

Effect of Designed Nursing Education on Awareness of Patients Receiving Head and Neck Radiation Therapy

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Abstract:

The purpose for the study was to evaluate the effect of designed nursing education on awareness of patients receiving head and neck radiation therapy. **Setting:** The study was carried out at the Outpatient Clinics of Clinical Oncology Department and Radiotherapy Unit in Menoufia University Hospital. **Subjects:** A consecutive sample of 100 patients of both sexes with head and neck cancer patients receiving external radiation was selected and randomly assigned alternatively and randomly into two equal groups, 50 patients for each group. **Instruments:** Structured interview schedule, includes: three parts as following: Part one: patient's Sociodemographic data, Part two: Medical data, Part three: Patient's knowledge which contains knowledge about head and neck cancer and knowledge about radiotherapy. **Results:** It is revealed that the mean ages for the study group was 49.12±11.25 years and control group 48.24±10.45 years. There is a significant improvement in the total knowledge score among study group than control group at post intervention regarding. **Conclusion:** The total knowledge score among study group (group I) was significantly higher than control group (group II) after the designed nursing intervention. **Recommendation:** The designed nursing intervention program should be carried out for patients with head and neck cancer at radiotherapy unit in oncology department .A colored booklet about this intervention should be prepared and distributed among nurses working at radiotherapy unit in Oncology Department.

Key words: head and neck cancer, radiation therapy, nursing education.

Introduction:

Cancer is a large group of diseases that can start in almost any organ or tissue of the body when abnormal cells grow uncontrollably, go beyond their usual boundaries to invade adjoining parts of the body and/or spread to other organs. It is the second leading cause of death globally, accounting for an estimated 9.6 million deaths (World Health Organization, 2019).

Overall incidence of head and neck cancer (HNC) in Egypt was approximately twice among males than females. Based on population-based study and cancer registry data, Egypt had one of the highest overall incidence rates of cancer of oral cavity and pharynx among Middle East countries (Attar, Dey & Hablas, 2018).

There are many types of head and neck cancer treatment that depend on the type of cancer, how advanced it is, tumor site, relative morbidity of various treatment options, patient's performance, nutritional status, concomitant health problems and previous primary tumors. The main types of the treatment are radiation, surgery and chemotherapy (Thomson, Ashcroft, Denton & Betts, 2015).

Radiotherapy (RT) is a treatment modality that is based on the use of high energy rays or radioactive substances to damage tumor cells and to suppress their growth and division. RT is used alone or in association with different treatments (Jonathan, Tward, Christopher & Anker, 2012).

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Head and neck cancer is a serious disease that influence quality of life even during the early stage of RT (Haisfield-Wolfe, McGuire, Soeken, Geiger-Brown, De Forge & Suntharalingam, 2012) .So, it is important to identify and manage symptoms and impairments in patients recently diagnosed with cancer. Assessments of an individual's needs and interventions that are tailored to these needs from the time between diagnosis and the start of cancer treatment can offer significant physical and psychological relief for patients (Silver, 2014).Nursing intervention has a positive effect on the feeling of hope, physical and emotional aspects of the cancer patient(Li, Guo, Tang & Yang, 2018) .

Before beginning radiation therapy for any type of head and neck cancer, patients should be examined by an oncologic dentist or oral oncologist. Because radiation therapy can cause tooth decay, damaged teeth may need to be removed. Also, they should also receive an evaluation from a speech pathologist (Moore-Higgs, 2017).

However, the use of ionizing radiation is essential in treatment of head and neck cancer, it has several side effects that may limit or interrupt treatment with radiation, thus compromising the chance for a cure. Radiotherapy causes general and site specific or local side effects. General Side effects are as fatigue, malaise, headache, nausea, anorexia and vomiting. While site specific Side effects of radiotherapy for head and neck cancer consist of acute toxicities or adverse effects in which symptoms can be present both during the course of radiation and immediate post-irradiation period for up to three months post-radiotherapy and late toxicities or adverse effects which tend to persist several months or years after the completion of radiotherapy (Kelly, Paleri, Downs & Shah, 2017).

Moreover, Pain seems to be very common in HNC patients. It is present in about half of patients before treatment, 81% during treatment, 70% at the end and 36% of patients by 6 months after treatment. Highly intense pain may also require special pain-therapies or pain sessions in order to minimize it and increase the patient's QOL (Epstein, Tsang, Warkentin & Ship, 2015).

