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ORIGINAL RESEARCH ARTICLE

Effect of Yogic Interventions on Perceived Stress among Guardians of Pediatric Cancer Patients in Chandigarh

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ABSTRACT

Background: Caregivers of pediatric cancer patients often endure significant psychological stress due to prolonged caregiving demands, emotional strain, and uncertainty related to the child's prognosis. In India, this burden is further intensified by socioeconomic and healthcare access challenges. While pharmacological treatments for stress exist, there is increasing interest in culturally grounded, holistic interventions such as Yoga for stress alleviation.

Aim: This study aimed to evaluate the effect of an 8-week structured Yogic intervention on perceived stress among guardians of pediatric cancer patients in Chandigarh, India.

Materials and Methods: A quasi-experimental pre-post design was adopted. A purposive sample of 40 guardians (aged 25–60 years) of pediatric cancer patients undergoing treatment at Access Life - HBS Foundation Centre was selected based on inclusion and exclusion criteria. The personal stress source inventory (PSSI) was administered pre- and post-intervention to assess perceived stress levels.

Intervention: Participants engaged in a structured Yogic program for 8 weeks, 5 days per week, 60 min per session. The program included opening chanting, warming-up exercises, selected *asanas*, *pranayama* (Anulom-Vilom, Bhramari, Nadi Shodhana), and meditation/guided relaxation. Sessions were delivered by certified Yoga therapists and tailored for accessibility.

Results: Statistical analysis using paired sample t-tests revealed a significant reduction in perceived stress post-intervention. The mean PSSI score decreased from 50.200 (Standard deviation [SD] = 12.650) to 44.075 (SD = 11.400), with a mean difference of 6.125 (t = 7.611, df = 39, $P < 0.0001$). The reduction in SD and shift in median from 48.5 to 40.0 suggest more consistent stress alleviation among participants. Histograms and distribution indices indicated a leftward shift in stress scores post-intervention.

Conclusion: The findings strongly suggest that structured Yogic interventions are effective in reducing perceived stress among guardians of pediatric cancer patients. The significant improvement in stress levels supports integrating Yoga into psychosocial care frameworks for caregivers in pediatric oncology settings. Future research should explore long-term benefits, potential individual variability in responsiveness, and scalability across diverse cultural and socioeconomic contexts.

1. INTRODUCTION

The diagnosis and treatment of pediatric cancer not only affects young patients but also places a tremendous psychological, emotional, and physical burden on their caregivers, particularly their parents or guardians. The process of managing hospital visits, coping with uncertainty regarding outcomes, and providing emotional support to a sick child often contributes to elevated levels of perceived stress among guardians. This stress, if unaddressed, can have deleterious effects on both the mental well-being of caregivers and their ability to provide optimal support for their children. In recent years, complementary and integrative therapies such as Yogic interventions have gained prominence as promising approaches to stress management. This study investigates the effect of Yogic interventions on perceived stress among guardians of pediatric cancer patients in Chandigarh, aiming to evaluate their efficacy in reducing psychological distress in this vulnerable group.

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Research has established that caregivers of children with chronic illnesses experience heightened psychological distress compared to caregivers of healthy children (Cousino and Hazen, 2013).[1] Specifically, in pediatric oncology, studies have documented elevated levels of anxiety, depression, and post-traumatic stress symptoms in caregivers, particularly mothers (Patiño-Fernández *et al*., 2008).[2] In the Indian context, cultural, economic, and healthcare system challenges further exacerbate the caregiver burden (Sharma, 2017).[3] The need for accessible, cost-effective, and culturally acceptable interventions is thus paramount.

