range of 0–115, higher the score, higher the level of stress. The Cronbach's alpha of the scale was 0.89.^[14]

Patients' health-related QoL was measured using the European Organization for the Cancer QoL Questionnaire (Aronson *et al.*, 1993, Brussels, Belgium), version 3.0 (EORTC QLQ-C30 version 3.0).^[15] The questionnaire consists of five functional scales (physical, role, emotional, cognitive, and social); three symptoms scales (Fatigue, nausea/vomiting, and pain) a global health status and QoL (GHS/QoL) scale, and a few single items measuring additional symptoms (dyspnea, insomnia, appetite loss, constipation, and diarrhea) and perceived financial impact. All the items in the scale were scored on a 4-point Likert scale with 1 implying "not at all" and 4 as "very much", except for the two GHS/QoL items which were rated on 7-point Likert scale (1 = very poor; 7 = excellent). While a

higher score corresponded to better functioning in the functional and GHS/QoL scales, a higher score for the symptoms scales and items, implicated a higher symptomatic ness.

Procedure

A psychological package of psychoeducation, relaxation, and CBT was tailored for the study, followed by the recruitment of three cancer hospitals. Each participant was then briefed about the study and was recruited for the study of all those who consented to participate for the whole 6 weeks of the study. Research instruments were administered to each of the participants followed by the introduction of the tailored MPI under the supervision of a senior medical oncologist and a psychologist. Each of the participants was under various medical intervention, namely, surgery, chemotherapy, and radiation-hormonal therapy during this study. Thus, the participants underwent a combination of MPIs during this period. The period between the pre-and-post-medical and psychological intervention assessment (pre-MPIA/post-MPIA) was kept at 6 weeks. Each of the participants was debriefed on the completion of the study. An observation record was also maintained to document the whole study.

RESULTS

Data were analyzed applying descriptive statistics, paired *t*-test, Cohen’s *d*, and bar graphs using the IBM SPSS software (Statistical Package for Social Sciences), version 20.0.

Stress of cancer patients: Pre-and post-medical and psychological assessment

Table 1 showed mean, standard deviation (SD), and *t* values of the patients’ overall stress and the various components (PSC, FR, ID, ELR, and SS) of the stress scale.

Paired *t*-test showed a statistically significant difference between pre-and-post-MPIA scores of the overall stress scale in cancer patients, *t* (29) = 22.85, *P* < 0.01, effect size = 4.55. This indicated that the overall stress in cancer patients decreased in the post-MPIA (M = 16.80, SD = 6.69) in comparison to pre - MPIA (M = 69.43, SD = 14.91), which also implied that the effect of MPI was high.

Statistical significant differences were also noticed between the pre-and-post-MPIA scores of the components of stress, namely, psychosomatic complains, *t* (29) = 15.84, *P* < 0.01, effect size = 3.04; fear, *t* (29) = 17.29, *P* < 0.01, effect size = 4.64; information deficits, *t* (29) = 8.50, *P* < 0.01, effect size = 2.16; everyday life restrictions, *t* (29) = 15.60, *P* < 0.01, effect size = 3.04; and social strains, *t* (29) = 11.29, *P* < 0.01, effect

size = 2.63. The effect of MPI was also found to be high. This implicated that patients showed lowered level of stress in all of its components, psychosomatic complains, post-MPIA (M = 6.10, SD = 3.81) in comparison to pre-MPIA (M = 20.40, SD = 5.43); fears, post-MPIA (M = 4.17, SD = 1.88) in comparison to pre-MPIA (M = 12.90, SD = 1.88); information deficits, post-MPIA (M = 0.07, SD = 0.25) (indicating that they have acquired more information) in comparison to pre-MPIA (M = 8.13, SD = 5.26); everyday life restrictions, post-MPIA (M = 4.17, SD = 2.15) in comparison to pre-MPIA (M = 14.77, SD = 4.30); social strains, post-MPIA (M = 2.30, SD = 1.66) in comparison to pre-MPIA (M = 11.60, SD = 4.70).

