

Effect of Teaching Self-care Module on Radiation- therapy' Side Effects and Clinical Outcomes of Head and Neck Cancer Patients

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Abstract:The major concern of health care professionals regarding the value of teaching self-care for management of side effects of radiation therapy of head and neck cancer patients is the improvement of their clinical outcomes. **This study aimed to** evaluate the effect of self-care teaching module on radiation-induced side effects and clinical outcomes among head and neck cancer patient. **Subjects:** a quasi-experimental randomized controlled study design was used . A sample of (50) adult patients with head and neck cancer undergoing recent radiation therapy were divided into two equal groups; control group did not receive self-care teaching module about acute side effect whereas these self-care teaching module was provided by the researcher to the study group. Three tools were utilized to collect data. Tool I was structured patient assessment interview questionnaire. Tool (II) Modified Eastern Cooperative Oncology Group performance scale (ECOG). Tool (III) was Self-care questionnaire. **Results:** The main results revealed that there were improvement of mean scores regarding change of quality grade of functional ability of the study group II in one and three months after receiving self-care teaching module with very high statistical significance difference. Also, the occurrence and severity of acute side effects was improved in the study group II compared to control group I. **Conclusion and recommendations:** It was recommended that teaching self-care module to the patients before receiving radiation therapy should be used as routine intervention for all head and neck cancer patients.

Key words: Self- Care- Teaching Module- Radiation therapy- Acute Side Effects- Head and Neck Cancer.

Introduction

Worldwide head and neck cancers are considered the sixth most common type of cancer. According to the International Classification of Diseases, head and neck cancers HNC occur at the following sites lip, tongue, floor of the mouth, gum, other oral cavity sites, salivary glands, oropharynx, nasopharynx, hypopharynx, larynx, nose, sinuses, ear and thyroid. The cells most commonly involved in HNC are squamous epithelial cells that line the upper respiratory and gastrointestinal tract. ^(1,2)

The exact cause of HNC is unknown but there are risk factors that increase the chance of developing the disease, Tobacco smoking is a dominant risk factor and this risk is correlated with the intensity and duration of smoking habit. The cigarette contains nitrosamines and polycyclic hydrocarbons carcinogens elements that have genotoxic effects and these elements can change the molecular profile of the individuals and cause mutations. ⁽³⁻⁵⁾

Alcohol Consumption, Alcohol acts as a solvent to enhance mucosal exposure to carcinogen. The acetaldehyde, a metabolite of alcohol can form DNA adducts that interfere with DNA synthesis and repair. Furthermore, there is a strong relationship

between alcohol and tobacco use and the combined use of these further increases the risk. ^(6,7)

The clinical manifestations are classified according to type of HNC. Mouth (oral) cancer symptoms include sore, irritation, lump or thick patch in the mouth, lip, or throat, a white or red patch in the mouth, feeling that something is caught in the throat, difficulty chewing or swallowing, difficulty moving the jaw or tongue, numbness in the tongue or other areas of the mouth, swelling of the jaw that causes dentures to fit poorly or become uncomfortable and pain in one ear without hearing loss. ^(8,9)

The first step for diagnosing HNC is taking history from patient which include a history of tobacco, alcohol use, environmental exposures and take in consideration any adult patient with symptoms referable to the upper aero digestive tract that have lasted longer than 2 weeks or with an asymptomatic neck mass should undergo a thorough examination with a high index of suspicion for carcinoma. ⁽¹⁰⁾

Radiation not only kills slows the growth of cancer cells, it can also affect nearby healthy cells, the healthy cells almost

always recover after treatment is over but sometimes people may have side effects that are severe or do not get better and other side effects may still months or years after radiation is over therefore it classified as acute and consequential late effects depending on the time of appearance of symptoms. Acute side effects usually develop during treatment and usually reversible which include radiation dermatitis, mucositis and difficulty of swallowing while consequential late side-effects appear later and are caused by persistent acute side-effects which include trismus, fibrosis, atrophy and vascular damage.⁽¹¹⁻¹³⁾

There are many approaches for nurses when caring for HNC Patients as the patients need guidance, support from nurses to navigate the healthcare system and the cancer-care continuum, encouragement and problem-solving help. Teaching is a primary responsibility of nursing care for radiation patients as Patients and families must know what to expect, get a chance to ask questions and have those questions answered to their satisfaction.⁽¹⁴⁾

Nurses in radiation therapy department apply evidence based practice when providing patient and family education and

managing side effects. However, patients receiving radiation therapy are only in the department for a short period of time each day so much of the management of acute side effects of treatment falls on patients and their family so these study adopted patient teaching on self-care⁽¹⁵⁻¹⁷⁾

Aim of the study

The aim of this study is to evaluate the effect of a teaching module on radiation side effects and clinical outcomes for head and neck cancer patient.

Research hypothesis:

Adult Patients with head and neck cancer undergoing radiation therapy who will receive a teaching module beside hospital routine care expected to minimize side effects of radiation therapy .

Subjects & Method

Study design:

This study used quasi-experimental design.

Setting of the study:

The study was conducted at Radiation Therapy department at outpatient clinic of Tanta University **Subjects:**

A random sample of (50) adult patients who were suffering from head and neck cancer and were receiving Radiation Therapy and meeting inclusion criteria . The sample size calculation according to patient admission to the hospital was found

to be 50 patients. This calculation was based on expected improvement on radiation induced side effects outcomes among study group at 95% confidence power of the study IP information software program:

Steven Thimpson equation

n=Sample size, N=Total society size,
d=error

percentage = (0.05), P=percentage of availability of the character and objectivity= (0.7) for 70%, Z=The corresponding standard class of significance 95%=

(1.96), The calculated sample size was 50

The subjects were divided into two equal groups: -

Group I (control group): It consisted of 25 patients with head and neck cancer, received routine nursing care.

