



Effectiveness of Video-Assisted Teaching with Reinforcement Booklet on Knowledge of Primary Caregivers Regarding Self-Care Management of Patients Undergoing Chemotherapy

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ABSTRACT:

Background: Primary caregivers play an important role in supporting patients undergoing chemotherapy. Adequate knowledge regarding self-care management is essential for providing appropriate care and recognising treatment-related complications. Structured educational interventions may improve caregivers' knowledge and preparedness.

Objective: To determine the effectiveness of video-assisted teaching with a reinforcement booklet on the knowledge of primary caregivers regarding self-care management of patients undergoing chemotherapy.

Methods: A pretest–posttest control-group design was used. The study was conducted among 120 primary caregivers recruited from the medical oncology and radiation oncology units of AIIMS, Bhubaneswar, using convenience sampling. Participants were allocated alternately to experimental and control groups, comprising 60 patient–caregiver pairs in each group. The experimental group received video-assisted teaching with a reinforcement booklet on self-care management during chemotherapy, whereas the control group received routine care. Caregivers' knowledge was assessed before and after the intervention. Data were analysed using descriptive statistics, repeated-measures analysis of variance (ANOVA) and Bonferroni post hoc comparisons.

Results: The mean pretest knowledge scores of caregivers were 7.62 ± 4.21 in the experimental group and 8.18 ± 4.03 in the control group. Following the intervention, the mean knowledge score increased to 14.77 ± 3.35 in the experimental group compared with 9.55 ± 3.81 in the control group. Repeated-measures ANOVA demonstrated a statistically significant group-by-time effect ($F = 14.71$, $p < 0.001$), indicating greater improvement in caregivers' knowledge in the experimental group.

Conclusion: Video-assisted teaching with a reinforcement booklet significantly improved primary caregivers' knowledge regarding self-care management of patients undergoing chemotherapy. Integrating structured audio-visual education with written reinforcement into routine oncology nursing practice may strengthen caregiver education and support home-based cancer care.

Keywords: Chemotherapy; Primary Caregivers; Video-Assisted Teaching; Reinforcement Booklet; Knowledge; Self-Care Management; Oncology Nursing.

Introduction

Cancer continues to be a major public health concern worldwide, contributing substantially to morbidity, mortality and healthcare burden. Chemotherapy remains an important treatment modality for several malignancies, either independently or in combination with other therapeutic approaches. Despite its therapeutic benefits, chemotherapy is frequently associated with adverse effects that require appropriate monitoring and supportive care. Patients undergoing chemotherapy often experience physical and psychological difficulties that affect their daily functioning and increase their dependence on family members. Consequently, primary caregivers play an important role in supporting patients throughout the treatment period.^{1,2}

Primary caregivers are frequently involved in assisting patients with daily activities, medication management, nutritional support, symptom monitoring and decisions regarding medical consultation. However, many caregivers assume these responsibilities without adequate preparation or formal training. Northouse et al., in a meta-analysis of 29 randomized clinical trials, highlighted the limited preparation and support available to family caregivers of patients with cancer. Their findings demonstrated that structured interventions could improve caregiver coping, self-efficacy and quality of life.¹ Similarly, Cheng et al., in a systematic review and meta-analysis, identified substantial unmet informational and psychological needs among caregivers, emphasising the importance of structured educational support.²

Caregivers' knowledge regarding chemotherapy-related self-care management is particularly important because patients may develop complications requiring timely recognition and intervention. Inadequate understanding of treatment-related adverse effects, infection prevention, nutritional requirements and symptom management may create difficulties in providing appropriate care. A systematic review by Bilgin and Ozdemir demonstrated that educational and supportive interventions improved preparedness among family caregivers of patients with cancer.³ These findings indicate that caregiver education should be considered an essential component of comprehensive oncology nursing care.