Yoga, rooted in Indian philosophy, is increasingly recognized as a holistic mind-body practice that incorporates physical postures (*asanas*), breathing techniques (*pranayama*), and meditation (*dhyana*). Its therapeutic potential in managing stress, improving mood, and enhancing quality of life has been widely studied in both clinical and non-clinical populations. For example, a meta-analysis by Pascoe and Bauer (2015).[4] found that Yoga significantly reduces stress by modulating the hypothalamic-pituitary-adrenal axis and sympathetic nervous system activity. Moreover, interventions incorporating Yoga and mindfulness have demonstrated efficacy in reducing caregiver stress in diverse settings, including among caregivers of patients with Alzheimer's disease and those with terminal illnesses (Waelde *et al*., 2004[5]; Danucalov *et al*., 2013).[6]

In the Indian healthcare landscape, Yoga-based interventions are gaining institutional support and have been successfully integrated into psycho-oncological care models. A study by Raghavendra *et al*. (2007)[7] reported significant reductions in anxiety and improvements in psychological well-being among caregivers of cancer patients following a structured Yoga program. Furthermore, the growing recognition of Yoga by national health bodies such as the Ministry of Ayush underscores its cultural relevance and potential scalability within the Indian context.

Despite the promising evidence base, research specifically addressing the effects of Yogic practices on caregivers of pediatric cancer patients in India remains limited. This study thus seeks to fill this gap by evaluating the impact of a structured Yogic intervention on perceived stress levels among guardians in Chandigarh, a city with well-established oncology services. The findings aim to inform integrative care strategies that not only support pediatric cancer patients but also attend to the psychosocial needs of their families.

1.1. Objective of this Study

The objective of this study is to study the effect of a structured Yogic intervention on perceived stress among guardians of pediatric cancer patients in Chandigarh.

2. MATERIALS AND METHODS

2.1. Participants

A purposive sample of 40 guardians (male and female, aged 25–60 years) of pediatric cancer patients was drawn from Access Life - HBS Foundation Centre, Chandigarh. Participants were selected through random sampling from those who expressed interest and met the inclusion criteria:

i. Primary caregiver of a pediatric cancer patient undergoing treatment,
ii. No diagnosed psychiatric illness, and
iii. Not currently undergoing any other formal stress-relief program.

Exclusion criteria included physical limitations preventing Yoga practice and present psychiatric medication usage.

2.2. Study Design

This study employed a pre-post quasi-experimental design without a control group. Participants underwent pre-assessment using standardized psychometric tools followed by an 8-week Yogic intervention. A post-assessment was conducted using the same tools to determine the effect of the intervention. Statistical comparisons were made between pre- and post-intervention scores.

2.3. Yogic Intervention

The intervention consisted of a structured Yoga module designed and supervised by certified Yoga therapists. The program was conducted over 8 weeks, with sessions held 5 days a week, each lasting 60 min. Each session included: Opening Chanting and Prayers (5 min) Warming-up Exercises and Sukshma Vyayama (10 min) some few selected Asanas (20 min) Pranayama: Anulom-Vilom, Bhramari, and Nadi Shodhana (15 min), and Meditation and Guided Relaxation (10 min). The intervention was tailored to be accessible for individuals of all physical fitness levels and was conducted in a calm, supportive group setting within the premises of the HBS Foundation Centre.

2.4. Yogic Practices Administered

Each Yogic practice was chosen based on its known benefits in stress reduction:

- Asanas were selected to improve physical flexibility and release muscular tension.
- Pranayama techniques focused on breath regulation to induce parasympathetic activity and reduce autonomic arousal.
- Meditation and guided relaxation targeted mental quietude and enhanced present-moment awareness, known to reduce ruminative thinking and anxiety.

2.5. Assessment and Measurement

Perceived stress was assessed using the personal stress source inventory (PSSI), a validated psychometric instrument that identifies both the sources and manifestations of stress across multiple life domains – relationships, work, finances, health, and personal development.

The PSSI enables individuals to self-report on the frequency and intensity of stress-inducing situations. Its reliability and validity for use in caregiver populations have been established in prior literature. The inventory not only measures stress levels but also provides insights into specific areas contributing to stress, making it useful for targeted intervention planning.