Figure 1 showed the mean values of stress in patients with cancer pre-and post-MPIA. The figure indicated mean values on overall stress and its components. The figure clearly demonstrated the lowering of psychosomatic complains, fear, information deficit, everyday life restrictions, and social strains during the post-MPIA, in comparison to pre-MPIA.

Global health status/quality of life of cancer patients: Pre-and-post-medical and psychological assessment

Table 2 showed mean, SD, and *t* values of the

Table 1: Mean, standard deviation, and *t* values for stress scores of cancer patients in pre- and post-medical and psychological assessment

Variables	Pre-MPIA		Post-MPIA		<i>t</i>	Cohen’s <i>d</i>
	Mean	SD	Mean	SD		
Stress	69.43	14.91	16.80	6.69	22.85**	4.55
Psychosomatic complains	20.40	5.43	6.10	3.81	15.84**	3.04
Fears	12.90	1.88	4.17	1.88	17.29**	4.64
Information deficits	8.13	5.26	0.07	0.25	8.50**	2.16
Everyday life restrictions	14.77	4.30	4.17	2.15	15.60**	3.18
Social strains	11.60	4.70	2.30	1.66	11.29**	2.63

P*<0.05, *P*<0.01. MPIA: Medical and psychological intervention assessment, SD: Standard deviation

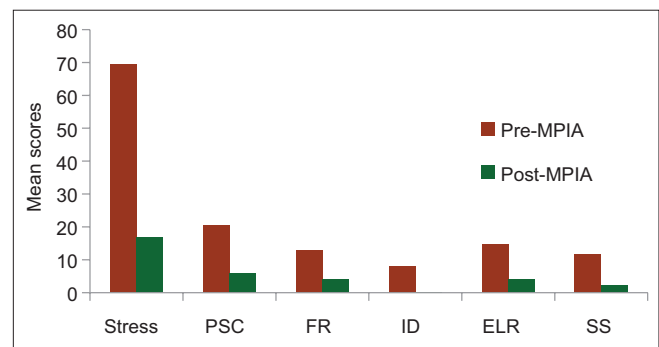


Figure 1: Mean stress scores of cancer patients’ pre-and-post-medical and psychological assessment. Note: Stress: Overall Stress, PSC: Psychosomatic complains, FR: Fears, ID: Information deficits, ELR: Everyday life restrictions, SS: Social strains

EORTC-QLQ-30 and its scales (GHS/QoL, functional and symptoms scales) in cancer patients during pre-and-post-MPIA.

Paired *t*-test from Table 2 showed a statistical significant difference between pre-and-post-MPIA GHS/QoL scores of the cancer patients, $t(29) = 15.87, P < 0.01$, effect size = 2.16. This indicated that the GHS/QoL in cancer patients was better in the post-MPIA ($M = 52.27, SD = 18.00$) in comparison to pre-MPIA ($M = 19.58, SD = 11.50$). The effect of MPI was found to be high. These results showed that the patients with cancer in the sample have improved in their overall QoL.

Statistical significant difference was also observed between the pre-and-post-MPIA scores in the three functional scales of QoL, namely, physical functioning, $t(29) = 9.63, P < 0.01$, effect size = 1.36; role functioning, $t(29) = 4.85, P < 0.01$, effect size = 0.52; and emotional functioning, $t(29) = 13.97, P < 0.01$, effect size = 2.77. The effect of MPI on patients' physical, role, and emotional functioning ranged from average to above average and high, which are indicative of improvement during the post-MPIA in all these scales. This can be observed through their pre-and-post-MPIA, mean, and SD differences – physical functioning, post-MPIA ($M = 70.63, SD = 23.91$) in comparison to pre-MPIA ($M = 32.40, SD = 31.58$); role functioning, post-MPIA ($M = 25.60, SD = 28.26$) in comparison to pre-MPIA ($M = 11.60, SD = 25.11$); and emotional functioning, post-MPIA ($M = 87.27, SD = 10.91$) in comparison to pre-MPIA ($M = 31.17, SD = 87.27$).