As radiation therapy to the head and neck area presents a major challenge to patients and nurses. Side effects are often severe and disabling and may significantly impact quality of life. The lived experience of radiation therapy to head and neck area profoundly affects activities of daily living, requiring nursing support and education throughout the trajectory of treatment (Donovan & Glacken ,2015).

American College of Radiology (ACR) defined the radiation oncology nurse as the nurse who will assess and provide appropriate nursing intervention for the actual and potential problems that the patients and their families may experience related to the disease process, treatment course and follow-up period. This role includes teaching, counselling and support functions needed to assist patients and families to cope with and adjust to the diagnosis and treatment of cancer (Bruner, 2015).

Nurses' role is not only in the maintenance of the treatment and its adverse effects, but also act as information disseminators about the disease and its treatment, offering relief measures and helping the patients to cope with the disease. Therefore, the challenge of nursing care for this population relates to the different physical and psychosocial demands which need to be attended to through different forms of communication and counseling, besides specialized theoretical and practical knowledge involving care (Gill & Duffy, 2010).

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Teaching is a primary responsibility of nurses for many cancer patients including head and neck cancer. Patients and their families must know what to expect, get a chance to ask questions and have those questions to be answered. Those patients who are undergoing radiation treatment presents the nurse with many challenges that result from the site of the cancer as well as the radical treatments for this disease (Vickery, Latchford & Hewison , 2016) So, enough information must be provided for patients receiving radiotherapy, before the first treatment session as an orientation and educational programme (Dunberger & Bergmark, 2016). The nursing care for patients focuses on preparing the patients physically and psychologically for therapy, so, pretreatment assessment data is very important. These assessments include knowledge of the treatment plan and goal of therapy, the patient's and family's understanding of disease process and treatment plan, knowledge of possible side effects and problems such as patient's transportation to the treatment center. Patient's education and implementation of interventions during treatment also is very important (Shepard & Kelvin, 2014).

The nursing care for patients with head and neck cancer concerns the management of the actual and potential responses of patients to their cancer and its treatment and of the rehabilitation of patients back into daily life. It is acknowledged that experienced nursing care and coordination is vital to support the patients (National Cancer Institute, 2018).

Significance of the study

Grant ,Padilla ,Ferrell and Rhiner (2009) reported that due to the severity of radiotherapy side effects , an understanding of the factors influencing patients' perceived well-being enables

health professionals to tailor interventions more effectively toward the relief of physical symptoms and emotional distress because these may affect overall well-being and quality of life. Egypt had one of the highest overall incidence rates of cancer of oral cavity and pharynx among Middle East countries. For this reason, this study will be conducted to evaluate the effect of designed nursing education on awareness of patients receiving head and neck radiation therapy.

Purpose of the study

The purpose of the current study was to evaluate the effect of a designed nursing education on knowledge of patients receiving head and neck radiation therapy

Research Hypotheses

The following research hypotheses were formulated to achieve the aim of the study: -

Patients in the study group who receive designed nursing education will have higher level of awareness than patients than patients who didn't receive (control group).

Method

Research design:

A quasi experimental research design was utilized to achieve the purpose of this study.

Setting:

The study was conducted at the Outpatient Clinics of Clinical Oncology Department and Radiotherapy Unit of Menoufia University Hospital .

Sampling:

A consecutive sample of 100 head and neck cancer patients receiving external radiation. They were assigned randomly and alternatively into two equal groups,

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50 patients for each group .Group one was the study group. They received the designed nursing education program along with routine hospital care. Group two was the control group .they only received routine hospital care that was provided during receiving radiotherapy sessions.

Inclusion criteria:

The study subjects were selected according to the following criteria:

- Adult, Conscious patients.
- Newly diagnosed patients with head and neck cancer who didn't receive any radiotherapy session.

Exclusion criteria:

Patients with other associated disorders such as connective tissue diseases or genetic conditions predisposing to skin cancer because in conjunction with radiotherapy more tumors in the treated area may be induced.

Sampling technique:

The participants of the study were chosen from Oncology Department, Menoufia University Hospital. Sample size and power of the study: 50 patients in group 1 and 50 patients in group 2 were required based on the following assumptions: with the power of 80%, $\alpha=0.05$ and ratio of the study to control (1:1). The required sample size was determined using PS (power and Sample size calculation software) (Soga, Sugiura, Takahashi, Nishimoto & Maeda, 2010).