Data were collected during the 1st week (pre-intervention) and the final week (post-intervention) using printed and verbally-administered questionnaires, depending on participant literacy level.

2.6. Ethical Considerations

The research was conducted in strict accordance with ethical guidelines outlined by the Indian Council of Medical Research. Informed consent was obtained from all participants after explaining the study objectives, procedures, and potential benefits or risks in their native language. Participants were informed of their right to withdraw from the study at any time without any consequence. Confidentiality of all data was strictly maintained. The study protocol was reviewed and approved by the Chandigarh Yog Institutional Ethical Committee

(CYIEC), ensuring compliance with national ethical standards for research involving human subjects.

2.7. Statistical Analysis

Data were analyzed using Statistical Package for Social Sciences Version 28.0. Descriptive statistics (mean, standard deviation [SD]) were calculated for all variables. To assess the significance of changes in perceived stress levels before and after the intervention, a paired-sample t-test was conducted. The level of statistical significance was set at $P < 0.05$.

2.8. Analysis and Interpretation of the Data

The present study titled "Effect of Yogic Interventions on Perceived Stress among Guardians of Pediatric Cancer Patients in Chandigarh" aimed to evaluate the effectiveness of Yogic practices in alleviating psychological stress among guardians who are primary caregivers for children undergoing cancer treatment. This research is rooted in the context of chronic emotional strain often experienced by guardians, where psychological burden can significantly impact their overall well-being, caregiving efficiency, and quality of life. To explore the potential mitigating effects of Yoga-based practices, quantitative analysis was conducted using the perceived stress scale index (PSSI-SSS), and both descriptive and inferential statistics were employed to draw meaningful conclusions.

In the quantitative analysis, a sample size of 40 guardians was assessed before and after the Yogic intervention. The descriptive statistics reveal a clear trend in the data indicating a reduction in perceived stress following the intervention. Specifically [Table 1], the mean perceived stress score decreased from 50.2 in the pre-intervention phase to 44.075 in the post-intervention phase. This reduction in mean scores is indicative of a positive effect of the Yogic intervention on stress management among the participants. The observed drop in stress levels, as reflected in the mean values, suggests that the structured Yogic program had a therapeutic impact on the participants' mental state, possibly due to enhanced relaxation, improved emotional regulation, and greater self-awareness facilitated through Yoga and meditation techniques.

Further, a closer examination of the SD reveals a slight decrease from 12.65 in the pre-phase to 11.4 in the post-phase, indicating a more homogeneous response to the intervention in terms of perceived stress levels. The decrease in the dispersion of scores suggests that the post-intervention stress levels among the participants were more consistent compared to the variability seen in the pre-intervention phase. This may reflect a shared positive impact among participants, likely due to the standard structure of the Yogic practices provided and the commonality of their caregiving roles.

The median scores further support this trend, with a decrease from 48.5 in the pre-phase to 40.0 in the post-phase. Medians being less sensitive to outliers than means confirm that the central tendency of stress scores shifted downward post-intervention. This consistency between mean and median values strengthens the argument that the intervention contributed meaningfully to stress reduction. Notably, the minimum and maximum scores also shifted downward, from 31.0 and 79.0 pre-intervention to 30.0 and 69.0 post-intervention respectively, showing a reduction in extreme stress experiences among participants.

The shape of the distribution, analyzed through skewness and kurtosis, adds further insight into the pattern of stress score distribution. The skewness values of 0.350 (pre) and 0.566 (post) denote that both distributions were positively skewed, implying that a small number of participants experienced relatively higher levels of stress compared to the average. Interestingly, the skewness increased slightly in the post-intervention phase, which may suggest that while the average stress level decreased, a few individuals still experienced elevated stress levels possibly due to personal or contextual variables not addressed by the intervention.

