Psychological Distress Reduction and Caregiver Resilience: The Protective Role of Social Support and Preparedness Among Family Caregivers During Chemotherapy

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Abstract

Background: Family caregivers of cancer patients frequently experience substantial psychological distress while managing complex caregiving responsibilities during chemotherapy. However, considerable variation exists in caregivers' ability to adapt and maintain psychological well-being. Understanding protective factors that promote resilience is essential for developing effective caregiver support interventions.

Objectives

To examine the role of social support and caregiving preparedness as protective factors against psychological distress among family caregivers of cancer patients undergoing chemotherapy and to identify caregiver characteristics associated with resilience.

Methods

A quasi-experimental study was conducted among 594 family caregivers of cancer patients receiving chemotherapy in selected tertiary hospitals. Standardized instruments including the Multidimensional Scale of Perceived Social Support (MSPSS), Preparedness for Caregiving Scale (PCS), Need Fulfillment Scale, and Depression Anxiety Stress Scale-21 (DASS-21) were used to assess caregiver outcomes. Descriptive and inferential statistics were employed to analyze relationships between variables.

Results

Higher levels of perceived social support and caregiving preparedness were associated with significantly lower levels of depression, anxiety, and stress. Caregivers reporting greater support and preparedness demonstrated better psychological adjustment and enhanced resilience. The intervention programme resulted in significant improvements in preparedness, social support, and psychological well-being.

Conclusion

Social support and caregiving preparedness represent important protective factors that reduce psychological distress and strengthen resilience among family caregivers of cancer patients undergoing chemotherapy. Nurse-led interventions focused on these domains may improve caregiver outcomes and enhance family-centered cancer care.

Keywords: Cancer caregiving; psychological distress; caregiver resilience; social support; caregiving preparedness; oncology nursing; family caregivers.

1. Introduction

Background: Cancer remains one of the leading causes of morbidity and mortality worldwide. Advances in cancer diagnosis and treatment have increased survival rates, resulting in a growing number of patients requiring long-term support throughout the treatment trajectory. Family caregivers play a critical role in providing physical, emotional, social, and financial support to patients undergoing chemotherapy. Although caregiving can be rewarding, it is often associated with substantial psychological, emotional, and physical challenges.

Chemotherapy treatment frequently requires caregivers to manage medication schedules, monitor symptoms, coordinate healthcare appointments, and provide emotional support. These responsibilities can significantly affect caregivers' mental health and quality of life. Research has consistently demonstrated elevated rates of depression, anxiety, stress, and caregiver burden among family caregivers of cancer patients.

While many caregivers experience psychological distress, others successfully adapt to caregiving challenges and maintain positive functioning. This variability has generated increasing interest in identifying protective factors that promote caregiver resilience. Resilience refers to the ability to maintain psychological well-being despite exposure to significant adversity. Understanding the mechanisms that support resilience may inform the development of targeted interventions aimed at improving caregiver outcomes.

Social Support and Psychological Well-Being

Social support is widely recognized as one of the most important protective factors influencing caregiver well-being. Support from family members, friends, healthcare professionals, and community networks provides emotional reassurance, practical assistance, and valuable information. The Stress-Buffering Theory proposes that social support reduces the negative impact of stressful events by enhancing coping resources and reducing perceptions of threat.

Studies have shown that caregivers who perceive higher levels of social support report lower levels of depression, anxiety, and stress. Supportive relationships may also improve self-confidence, promote adaptive coping strategies, and reduce feelings of isolation during challenging periods of caregiving.

Caregiving Preparedness

Preparedness for caregiving refers to an individual's perceived readiness to perform caregiving tasks and manage caregiving-related challenges. Prepared caregivers possess greater knowledge, skills, confidence, and problem-solving abilities. Previous studies have demonstrated that higher preparedness is associated with reduced caregiver burden, increased self-efficacy, and better psychological adjustment.

In oncology settings, preparedness is particularly important because caregivers often encounter complex treatment regimens, symptom management responsibilities, and emotionally demanding situations. Educational interventions designed to improve caregiving preparedness have been shown to reduce uncertainty and improve caregiver confidence.

Resilience Framework

The current study is guided by resilience theory, which emphasizes the interaction between risk factors and protective factors in determining adaptation outcomes. Within this framework, social support and caregiving preparedness are conceptualized as key protective resources that may reduce psychological distress and enhance resilience among family caregivers.