Coming to the symptom domains, significant differences were observed in all these scales: fatigue, $t(29) = 16.58, P < 0.01$, effect size = 2.83; pain, $t(29) = 8.79, P < 0.01$, effect size = 1.80; dyspnea, $t(29) = 4.17, P < 0.01$, effect size = 0.79; insomnia, $t(29) = 11.24, P < 0.01$, effect size = 2.50; appetite loss, $t(29) = 11.01, P < 0.01$, effect size = 2.88; constipation, $t(29) = 5.10, P < 0.01$, effect size = 1.54 (this increase in constipation is attributed to narcotic effect); and diarrhea, $t(29) = 1.96, P < 0.05$, effect size = 0.50. This is shown through their pre-and-post-MPIA mean and SD differences – fatigue, post-MPIA ($M = 36.53, SD = 14.24$) in comparison to pre-MPIA ($M = 84, SD = 18.92$); pain, post-MPIA ($M = 29.47, SD = 20.77$) in comparison to pre-MPIA ($M = 74.50, SD = 28.58$); dyspnea, post-MPIA ($M = 13.30, SD = 22.51$) in comparison to pre-MPIA ($M = 42.17, SD = 46.27$); insomnia, post-MPIA ($M = 18.73, SD = 18.84$) in comparison to pre-MPIA ($M = 74.50, SD = 28.58$); appetite loss, post-MPIA ($M = 9.93, SD = 17.76$) in comparison to pre-MPIA ($M = 83.33, SD = 31.29$); constipation increased during post-MPIA ($M = 30.90, SD = 17.40$) in comparison to pre-MPIA ($M = 5.53,$

$SD = 15.35$), this increase in constipation is attributed to narcotic effect; diarrhea, post-MPIA ($M = 0, SD = 0$) in comparison to pre-MPIA ($M = 10, SD = 27.90$). The MPI effect was found to be high in all the symptom scales except for dyspnea, which was medium. This effect size implied that symptoms decreased from severe to mild, during their post-MPIA as compared to their pre-MPIA.

However, no significant difference was observed between the pre-and-post-MPIA scores of cognitive and social functioning of the functional scales and nausea and

Table 2: Mean, standard deviation, and *t* values for global health status and quality of life of cancer patients in pre- and post-medical and psychological assessment

Variables	Pre-MPIA		Post-MPIA		<i>t</i>	Cohen's <i>d</i>
	Mean	SD	Mean	SD		
GHS/QoL	19.58	11.50	52.27	18.00	15.87**	2.16
Functional scales						
Physical functioning	32.40	31.58	70.63	23.91	9.63**	1.36
Role functioning	11.60	25.11	25.60	28.26	4.85**	0.52
Emotional functioning	31.17	26.47	87.27	10.91	13.97**	2.77
Cognitive functioning	86.33	30.20	96.68	9.14	1.87	0.46
Social functioning	21.13	34.76	24.47	36.57	1.45	0.09
Symptoms scales						
Fatigue	84	18.92	36.53	14.24	16.58**	2.83
Nausea and vomiting	5.60	13.41	1.70	5.18	1.49	0.38
Pain	74.50	28.58	29.47	20.77	8.79**	1.80
Dyspnea	42.17	46.27	13.30	22.51	4.17**	0.79
Insomnia	83.33	31.29	18.73	18.84	11.24**	2.50
Appetite loss	83.33	31.29	9.93	17.76	11.01**	2.88
Constipation [#]	5.53	15.35	30.90	17.40	5.10**	1.54
Diarrhea	10.00	27.90	0	0	1.96*	0.50
Financial difficulties	81.07	33.62	77.80	36.46	0.98	0.09

N=30, **P*<0.05, ***P*<0.01, [#]Induced through narcotics. MPIA: Medical and psychological intervention assessment, GHS/QoL: Global health status and quality of life, SD: Standard deviation