Kurtosis values of −0.686 (pre) and −0.591 (post) suggest that both distributions were platykurtic, indicating a flatter distribution with light tails compared to a normal distribution. This means that extreme values of stress (either very high or very low) were less frequent than would be expected in a normal distribution. The platykurtic nature of the distributions suggests that stress scores were more evenly spread, and the decrease in kurtosis further supports the view that the intervention contributed to reducing extreme stress variations.

The histograms corresponding to the pre- and post-intervention phases [Figures 1 and 2] visually reinforce the statistical findings. The pre-intervention histogram depicts a broader and taller spread, indicating a wider distribution of stress scores, including more instances of higher stress levels. In contrast, the post-intervention histogram demonstrates a noticeable shift toward lower stress levels, with a more condensed and left-skewed distribution, illustrating a positive trend in stress reduction. These visual representations corroborate the numerical data, highlighting the intervention's efficacy in stress mitigation.

Overall, the analysis and interpretation of the data clearly demonstrate that the Yogic intervention had a beneficial impact on the perceived stress levels of guardians of pediatric cancer patients. The consistent reduction in mean and median scores, the narrowing of score dispersion, and the visual trends in the histograms collectively suggest that the participants experienced substantial psychological relief following the intervention. The slightly increased skewness post-intervention may indicate the need for more individualized approaches in future interventions to address outliers who did not respond as effectively.

The present study aimed to assess the effect of Yogic interventions on perceived stress levels among guardians of pediatric cancer patients in Chandigarh. The findings presented in Tables 2 and 3, along with Figure 3, provide a clear indication of a significant reduction in perceived stress following the Yogic intervention. According to the descriptive statistics [Table 2], the mean perceived stress score before the intervention was 50.200 with a SD of 12.650, while the mean score after the intervention dropped to 44.075 with a SD of 11.400. This decrease suggests a notable improvement in stress management among the participants after engaging in the Yogic practices.

The paired samples test [Table 3] further reinforces the statistical significance of this change. The mean difference in perceived stress scores between the pre- and post-intervention phases was 6.125, with a SD of 5.090. The $t = 7.611$ and a $P = 0.0001$ ($P < 0.01$) indicate a highly significant reduction in stress levels post-intervention. This statistical significance confirms the reliability of the observed differences, ruling out the possibility that they occurred due to random chance.

The visual representation in Figure 3 complements these findings by illustrating the decline in the mean perceived stress levels after the intervention. These results suggest that the Yogic intervention had a positive and measurable impact on the mental well-being of guardians, who often endure immense emotional and psychological strain due to their child's illness. The consistent reduction in perceived stress highlights the potential of structured Yogic practices

as a complementary therapeutic approach for caregivers dealing with chronic pediatric illnesses. Overall, the study underscores the importance of integrating holistic wellness strategies, such as Yoga, into caregiver support systems within clinical settings.

3. DISCUSSION

The results revealed a marked decrease in mean perceived stress scores from 50.2 to 44.075, supported by statistically significant results from the paired samples t-test ($t = 7.611$, $P < 0.0001$). These findings align with existing literature that supports the effectiveness of Yoga as a stress-reducing modality among caregivers and individuals experiencing high psychological burden.

Similar outcomes were reported by Telles *et al*. (2018),[8] who investigated the impact of Yoga and mindfulness practices on mental health parameters and found substantial reductions in anxiety and stress scores among caregivers of chronically ill patients. Their study concluded that regular engagement in Yogic practices promotes better emotional regulation and resilience. Similarly, a randomized controlled trial by Kinser *et al*. (2016)[9] demonstrated that a Yoga-based intervention significantly reduced perceived stress and improved mood in mothers caring for children with complex medical needs. These studies corroborate the present findings and underscore the utility of Yoga in caregiving contexts.

Moreover, the slight decline in the SD post-intervention (from 12.65 to 11.4) and the decrease in median stress scores (from 48.5 to 40.0) suggest that not only did average stress levels decrease, but participants exhibited more uniform improvements. This is consistent with the results of a study by Satyapriya *et al*. (2009),[10] which noted that structured Yoga sessions yielded consistent psychological benefits across a varied participant base, reducing stress responses as measured by both self-report scales and physiological markers.