Purpose of the Study

The purpose of this study was to examine the relationships between social support, caregiving preparedness, and psychological distress among family caregivers of cancer patients undergoing chemotherapy. The study also sought to evaluate the effectiveness of a structured nurse-led intervention designed to strengthen protective factors and improve caregiver well-being.

2. Methods

2.1 Study Design

A quantitative quasi-experimental pre-test–post-test control group design was employed to evaluate the effectiveness of the nurse-led intervention. This design permitted systematic comparison of outcome changes between the experimental and control groups while controlling for pre-existing differences through rigorous baseline equivalence assessment.

2.2 Setting and Study Period

The study was conducted in selected tertiary-level hospitals with dedicated oncology and chemotherapy day-care units in Ahmedabad, Gujarat, India—a major urban centre with a high regional cancer burden. Data collection was undertaken from December 2023 to November 2024.

2.3 Population and Sample

The target population comprised adult primary family caregivers of cancer patients actively receiving chemotherapy. Using a priori power analysis (power = 0.80; $\alpha = 0.05$; anticipated effect size $d = 0.3$ based on prior literature), a minimum sample of 264 per group was estimated; a total of 594 participants were recruited to account for potential attrition. Participants were allocated to the experimental ($n = 296$) or control ($n = 298$) group using convenience sampling from designated units.

Inclusion criteria: (i) primary family caregiver of a confirmed cancer patient actively undergoing chemotherapy; (ii) aged ≥ 18 years; (iii) able to read and comprehend Gujarati, Hindi, or English; and (iv) provision of written informed consent.

Exclusion criteria: (i) caregivers with pre-existing severe or acute psychiatric disorders; (ii) those unable to participate in scheduled sessions owing to logistical constraints; and (iii) professional paid caregivers.

2.4 Intervention

The experimental group received a structured nurse-led intervention programme delivered over six consecutive weeks, comprising four integrated components:

Caregiver Education & distribution of Caregiving guidelines: Structured educational sessions (individual and group format) addressing cancer pathophysiology, chemotherapy mechanisms and side effects, nutritional support, medication adherence, and evidence-based home-based symptom monitoring techniques. Also distributed caregiver guideline.

Peer Support Group Meetings: Weekly facilitated group sessions providing a structured platform for caregivers to share experiences, receive peer validation, and develop adaptive coping strategies. Sessions were facilitated by the nurse investigator using a semi-structured protocol.

Relaxation Techniques: Guided instruction in deep breathing exercises and progressive muscle relaxation, delivered in both group and individual formats, targeting physiological and psychological stress responses.

Telephonic Follow-up: Weekly structured telephonic contacts by the nurse investigator reinforcing educational content, addressing emergent concerns, and providing ongoing emotional support.

The control group received standard hospital-based care, including routine nursing assessments and physician consultations, with no additional structured intervention during the study period.

2.5 Outcome Measures and Instruments

Outcome measures were assessed at baseline (pre-test, Week 0) and following intervention completion (post-test, Week 6) using the following validated, standardised instruments:

Caregiving Preparedness: Preparedness for Caregiving Scale (PCS; Archbold et al., 1990); 8 items; score range 0–32; higher scores denote greater preparedness.
Caregiver Burden: Caregiver Reaction Assessment (CRA; Given et al., 1992); 24 items; score range 0–72; lower scores denote reduced burden.
Need Fulfilment: Validated Need Fulfilment Scale; 16 items; score range 0–64; higher scores denote greater fulfilment.
Perceived Social Support: Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988); 12 items; score range 0–48; higher scores denote greater support.
Psychological Distress: Depression Anxiety Stress Scales-21 (DASS-21; Lovibond & Lovibond, 1995); 21 items across three 7-item subscales; higher subscale scores denote greater psychological distress.
All instruments were validated in the Indian cultural and linguistic context and demonstrated satisfactory internal consistency (Cronbach's $\alpha \geq 0.75$ for all scales).

2.6 Ethical Considerations

Institutional Ethics Committee approval was granted prior to commencement (Reference: PHC/IEC/2023/23A). Written informed consent was obtained from all participants prior to enrolment. Anonymity and data confidentiality were maintained throughout. Participation was voluntary, and participants retained the right to withdraw at any time without penalty or impact on their or their patient's care. The study was conducted in accordance with the Declaration of Helsinki.