Group II (study group): It consisted of 25 patients with head and neck cancer received a teaching module about side effect as designed and implemented by researcher

Data collection tools

Three tools were used for data collection of this study: -

Tool (I) assessment of head and neck cancer patient structured interview

questionnaire: -structured interview sheet was developed by the researcher after review of relevant literature⁽¹⁴⁻¹⁷⁾ and consisted of two parts: -

Part one: “Socio-demographic data”

Which included patient name, age, sex, marital status, educational level, occupation, address and telephone number^(18,19)

Part two: “Health assessment tool” it included medical diagnosis other than cancer, stage of cancer, site of radiation therapy, other received cancer treatment patient, other cancer treatment received previously.^(20,21)

Tool (II) “Modified Eastern Cooperative Oncology Group performance scale” (ECOG):

it was developed by the Eastern Cooperative Oncology Group (ECOG), published in 1982 and adopted by the researcher as a standard way of measuring the ability of cancer patients to perform ordinary tasks. The performance status was determined on the five-point scale ranging from (0) to (4) scale. The patient indicated level of his ability to perform ordinary task by marking the point on the scale.

The scoring system is 0-4 and interpreting as follow⁽²²⁾

ECOG performance status	Grade
Fully active, able to carry on all pre-disease performance without restriction.	0
Restricted in physically strenuous activity but ambulatory and able to carry out work of a light or sedentary nature, e.g., light house work, office work.	1
Ambulatory and capable of all self-care but unable to carry out any work activities; up and about more than 50% of waking hours.	2
Capable of only limited self-care; confined to bed or chair more than 50% of waking hours.	3
Completely disabled; cannot carry on any self-care; totally confined to bed or chair.	4

Tool (III): “Self-care questionnaire “: - Self-care questionnaire was developed by the researcher based on Dodd (1987) as a self-documentation tool which consisted of three parts: ⁽²³⁾

Part one: “Structured knowledge questionnaire schedule “: - It was used to asses patient Knowledge about radiation therapy, side effects, factors contributing to side effect and possible actions to be taken to alleviate these side effects .it included definition of radiation therapy, benefits of radiation therapy, types and forms of radiation therapy, common acute side effects according to National Cancer

Institute, contributing factors, alleviating and aggravating factors, duration of each side effect and actions to be taken to reduce distress from these side effects.

The total score of knowledge items was calculated and categorized as following:

-High level of knowledge was considered when the total score of items response was more than or equal 75%.

-Moderate level of knowledge was considered when the total score of items response was equal to 65-74%.

-Low level of knowledge was considered when the total score of items response was less than 65 %.

Part two: - “side effects experienced by the Patient “: - The patient recorded each side effect that was experienced after the radiation therapy is given and if he was illiterate the researcher asked him and recorded the answer as it was experienced by the patient and indicates the date of the onset of the side effect. Patients rated on a five-point scale ranging from (1) to (5) the intensity of the side effect which indicated: -

- Rarely happen.

-Very simple intensity.

-Simple intensity.

- Moderate intensity.

- Sever intensity.

Also the patient rated the distress of the side effect on another five-point scale ranging from (1) to (5) as follow: -

- Rarely distressing.
- Very simple distressing.
- Simple distressing.
- Moderate distressing.
- Sever distressing.

And the effectiveness of each self-care action in alleviating these side effect was also rated on a three-point scale ranging from (1) to (3) as follow:

- Completely alleviate the side effect.
- Partially alleviate the side effect.
- Did not help at all and the grades were calculated as the following table:

The intensity of side effect	Grade
Low intensity.	1-2
Medium intensity.	3
High intensity.	4-5
The distressing of side effect	Grade
Minor distressing.	1-2
Moderate distressing.	3
Sever distressing.	4-5
The effectiveness of self-care action in alleviating the side effect	Grade
Completely alleviate the side effect.	1
Partially alleviate the side effect.	2
Did not help at all.	3

Method

1- Administrative process:

A written approval Hospital permission

was obtained from the responsible authority.

2- Ethical consideration: -

Written informed consent was obtained from patient and their families after explanation of the aim of the study, Confidentiality and privacy were assured .using code number instead of patient name and withdrawal from study was allowed at any time. Data collection was done for eight months' period from the first November 2016 to the end July 2017.

3- Content Validity:

The tools of the study were tested for content validity by jury of nine experts in the academic staff medical-surgical nursing, radiation therapy outpatient clinic professors and biostatistics at the Faculty of Medicine.

4-Reliability of the tools:

All tools of the study were tested for reliability, Cronbach alpha was used and found to be 0.821 for Tool I, 0.842 for Tool II and 0.829 for tool III which consider highly reliable tools.

5- A pilot study

It was conducted on five head and neck cancer patient receiving recent radiation therapy to test the clarity, feasibility and the applicability and modifications were carried out accordingly.

. **The study was conducted on four phases:**

Phase I: Assessment Phase: -

- Each subject of the study was informed about the purpose, benefits and the nature of the study and that he or she had the right to withdraw from the study at any time .
- The researcher reviewed the related literature and a designed program was developed and the teaching methods were selected including demonstration and re-demonstration with illustration graphs.
- Patients of control and study groups were assessed individually immediately before giving radiation therapy session using tool I, II and tool III-part one and photos were taken to the site of radiation before the beginning of radiation therapy and use as a baseline to exclude another cause of side effect after taking the radiation.

- Phase II: The planning phase: -

- Four sessions were designed in this phase by the researcher for study group to provide the patients with information about skills and that were necessary to overcome radiation induced acute side effects and exactly it took 20-30 minutes' duration of time in addition to training them to performing these, a colored booklet was developed by the researcher.

- Session 1: - Anatomy and physiology of head and neck , Definition and types of head and neck cancer

The aim of this session was to provide the patient with information about the anatomy and physiology of head and neck, definition and types of head and neck. The content including definition, types and manifestations of head and neck. It was taking the duration of 30 minutes. The method of teaching used was presentation and discussion. Materials used for teaching was booklet with pictures.

