

Effectiveness of a Structured Nurse-Led Intervention Programme on Caregiving Preparedness, Burden, Psychological Distress, and Social Support among Family Caregivers of Cancer Patients Undergoing Chemotherapy: A Quasi-Experimental Study

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Abstract

Background: Cancer is a leading cause of morbidity and mortality worldwide, with chemotherapy representing a cornerstone of treatment. However, chemotherapy-associated side effects impose substantial caregiving demands on family members. Family caregivers frequently experience inadequate preparedness, elevated burden, psychological distress, and insufficient social support—yet structured caregiver-targeted interventions remain poorly integrated into routine oncology care, particularly in low- and middle-income countries such as India.

Objectives: To evaluate the effectiveness of a structured, multi-component nurse-led intervention programme on caregiving preparedness, caregiver burden, need fulfilment, perceived social support, and psychological outcomes (depression, anxiety, and stress) among family caregivers of cancer patients undergoing chemotherapy.

Methods: A quantitative quasi-experimental pre-test–post-test control group design was employed. A total of 594 family caregivers (experimental group: n = 296; control group: n = 298) were recruited via convenience sampling from oncology and chemotherapy units in selected hospitals in Ahmedabad, Gujarat, India. The nurse-led intervention comprised six structured weeks of caregiver education, facilitated peer support group sessions, deep breathing and progressive muscle relaxation training, and weekly telephonic follow-up. Outcomes were assessed using validated standardised instruments—the Preparedness for Caregiving Scale (PCS), Caregiver Reaction Assessment (CRA), Need Fulfilment Scale, Multidimensional

Scale of Perceived Social Support (MSPSS), and the Depression Anxiety Stress Scales-21 (DASS-21). Data were analysed using descriptive statistics and independent samples t-tests via SPSS version 25.0.

Results: Groups were comparable at baseline ($p > 0.05$). Post-intervention, the experimental group demonstrated significantly greater caregiving preparedness (33.81 ± 5.96 vs. 29.87 ± 5.48 ; $t = 8.21$; $p < 0.001$), need fulfilment (34.12 ± 5.74 vs. 29.90 ± 5.32 ; $t = 9.36$; $p < 0.001$), and perceived social support (34.65 ± 6.02 vs. 29.92 ± 5.62 ; $t = 10.02$; $p < 0.001$), with significantly lower caregiver burden (23.41 ± 6.12 vs. 29.88 ± 5.01 ; $t = 12.45$; $p < 0.001$) and reduced depression, anxiety, and stress (all $p < 0.001$).

Conclusion: A structured nurse-led intervention programme significantly improved caregiver preparedness, need fulfilment, and social support while reducing burden and psychological distress. Systematic integration of such programmes into oncology nursing practice is warranted to optimise caregiver and patient outcomes.

Keywords: *Cancer caregivers; Chemotherapy; Caregiver burden; Nurse-led intervention; Caregiving preparedness; Psychological distress; Social support; Quasi-experimental study; DASS-21; Psycho-oncology*

1. Introduction

Cancer constitutes a major global public health burden and remains among the foremost causes of morbidity and mortality worldwide. The Global Cancer Statistics 2020 (GLOBOCAN) estimated 19.3 million new cancer diagnoses globally, with projections indicating continued escalation driven by population ageing, urbanization, and changing lifestyle patterns [1]. In India, the burden is particularly formidable: the National Cancer Registry Programme documented approximately 1.39 million new cases in 2020, with leading cancers including breast, cervical, oral, and lung malignancies [2]. Cancer survival improvements attributable to advances in chemotherapy have simultaneously extended the duration and intensity of caregiving demands placed upon families, positioning family caregivers as essential—yet frequently unsupported—partners in oncological care.

Chemotherapy, while substantially improving survival outcomes, is associated with debilitating adverse effects including nausea, fatigue, peripheral neuropathy, immunosuppression, and functional decline. These effects necessitate continuous, complex care that extends well beyond hospital settings into patients' homes, where the primary caregiving responsibility falls on family members [3]. In India and other low- and middle-income countries (LMICs), formal home-care infrastructure remains limited, further amplifying reliance on informal family caregivers [4].

Family caregivers of cancer patients are a vulnerable population frequently overlooked in clinical practice. Research consistently documents that caregivers experience multidimensional burden—encompassing physical strain, psychological distress (including depression, anxiety, and post-traumatic stress), social isolation, and financial hardship—often exceeding that of caregivers in other chronic disease contexts [5,6]. Caregiving preparedness, defined as the degree to which individuals feel equipped with the knowledge and skills necessary to manage caregiving tasks, has been identified as a critical determinant of caregiver

competence, confidence, and resilience [7]. Low preparedness has been associated with increased burden, higher rates of psychological distress, and poorer patient outcomes [8].

Despite the established clinical significance of caregiver burden and inadequate preparedness, structured supportive interventions targeting family caregivers remain insufficiently integrated into routine oncology care globally, and particularly within the Indian healthcare context [9]. Nurse-led interventions—encompassing patient and caregiver education, psychosocial support, relaxation-based stress reduction, and structured follow-up—represent a cost-effective and scalable approach to empowering caregivers, enhancing preparedness, and mitigating psychological distress [10]. Nurses occupy a uniquely privileged position at the interface of patients, families, and health systems, rendering them ideally placed to deliver and coordinate such interventions.