The visual data, including histograms showing a shift toward lower stress levels, further substantiates the quantitative results and reflects the therapeutic potential of Yoga as an accessible, non-pharmacological intervention. It is worth noting that the increased skewness in the post-intervention scores may indicate the need for more tailored interventions to reach individuals who are less responsive to generalized Yogic approaches. This is in line with findings from Sharma and Gupta (2019),[11] who highlighted the importance of customizing Yoga modules to accommodate individual variability in psychological and physiological responses.

In a nutshell, this study contributes valuable evidence supporting the integration of Yogic interventions into psychosocial support frameworks for caregivers of pediatric cancer patients. Such approaches not only reduce perceived stress but also foster a more balanced mental state, thereby potentially improving the overall caregiving experience.

4. CONCLUSION

This study offers compelling evidence that Yogic interventions can serve as an effective strategy for reducing perceived stress among guardians of pediatric cancer patients in Chandigarh. The findings derived from both descriptive and inferential statistics demonstrate a consistent and statistically significant decline in stress levels post-intervention. The mean perceived stress score dropped from 50.200 to 44.075, while the median decreased from 48.5 to 40.0, indicating a broad-based reduction in stress across participants. Furthermore, a decline in SD from 12.650 to 11.400 suggests reduced variability in stress levels post-intervention, pointing to the potential universality of benefits from the Yogic practices offered. The visual data, including histograms, confirm these trends by illustrating a compression and leftward shift in the distribution of stress scores after the intervention. The skewness and kurtosis metrics further reveal a flattening and moderate right skew, suggesting a reduction in extreme stress experiences among most participants, although a few may still require individualized support. Notably, the paired t-test results ($t = 7.611$, $P < 0.0001$) affirm the statistical robustness of the findings, ruling out the likelihood that the observed improvements occurred by chance.

The results align with existing literature advocating the efficacy of Yoga as a holistic mind-body intervention for psychological distress, particularly in caregiving populations facing chronic emotional strain. For guardians of pediatric cancer patients – individuals who often experience prolonged psychological burdens due to their child's illness – Yogic practices may offer accessible, non-pharmacological relief through enhanced emotional regulation, mindfulness, and physical relaxation. These findings underscore the importance of integrating structured wellness interventions, such as Yoga into caregiver support programs within pediatric oncology settings.

However, the slight increase in skewness in the post-intervention phase also highlights the presence of outliers who did not benefit as substantially. This nuance points to the need for further research to explore personalized adaptations of Yogic practices and the influence of contextual factors such as socioeconomic status, emotional coping styles, or duration of caregiving. Future studies with larger sample sizes, control groups, and longitudinal follow-ups are recommended to build on these results and explore the sustainability of benefits over time.

In summary, the present study not only validates the effectiveness of Yogic interventions in alleviating caregiver stress but also advocates for their broader implementation in healthcare environments. By enhancing the mental well-being of guardians, such interventions may indirectly contribute to improved caregiving quality and better psychosocial outcomes for pediatric patients themselves.

5. ACKNOWLEDGMENT

None.

6. AUTHORS CONTRIBUTIONS

All authors contributed equally to the conception, design, and execution of the manuscript.

7. FUNDING

None.

8. ETHICAL APPROVAL

This study was approved by the CYIEC under approval number EC/NPW111/2025/305, dated January 09, 2025.

9. CONFLICT OF INTEREST

None declared.

10. DATA AVAILABILITY

This is an original manuscript. All data are available from the principal investigators upon request for review purposes only.