- Session 2: - Causes and treatment of head and neck cancer and radiation therapy

The content including causes and ways of treatment of head and neck and information about radiation therapy including definition, benefits, external and internal radiation and forms of radiation therapy. It was taking the duration of 30 minutes. The method of teaching used was presentation, discussion, demonstration and re-demonstration. Materials used for teaching was color booklet with pictures and real materials (soft towel, electrical razors, irritant soap, perfumes and heating bags)

- Session 3: - Dermatitis and Mucositis

The aim of the study was to provide the

patient with information about dermatitis and Mucositis. The content including definition, time of onset, duration, aggravating and relieving factors and actions to be taken to relieve of dermatitis and Mucositis. Materials used for teaching was booklet with pictures and real materials (soft tooth brush, toothpaste, soft tissue, throat and normal saline).

- Session 4: - Dysphagia

The aim of the study was to provide the patient with information about dysphagia. The content including definition, time of onset, duration, aggravating and relieving factors and actions to be taken to relieve of dysphagia. Materials used for teaching was color booklet with pictures.

-Phase IV: The Evaluation phase: -

- Evaluation was done for both groups (the control and the study group) by using tool II and III for experiencing radiation induced acute side effects in head and neck cancer patients immediately, one month and three months after implementing the module .
- Severity of acute side effects was assessed using Modified Eastern Cooperative Oncology Group performance scale (tool II) and Self-care questionnaire (tool III) before and after sessions.

Data processing and Analysis:

The collected data were organized, tabulated and statistically analyzed using SPSS software (Statistical Package for the Social Sciences, version 19, SPSS Inc. Chicago, IL, USA). For quantitative the range, mean and standard deviation were calculated. For qualitative data, percentage or proportion of each category using Chi-square test and Fisher Exact test (FE) between means of two groups of parametric data of student t-test was used. For comparison between means of two groups of non-parametric data of independent samples, Z value of Mann-whitney test was used. For comparison between more than two means of parametric data, F value of ANOVA test was calculated For comparison between more than two means of non-parametric data, Kruskal-Wallis (2) was calculated. For comparison between more than two means of non-parametric data of related samples, Friedman test (2 value) was calculated. Significance was adopted at $p < 0.05$ for interpretation of results of tests of significance.

Results

Table (1) Current medical history data among the studied head and neck cancer patients undergoing radiotherapy both

(control and study groups) (n=50).

This table illustrates that equal percentage (24%) of the control group I were diagnosed with laryngeal and salivary gland cancer while near quarter (24%) of the study group II were diagnosed with nasopharyngeal cancer with no significance difference.

Moreover, it illustrates that more than half (68%) of the control group I and near half (40%) of the study group II suffered from pain as chief complaint with very high statistical significance difference at p level=0.047 and slightly more than two third (76%) of the control group I and more than half (68%) of the study group II suffered from difficulty of swallowing as chief complaint and near quarter (20%) of the control group I suffered from mouth mass as chief complaint with very high statistical significance difference at p level=0.025.

Table (2): Quality grade of functional ability (ECOG performance status scale) among the studied head and neck cancer patients undergoing radiotherapy both (control and study groups) before and after one and three months of radiotherapy (n=50).

This table and figure illustrate that before receiving the radiation therapy the

minority (4%), (8%) of the control group I and the study group II were fully active, able to carry on all pre-disease performance without restriction with no statistical significance difference and one month after receiving radiotherapy slightly more than half (52%) of the control group I were Capable of only limited self-care; confined to bed or chair more than 50% of waking hours compared to near half (40%) of the study group II were restricted in physically strenuous activity but ambulatory and able to carry out work of a light or sedentary nature, e.g., light house work, office work with no statistical significance difference.

Also, three months' post receiving radiation therapy, only quarter (24%) of the control group I while more than half (60%) of the study group II return to be fully active and able to carry on all pre-disease performance without restriction with very high statistical significance difference at p level=0.0001.

Table (3): Mucositis occurrence among the studied head and neck cancer patients undergoing radiotherapy both (control and study groups) immediately, one month and three months after radiation treatment (n=50).

This table illustrates that there was a

reduction of mucositis occurrence in about quarter (20%) of the study group II than control group I immediate after radiotherapy with no statistical significance difference and this reduction raise in approximately equal percentage (32%) of the study group II than control group I one month and three months after radiotherapy with very high statistical significance difference at p level=0.0039, 0.0020 respectively.

Also, it reveals that about two third (76.5%) of the control group I compared to one quarter (25%) of the study group II had sever Mucositis immediate after radiotherapy with very high statistical significance difference at p level=0.025 and slightly more than half (53.8%) of the control group I and less than half (40%) of the study group II had moderate Mucositis one month with very high statistical significance difference at p level=0.006 and more than half (60%) of the control group I and half (50%) of the study group II had moderate mucositis three months after radiotherapy.

Table (4): Self-care practicing in alleviating dermatitis side effect of radiotherapy and its alleviating effect among the study group of head and neck cancer patients undergoing

radiotherapy (post receiving self-care teaching module on radiation induced acute side (n=50).

This table reveals that immediately post radiotherapy, by practicing self-care actions following teaching module, dermatitis completely relieved in more than half (66.7%) of the study group II and one-month post radiotherapy dermatitis relieved completely in all patients (100%) of the study group II with no statistical significance.

Table (5): Self-care practices in alleviating dysphagia side effect of radiotherapy and its alleviating effect among the study group of head and neck cancer patients undergoing radiotherapy (post receiving self-care teaching module on radiation induced acute side (n=50).

This table reveal that immediately post radiotherapy, by practicing self-care actions following teaching module, dysphagia partially relieved in more than half (68.7%) of the study group II and one-month post radiotherapy dysphagia relieved completely in about two third (70%) of the study group II while three months' post radiotherapy dysphagia completely relieved in all patients (100%) of the study group II with very high

statistical significance difference at p level=0.033.

Figure (1): - alleviating effect of self-care actions to Mucositis side effect of radiotherapy among the study group of head and neck cancer patients undergoing radiotherapy (post receiving self-care teaching module on radiation induced acute side (n=50).