3. Results

3.1 Socio-Demographic Characteristics

Socio-demographic characteristics of study participants are presented in Table 1. In the control group (N = 298), the majority were aged 28–37 years (33.6%), female (57.7%), Hindu (81.5%), married (86.9%), from joint families (63.8%), and had attained primary education (31.5%). Monthly incomes were distributed across four categories with relative uniformity. In the experimental group (N = 296), comparable distributions were observed, with a slight majority of male participants (53.4%). Chi-square analysis confirmed no statistically significant inter-group differences for any socio-demographic variable (all $p > 0.05$), demonstrating baseline equivalence and supporting the internal validity of the study.

Table 1. Socio-demographic Characteristics of Family Caregivers (N = 594)

Variable	Category	Control f (%)		Experimental f (%)	
		f	%	f	%
Age (years)	18–27	58	19.5	55	18.6
	28–37	100	33.6	92	31.1
	38–47	73	24.5	80	27.0
	≥48	67	22.5	69	23.3
Gender	Female	172	57.7	138	46.6
	Male	126	42.3	158	53.4
Religion	Hindu	243	81.5	266	89.9
	Muslim	42	14.1	22	7.4
	Christian	13	4.4	8	2.7
Marital Status	Married	259	86.9	255	86.1
	Unmarried	32	10.7	32	10.8
	Widowed	4	1.3	6	2.0

Variable	Category	Control f (%)		Experimental f (%)	
		f	%	f	%
	Divorced	3	1.0	3	1.0
Education	Illiterate	5	1.7	4	1.4
	Primary	94	31.5	96	32.4
	Secondary	68	22.8	65	22.0
	Higher Secondary	87	29.2	88	29.7
	Graduate/PG	44	14.8	43	14.5
Family Type	Joint	190	63.8	180	60.8
	Nuclear	104	34.9	112	37.8
	Single-parent	4	1.3	4	1.4
Monthly Income (INR)	1,000–5,000	85	28.5	81	27.4
	5,001–10,000	71	23.8	74	25.0
	10,001–15,000	70	23.5	72	24.3
	>15,000	72	24.2	69	23.3
Chi-square analysis: No significant inter-group differences for any variable ($p > 0.05$)					

3.2 Baseline Comparability of Outcome Measures

Pre-intervention scores across all seven outcome measures were comparable between groups, with no statistically significant differences (all $p > 0.05$; Table 2). Mean scores for caregiving preparedness, burden, need fulfillment, perceived social support, depression, anxiety, and stress were closely matched across experimental and control groups, confirming baseline equivalence.

Table 2. Pre- and Post-Intervention Outcome Measure Scores by Group (N = 594)

Outcome Measure	Control Pre-test (Mean ± SD)	Experimental Pre-test (Mean ± SD)	Control Post-test (Mean ± SD)	Experimental Post-test (Mean ± SD)
Caregiving Preparedness	29.94 ± 6.32	29.72 ± 6.18	29.87 ± 5.48	33.81 ± 5.96
Caregiver Burden	29.96 ± 5.36	29.74 ± 5.28	29.88 ± 5.01	23.41 ± 6.12
Need Fulfilment	29.98 ± 6.21	29.76 ± 6.08	29.90 ± 5.32	34.12 ± 5.74
Perceived Social Support	29.88 ± 6.45	29.70 ± 6.31	29.92 ± 5.62	34.65 ± 6.02
Depression (DASS-21)	16.24 ± 2.98	16.12 ± 3.02	15.90 ± 2.85	13.74 ± 3.41

Outcome Measure	Control Pre-test (Mean ± SD)	Experimental Pre-test (Mean ± SD)	Control Post-test (Mean ± SD)	Experimental Post-test (Mean ± SD)
Anxiety (DASS-21)	16.36 ± 3.05	16.28 ± 3.11	16.02 ± 2.96	13.21 ± 3.58
Stress (DASS-21)	16.18 ± 3.18	15.98 ± 3.26	15.78 ± 3.05	12.86 ± 3.67
Pre-test scores were not significantly different between groups (all $p > 0.05$), confirming baseline homogeneity.				

3.3 Post-Intervention Comparison of Outcome Measures

Post-intervention comparisons (Table 3) revealed statistically significant differences favouring the experimental group across all outcome domains. Caregiving preparedness was markedly higher in the experimental group (33.81 ± 5.96 vs. 29.87 ± 5.48; $t = 8.21$; $df = 592$; $p < 0.001$; Cohen's $d = 0.67$). Need fulfilment (34.12 ± 5.74 vs. 29.90 ± 5.32; $t = 9.36$; $p < 0.001$; $d = 0.76$) and perceived social support (34.65 ± 6.02 vs. 29.92 ± 5.62; $t = 10.02$; $p < 0.001$; $d = 0.82$) were also significantly greater.