Instruments of the study:

Based on the review of related literatures (Kaur, Pathak & Patel, 2014) instruments used by the researcher for data collection, were as the following:

Structured interview schedule:

One instrument was developed by the researcher after reviewing the related literature (Kaur, Pathak & Patel, 2014) to assess patient's knowledge. It was comprised of three parts as follows:

▪ **Part one: patient's Social characteristics:** It was comprised of six questions including data related to patient's age, sex, marital status...etc.

▪ **Part two: Medical data:** It was comprised of questions about cause of hospitalization, other chronic diseases, previous surgeries, family history of cancer, treatment modalities, head and neck cancer site, time of disease discovery, risk factors for head and neck cancer as prolonged exposure to sun, smoking, alcoholism, high intake of certain foods, mouth care and previous exposure to viral infection.

▪ **Part three: Patient's knowledge:**
It contained two sections about :

A. Patient's knowledge about head and neck cancer:

It was comprised of 5 questions related to patient's knowledge about definition, risk factors, clinical manifestations, methods of diagnosis and treatment of head and neck cancer.

B. Patient's knowledge about radiotherapy:

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It was comprised of 4 questions related to patient's knowledge about definition, types, benefits and side effects of radiotherapy.

Scoring system: Each question was given two marks if the subject reported completely correct answer, one mark if he /she reported incompletely correct answer and zero if the answer was incorrect or I don't know. All questions were summed to give a score that ranged from zero to eighteen. The score was categorized as:

- ❖ A score less than 50% denoted poor knowledge (from zero to eight marks).
- ❖ A score from 50 % to less than 70% denoted fair knowledge (from nine to twelve marks).
- ❖ A score of 70% or more denoted good knowledge (from thirteen to eighteen marks).

Procedure

Written approval: An official letter was submitted from the dean of the Faculty of Nursing to the directors of the Oncology University hospital explaining the purpose of the study and the methods of data collection.

Pilot study: A pilot study was conducted prior to data collection on 10% of the study sample (ten patients) to test the feasibility, clarity and

applicability of the instruments. Then necessary modifications were done. These patients were excluded from the study sample.

Ethical Considerations: An agreement from the ethical commitment was obtained from ethical and research committee of the Faculty of Nursing, Menoufia University. A verbal and written agreement to participate in this study was obtained from subjects who met the inclusion criteria after explanation of the purpose of study. Each subject was reassured that any obtained information would be confidential and would only be used for the study purpose. The researcher emphasized that participation in the study was entirely voluntary and anonymity of the patients were assured through coding data. Patients were also informed that they can withdraw from the study at any time without any penalty and their refusal to participate wouldn't affect their care. Moreover, they were assured that the nature of the questionnaire would not cause any physical or emotional harm.

- Data collection extended over a period of 12 months starting from January 2019 to January 2020.
- Patients who agreed to participate in the study and fulfilled the inclusion

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criteria were interviewed individually by the researcher at the Outpatient Clinics at Clinical Oncology Department and Radiotherapy Unit.

- The researcher dealt with the control group (II) firstly then the study group (I) to avoid the contamination of results. The purpose of the study was explained to each subject of both study and control groups.
- The study was conducted on four phases: Assessment, planning, implementation and evaluation phases as following:

1) Assessment phase:

During this phase the researcher interviewed each patient in the two groups before starting radiotherapy sessions to collect base line data. All patients of both groups were assessed for social characteristics, medical data and knowledge about head and neck cancer, treatment modalities, radiation therapy and its associated problems by utilizing the instrument part one, two and three.

2) Planning phase:

Based on the gathered information and knowledge level of patients during the assessment phase, a colored booklet as developed and distributed among patients supported with illustrative pictures about:

- **Head and neck cancer:** Definition, types, risk factors, warning signs, diagnosis and treatment.
- **Radiotherapy:** Definition, types, benefits, side effects and preparations before and during procedure.
- **Nursing intervention to problems associated with radiotherapy to increase patients' awareness:** (general and local side effects).

3) Implementation phase

The researcher interviewed each patient in the study group individually at the waiting room of Radiotherapy Unit at Clinical Oncology Department. The researcher conducted at least three teaching sessions or more for each patient according to his/ her level of understanding. Each session was conducted using lecture and discussion and during the final session demonstration and re-demonstration were used additionally. The sessions were started following the physician decision for starting radiotherapy and ended before starting radiotherapy. This took about from one to two weeks. The researcher distributed the prepared booklet between patients in group 1 (study group) or his/her

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accompanying person before starting the first session.