This table and figure reveals that immediately post radiotherapy, by practicing self-care actions following teaching module, Mucositis partially relieved slightly more than half (58.3%) of the study group II and one-month post radiotherapy Mucositis relieved partially in more than half (60%) of the study group II while three months' post radiotherapy mucositis completely relieved in all patients (100%)

of the study group II with no statistical significance difference.

Figure (2): - Self-care practicing in alleviating dermatitis side effect of radiotherapy and its alleviating effect among the study group of head and neck cancer patients undergoing radiotherapy (post receiving self-care teaching module on radiation induced acute side (n=50).

This figure reveals that immediately post radiotherapy, by practicing self-care actions following teaching module, dermatitis completely relieved in more than half (66.7%) of the study group II and one-month post radiotherapy dermatitis relieved completely in all patients (100%) of the study group II with no statistical significance.

Figure (3) Grades of severity of dysphagia side effect among the studied head and neck cancer patients undergoing radiotherapy both (control and study groups) immediately, one month and three months after radiation treatment (n=50).

This figure reveals that equal percentage (100%) (100%) and the majority (85.7%) of the control group I had high intensity of dysphagia immediate, one and three months after radiotherapy compared to more than half (62.5%), (60%) and no one (0%) of the study group II had high intensity of dysphagia immediate, one and three months after radiotherapy with no statistical significance difference.

Table (1): Current medical history data among the studied head and neck cancer patients undergoing radiotherapy both (control and study groups) (n=50).

Current medical history data	The studied head and neck cancer patients (n=50)				χ^2	P
	Control group (n=25)		Study group (n=25)			
	n	%	n	%		
•Current diagnosis:					17.243	0.101
Buccal cancer	3	12.0	2	8.0		
Cancer of the nose & sinuses	0	0	1	4.0		
Glottic cancer	1	4.0	2	8.0		
Hypo pharyngeal cancer	5	20.0	2	8.0		
Laryngeal cancer	6	24.0	5	20.0		
Lip cancer	1	4.0	1	4.0		
Maxilla cancer	0	0	1	4.0		
Nasopharyngeal cancer	0	0	6	24.0		
Recurrent thyroid cancer	0	0	1	4.0		
Salivary glands cancer	6	24.0	0	0		
Thyroid cancer	1	4.0	2	8.0		
Tongue cancer	2	8.0	2	8.0		
•Grade of tumor:					1.220	0.543
Grade I	5	20.0	6	24.0		
Grade II	14	56.0	11	44.0		
Grade III	6	24.0	8	32.0		
•Chief complaint:					3.945	0.047*
Pain	17	68.0	10	40.0		
Sore throat	9	36.0	12	48.0	0.739	0.390
Difficulty of swallowing	19	76.0	17	68.0	0.397	0.529
A lump in the mouth	4	16.0	4	16.0	0.000	1.000
Others:						
-Lips ulcer	1	4.0	0	0	FE	1.000
-Mass in throat	1	4.0	0	0	FE	1.000
-Mouth mass	5	20.0	0	0	FE	0.025*
-Nasal mass	0	0	1	4.0	FE	1.000
-Tongue ulcer	0	0	2	8.0	FE	0.489

*Significant (P<0.05)

FE=Fisher Exact test

Table (2): Quality grade of functional ability (ECOG performance status scale) among the studied head and neck cancer patients undergoing radiotherapy both (control and study groups) before and after one and three months of radiotherapy (n=50).

Quality grade of functional ability items (ECOG performance status scale)	Functional ability (ECOG scale) among the studied head and neck cancer patients before and one month and three months after radiotherapy (n=50)												χ^2 P (Control vs Study group)		
	Control group (n=25)						Study group (n=25)						Before	One month after	3 months after
	Before		One month after		3 months after		Before		One month after		3 months after				
	n	%	n	%	n	%	n	%	n	%	n	%			
•Grade 0 (Fully active, able to carry on all pre-disease performance without restriction)	1	4.0	0	0	6	24.0	2	8.0	0	0	15	60.0	1.034 0.905	6.159 0.104	20.165 0.0001*
•Grade 1 (Restricted in physically strenuous activity but ambulatory and able to carry out work of a light or sedentary nature, e.g., light house work, office work)	2	8.0	5	20.0	3	12.0	1	4.0	10	40.0	9	36.0			
•Grade 2 (Ambulatory and capable of all self-care but unable to carry out any work activities; up and about more than 50% of waking hours)	7	28.0	5	20.0	12	48.0	6	24.0	8	32.0	1	4.0			
•Grade 3 (Capable of only limited self-care; confined to bed or chair more than 50% of waking hours)	9	36.0	13	52.0	3	12.0	11	44.0	7	28.0	0	0			
Grade 4 (Completely disabled; cannot carry on any self-care; totally confined to bed or chair)	6	24.0	2	8.0	1	4.0	5	20.0	0	0	0	0			
χ^2 P	24.254 0.002*						56.245 0.0001*								

*Significant (P<0.05)

Table (3): Mucositis occurrence among the studied head and neck cancer patients undergoing radiotherapy both (control and study groups) immediately, one month and three months after radiation treatment (n=50)