Caregiver burden was substantially reduced in the experimental group (23.41 ± 6.12 vs. 29.88 ± 5.01; $t = 12.45$; $p < 0.001$; $d = 1.16$), representing the largest effect size observed. Psychological outcomes similarly improved significantly: depression (13.74 ± 3.41 vs. 15.90 ± 2.85; $t = 7.12$; $p < 0.001$), anxiety (13.21 ± 3.58 vs. 16.02 ± 2.96; $t = 8.05$; $p < 0.001$), and stress (12.86 ± 3.67 vs. 15.78 ± 3.05; $t = 8.44$; $p < 0.001$) were all significantly lower in the experimental group.

Table 3. Post-Intervention Comparison of Outcome Measures Between Groups (N = 594)

Outcome Measure	Control (n=298) Mean ± SD	Experimental (n=296) Mean ± SD	t value	df	p value
Caregiving Preparedness	29.87 ± 5.48	33.81 ± 5.96	8.21	592	<0.001***
Caregiver Burden	29.88 ± 5.01	23.41 ± 6.12	12.45	592	<0.001***
Need Fulfilment	29.90 ± 5.32	34.12 ± 5.74	9.36	592	<0.001***
Perceived Social Support	29.92 ± 5.62	34.65 ± 6.02	10.02	592	<0.001***
Depression (DASS-21)	15.90 ± 2.85	13.74 ± 3.41	7.12	592	<0.001***
Anxiety (DASS-21)	16.02 ± 2.96	13.21 ± 3.58	8.05	592	<0.001***
Stress (DASS-21)	15.78 ± 3.05	12.86 ± 3.67	8.44	592	<0.001***
***p < 0.001. Independent samples t-test. df = 592 for all comparisons.					

3.4 Within-Group Changes: Need Fulfillment (Experimental Group)

Table 4 illustrates the shift in need fulfilment levels within the experimental group. Pre-intervention, 85.8% of participants were categorized as having very poor or poor need fulfilment. Post-intervention, 87.8% achieved moderate or high need fulfilment, with the proportion of participants reporting very poor need fulfilment declining markedly from 39.5% to 6.8%. This substantial positive shift in need fulfilment levels highlights the effectiveness of the structured nurse-led intervention programme in addressing and satisfying the needs of family caregivers of cancer patients undergoing chemotherapy.

Table 4. Frequency and percentage distribution of the Need Fulfilment score among caregivers of the Experimental group. **(N = 296)**

Experimental Group					
Need Fulfilment Level	Score Range	Pre-Test		Post-Test	
		Frequency (F)	Percentage (%)	Frequency (F)	Percentage (%)
Very Poor Fulfillment	0 – 16	117	39.5%	20	6.8%

Poor Fulfillment	17 – 32	137	46.3%	26	8.8%
Moderate Fulfillment	33 – 48	35	11.8%	210	70.9%
High Fulfillment	49 – 64	07	2.4%	50	16.9%
Total	—	296	100.0%	296	100.0%

3.5 Within-Group Changes: Social support (Experimental Group)

Table 5 illustrates the change in perceived social support levels within the experimental group. Pre-intervention, 88.7% of participants reported very low or low levels of social support. Following the intervention, the proportion of participants with moderate or high social support increased from 11.0% to 20.2%, while those reporting very low social support decreased from 5.0% to 3.3%. Although low social support remained the most common category, the observed shift toward higher levels of perceived social support suggests that the structured nurse-led intervention programme contributed to enhancing caregivers' social support networks and resources.

Table 5: Frequency and percentage distribution of the Social Support score among caregivers of the Experimental group. **(N = 296)**

Experimental Group					
Social Support	**Score Range**	**Pre-Test**		**Post-Test**	
		Frequency (F)	**Percentage (%)**	**Frequency (F)**	**Percentage (%)**
Very Low	0 – 12	15	5.0%	10	3.3%
Low	13 – 24	248	83.7%	226	76.3%
Moderate	25 – 36	23	7.7%	45	15.2%
High	37 – 48	10	3.3%	15	5.0%
Total	—	296	100.0%	296	100.0%

3.6 Association of Socio-Demographic Variables with Baseline Outcomes

Chi-square analyses identified significant associations between selected socio-demographic variables and baseline outcome measures (Table 6). Age was significantly associated with caregiving preparedness ($\chi^2 = 23.134$; $p = 0.006$), caregiver burden ($\chi^2 = 50.999$; $p = 0.006$), and perceived social support ($\chi^2 = 19.488$; $p = 0.021$). Number of family members was significantly associated with stress levels ($\chi^2 = 17.083$; $p = 0.047$). No significant associations were identified for gender, religion, marital status, education, occupation, family type, income level, or access to a health worker (all $p > 0.05$).