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Table 1: Descriptive statistics of perceived stress for pre- and post-phase

PSSI-SSS		
Statistic	**Pre**	**Post**
N	40	40
Mean	50.200	44.075
Median	48.500	40.000
Std. Deviation	12.650	11.400
Skewness	0.350	0.566
Kurtosis	−0.686	−0.591
Minimum	31.000	30.000
Maximum	79.000	69.000

Table 2: Descriptive statistics of perceived stress at pre-intervention and post-intervention phase

Paired samples statistics				
Scale & Time Point	***n***	**Mean**	**Standard deviation**	**Standard error mean**
PSSI-SSS				
Pre	40	50.200	12.650	2.000
Post	40	44.075	11.400	1.803

Table 3: Comparison of perceived stress in pre-intervention and post-intervention phase

Paired samples test								
Measure	**Paired differences**					**t-value**	**df**	***P*-value**
	Mean	**Standard deviation**	**Standard error mean**	**95% confidence interval of the difference**				
				Lower	**Upper**			
PSSI-SSS								
Pre-post-test	6.125	5.090	0.805	4.497	7.753	7.611	39	0.0001**

**p < 0.01, highly significant

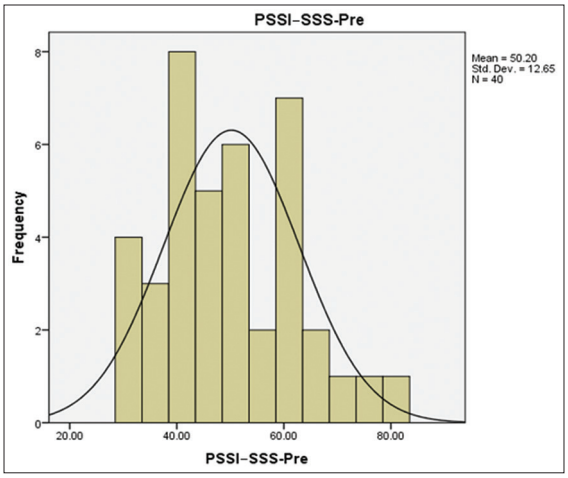

Figure 1: Histogram for perceived stress of guardian in pre-intervention data

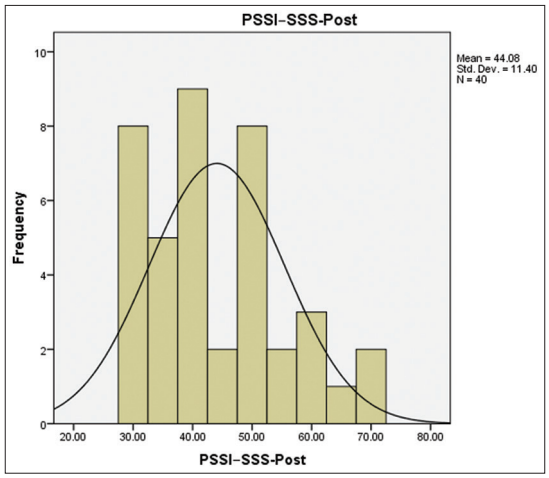

Figure 2: Histogram for perceived stress of guardian in post-intervention data

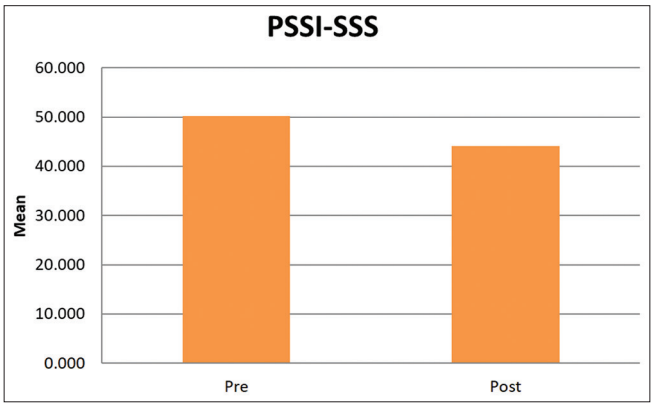

Figure 3: Mean value of pre- and post-intervention of perceived stress of guardians