Mucositis as a side effect after radiation treatment	Mucositis occurrence among the studied head and neck cancer patients immediately, one month and three months after radiation treatment (n=50)												χ^2 P		
	Control group (n=25)						Study group (n=25)								
	Immediate after		One month after		3 months after		Immediate after		One month after		3 months after		Immediate after	One month after	3 months after
	n	%	n	%	n	%	n	%	n	%	n	%			
Occurrence of mucositis:															
No	8	32.0	12	48.0	15	60.0	13	52.0	20	80.0	23	92.0	1.310 0.251	4.250 0.039*	5.370 0.020*
Yes	17	68.0	13	52.0	10	40.0	12	48.0	5	20.0	2	8.0			
χ^2 (P)	3.960 (0.138)						11.140 (0.004*)								
Severity of mucositis:															
Very simple	0	0	0	0	0	0	3	25.0	0	0	0	0	9.332 0.025*	10.246 0.006*	5.830 0.054
Simple	2	11.8	0	0	0	0	2	16.7	3	60.0	1	50.0			
Moderate	2	11.8	7	53.8	6	60.0	4	33.3	2	40.0	1	50.0			
Very severe	13	76.5	6	46.2	4	40.0	3	25.0	0	0	0	0			
χ^2 (P)	8.060 (0.020*)						5.900 (0.116)								
Distress from mucositis:															
Very simple	0	0	0	0	0	0	1	8.3	2	40.0	0	0	7.420 0.059	7.590 0.055	5.700 0.058
Simple	2	11.8	3	23.1	0	0	5	41.7	2	40.0	1	50.0			
Moderate	7	41.2	8	61.5	7	70.0	5	41.7	1	20.0	1	50.0			
Very severe	8	47.0	2	15.4	3	30.0	1	8.3	0	0	0	0			
χ^2 (P)	3.410 (0.181)						1940 (0.585)								

Table (4): Self-care actions in alleviating dermatitis side effect of radiotherapy and its alleviating effect among the study group of head and neck cancer patients undergoing radiotherapy (post receiving self-care teaching module on radiation induced acute side (n=50).

Self-care actions in alleviating dermatitis	The studied head and neck cancer patients who received self-care teaching module (n=25)					
	Immediate after module		One month after module		Three months after module	
	n	%	n	%	n	%
Self-care actions in alleviating dermatitis:						
•Avoid using irritant soap, deodorant, perfumes and other creams over the treated area with radiotherapy	25	100	25	100	25	100
•Gently washing and drying the treatment area without massage or friction by using soft towel	25	100	25	100	25	100
•Shave the treatment area with electrical razor rather than normal razor and avoid using perfumes after shaving	25	100	25	100	25	100
•Wear loose-fitting cotton clothing over the treated area with radiotherapy	25	100	25	100	25	100
•Using cotton linen for beds	25	100	25	100	25	100
•Expose treated area to air as possible	25	100	25	100	25	100
•Avoid tape and adhesives over the treated area with radiotherapy	25	100	25	100	25	100
•Avoid ice or heating pads over the treated area and use only tape water	25	100	25	100	25	100
•Avoid exposure of treated area to sunlight and avoid using sunscreen	25	100	25	100	25	100
•Occurrence of dermatitis:						
No	19	76.0	24	96.0	25	100
Yes	6	24.0	1	4.0	0	0
χ^2	9.770					
P	0.007*					
Alleviating effect of self-care actions:						
Partially relieved	2	33.3	0	0	0	0
Completely relieved	4	66.7	1	100	0	0
FE (P)	FE (0.428)					

FE=Fisher Exact test *Significant (P <0.05)

Table (5): Self-care actions in alleviating dysphagia side effect of radiotherapy and its alleviating effect among the study group of head and neck cancer patients undergoing radiotherapy (post receiving self-care teaching module about radiation induced acute side (n=50).

Self-care actions in alleviating dysphagia	The studied head and neck cancer patients who received self-care teaching module (n=25)					
	Immediate after module		One month after module		Three months after module	
	N	%	n	%	n	%
Self-care actions in alleviating dysphagia:						
•Chew sugar free gum to stimulate flow of saliva	25	100	25	100	25	100
•Moisten your lips continuously by using lip moistening	25	100	25	100	25	100
•Eat smooth foods such as yogurt and blend food with milk	25	100	25	100	25	100
•Drink acidic juice only in absence of mucositis such as orange and lemon juice	25	100	25	100	25	100
•Carry a water bottle and have regular sips throughout the day	25	100	25	100	25	100
•Cook the food very well and eat small frequent meals and snacks easier than three large meals	25	100	25	100	25	100
•Avoid sharp or crunchy foods such as potato chips, dry bread and nuts	25	100	25	100	25	100
•Occurrence of dermatitis:						
No	9	36.0	15	60.0	22	88.0
Yes	16	64.0	10	40.0	3	12.0
χ^2	14.280					
P	0.0008*					
Alleviating effect of self-care actions of dysphagia:						
Partially relieved	11	68.7	3	30.0	0	0
Completely relieved	5	31.3	7	70.0	3	100
χ^2	6.820					
P	0.033*					