Educational interventions delivered through different methods have been investigated to improve caregivers' knowledge and preparedness. Video-assisted teaching provides information through visual demonstrations and verbal explanations, which may facilitate understanding of complex healthcare instructions. A randomized clinical trial by Silva et al. among 26 caregivers of children and adolescents undergoing chemotherapy demonstrated that video-based education, when combined with verbal guidance, improved knowledge acquisition compared with verbal instructions alone.⁴ Although conducted in a paediatric oncology setting, these findings suggest the potential usefulness of audio-visual educational strategies in chemotherapy-related caregiver education.

The effectiveness of structured educational interventions has also been demonstrated in broader oncology populations. Kusi et al., in a meta-analysis involving 28 controlled trials and 3,876 participants, reported beneficial effects of psychoeducational interventions on caregiver burden, psychological outcomes and quality of life.⁵ Similarly, Gucuyener and Karabacak evaluated a structured teach-back educational intervention among patients receiving chemotherapy, highlighting the importance of interactive educational approaches in symptom management.⁶ These studies support the integration of planned educational strategies into oncology care, although their outcomes and target populations differ from those of the present study.

Video-assisted teaching supported by a reinforcement booklet may offer additional advantages by allowing caregivers to review essential information after the initial educational session. Written materials can complement audio-visual instructions and provide a reference during home-based care. However, evidence specifically examining the combined effectiveness of video-assisted teaching and reinforcement booklets on primary caregivers' knowledge regarding chemotherapy-related self-care remains limited. Therefore, the present study aimed to evaluate the effectiveness of video-assisted teaching with a reinforcement booklet on the knowledge of primary caregivers regarding self-care management of patients undergoing chemotherapy.

Methods: A pretest–posttest control-group design was used. The study was conducted among 120 primary caregivers recruited from the medical oncology and radiation oncology units of AIIMS, Bhubaneswar, using convenience sampling. Alternative random assignment was used to assign subjects to experimental or control group, comprising 60 patient–caregiver pairs in each group. The experimental group received video-assisted teaching with a reinforcement booklet on self-care management during chemotherapy, whereas the control group received routine care. Caregivers' knowledge was assessed before and after the intervention.

Inclusion criteria

1. Primary caregivers who were able to read, write and understand Odia, Hindi or English.
2. Primary caregivers of patients who had undergone at least one cycle of chemotherapy.
3. Primary caregivers aged above 18 years.

Data Collection Instruments

Socio-demographic Proforma:

The socio-demographic proforma was developed by the investigator to collect demographic characteristics of primary caregivers, including age, gender, educational qualification, occupation, marital status and duration of caregiving.

Knowledge Questionnaire:

A structured knowledge questionnaire was developed by the researcher to assess primary caregivers' knowledge regarding self-care management of patients undergoing chemotherapy, with emphasis on the management of chemotherapy-related side effects. The questionnaire consisted of 22 questions related to self-care management of patients undergoing chemotherapy. The content validity index was 0.86. Reliability was established using the test–retest method, and the reliability coefficient was 0.84.

Intervention

The basic components of video-assisted teaching and the reinforcement booklet were developed to address common problems experienced by patients undergoing chemotherapy. The teaching focused mainly on self-care management of chemotherapy-related side effects and was intended to enhance primary caregivers' knowledge regarding the management of these complications.

The educational content included the management of chemotherapy-related side effects such as myelosuppression, including neutropenia, thrombocytopenia and anaemia; gastrointestinal effects, including nausea and vomiting, anorexia, stomatitis, diarrhoea and constipation; integumentary effects, including alopecia and skin reactions; and oncological emergencies, including infection and pain.

The video-assisted teaching lasted 30 minutes and was supplemented with a reinforcement booklet containing information on the management of chemotherapy-related side effects. The intervention was provided to primary caregivers in the experimental group, whereas the control group received routine care.

Data Collection

Primary caregivers of patients undergoing chemotherapy admitted to the Medical Oncology ward and attending the Medical Oncology and Radiotherapy day-care units were recruited for the study. Informed consent was obtained from the participants. Baseline knowledge regarding self-care management of patients undergoing chemotherapy was assessed using the structured knowledge questionnaire. Primary caregivers in the experimental group received video-assisted teaching with a reinforcement booklet, whereas those in the control group received routine care. The intervention was administered by the investigator through a 30-minute video presentation supported by the reinforcement booklet. The educational sessions were conducted in small groups of three to four participants. Post-test assessment of caregivers' knowledge was conducted on days 14 and 21, considering the chemotherapy schedules of seven, fourteen and twenty-one days. Knowledge scores obtained before and after the intervention were compared to determine the effectiveness of video-assisted teaching with the reinforcement booklet.