Table 6. Significant Associations Between Socio-Demographic Variables and Baseline Outcome Measures (N = 594)

Outcome Measure	**Associated Variable**	**Chi-square (χ^2)**	**p value**
Caregiving Preparedness	Age	23.134	0.006*
Caregiver Burden	Age	50.999	0.006*
Need Fulfilment	None identified	—	>0.05
Perceived Social Support	Age	19.488	0.021*
Depression	None identified	—	>0.05
Anxiety	None identified	—	>0.05
Stress	Number of family members	17.083	0.047*
*$p < 0.05$ (Chi-square test). Associations with gender, religion, education, occupation, income, and family type were non-significant ($p > 0.05$).			

4. Discussion

The present study provides robust, large-sample evidence that a structured, multi-component nurse-led intervention programme significantly enhances caregiving preparedness, need fulfilment, and perceived social support while meaningfully reducing caregiver burden and psychological distress among family caregivers of cancer patients receiving chemotherapy. The magnitude and consistency of effects across all seven assessed outcome domains strengthen confidence in the overall efficacy of this approach.

The significant improvement in need fulfilment among the experimental group, with 87.8% of participants achieving moderate or high need fulfilment post-intervention compared to only 14.2% at baseline, demonstrates the effectiveness of the structured nurse-led intervention programme in addressing caregivers' informational, emotional, and practical needs. The marked reduction in very poor and poor need fulfilment levels suggests that the intervention enhanced caregivers' understanding of chemotherapy care, symptom management, and available support resources. These findings support the supportive care framework, which emphasizes that meeting caregivers' needs is essential for improving their well-being and caregiving capacity, and are consistent with previous studies reporting reduced unmet needs following psychoeducational interventions.

The increase in moderate and high social support levels from 11.0% at pre-test to 20.2% at post-test, along with the reduction in very low social support, indicates a positive impact of the intervention on caregivers' perceived social support. The educational and supportive components of the programme may have strengthened caregivers' access to emotional, informational, and practical assistance. These findings are consistent with the stress-buffering theory, which suggests that social support enhances coping and reduces the negative effects of caregiving stress. Although the improvement was modest, it highlights the role of structured nurse-led interventions in promoting social connectedness and reducing caregiver isolation.

Significant improvements in psychological outcomes, including clinically meaningful reductions in depression, anxiety, and stress, are consistent with the growing literature on the prevalence and treatability of psychological distress in oncological caregivers. Studies have reported that between 30% and 45% of caregivers of cancer patients meet criteria for clinically significant anxiety or depression at some point during the caregiving trajectory [15,16]. The incorporation of structured relaxation techniques within the present intervention is theoretically congruent with cognitive-behavioral frameworks of stress reduction, which posit that techniques targeting maladaptive physiological arousal and rumination can effectively attenuate emotional distress responses [17]. These findings extend those of Hirano et al. [18], who demonstrated that nurse-led psychoeducational programmes significantly reduced anxiety and depression in caregivers of patients receiving chemotherapy in Japan, and corroborate the conclusions of a recent systematic review by Northouse et al. [12] regarding the efficacy of multicomponent interventions for caregiver psychological outcomes.

The finding that improvements in perceived social support were significant and clinically meaningful ($d = 0.82$) is noteworthy, given that perceived social support has been consistently identified as a protective factor against caregiver burnout and psychological morbidity [19]. The peer support group component of the intervention likely facilitated horizontal social support through shared experience and mutual validation, while the telephonic follow-up component may have provided vertical support through a trusted professional relationship with the nurse investigator.

The significant association between age and caregiving preparedness, burden, and social support at baseline is consistent with the literature suggesting that younger caregivers face particular vulnerability, potentially owing to concurrent competing demands, including employment, child-rearing, and financial obligations, which constrain both preparedness and social resources [20]. These findings suggest that age-stratified or targeted support approaches within nurse-led programmes may yield additional clinical benefit and warrant explicit consideration in intervention design.