***Significant (P<0.05)**

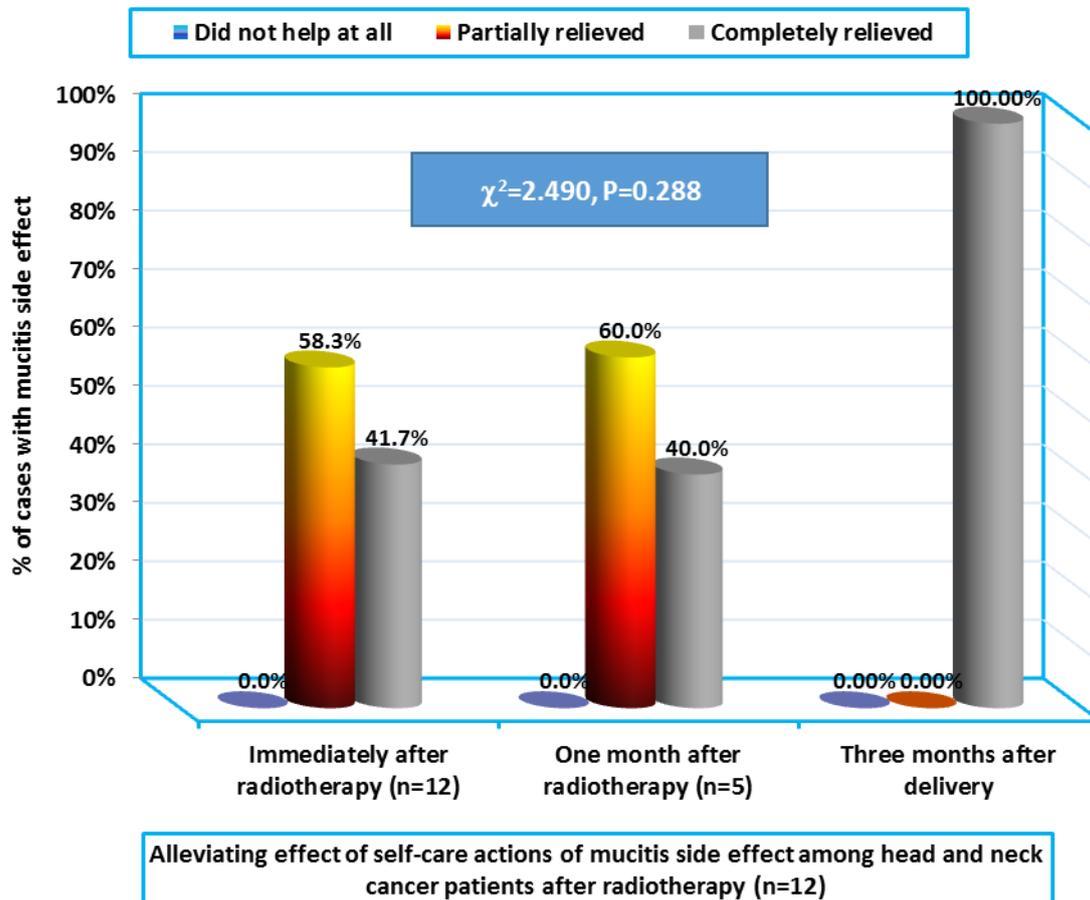


Figure (1): Alleviating effect of self-care actions to Mucositis side effect of radiotherapy among the study group of head and neck cancer patients undergoing radiotherapy (post receiving self-care teaching module on radiation induced acute side (n=50).

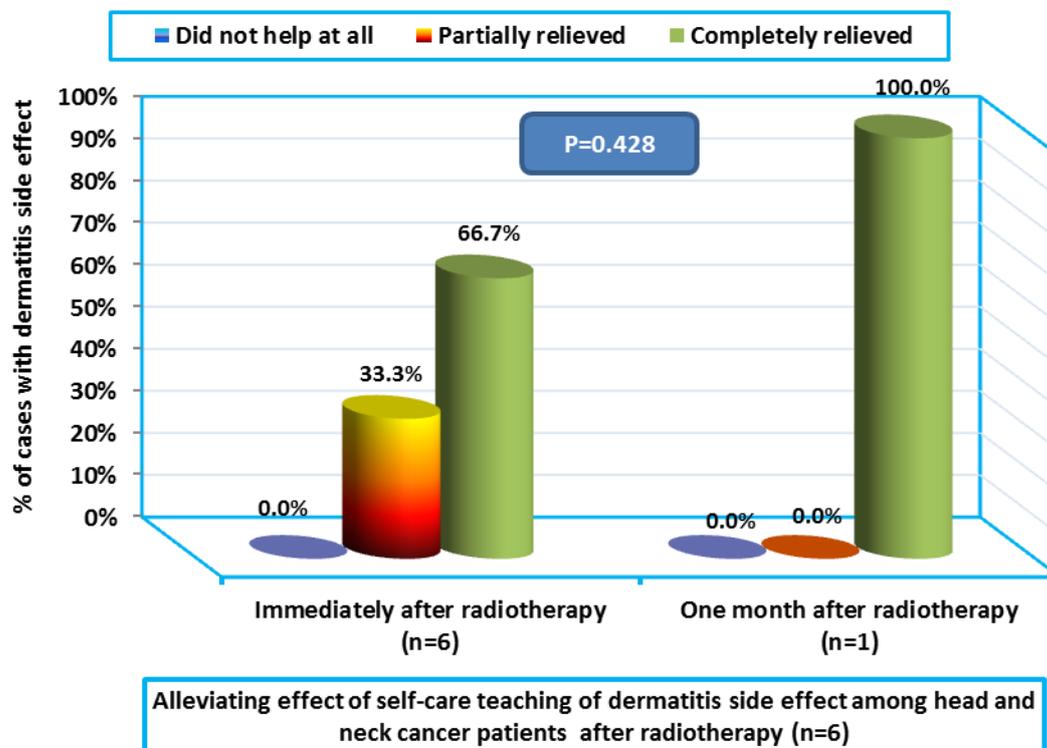


Figure (2): Alleviating effect of self-care actions to dermatitis side effect of radiotherapy among the study group of head and neck cancer patients undergoing radiotherapy (post receiving self-care teaching module on radiation induced acute side (n=50).