Results

Comparison of socio-demographic characteristics of patient's caregiver in both experimental and control group.

Age of the patient's caregivers in experimental group have median 38 with IQR 19 and median 39 with IQR 18 in control group. Majority were the males in both the experimental (65%) and control (61.7%) group respectively. Regarding education, 43.3% were graduates in the experimental group whereas in the control group 45% were graduates. About the occupation of primary care giver 26.7% were skilled workers and shop and market sales workers in the experimental group whereas in control group 28.3% were unemployed. Majority of the primary care givers (86.7%) and 55 (91.7%) were married in both experimental and control group. About the care of the patient, 61.7% in the experimental group and 45% in the control group were taking care of the patient for 3 -6 months. Subjects in both the experimental and control group were comparable in terms of their sociodemographic variables. (Table 1)

Table 1: Comparison of socio-demographic characteristics of patient's caregiver in both experimental and control group

n=120			
Variable	Experimental group (n=60) f (%)	Control group (n=60) f (%)	Test statistics p value
Age of Caregiver	38(19)		Z=0.116
Median (IQR)		39 (18)	P=0.9
Gender of primary care giver			
Male	39 (65)	37 (61.7)	$\chi^2= 0.144^a$
Female	21 (35)	23 (38.3)	p= 0.705
Education of Primary care giver			
Profession or Honours	03 (05)	4 (6.7)	Fishers exact test
Graduate	26 (43.3)	27 (45)	p= 0.557
Intermediate or diploma	18 (30)	14 (23.3)	
High school certificate	04 (6.7)	10 (16.7)	
Middle school certificate	02 (3.3)	02 (3.3)	
Primary school certificate	04 (6.7)	02 (3.3)	
Not formally educated	03 (05)	01 (1.7)	
Occupation of primary care giver			
Professionals	05 (8.3)	07 (11.7)	Fishers exact test
Technicians and Associate Professionals Clerks	05 (8.3)	03 (05)	p= .166
Skilled Workers and Shop & Market Sales Workers	02 (3.3)	01 (1.7)	
Skilled Agricultural & Fishery Workers	16 (26.7) (6.7)	14 (23.3)	
Craft & Related Trade Workers	03 (05)	11 (18.3)	
Plant & Machine Operators and Assemblers	06 (10)	00	
Elementary Occupation	06 (10)	01 (1.7)	
Unemployed	13 (21.7)	06 (10) 17 (28.3)	
Marital status of primary care giver			
Unmarried	08 (13.3)	05 (8.3)	$\chi^2= 0.776^a$
Married	52 (86.7)	55 (91.7)	p= 0.378
How long you taking care of patient			
Less than 3 months	07 (11.7)	10 (16.7)	$\chi^2= 5.618^a$
3-6 months	37 (61.7)	27 (45)	p= 0.132
7-12 months	08 (13.3)	17 (28.3)	
> 12 months	08 (13.3)	06 (10)	

Effectiveness video assisted teaching with reinforcement booklet on knowledge of primary care givers regarding self-care management of patients undergoing chemotherapy

Within group and between group comparison of knowledge score of primary caregiver between experimental and control group across time. Repeated measures ANOVA with Greenhouse-Geisser correction shows that, within the group difference of mean knowledge score of caregiver across time in experimental group is 7.1 and 1.4 in the control group respectively. Between the group difference in the mean knowledge score of caregiver is more in experimental group as compared to control group which is statistically significant across two time points ($F=14.71$, $p<0.00$) (Table2)

Post hoc test using the Bonferroni correction revealed that there is slight improvement in mean Post-test knowledge score of caregivers the control group (Mean difference), but it was not statistically significant ($p=0.001$). However, the mean post-test knowledge score of caregivers in the experimental group showed a significant improvement as compared to pre-test mean knowledge score of caregivers (Mean difference 7.1), which was statically significant ($p<0.001$). There is a statistically significant improvement in knowledge score of caregivers after video assisted teaching with reinforcement booklet in the experiment group only. (fig:1)