- **During the first session:** Information about cancer, head and neck cancer: definition, types, risk factors, warning signs, diagnosis and treatment. It took about 30-45 minutes according to patients' level of understanding. At the end of the session the researcher allowed subjects to ask questions and provided them with the answers.
- **During the second session:** The researcher refreshed the previous information and then provided education about radiotherapy: definition, types, benefits, side effects and procedure. Also, description of preparations before and during procedure and nursing management of common side effects of radiotherapy as anorexia, nausea and vomiting, malnutrition, risk for infection, risk for bleeding, stomatitis, decreased salivation and skin care. At the end of the session the researcher allowed the patients to ask questions and provided them with the answers. It took about 45 - 60 minutes according to subjects' level of understanding.
- **During the third session:** In this session the researcher refreshed and reinforced the previous information.
- The researcher taught subjects how to perform proper oral hygiene by

proper technique using proper solutions. Swallowing exercises to improve swallowing and speech were demonstrated. Then subjects re-demonstrated the learned skills. It took about 30-45 minutes.

4) Evaluation phase:

Evaluation of all subjects of both groups was carried out at the midst session of treatment period after 3 weeks from the first interview (posttest) and at the last session of radiotherapy for determining the effectiveness of nursing education using the designed instrument.

Statistical 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). The range, mean and standard deviation were calculated for quantitative data. Qualitative data which described categorical set of data by frequency, percentage or proportion of each category, comparison between two groups and more was done using Chi-square test (χ^2). 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 non-parametric data, Kruskal-Wallis (χ^2 value) was calculated. If P-value > 0.05 there is a non-statistically significant difference, a statistical significant difference was considered if P-value ≤ 0.05 , a highly statistical significant difference if P-value ≤ 0.001 .

Results:

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Table (1): Percentage distribution of both study and control groups according to their social characteristics (n=100).

Social characteristics	Studied subjects (n=100)				χ^2	P
	Study group (n=50)		Control group (n=50)			
	N	%	N	%		
•Age years: 18 25 35 45 55-65 Range Mean±SD	2	4.0	2	4.0	1.605	0.808
	6	12.0	4	8.0		
	8	16.0	11	22.0		
	13	26.0	16	32.0		
	21	42.0	17	34.0		
	24-64		22-64		t-test	0.686
	49.12±11.25		48.24±10.45		=0.405	
•Sex: Male Female	37	74.0	39	78.0	0.219	0.640
	13	26.0	11	22.0		
•Marital status: Single Married Divorced Widow	2	4.0	3	6.0	1.392	0.707
	37	74.0	37	74.0		
	3	6.0	5	10.0		
	8	16.0	5	10.0		
•Educational level: Illiterate Basic education Secondary education University & higher education	18	36.0	17	34.0	0.960	0.811
	14	28.0	11	22.0		
	12	24.0	16	32.0		
	6	12.0	6	12.0		
•Occupation: Housewives Employee Worker Not working	9	18.0	5	10.0	3.276	0.351
	16	32.0	14	28.0		
	19	38.0	19	38.0		
	6	12.0	12	24.0		
•Residence: Rural Urban;	24	48.0	28	56.0	0.641	0.423
	26	52.0	22	44.0		

Table (1): This table shows that 42.0 % and 34.0% of the sample in the study and control groups were between 55 to 65 years. About three fourths of both groups (74.0% and 78% respectively) were males. Concerning marital status, about three fourths of both groups (74.0%) were married. Regarding level of education, about one third of both study and control groups (36.0% and

34.0% respectively) were illiterate. More than one third of them (38.0%) were workers. As regards residence, more than half of study group (52.0%) were from urban areas where as more than half of the control group (56.0%) were from rural areas. There were no statistically significant differences between both groups regarding all sociodemographic characteristics.

Table (2): Percentage distribution of patients in the study and control groups according to their medical history (n=100).