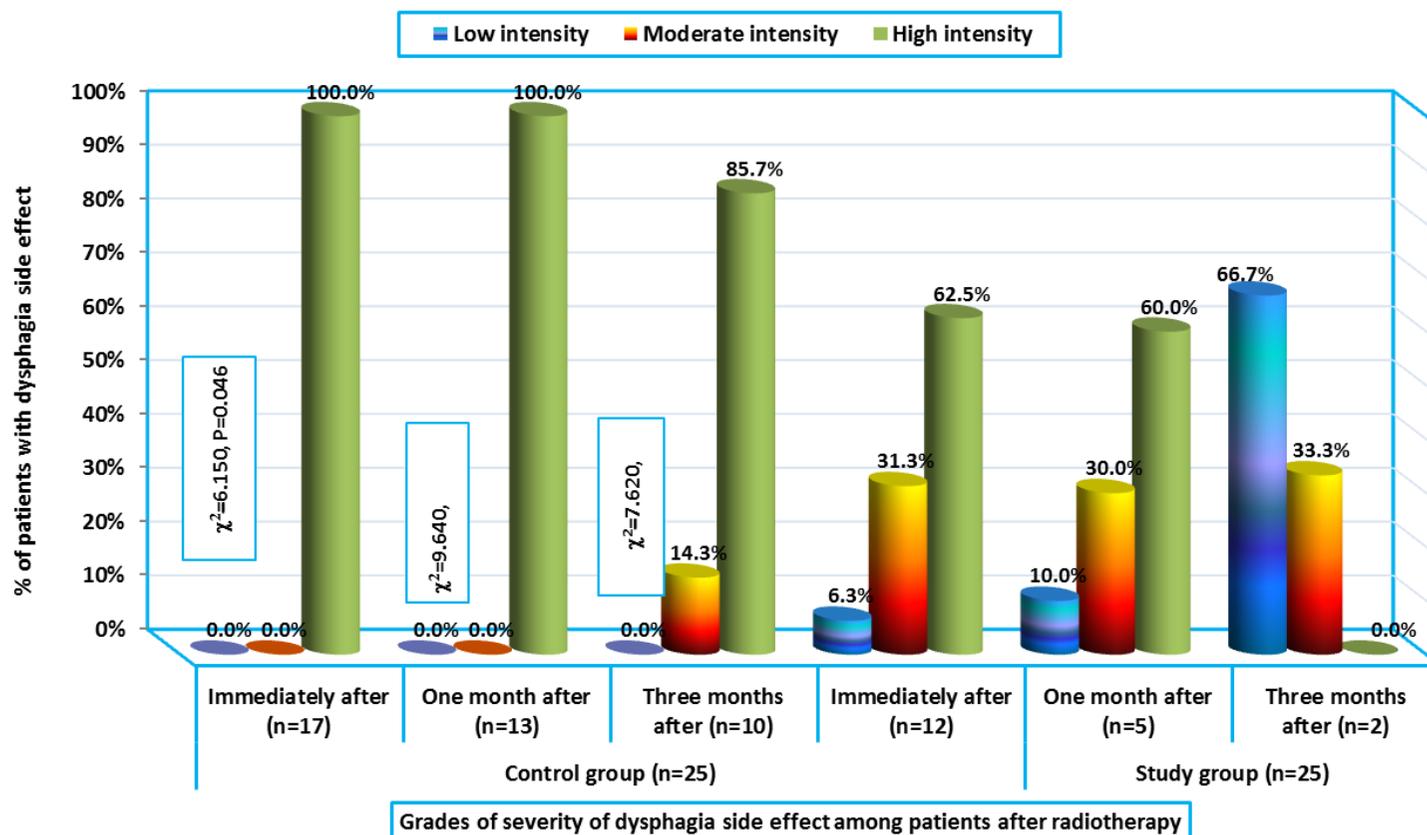


Figure (3): Grades of severity of dysphagia side effect among the studied head and neck cancer patients undergoing radiotherapy both (control and study groups) immediately, one month and three months after radiation treatment (n=50). NB Comparison of the control and study group (immediately after, one month and 3 months after radiotherapy)

Discussion

Patient education by using teaching module is the process by which health professionals and others impart information to patients and their caregivers that will alter their health behaviors or improve their health. Every effort must be made to ensure that learning takes place in incremental steps and that patients are not overwhelmed with too much information at onetime. (25)

The current study reveals that, the highest incidence of HNC patients of the control group I were among the mean age group of thirty-one to less than or equal forty-one years old while the highest incidence of study group II among the mean age group of fifty-one to less than or equal fifty-five years old. This is the same line with **De Melo et.al; (2013)** (26) results indicated that patients diagnosed with head and neck cancer aged under sixty years old. In the other aspect **Mouw et.al; (2008)** (27), mentioned that the patients aged ranged only from fifty- one to seventy years old. **In relation to sex of the control and study groups,** the findings of the current study indicate that the majority of the study were male. Many research study

results (28-30,4) had proven that a higher incidence of head and neck tumors in males and relatively rare in females. However, in recent years there has been significant increase in the incidence of head and neck tumors in females probably due to changes in female behavior toward smoking and alcohol drinking habits. (31)

In relation to current medical history data among control and study groups, the findings from the current study indicate that more than half of control group I and less than half of the study group II reported pain while near quarter of the control group I and no one of the study group II had mouth mass so there was significant difference among the control and study groups regarding pain and mouth mass as chief complaint of HNC. This finding is similar to result findings of study was done by **Wan et.al; (2011)** (32), who pointed out that a large number of HNC patients experienced symptoms as pain and mouth mass as a chief complaint by using EORTC QLQ-C30 and QLQ-H&N35 Questionnaires.

Concerning type of head and neck cancer, the result of current study

reveals that the high incidence was laryngeal cancer followed by hypopharyngeal cancer among the control and study groups while the lowest incidence was cancer of the nose, sinus followed by maxilla and finally recurrent thyroid cancer at equal four percentages among the control and study groups. This finding is in disagreement with **Dobrossy (2005)**⁽³³⁾, who stated that most frequent tumor site was the oral cavity. Also, this finding is incongruent with **Hassanein (2005)**⁽³⁴⁾, who concluded that the most commonly affected site was the floor of the mouth followed by the gingiva, the maxilla and the tongue.

As regards to grade of head and neck cancer, biopsy pathological study of HNC patients proven that most of the current studied patients had diagnosed as grade II HNC while the minority of them had grade I HNC diagnosis. This finding is contradict with the study result done by **Rosenthal et.al; (2015)**⁽³⁵⁾, who recorded that the majority of the patients were diagnosed as stage III of head and neck cancer and also this finding is in disagreement with **Stewart (2003)**⁽³⁶⁾, who concluded that a high frequency of head and neck cancer cases were

diagnosed at an advanced stage III and low frequency of HNC cases were diagnosed at early stage I, II according to world health organization.

Comparing HNC quality grade of functional ability before, one and three months after receiving radiotherapy, the current study findings records that before receiving radiotherapy the minority of the study were scored zero that means they were fully active and able to carry on all pre disease performance without restriction. This finding is in the same line with **Conill et.al; (2000)**⁽³⁷⁾, who pointed out that the minority of the patients were fully active before receiving the radiotherapy.

However, post three months from receiving radiotherapy near quarter of the control group I compared to more than half of the study group II still fully active. The present finding support research hypothesis that adult patients with HNC undergoing RT who received self-care teaching module beside hospital routine care have higher mean score clinical outcome than control group I. This finding is consistent with **Conill et.al; (2000)**⁽³⁷⁾, who study finding pointed out that the majority of the patients still fully active or restricted in

physically strenuous activity but ambulated after three months from receiving radiotherapy.