Previous systematic reviews and meta-analyses have demonstrated the efficacy of psychoeducational and multicomponent caregiver interventions in reducing burden and psychological distress [11,12]; however, large-scale evidence from quasi-experimental studies conducted within the Indian oncological context, addressing multiple caregiver outcome domains simultaneously, remains sparse. Existing studies have predominantly focused on individual outcome domains or have been limited by small sample sizes or single-site designs, representing a significant evidence gap.

The present study aimed to address this gap by rigorously evaluating the effectiveness of a structured, multi-component nurse-led intervention programme on caregiving preparedness, caregiver burden, need fulfilment, perceived social support, and psychological outcomes (depression, anxiety, and stress) among family caregivers of cancer patients undergoing chemotherapy in Gujarat, India. It was hypothesised that family caregivers who received the nurse-led intervention would demonstrate significantly greater improvements in all assessed outcome domains compared to those receiving standard care alone.

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; α = 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

Variable	Category	Control f (%)		Experimental f (%)	
		f	%	f	%
	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
	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

Variable	Category	Control f (%)		Experimental f (%)	
		f	%	f	%
	>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
Anxiety (DASS-21)	16.36 ± 3.05	16.28 ± 3.11	16.02 ± 2.96	13.21 ± 3.58

Outcome Measure	Control Pre-test (Mean ± SD)	Experimental Pre-test (Mean ± SD)	Control Post-test (Mean ± SD)	Experimental Post-test (Mean ± SD)
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***

Outcome Measure	Control (n=298) Mean ± SD	Experimental (n=296) Mean ± SD	t value	df	p value
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: Caregiving Preparedness (Experimental Group)

Table 4 illustrates the shift in caregiving preparedness levels within the experimental group. Pre-intervention, 81.7% of participants fell in the very low or low preparedness categories. Post-intervention, 91.5% achieved moderate or high preparedness, with very low preparedness declining from 20.9% to 1.7%. This substantial categorical shift underscores the clinical impact of the intervention on caregiver competence and confidence.

Table 4. Distribution of Caregiving Preparedness Levels — Experimental Group

(N = 296)

Preparedness Level	Score Range	Pre-test f	Pre-test %	Post-test f	Post-test %
Very Low	0–8	62	20.9	5	1.7
Low	9–16	180	60.8	20	6.8
Moderate	17–24	50	16.9	215	72.6
High	25–32	6	2.0	56	18.9
Total	—	296	100	296	100

3.5 Within-Group Changes: Caregiver Burden (Experimental Group)

Table 5 presents the distribution of caregiver burden severity within the experimental group before and after intervention. Severe burden declined from 19.3% to 4.1%, and moderate burden from 32.8% to 9.8%. Correspondingly, the proportion reporting no burden increased from 6.8% to 29.1%, and mild burden from

41.2% to 57.1%. These categorical improvements reflect the clinical meaningfulness of the observed burden reduction.

Table 5. Distribution of Caregiver Burden Levels — Experimental Group (N = 296)

Burden Level	Score Range	Pre-test f	Pre-test %	Post-test f	Post-test %
No Burden	0–18	20	6.8	86	29.1
Mild Burden	19–36	122	41.2	169	57.1
Moderate Burden	37–54	97	32.8	29	9.8
Severe Burden	55–72	57	19.3	12	4.1
Total	—	296	100	296	100

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

Outcome Measure	Associated Variable	Chi-square (χ^2)	p value
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 caregiving preparedness—with 91.5% of experimental group participants achieving moderate or high preparedness post-intervention, compared to only 18.9% pre-intervention—is consistent with the foundational conceptualisation of preparedness for caregiving by Archbold et al. [7], who identified preparedness as a critical antecedent of caregiver competence and role satisfaction. The nurse-led educational component of the present intervention appears to have directly and effectively addressed knowledge deficits concerning chemotherapy side effects, home-based symptom management, and supportive care practices. These findings align with those of Northouse et al. [11], whose meta-analysis demonstrated that psychoeducational interventions significantly improved preparedness and self-efficacy among family caregivers of cancer patients.

The substantial reduction in caregiver burden in the experimental group—accompanied by a large effect size ($d = 1.16$)—is particularly clinically significant given the established multidimensional nature of oncological caregiver burden [13]. The observed reduction is plausibly attributable to the synergistic contributions of multiple intervention components: educational provision reducing uncertainty and enhancing role competence, peer support reducing social isolation and normalizing caregiving experiences, and relaxation training attenuating maladaptive physiological stress responses. These mechanisms are theoretically grounded in Lazarus and Folkman's transactional model of stress and coping [14], which posits that both

primary appraisal of stressors and secondary appraisal of coping resources are modifiable determinants of psychological distress. This finding is consistent with Northouse et al. [11], who demonstrated that multicomponent interventions, particularly those incorporating both educational and psychosocial elements, yielded the greatest reductions in caregiver burden.

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 characterised by late-stage presentation, high out-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

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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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