



Effectiveness of Planned Teaching Program on Knowledge Regarding Prevention and Management of Radiotherapy Induced Oral and Gastrointestinal Tract Toxicity Among Cancer Patients

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Abstract:

Background: Radiotherapy (RT) is a usual treatment option for a wide range of cancers. Almost 50% of patients with cancer get radiation throughout their illness. RT has an important role in 40% of all cancer cures. RT induced Gastrointestinal tract (GIT) problems are many and serious. The objectives of the study were to evaluate the effectiveness of planned teaching program on knowledge regarding prevention and management of RT induced oral and GIT toxicity among cancer patients.

Methods: A quantitative research using a quasi-experimental design (pretest - post-test control group) on 60 cancer patients (Experimental group-30, Control group-30) between the ages of 20 and 60 years using convenience sampling technique. A standardized knowledge questionnaire (30 questions) was used for data collection.

Results: Statistically significant difference was found between the posttest knowledge scores of the experimental group and control group ($t = 7.979$; p value 0.000). There was no statistically significant association between the pretest knowledge level on prevention and management of RT induced oral and GIT toxicity with selected demographic variables in the subjects of both the groups at 0.05 level.

Conclusion: Oral and GIT toxicity among cancer patients undergoing radiation therapy can be effectively prevented and managed by planned teaching program.

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Keywords: Radiotherapy, Cancer Patients, Planned Teaching Program, Management, Oral and Gastrointestinal tract toxicity

Key Messages

1. Patient's awareness on Radiotherapy, its effects on oral and gastrointestinal tract should be explored before starting the therapy.
2. Patient education on RT and its side effects need to be a part of radiotherapy.
3. Prevention of the toxic effects of RT is more important than its cure.

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Introduction

Radiotherapy (RT) is a usual treatment option for a wide range of cancers. Further, approximately 50% of all cancer patients receive radiation therapy during their course of illness thus contributing to around 40% towards curative treatment. (Begg AC 2011, Barnett GC, 2009). RT is a low-cost therapy, causing just 5% of overall cancer treatment expenditure. (Ringborg U, 2003) During the present years, the expense has grown as current technology has advanced in modelling, delineation, dosage computation, and RT administration have been more widely used.

The aim of radiotherapy is to deliver a precisely measured dose of ionizing radiation to a defined tumour with the minimum possible damage to the surrounding healthy tissue, resulting in the eradication of the tumour, a high quality of life and prolongation of survival at a reasonable cost (Perez & Brady 1995). (Perez C.A, 1995)

The most common side-effect of radiotherapy is skin reaction. Around 95% of patients experience some degree of skin reaction. [King K.B et al. 1985] The tissue damage occurs immediately after the first dose of Radiation therapy. (Hymes SR, 2006) In radiotherapy, damage to normal tissue results from the direct loss of cells induced by ionizing radiation, bystander effects on unirradiated cells and inflammation, which is triggered by the activation of the innate and the adaptive immune system. (Ventura, J. et al, 2017, Peng, Y. et al., 2017, Moding EJ, 2013)

RT is an integral part of the treatment of oral cavity malignancies. Consequently, common unaffected tissues such as the salivary glands, oral mucosa, masticatory apparatus, teeth, and jaws accidentally get substantial doses of radiation. The associated oral sequelae may create significant issues during and after RT and are essential determinants in deciding the patient's long-term quality of life.

RT induced oral mucosa damage arises from radiation's harmful effects on the oral mucosa, as well as the skin, surrounding salivary glands, bone, dentition, and masticatory equipment. Several ointments and lotions, oral and parenteral pharmaceuticals, substances that

modify immune responses, cytoprotective agents, and surgery have been devised to treat and, more importantly, avoid developing these problems. Oral problems caused by RT include complicated and dynamic mechanisms. This short-and long-term course reduces patients' quality of life and predisposes them to serious clinical problems.

The accurate diagnosis and treatment of intestinal radiation injury is a clinical challenge even then researches conducted during the recent years seem to be relatively few. (Shadad AK, 2013) Radiation injury to the GIT may occur during or soon after RT due to acute mucosal injury and inflammation. Delayed symptoms may occur a few months or years after RT due to a chronic process of transmural fibrosis and vascular sclerosis. The onset of delayed symptoms has been reported as much as after 30 years following RT. Symptoms are considered "acute" if they occur within the course of treatment or up to 90 days following the treatment which are generally reversible. Chronic side effects are much less common and occur more than 90 days' post radiation and are usually irreversible. (Andreyev J, 2005)

GIT toxicity due to radiation may be diminished using one of two approaches: the technical method, that attempts to move the radiation dosage distant from normal tissues, or the biological approach, that aims to alter the cellular response to ionizing radiation.