Medical history	Studied subjects (n=100)				χ^2	P
	Study group (n=50)		Control group (n=50)			
	N	%	N	%		
•Previous hospitalization:						
Yes	21	42.0	15	30.0	1.563	0.211
No	29	58.0	35	70.0		
Causes of previous hospitalization					0.396	0.821
Appendectomy	8	38.1	5	33.3		
Hemiorrhaphy Section	8	38.1	5	33.3		
	5	23.8	5	33.3		
Number of previous hospitalizations					4.918	0.086
One time	10	47.6	12	80.0		
Two times	7	33.3	3	20.0		
More than two times	4	19.0	0	0		
-The last treatment period (days):					0.264	0.607
< 3	13	61.9	8	53.3		
3 & more	8	38.1	7	46.7		
•Other chronic diseases:					0.932	0.627
Hypertension	9	18.0	13	26.0		
Bronchial asthma	10	20.0	9	18.0		
No	31	62.0	28	56.0		
•Previous surgery					2.154	0.142
Cosmetic	0	0	1	2		
Obstetric	5	10	4	8		
General surgery	16	32	9	18		
No	29	58	36	72		
•Family history of cancer					0.407	0.523
Yes	18	36.0	15	30.0		
No	32	64.0	35	70.0		
Type of family cancer:					1.819	0.611
Liver	3	16.7	2	13.3		
Colon	5	27.8	5	33.3		
Breast	4	22.2	1	6.7		
Head and neck	6	33.3	7	46.7		
Relative degree					0.203	0.653
First degree	11	61.1	8	53.3		
Second degree	7	38.9	7	46.7		
•Used treatment method:					0.542	0.461
Radiotherapy	38	76.0	41	82.0		
Surgery and radiotherapy	12	24.0	9	18.0		
•Cancer site:					1.986	0.921
Oral cavity	14	28.0	12	24.0		
Oropharynx	12	24.0	16	32.0		
Nasopharynx	9	18.0	8	16.0		
Hypopharyngeal	5	10.0	4	8.0		
Larynx	6	12.0	5	10.0		
Paranasal sinuses	2	4.0	1	2.0		
Salivary glands	2	4.0	4	8.0		
•Time of disease diagnosis:					0.796	0.372
< 2 months	42	84.0	45	90.0		
2-6 months	8	16.0	5	10.0		

Table (2): This table reveals that more than half of patients in the study and control groups (58.0% and 70.0% respectively) were not hospitalized

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before. Regarding the last treatment period, it was less than three days for about two thirds (61.9%) of study group and for about half (53.3%) of control group. More than half of both groups (62.0% and 56.0% respectively) did not complain from other chronic diseases. Also, more than half of both groups (58.0% and 72.0% respectively) did not have any previous surgery. As regards family history, about one third of both groups (36.0% and 30.0% respectively) had family history for cancer where about one third of them was for head and neck cancer(33.3% and 46.7% respectively) and more than half of them

(61.1% and 53.3% respectively) had first degree history for cancer. More than three fourths (76.0% and 82.0%) of both study and control groups respectively used radiotherapy for treatment of cancer. Regarding cancer site, about one fourth of both groups (24.0% and 32.0% respectively) had oropharyngeal cancer. Regarding time of disease diagnosis, most of both groups (84.0% and 90.0% respectively) were diagnosed from less than 2 months. There were no statistically significant differences between both study and control groups regarding medical history.