Table 2: Within group and between group comparison of knowledge score of primary caregivers between experimental and control group across time
n= 120

Time	Experimental group $n_1= 60$ mean (SD)	Control group $n_2= 60$ mean (SD)	Between group*time Test statistic P value
Pre-test	7.62 (4.21)	8.18(4.03)	
Post-test	14.77(3.35)	9.55(3.81)	$F=14.71$
Mean difference	7.1	1.4	
Standard error	0.6	0.4	$P<0.001^*$
Within subjects *time	$p<0.001$		

F-Repeated measures ANOVA, level of significance $p<0.05$

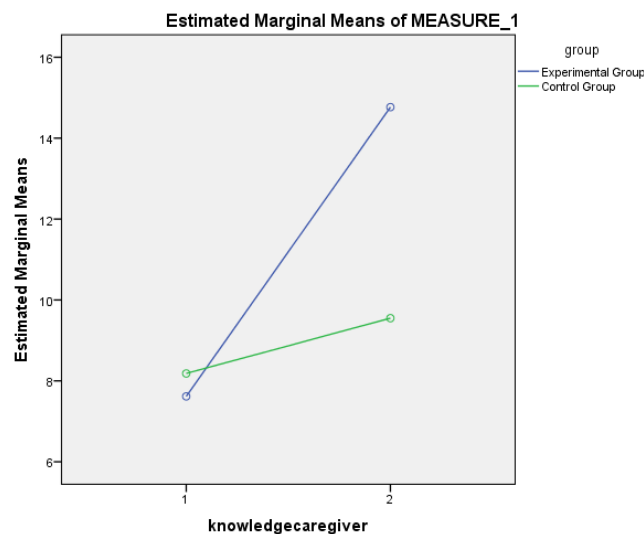


Figure 1: Bonferroni Post Hoc comparison of mean knowledge of caregiver scores between experimental and control group across time (n=120)

Discussion

The present study evaluated the effectiveness of video-assisted teaching with a reinforcement booklet on the knowledge of primary caregivers regarding self-care management of patients undergoing chemotherapy. The findings demonstrated a significant improvement in knowledge among caregivers who received the educational intervention compared with those in the control group. The results support the usefulness of structured educational interventions in improving caregivers' understanding of chemotherapy-related self-care.

The study included 120 primary caregivers, with 60 participants each in the experimental and control groups. The median age was 38 years in the experimental group and 39 years in the control group. Most caregivers were male (65% and 61.7%, respectively), married and had been providing care for three to six months. No statistically significant differences were observed between the groups regarding the selected sociodemographic characteristics. These findings indicate that the groups were comparable with respect to the measured baseline characteristics. Previous research has shown that family

caregivers frequently undertake substantial responsibilities during cancer treatment, often without adequate preparation. Northouse et al.¹ and Jadalla et al.⁷ emphasised the importance of educational and supportive interventions in addressing the challenges associated with cancer caregiving.

In the present study, the mean pretest knowledge scores were 7.62 ± 4.21 and 8.18 ± 4.03 in the experimental and control groups, respectively. Following the intervention, the mean knowledge score increased to 14.77 ± 3.35 in the experimental group compared with 9.55 ± 3.81 in the control group. The mean improvement was approximately 7.1 points in the experimental group and 1.4 points in the control group. Repeated-measures ANOVA demonstrated a statistically significant group-by-time effect ($F = 14.71$, $p < 0.001$), indicating that the change in knowledge differed significantly between the groups. These findings suggest that video-assisted teaching supported by a reinforcement booklet was effective in improving caregivers' knowledge during the study period.