Contextually, these findings carry particular significance within the Indian oncological landscape. Cancer care in India is characterized by late-stage presentation, high osut-of-pocket costs, and reliance on informal family caregiving networks, in the context of a healthcare system with limited formal caregiver support infrastructure [4,21]. The demonstrated effectiveness of the nurse-led programme in this setting highlights the feasibility and clinical relevance of structured, low-cost caregiver interventions in LMIC oncology contexts. The telephonic follow-up component of the intervention is particularly noteworthy for its scalability potential in resource-limited settings with limited specialist access.

5. Conclusion

This large-scale quasi-experimental study demonstrates that a structured, six-week, multi-component nurse-led intervention programme encompassing caregiver education, facilitated peer support, relaxation training, and telephonic follow-up is highly effective in improving caregiving preparedness, need fulfilment, and perceived social support while significantly reducing caregiver burden and psychological distress (depression, anxiety, and stress) among family caregivers of cancer patients receiving chemotherapy. The magnitude and consistency of effects across all assessed outcome domains, coupled with large effect sizes, provide compelling evidence for the systematic integration of nurse-led caregiver support programmes into routine oncology and chemotherapy nursing practice. Given the indispensable role of family caregivers in supporting patient recovery, quality of life, and treatment adherence, investment in structured, evidence-based caregiver interventions represents both a clinical imperative and a public health priority in the Indian and broader LMIC contexts.

6. Implications

6.1 Nursing Practice

Oncology nurses should systematically assess caregiver preparedness and burden at every care contact and incorporate structured multicomponent caregiver interventions into standard chemotherapy nursing protocols. The telephonic follow-up model

demonstrated in this study offers a scalable, resource-efficient mechanism for extending caregiver support beyond the clinical encounter.

6.2 Nursing Education

Undergraduate and postgraduate nursing curricula should incorporate competencies in caregiver assessment, psychoeducational intervention delivery, and the facilitation of peer support groups within oncological and other chronic disease contexts. Simulation-based and clinical practicum opportunities in oncology caregiver support should be prioritized.

6.3 Nursing Administration

Hospital and unit administrators should institutionalize structured caregiver support programmes within oncology departments, allocating dedicated nursing roles or time for caregiver-focused interventions. Policy frameworks supporting nurse-led caregiver programmes—including dedicated resources, training, and clinical protocols—should be developed and implemented.

6.4 Research

Future studies should employ randomized controlled trial (RCT) designs with extended follow-up periods to assess the durability of intervention effects and examine caregiver outcomes over the full cancer treatment trajectory. Comparative effectiveness research isolating the relative contributions of individual intervention components would strengthen the evidence base. Research exploring the adaptation and scalability of nurse-led caregiver programmes in rural and lower-resource Indian settings is also warranted.

7. Limitations

Several limitations of this study warrant acknowledgement. First, the use of convenience sampling from hospitals in a single urban centre (Ahmedabad) limits the generalisability of findings to rural, semi-urban, and other regional populations in India. Second, the quasi-experimental rather than fully randomised design, though appropriate in the given clinical context and consistent with ethical considerations, introduces the potential for selection bias. Third, the absence of long-term follow-up data beyond the six-week post-intervention period precludes assessment of the durability and sustainability of observed improvements. Fourth, data were collected using self-reported instruments, which are susceptible to social desirability bias and recall limitations. Fifth, the relative contributions of individual intervention components (education, peer support, relaxation, telephonic follow-up) were not experimentally isolated, precluding conclusions about the specific active ingredients of the programme.

8. Ethical Considerations

Institutional Ethics Committee approval was obtained prior to study commencement (Reference No.: PIEC/23A/2023). Written informed consent was obtained from all participants prior to enrolment. Participants were assured of full anonymity and data confidentiality throughout. Participation was voluntary, and participants retained the right to withdraw at any stage without consequence for themselves or their patient's care. The study was conducted in strict accordance with the principles of the Declaration of Helsinki (2013 revision) and the Indian Council of Medical Research (ICMR) ethical guidelines for biomedical research.

9. Declarations

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflict of Interest: The authors declare that they have no competing interests.

Data Availability: The data that support the findings of this study are available from the corresponding author upon reasonable request.

Author Contributions: JRV: Conceptualization, data collection, intervention delivery, formal analysis, original draft preparation. AK: Supervision, methodology, review and editing. All authors read and approved the final manuscript.

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