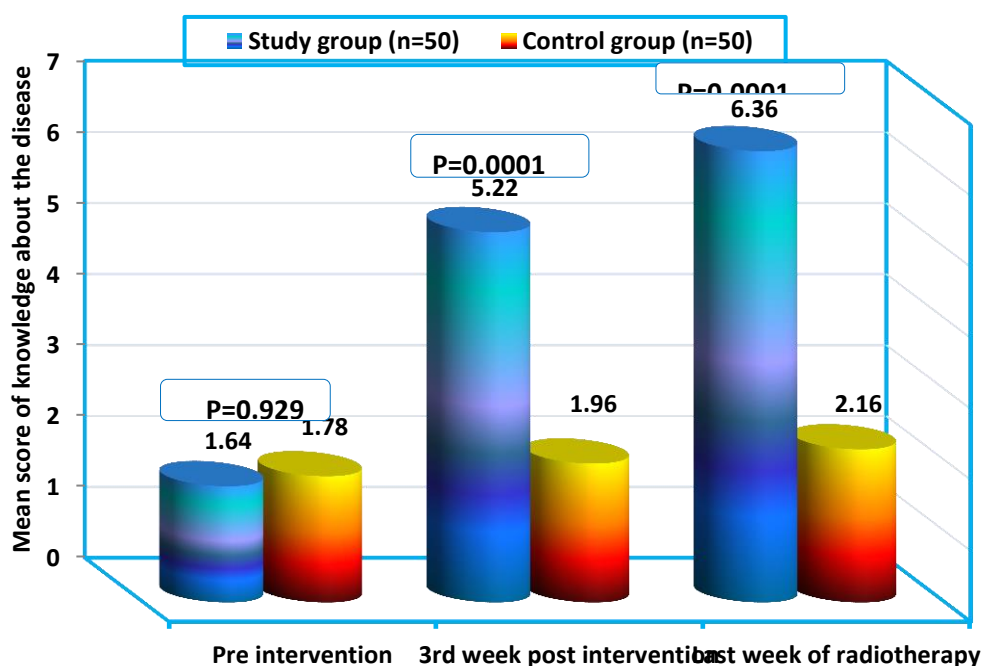


Figure (1): Mean subtotal knowledge score about head and neck cancer of study and control groups pre and post intervention (n=100).

This figure shows that mean scores of subtotal level of knowledge at pre intervention were 1.64 and 1.78 among study and control groups respectively. While mean scores of subtotal level of knowledge

increased in the 3rd and last week post-intervention recording 5.22 and 6.36 for the study group. For the control group, the mean was 1.78 (pre intervention), 1.96 (3rd week post intervention) and 2.16. Last week post intervention.

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Table (5): Percentage distribution of patients (study and control groups) regarding their knowledge score about radiotherapy treatment pre intervention, 3rd week post intervention and last week of radiotherapy.

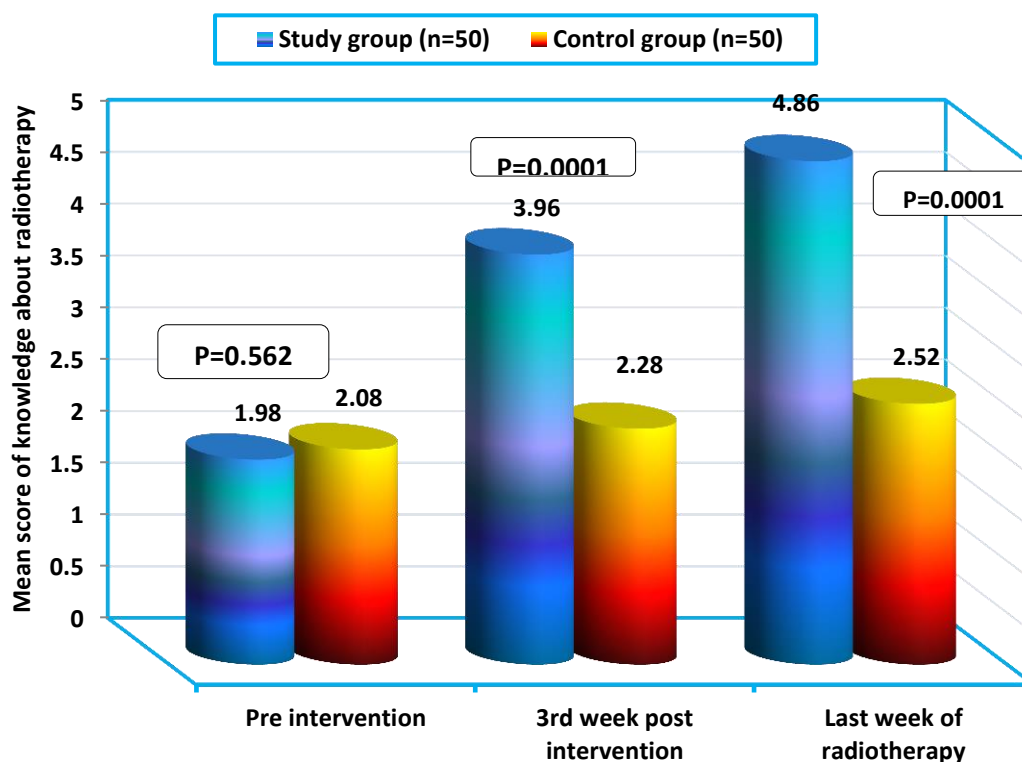
Knowledge about radiotherapy treatment	Head and neck cancer patients (n=100)														$\chi^2 - P$		
	Study group (n=50)							Control group (n=50)							Study vs Control group		
	Pre-intervention		3 rd week post intervention		Last week of radiotherapy		$\chi^2 P$	Pre-intervention		3 rd week post intervention		Last week of radiotherapy		$\chi^2 P$	Pre-intervention	3 rd week post intervention	Last week of radiotherapy
	N	%	N	%	N	%		N	%	N	%	N	%				
•Definition:																	
Incorrect answer or don't know	26	52.0	10	20.0	6	12.0	23.501	25	50.0	23	46.0	20	40.0	1.214	0.823	7.678	10.630
Incomplete correct answer	19	38.0	29	58.0	29	58.0	0.0001*	17	34.0	19	38.0	22	44.0	0.876	0.663	0.022*	0.005*
Complete correct answer	5	10.0	11	22.0	15	30.0		8	16.0	8	16.0	8	16.0				
•Types:																	
Incorrect answer or don't know	27	54.0	9	18.0	3	6.0	41.756	26	52.0	24	48.0	22	44.0	0.641	1.106	17.257	33.440
Incomplete correct answer	22	44.0	31	62.0	28	56.0	0.0001*	24	48.0	26	52.0	28	56.0	0.726	0.574	0.0001*	0.0001*
Complete correct answer	1	2.0	10	0.0	19	38.0		0	0	0	0	0	0				
• Benefits:																	
Incorrect answer or don't know	30	60.0	10	20.0	6	12.0	34.865	29	58.0	25	50.0	22	44.0	1.974	2.248	15.288	23.212
Incomplete correct answer	18	36.0	32	64.0	30	60.0	0.0001*	21	42.0	25	50.0	28	56.0	0.373	0.325	0.0001*	0.0001*
Complete correct answer	2	4.0	8	16.0	14	28.0		0	0	0	0	0	0				
• Side effects:																	
Incorrect answer or don't know	26	52.0	11	22.0	7	14.0	31.074	24	48.0	22	44.0	18	36.0	1.526	0.160	12.736	22.461
Incomplete correct answer	24	48.0	30	60.0	26	52.0	0.0001*	26	52.0	28	56.0	32	64.0	0.466	0.689	0.002*	0.0001*
Complete correct answer	0	0	9	18.0	17	34.0		0	0	0	0	0	0				