The findings are consistent with those reported by Silva et al.,⁴ who conducted a randomized clinical trial among 26 caregivers of children and adolescents undergoing chemotherapy. Caregivers receiving video-based education along with verbal instructions demonstrated better knowledge acquisition than those receiving verbal instructions alone. Although the study population differed from that of the present investigation, both studies highlight the potential value of audio-visual educational interventions in improving caregivers' understanding of chemotherapy-related care. The improvement observed in the present study may be related to the combination of visual explanations, structured information and opportunities for reviewing educational content through the reinforcement booklet.

Similar findings regarding the benefits of structured caregiver education have been reported in systematic reviews and meta-analyses. Bilgin and Ozdemir³ reviewed 11 studies and found that educational and supportive interventions improved preparedness among family caregivers of patients with cancer. Cheng et al.² reported that psychoeducational interventions improved caregivers' self-efficacy and quality of life while reducing anxiety, depression and caregiver burden. Although these reviews primarily evaluated preparedness and psychosocial outcomes rather than knowledge alone, their findings support the broader value of caregiver-focused educational interventions. The present study adds to this evidence by demonstrating a significant improvement in knowledge following a combined audio-visual and written educational intervention.

Kusi et al.⁵ also reported beneficial effects of psychoeducational interventions on caregiver-oriented outcomes, including caregiver burden and quality of life. Similarly, Chen et al.,⁸ in a meta-analysis of eight randomized controlled trials involving 1,234 patient-caregiver dyads, found that dyadic psychoeducational interventions reduced depressive symptoms and improved caregivers' quality of life. These findings suggest that structured educational and supportive interventions can address different aspects of caregiving.

The findings also have relevance to chemotherapy-related symptom management. Gucuyener and Karabacak⁶ evaluated the teach-back method in a randomized controlled trial involving 80 patients receiving chemotherapy. Their study examined symptom management and quality of life following structured patient education. Although the intervention targeted patients rather than caregivers, it reinforces the importance of ensuring that individuals involved in chemotherapy care understand essential treatment-related information. In the present study, the reinforcement booklet may have provided an opportunity for caregivers to revisit information after the teaching session. Such reinforcement may be particularly useful when caregivers need to recall instructions during home-based care, although this mechanism was not directly measured.

Further support for caregiver-focused interventions comes from Becque et al.,⁹ who reviewed 32 studies involving family caregivers of patients with advanced cancer. Most interventions demonstrated beneficial effects on caregiver outcomes, particularly psychological well-being and daily functioning. Zhang et al.¹⁰ also reported that psychoeducational interventions among caregivers of patients with colorectal cancer improved caregiver ability and quality of life while reducing caregiver burden. However, improvements were not consistent across all psychological outcomes. These findings indicate that caregiver education may provide benefits beyond knowledge acquisition, although the extent of improvement depends on the intervention and outcomes assessed.

The significant improvement in knowledge observed in the present study has important implications for oncology nursing practice. Primary caregivers often assist patients in managing treatment-related symptoms and identifying complications requiring medical attention. Providing structured information through audio-visual teaching and written reinforcement may help nurses communicate essential self-care instructions more consistently. Such approaches may be incorporated into chemotherapy counselling and discharge education. Nevertheless, improved knowledge should not be interpreted as evidence of improved caregiving practices or patient outcomes without further assessment.

Limitations

Although the intervention demonstrated a significant improvement in knowledge, some limitations should be considered. The study evaluated knowledge before and after the educational intervention but did not establish whether the improvement was sustained over time. Caregiving practices, patient complications and caregiver-related psychological outcomes were not assessed. These limitations restrict conclusions regarding long-term effectiveness and broader clinical benefits.

Video-assisted teaching with a reinforcement booklet is a useful educational approach for improving primary caregivers' knowledge regarding self-care management of patients undergoing chemotherapy. Incorporating structured caregiver education into routine oncology nursing services may strengthen the informational support provided to families. Future studies should examine knowledge retention, actual caregiving practices, caregiver confidence and patient-related outcomes to establish the broader clinical effectiveness of such interventions.

Conclusion

Video-assisted teaching supported by a reinforcement booklet significantly improved primary caregivers' knowledge regarding self-care management of patients undergoing chemotherapy. The improvement was substantially greater in the experimental group than in the control group. The findings support the incorporation of structured audio-visual education and written reinforcement into routine oncology nursing practice. Further studies are needed to determine whether these improvements in knowledge are sustained and translate into better caregiving practices and patient outcomes.