Mucositis is the most common acute side effect experienced by patients undergoing head and neck radiotherapy.

In almost all cases, the patients

Experience confluent mucositis by approximately the third week of treatment. Mucosal damage occurs because of decreased cell renewal in the epithelium, which causes mucosal atrophy and ulceration. This is accompanied by pain, burning and discomfort, which are greatly aggravated by contact with highly spicy foods. Clinically mucositis is characterized by inflammation, erythema, mucosal atrophy and ulceration of the oral mucosa.⁽³⁸⁻⁴⁰⁾

In relation mucositis occurrence, the result of the current study reveals that approximately one third of the control group I and slightly more than half of the study group II had no mucositis occurrence immediate after radiotherapy. This finding is inconsistent with **Trotti et.al; (2003)**⁽⁴¹⁾, in a study to assess mucositis incidence, severity and associated outcomes in patients with head and neck cancer receiving

radiotherapy with or without chemotherapy who reported that virtually all patients who receive radiation therapy for HNC develop some degree of mucositis immediate after radiotherapy.

Also, one and three months' post radiotherapy the result of the current study indicates that more than half and less than half of the control group I had mucositis compared to less than quarter and the minority of the study group II had mucositis respectively. This finding is consistent with **Elting et.al; (2007)**⁽⁴²⁾, who reported that mucositis is a quite common complication in head and neck cancer patients treated with radiotherapy.

As regard severity of mucositis, the findings of the current study indicates that one quarter of the study group II had severe mucositis immediate after radiotherapy compared to less than half of them had moderate mucositis one month after receiving radiotherapy while half of the them had simple mucositis three months after radiotherapy. It may be due to application of self-care actions by the patients which help them to decrease severity of the mucositis. This finding is in congruent with a study result done by **Elting et.al; (2007)**⁽⁴²⁾, mentioned that more than half of patients

had severe mucositis immediately after radiotherapy.

Moreover, the result of the current study reports that the minority the study group II had severe distress from mucositis immediate after radiotherapy compared to near quarter of them had moderate distress one month after radiotherapy and half of them had simple distress three months' post radiotherapy which means that the severity of mucositis decrease by practicing self-care actions by the patients. This finding is congruent a study result was conducted by **Epstein and Stewart; (2003)** ⁽⁴³⁾, who pointed out that oral pain from mucositis is reported to decrease in distress through the course of radiation.

In relation to Routine care and self-care actions in alleviating dermatitis side effect of radiotherapy, the result of current study finds that immediately post radiotherapy by practicing routine and self-care actions, dermatitis completely relieved in more than half of the study group II compared to no one in the control group I and one-month post radiotherapy dermatitis relieved completely in all patients of both groups. This means that either practicing routine care only or in addition with self-care

actions provided in booklet by the researcher they help to relieved dermatitis in both groups one month later.

This finding is accordance a study result was done by **Abbas (2012)** ⁽⁴⁴⁾, reported that current care for patients with dermatitis is essentially palliative and includes hygiene orientation site, reduction of exposure and friction of the irradiated

area, use of appropriate clothing, preferably cotton, avoid sun exposure and contact with extreme temperatures as compresses, avoid itching the irradiated area, avoid using products that have strong agents in their composition as some types of soaps.

As regards self-care actions in alleviating dysphagia, it is found that immediately post radiotherapy by practicing self-care actions following teaching module, dysphagia partially relieved in more than half of the study group II and one-month post radiotherapy dysphagia relieved completely in about two third of the study group II while three months' post radiotherapy dysphagia completely relieved in all patients of the study group II. The present finding support research

hypothesis that by practicing specific actions which include eat soft, smooth foods, use a straw to drink liquids and soft foods, eat warm or room-temperature foods to reduce pain, Take small bites, and chew slowly and thoroughly. Eat small frequent meals and snacks, avoid spicy foods, foods that are acidic such as tomatoes and citrus, and sharp or crunchy foods such as potato chips, avoid Smoking and alcohol. (45,46,47)

This finding is in the same line with a study result was conducted by **Duarte et.al; (2013)**⁽⁴⁸⁾, mentioned that recommendations given to HNC patients for dietary modifications such as decrease size and consistency of foods is essential to alleviate dysphagia.

Finally, the current study shows that self-care actions either practiced by patients or their families for radiation induced acute side effects which include mucositis, dermatitis and dysphagia had positive effect on preventing or minimizing these acute side effects and patient distress from them and this leading to improving functional ability of the head and neck cancer patients. Consequently, the hypothesis of the current study was approved so we can

confirm that adult patients with head and neck cancer undergoing radiation therapy who were received self-care teaching module have higher mean scores clinical outcomes than control group and the study accepted the hypothesis.

Conclusion and recommendations

Conclusion

Based on the findings from the present study, it can be concluded that the functional ability measured by ECOG scale and the severity of radiation mucositis, dermatitis and dysphagia measured by Dodd self-care questionnaire were improved in study group II than control group I with very high statistical significance difference. So self-care teaching module for patient with HNC treated by radiation which induced acute side effect had an effect on decreasing the occurrence, the severity and distress of acute side effects in head and neck cancer patients undergoing radiotherapy

Recommendations

Based on the findings of the current study, the following recommendations are geared toward the following:

1- Recommendation for patients:

- Head and neck cancer patients should be practice self-care pre radiotherapy

procedure to relieve fear and enhance daily living activities .

- All head and neck cancer patients must perform self-care actions to prevent manage acute side effect of radiotherapy and improve their clinical outcomes.

2- Recommendation for nurses:

- In-service training for the nurses about self-care for patient undergoing radiotherapy

3- For further research studies:

- Assessment of quality of life (physical, psychological, social, spiritual) related to radiation induced acute side effects in early stage in head and neck cancer patients undergoing radiotherapy.

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