*Statistically significant (P<0.05)

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Table (5): This table shows that pre and correct answers about types, benefits and intervention a minimum of both study and side effects of radiotherapy that were control groups (10.0% and 16.0% respectively) significantly improved among study group to gave complete and correct answer regarding 38.0%, 28.0% and 34.0% respectively definition of radiotherapy that was increased to compared to none of control group. There was 30.0% among study group during the last week a statistically significant improvement among of radiotherapy while score of control group study group than control group during the 3rd didn't change. Nearly none of both groups and last week post intervention regarding all (2.0%, 4.0% and 0% of study group and 0%, items of knowledge about radiotherapy. 0% and 0% of control group) gave complete

Figure (2): Mean subtotal knowledge score about r



Radiotherapy treatment among study and control groups pre and post intervention (n=100).

This figure reveals that means of subtotal knowledge score at pre intervention were 1.98 ± 1.95 and 2.08 ± 1.68 for study and control groups respectively. While mean scores of

subtotal knowledge were higher in the 3rd and last week post-intervention recording 3.96 ± 1.29 and 4.86 ± 1.29 for study group and 2.28 ± 1.64 and 2.52 ± 1.61 for control group respectively.

Table (6): Percentage distribution of patients (study and control groups) according to total knowledge level about head and neck cancer pre and post intervention (n=100).

Level of total knowledge	Head and neck cancer patients (n=100)													χ^2 P			
	Study group (n=50)							Control group (n=50)							Study vs Control group		
	Pre-intervention		3 rd week post intervention		Last week of radiotherapy		χ^2 P	Pre-intervention		3 rd week post intervention		Last week of radiotherapy		χ^2 P	Pre-intervention	3 rd week post intervention	Last week of radiotherapy
	n	%	n	%	n	%		n	%	n	%	n	%				
Total knowledge level about head and neck cancer:																	
Poor	47	94.0	16	32.0	4	8.0	84.937	44	88.0	43	86.0	40	80.0	1.734	1.899	30.144	54.121
Fair	1	2.0	25	50.0	24	48.0	0.0001*	4	8.0	5	10.0	8	16.0	0.785	0.387	0.0001*	0.0001*
Good	2	4.0	9	18.0	22	44.0		2	4.0	2	4.0	2	4.0				
Total knowledge level about radiotherapy treatment:																	
Poor	35	70.0	16	32.0	7	14.0	45.312	37	74.0	36	72.0	33	66.0	0.836	2.056	17.510	35.784
Fair	13	26.0	30	60.0	26	52.0	0.0001*	13	26.0	14	28.0	17	34.0	0.658	0.358	0.0001*	0.0001*
Good	2	4.0	4	8.0	17	34.0		0	0	0	0	0	0				
Total knowledge level																	
Poor	47	94.0	20	40.0	5	10.0	80.052	46	92.0	45	90.0	42	84.0	2.053	0.211	27.949	55.439
Fair	2	4.0	28	56.0	32	64.0	0.0001*	3	6.0	4	8.0	7	14.0	0.726	0.900	0.0001*	0.0001*
Good	1	2.0	2	4.0	13	26.0		1	2.0	1	2.0	1	2.0				