References

1. Northouse LL, Katapodi MC, Song L, Zhang L, Mood DW. Interventions with family caregivers of cancer patients: meta-analysis of randomized trials. *CA Cancer J Clin.* 2010;60(5):317-339. doi:10.3322/caac.20081.PubMed — PMID: 20709946
2. Cheng Q, Xu B, Ng MSN, Duan Y, So WKW. Effectiveness of psychoeducational interventions among caregivers of patients with cancer: a systematic review and meta-analysis. *Int J Nurs Stud.* 2022;127:104162. doi:10.1016/j.ijnurstu.2021.104162.PubMed — PMID: 35121521
3. Bilgin A, Ozdemir L. Interventions to improve the preparedness to care for family caregivers of cancer patients: a systematic review and meta-analysis. *Cancer Nurs.* 2022;45(3):E689-E705. doi:10.1097/NCC.0000000000001014.PubMed — PMID: 34608043
4. Silva SO, de Araújo NM, Leal NTB, Silva ME, Dos Santos KVG, da Silva TTM, et al. Effect of video training on anxiety and knowledge level among caregivers of children and adolescents chemotherapy: a randomized clinical trial. *iScience.* 2025;28(5):112414. doi:10.1016/j.isci.2025.112414.PubMed — PMID: 40343285
5. Kusi G, Atenafu EG, Mensah ABB, Lee CT, Viswabandya A, Puts M, et al. The effectiveness of psychoeducational interventions on caregiver-oriented outcomes in caregivers of adult cancer patients: a systematic review and meta-analysis. *Psychooncology.* 2023;32(2):189-202. doi:10.1002/pon.6050.PubMed — PMID: 36251609
6. Gucuyener BG, Karabacak BG. Effect of chemotherapy patient education using the teach-back method on symptom management and quality of life: a randomized controlled trial. *J Cancer Educ.* 2025;40(5):700-712. doi:10.1007/s13187-024-02564-0.PubMed — PMID: 39775237
7. Jadalla A, Ginex P, Coleman M, Vrabel M, Bevans M. Family caregiver strain and burden: a systematic review of evidence-based interventions when caring for patients with cancer. *Clin J Oncol Nurs.* 2020;24(1):31-50. doi:10.1188/20.CJON.31-50.PubMed — PMID: 31961843
8. Chen D, Liu Q, Zhang L, Qian H. Effectiveness of dyadic psychoeducational intervention on cancer patients and their caregivers: a systematic review and meta-analysis. *Cancer Nurs.* 2025;48(4):316-326. doi:10.1097/NCC.0000000000001307.PubMed — PMID: 38011076
9. Becqué YN, van der Wel M, Aktan-Arslan M, van Driel AG, Rietjens JAC, van der Heide A, et al. Supportive interventions for family caregivers of patients with advanced cancer: a systematic review. *Psychooncology.* 2023;32(5):663-681. doi:10.1002/pon.6126.PubMed — PMID: 36959117
10. Zhang M, Xue Y, Shao M, Yang Y, Yu L, Ma B, et al. The effects of a psychoeducational intervention on caregivers of colorectal cancer patients: a meta-analysis of randomized controlled trials. *Eur J Oncol Nurs.* 2025;74:102739. doi:10.1016/j.ejon.2024.102739.PubMed — PMID: 39729814
11. Phiri L, Li WHC, Cheung AT, Phiri PGMC. Effectiveness of psychoeducation interventions in reducing negative psychological outcomes and improving coping skills in caregivers of children with cancer: a systematic review and meta-analysis. *Psychooncology.* 2023;32(10):1514-1527. doi:10.1002/pon.6208.PubMed — PMID: 37639282
12. The efficacy of psychosocial interventions for cancer caregiver burden: a systematic review and meta-analysis of randomized controlled trials. *Clin Psychol Rev.* 2023;99:102237. doi:10.1016/j.cpr.2022.102237.PubMed — PMID: 36516641