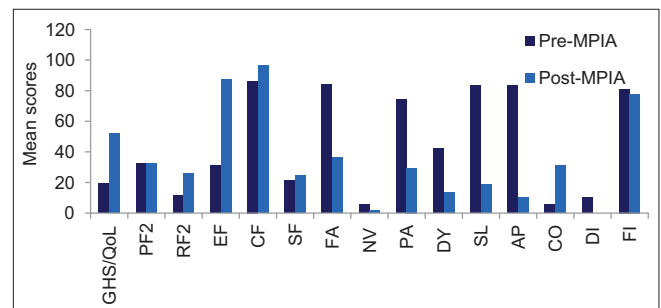


Figure 2: Mean global health status/quality of life scores of cancer patients in pre-and-post-medical and psychological assessment. Note: GHS/QoL: Global Health Status/Quality of Life, PF2: Physical Functioning, RF2: Role Functioning, EF: Emotional Functioning, F: Cognitive functioning, SF: Social functioning, FA: Fatigue, NV: Nausea and vomiting, PA: Pain, DY: Dyspnea, SL: Sleeping, AP: Appetite loss, CO: Constipation, DI: Diarrhea, FI: Financial difficulties

vomiting and financial difficulties of symptoms scales of QoL. This also implicated that MPI effect was low on these scales.

Figure 2 showed the mean values of QoL of cancer patients in the pre-and-post-MPIA. The figure indicated that the mean values on GHS/(QoL), physical functioning, Role Functioning, cognitive functioning, and social functioning were higher in post-MPIA, in comparison to Pre-MPIA. Values on symptoms scales: fatigue, nausea and vomiting, dyspnea, appetite loss, and diarrhea were lower in post-MPIA, whereas sleeping, constipation, and financial difficulties were higher in post-MPIA, in comparison to pre-MPIA.

DISCUSSION

Stress in cancer patients: Pre-and post-medical and psychological assessment

Of the many prolonging psychological impacts of cancer, stress is one associated with its growth and progression.^[16] It is also closely associated with other psychological comorbidities such as anxiety and depression.^[15] Studies have indicated the improvement of patients' prognosis by enhancing their immune system while alleviating stress through psychological interventions.^[16-18] The present results also show lower scores in all stress related domains post-MPIA, which indicates the impact of MPI.

Fear of disease progression, especially due to lack of information can cause stress in cancer patients. However, it can be reduced through psychotherapeutic interventions.^[19] Patients often place informational needs regarding their illness and treatment at the top.^[20] Enhancing their knowledge will aid in their decision-making, thus reducing their stress and better their QoL.^[21] Literature also shows the effectiveness of psychological interventions on the emotional adjustment, physical condition, treatment and disease-related symptoms, or improving patients' information.^[22] Six weeks of psychoeducation with attempts to dispel their myths and misconceptions, providing factual information seemed to have helped them in proper dissemination of information about their condition. In addition, reduced fear related to life expectancy through CBT that dealt with irrational cognitions, seemed to have contributed toward lowering of overall stress level, complementing the strength provided by medical intervention. The present study results indicate that patients experienced relatively lower stress after gaining those information provided through video clippings and written materials such as pamphlets and flip charts as well as discussions during the interventions. Similar findings were also found by Coulter and Ellins,^[23] which reported that patients'

knowledge and recall of health information were better when information was provided in a written format and that provision of a combined verbal and written format was more effective than either alone.

Somatic symptoms in cancer are reported to be high and are found to be associated with pain and other disabilities. Although recognition is often challenging because of its similarity with the biological-related symptoms, treating of somatic symptoms is important in improving QoL, and functional status in cancer patients.^[24]

The reduction in everyday life restrictions and social strains also highlights the combined impact of medical and psychological intervention. The MPI included therapist-patient interactions, three times a week for 6 weeks, providing relaxation, CBT, and psychoeducation. In addition, the caretakers of the patients were also involved in the relaxation training. Thus, through the period following diagnosis and immediate treatment, the therapist's psychological support combined with family support may have helped the patients deal with distress better. It is also observed that everyday life restrictions decreased post-MPI that patients were able to perform within normal limit. One reason for this could be that patients mostly stay at their home during their treatment, doing self-care and leisure, with social life restricted to their close family and friends alone.