*Statistically significant (P<0.05)

It is evident that majority of both groups (94.0% and 92.0%) had poor total knowledge score pre intervention that was decreased to 10.0 % last week of radiotherapy among study group compared to

84.0% among control group. There was significant improvement among study group than control group 3rd and last week post intervention regarding total and subtotal knowledge level (P=0.0001*)

Discussion:

Cancer has a major impact on society across the world. It was estimated to account for about 9.6 million deaths worldwide in 2018. The cancer burden continues to grow globally, exerting tremendous physical, emotional and financial strain on individuals, families, communities and health systems (World Health Organization, 2020)

In relation to types of foods eaten, the current study found that more than one third of both groups received high fat diet. Bravi (2012) documented that large amounts of dietary lipids has been regarded as an important risk factor for cancer of oral cavity.

Regarding mouth care, the current study reported that about three fourths of both groups didn't perform daily mouth care. Guha et al., (2015) said that poor oral hygiene as well as missing teeth and use of mouth wash that has high alcohol content are possible risk factors for cancers of oral cavity.

Knowledge about head and neck cancer and radiotherapy treatment:

Pre intervention, the majority of patients in the study and control groups had poor knowledge about head and neck cancer. Therefore, It is stated that sufficient information must be provided for patients receiving radiotherapy before the first treatment session as an orientation and educational program (Dunberger & Bergmark ,2016).The patient's and their family's understanding of disease process, treatment plan, possible side effects, education and implementation of interventions during the course of treatment is very important (Shepard & Kelvin ,2014). This explains the result of present study which showed that although the majority of patients in both groups had poor total knowledge score before intervention about head and neck cancer and radiotherapy treatment. There was a significant improvement in total knowledge score among study group rather than control group at 3rd week post intervention and last week of radiotherapy. These findings were in agreement with Kisuya et al .,(2015) who reported that there was a considerable

improvement in the level of knowledge of patients after providing educational sessions for cancer patients .Also, Berger ,Gronberg ,Loge,Kassa&Sand (2018) stated that after receiving information about cancer and its treatment , the average knowledge level of the patients had significantly increased . In the same line these results agree with Deeb, Shehata & Fareed (2019) who reported that the study group had higher levels of knowledge than control group related to total knowledge score after education. From the researcher point of view, the difference in knowledge score among study and control groups may be related to teaching that was provided about disease and management of radiotherapy side effects that supported by illustrative colored booklet.

Moreover, Ahmed, Esa & El-zayat (2018) reported that health education resulted in improvement of patients' knowledge about cancer and its treatment.

Previous studies have reported that nutritional counseling has a positive influence on nutritional intake and clinical outcomes in patients with HNSCC undergoing radiotherapy (Van den Berg et al, 2010).Moreover, Sian (2017) reported that nurses can help head and neck cancer patients to develop coping skills, social skills and improve emotional quality of life to support adjustment to cancer.

Hansson et al., (2017) reported that psychoeducation is one of the most frequently investigated psychological interventions for patients with HNC. Moreover, Georgia et al., (2018) documented that radiation therapy preparation intervention was effective in reducing cancer patients' psychological distress, preparing patients for treatment and improving emotional and total quality of life. This supported the results of the present study.

Conclusion:

The total knowledge score among study group (group I) was significantly higher than control group (group II) after the designed nursing intervention. Patients in the study group who received designed nursing intervention had higher level of awareness than patients who did not receive (control group).

Recommendation:

The designed nursing intervention program should be carried out for patients with head and neck cancer at radiotherapy unit in oncology department and a colored booklet should be available and distributed to all patients and nurses who working at radiotherapy unit in oncology department.

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