As RT is gaining gradual popularity among cancer patients, it would be vital to examine their knowledge towards prevention and management of RT induced oral and Gastrointestinal tract (GIT) toxicity. Health education is an important strategy of all the programs to prevent and control the oral and GIT toxicity.

Prevention of the toxic effects of RT is more important than its cure. The fact that patient awareness on the unwanted effects of radiation can play a significant role made the investigator to design the present study that was aimed at assessing the knowledge of the prevention and management of radiotherapy induced oral and gastrointestinal tract toxicity among cancer patients.



Statement of the Problem:

A study to assess the effectiveness of planned teaching program on knowledge regarding prevention and management of radiotherapy induced oral and gastrointestinal tract toxicity among cancer patients in selected Hospitals at Kochi, Kerala.

Primary Objective:

- To evaluate the effectiveness of planned teaching program on the knowledge regarding prevention and management of RT induced oral and GIT toxicity among cancer patients.

Secondary Objective

- To find the association between the pretest level of knowledge of cancer patients with selected demographic variables in both experimental and control groups

Hypothesis:

- H₁:** There is a statistically significant difference in the posttest knowledge scores on prevention and management of RT induced oral and GIT toxicity among cancer patients between experimental and control groups.

Delimitation

- Cancer patients in the age group of 20-60 years who were undergoing radiation therapy in the department of radiation oncology of one tertiary care centre only was included.

Materials and Methods

This study used a quantitative research approach with a quasi-experimental design (pretest- post-test control group). The research included 60 cancer patients (Experimental group-30, Control group-30) between the ages of 20 and 60 years who were getting radiation treatment at tertiary care centre. The convenience sampling technique was used to choose subjects. A standardized knowledge questionnaire (30 questions) and demographic data were administered in the pre-test in experimental and control groups. A 45-minute instruction using AV Aids was given on preventing and managing radiotherapy-induced oral and gastrointestinal tract damage only for the experimental group. The post-test was administered using the same tool of knowledge questionnaire after seven days, and the results obtained for both the groups. Descriptive and inferential statistics were used for data analysis.

Results

Table 1: Sample Characteristics

Sl. No	Sociodemographic variables	n=60			
		Experimental group (n=30)		Control group (n=30)	
		Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
1	Age (in years)				
	<40	11	36.7	11	36.7
	41-50	3	10	3	16.66
2	Gender				
	Male	16	53.3	21	70
	Female	14	46.7	9	30
3	Marital Status				
	Married	23	76.7	25	83.3
	Single	5	16.7	1	3.3
4	Educational Status				
	Primary	3	10	3	10
	Secondary	12	40	12	40
5	Monthly Family income (in Rs)				
	<5000	7	23.4	7	23.4
	5001-10000	8	26.6	8	26.6
6	Occupation				
	Unemployed	5	16.7	5	16.7
	Government Job	16	53.3	16	53.3
	Private Job	9	30	9	30



From table 1, it is clear that majority of the subjects (53.3%) were between 51-60 years and 50% of the subjects were graduates in both the groups.

Table 2: Comparison of Mean and SD in the pre and post-test of the experimental and control group.

n=60

Assessment of Knowledge	Groups	n	Mean	SD	t statistics	p value
Pre-test	Experimental	30	17.57	3.329	0.266	0.792
	Control	30	17.33	3.467		
Post test	Experimental	30	23.70	2.452	7.979	0.000*
	Control	30	17.23	3.520		

* Statistically Significant (p<0.01)

Table 2 depicts that there is statistically significant difference between the posttest knowledge scores of experimental and control groups (t =7.979; p value 0.000).

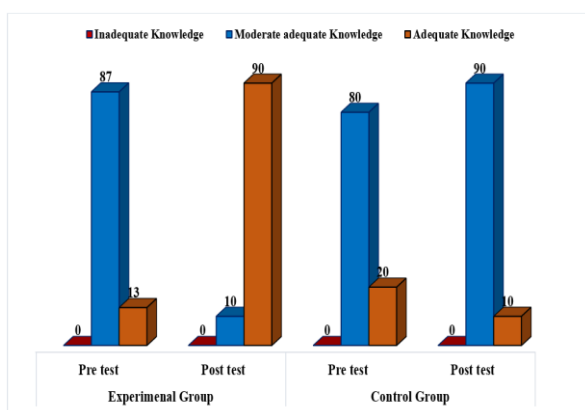


Figure 1: Distribution of subjects based on their knowledge level before and after planned teaching program in experimental and control groups.