Global health status/quality of life of cancer patients: Pre-and-post-medical and psychological assessment

Cancer treatment today emphasizes on "how well" along with "how long" and thus QoL becomes paramount in psychosocial care by relieving patients of their emotional distress and improving their well-being.^[9] Results show a significant improvement in the post-MPIA QoL scores, which also indicates the efficacy of MPI in cancer patients.

A statistical significant difference was observed between the pre-and-post-MPIA scores of GHS, besides physical and emotional functioning of the functional scales. Scores on these scales increased from average to high, and the effect of MPI was found to be high. Role functioning also improved but it was found to be low. Our results also replicate previous research findings.^[25-27]

Results also show a significant decrease of symptoms in the patients' post-MPIA. Post-MPIA scores of fatigue, pain, dyspnea, insomnia, appetite loss, and diarrhea decrease from severe mild as compared to their pre-MPIA scores. The effect of MPI was also found to be high. Pain, fatigue, and emotional distress are the three most co-occurring symptoms in cancer patients. Psychoeducation, relaxation, and CBT are all shown to alleviate pain, fatigue, and insomnia in cancer patients.^[28-30]

Findings in our study show that constipation increased during post-MPIA. Studies,^[31,32] as well as the opinions of medical experts gathered by the investigator, suggest that this may be attributed to the narcotics, due to which patients usually have constipation.

No significant difference was observed between the pre-and-post-MPIA scores of cognitive and social functioning of the functional scales and also in the nausea and vomiting and financial difficulties of the symptom scales. Similar findings were also observed in a study,^[33] where no impact was seen on the social functioning of the functional scale. There was no improvement in the financial aspect because it was not targeted through our interventions.

The present study shows the effectiveness of MPI on the various persistent psychological morbidity of cancer such as stress, anxiety, depression fear of recurrence or physical symptoms such as fatigue, pain, sleep disturbances, and poor QoL. Such interventions are also suggested by various studies.^[10,34] Various meta-analysis and systematic review of literatures have also supported our findings, be it psychoeducation, guided imagery, or behavioral modification in improving functional adaptation, symptom control, and QoL or reducing stress.^[18,35,36] Psychological interventions are also found to improve survival rate in cancer.^[37] They not only enhance patients' adherence to treatment, which improves outcomes in cancer care^[38] but are also found to have long-lasting impact on the patients' life.^[39] It is also suggested that targeting stress through early psychological interventions could improve the patients' mental health, health behaviors, and possibly biologic outcomes.^[40,41]

CONCLUSIONS

The present study aimed at using psychological (psychoeducation, relaxation, and cognitive behavior therapy) intervention as a complement to medical intervention in reducing the level of stress and improving the QoL of cancer patients. Results well-establish this fact. Looking at the results, it can be said that psychological interventions if given early, can both decrease the stress level and improve the QoL of cancer patients, which can further enhance clinical outcomes. Findings also points to the importance of a psycho-oncologist in helping the cancer patients attain quality care. It is therefore suggested that referring cancer patients to psycho-oncologists right after their diagnosis, may help them cope with their stress and enhance their QoL by giving early intervention. To achieve these issues, a well-designed, tailor-made package of psychoeducation, relaxation, and CBT as per the

needs of the patients, before and during treatment and posttreatment follow-ups are recommended.

Acknowledgement

We are thankful to Dr. Ravi Kumar Saxena, Hemato-oncologist, Global Hospitals, Hyderabad, for his valuable inputs and also the doctors, staffs, patients, and caregivers of MNJ Hospital, Hyderabad.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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