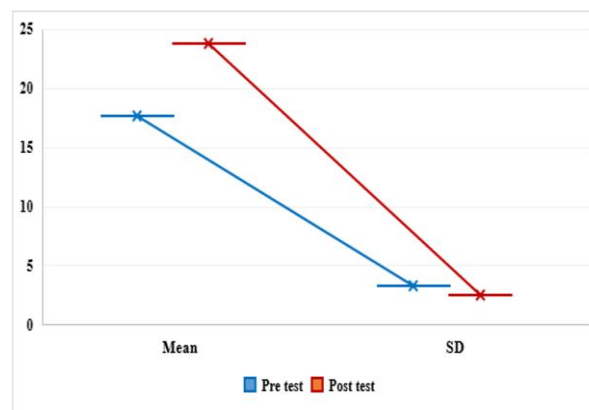


Figure 2: Mean and SD of Pre and post-test knowledge score in Experimental group

Table 3: Association between the pretest level of knowledge on Prevention and Management of RT induced oral and GIT toxicity with selected demographic variables in both experimental and control groups.

n=60

Sl. No	Demographic Variables	Pretest knowledge level				χ^2 value	p value
		Adequate (75-100%)		Moderately adequate (50-75%)			
		f	%	f	%		
1	Age (in years) <40 41-50 51-60	3	5	12	20	16.656	0.782
		3	5	8	13.3		
		4	6.7	30	50		
2	Gender Male Female	6	10	32	53.4	10.580	0.479
		4	6.6	18	30		
3	Marital Status Married Single Widow	8	13.4	36	60	24.239	0.335
		1	1.67	13	21.67		
		0	0	2	3.33		
4	Educational Status Primary Secondary Graduate	0	0	5	8.33	13.854	0.907
		4	6.66	19	31.66		
		5	8.33	27	45		
5	Monthly Income (in Rs) <5000 5001-10000 10001-15000	1	1.66	11	18.33	25.135	0.291
		2	3.33	5	8.33		
		3	5	15	25		
6	Occupation Unemployed Government Job Private Job	1	1.66	5	8.33	23.813	0.357
		6	10	26	43.33		
		2	3.33	20	33.33		



Table:3 shows that there is no statistically significant association between pretest knowledge level on Prevention and Management of RT induced oral and GIT toxicity with selected demographic variables in the subjects.

Discussion

The primary objective of the current study was to evaluate the effectiveness of planned teaching program on the knowledge regarding prevention and management of RT induced oral and GIT toxicity among cancer patients. The study result has shown a statistically significant difference between the posttest knowledge scores of experimental and control groups ($t = 7.979$; p value 0.000). Hence the hypothesis was accepted with the conclusion that planned teaching programme can improve the subjects' knowledge in prevention and management of RT induced oral and GIT toxicity.

The finding of the present study is consistent with that of a quasi-experimental study done at Kolar, Karnataka by S. Chetan Priya and G. Vijayalakshmi (2018) on effectiveness of planned teaching programme on side effects of RT among 60 patients with oral cancer. (Priya SC, 2018) The result showed an overall post-test mean knowledge score of experimental group (mean=27) which was apparently higher than the control group (mean=12.9).

The t value of post-test knowledge was 0.00 indicating the effectiveness of the structured teaching programme in improving the knowledge score in experimental group than in the control group.

In another quasi-experimental study conducted at Delhi by Pareek Shatrughan, et al, (2017) titled a structured teaching programme to assess the knowledge and practices of cancer patients regarding RT induced skin among 60 cancer patients showed it as an effective strategy for enhancing knowledge (t value-4.584*) and improving practices (t value-4.694*) of cancer patients receiving radiotherapy. (Shatrughan P, 2017) The study concluded that Structured Teaching Programme on management of RT induced skin reactions was helpful in enhancing the knowledge and practices of the subjects.

Yet another study among 30 rural women at Mangalore, Southern India on effectiveness of an educational package on cervical cancer (EPCC) evidenced that the mean post-test knowledge score of the women was significantly higher than that of their mean pre-test score, indicating that the EPCC was effective. (Mary B, 2014)

The current study also showed that there was no statistically significant association between pretest knowledge level on prevention and management of RT induced oral and GIT toxicity and selected demographic variables in the subjects.

The study recommends to have more researches on multiple interventions to prevent and treat radiation induced damage to oral and GIT of cancer patients which will undoubtedly enhance the quality of their life.

Ethical Considerations

The investigators obtained approval from the Institutional Scientific and Ethical Committee. Written informed permission was obtained from the study subjects.

Conclusion

RT produces various unwanted early adverse effects, making patients' compliance difficult and quality of life poor. The present study findings reinforce the literature that prevention and management of RT induced oral and GIT toxicity among cancer patients can be done through planned teaching program. Appropriate institutionalized strategies may be developed to educate every single cancer patient receiving RT to achieve the maximum benefits for the alleviation of their sufferings.

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