

Tailored Nursing Intervention for Quality of Life among Patients with Head and Neck Cancer

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Abstract:

Head and neck cancer patients receiving radiotherapy experience a variety of side effects which adversely affect their quality of life. **The study' aim was** to evaluate the effect of tailored nursing intervention on quality of life among patients receiving head and neck radiation therapy. **Setting:** The study was carried out at the Outpatient Clinics of Clinical Oncology Department and Radiotherapy Unit of Menoufia University Hospital. **Subjects:** A consecutive sample of 100 patients for head and neck cancer receiving external radiation was randomly selected and assigned alternatively and randomly into two equal groups. **Tools of the study:** three tools were used for data collection: Structured interview schedule, The Functional Assessment of Cancer Therapy: Head and Neck Scale. **Results:** There were significant improvement among study group than control group 3rd week post intervention and last week of radiotherapy regarding total knowledge score and total quality of life level. **Conclusions:** quality of life was improved among study group who received the tailored nursing intervention than those who exposed only to the routine hospital care. **Recommendations:** Supervised nursing intervention should be carried out for all cancer patients receiving head and neck radiotherapy and colored booklet should be available and distributed for all patients.

Key words: Head and neck cancer, Nursing intervention and Quality of life.

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I. Introduction

Cancer is a generic term for a large group of diseases characterized by the growth of abnormal cells beyond their usual boundaries that can then invade adjoining parts of the body and/or spread to other organs. It can affect almost any part of the body and has many anatomic and molecular subtypes that each requires specific management strategies. It is the second leading cause of death globally and is estimated to account for 9.6 million deaths in the year of 2018⁽¹⁾.

Head and neck cancer is a group of cancers that starts within the mouth, nose, throat, larynx, sinuses, or glands. Most head and neck cancers are squamous cell carcinomas (HNSCC) which are malignant growths that begin in the flat squamous cells that form the epithelium in many parts of the head and neck⁽²⁾.

Effective management of HNCs requires comprehensive consideration often competing treatment goals which require the integration of various treatment modalities and supportive services. Accordingly, representation from disciplines including head and neck surgery, plastic and reconstructive surgery, radiation oncology, medical oncology, pathology, neuroradiology, dentistry, oral and maxillofacial surgery, nutrition, rehabilitation medicine, and social work is necessary⁽³⁾.

Surgical resection and radiation therapy are the mainstays of treatment for most head and neck cancers and remain the standard of care in most cases. The use of surgery, radiation, and/or chemotherapy depends on tumor respectability and location, as well as whether an organ preservation approach is feasible or not⁽⁴⁾.

For head and neck cancer, radiation therapy can be the main treatment or it can be used after surgery to destroy small areas of cancer that cannot be removed surgically. A radiation therapy regimen or schedule usually consists of a specific number of treatments given over a set period⁽⁵⁾.

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⁽⁶⁾.

Quality of life is defined as the individual's' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, level of independence, social relationships, personal beliefs and their relationship to salient features of their environment⁽⁷⁾.

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⁽⁸⁾.

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⁽⁹⁾.

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⁽¹⁰⁾.

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⁽¹¹⁾.

Patients receiving radiation therapy experience a variety of side effects that impact their overall quality of life. Nurses in all settings who encounter patients receiving radiation therapy are the key for assessing the impact of these side effects on patients' lives and providing targeted education and recommendations for self-management. Nurses caring for those patients can identify patients at high risk for development of side effects, reinforce interventions recommended by radiation practitioners and evaluate the effectiveness of those interventions. Management of side effects of treatment not only leads to improved quality of life for patients, but also may lead to improved treatment outcomes and better overall survival⁽¹²⁾. Also Nigam & Prakash⁽¹³⁾ reported that providing instruction for management of side effects of radiation therapy is significantly effective in improving quality of life of cancer patients undergoing radiation therapy.

Patients who trained to deal with the complications of radiotherapy and begin self-care activities earlier, experience less anxiety levels and can better manage side effects and hence improve quality of life⁽¹⁴⁾.

Aim of the study

The aim of the current study was to evaluate the effect of tailored nursing intervention on quality of life among patients receiving head and neck radiation therapy.

Research Hypotheses

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

- Patients of study group who apply the tailored nursing intervention exhibit an improved quality of life than patients who don't (control group).

II. Method

Research design: A quasi experimental research design was utilized to achieve the aim of this study.

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

Subjects:

A consecutive sample of 100 head and neck cancer patients receiving external radiation assigned randomly and alternatively into two equal groups, 50 patients for each group:

- Study group (I): Exposed to the designed nursing intervention along with routine hospital care.
- Control group (II): Exposed only to routine hospital care as helping patients during receiving radiotherapy sessions.

Inclusion criteria:

The study subjects were selected according to the following criteria:

- Adult, Conscious patients of both sexes.
- Newly diagnosed with head and neck cancer who didn't start radiotherapy sessions.

Exclusion criteria:

- Previous radiation therapy experience on head and neck area.
- Patients with other associated disorders 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 which is considered a reference hospital for cancer cases. 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) ⁽¹⁵⁾.

Instruments of the study:

Based on the review of related literatures ⁽¹⁶⁾, three instruments were used by the researcher for data collection, these instruments were:

Instrument I: Structured interview schedule (Appendix II):

It was developed by the researcher after reviewing the related literature ⁽¹⁶⁾ to assess sociodemographic data, and patient's knowledge. It comprised of three parts as the following:

- **Part one: patient's Sociodemographic data:** It was comprised of six questions includes 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 disease, 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 was comprised of 9 questions of two sections about the following:

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:

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 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).

These are standardized categories as mentioned by AL- Khaled, Zaharan & EL-Souss ⁽¹⁷⁾.

Instrument II:The Functional Assessment of Cancer Therapy: Head and Neck Scale (FACT-H&NS) (Appendix III):

It was developed by (Webster and Kimberly, ⁽¹⁸⁾), modified and used by the researcher to assess the effects that the cancer and radiotherapy had on the patients' overall quality of life in the physical, emotional, social, and functional domains (FACT-G), as well as the impact of site-specific side effects from radiation treatment to the head and neck (Head and Neck Specific Concerns).It was composed of 37 questions in five subscales: Physical Well-Being (PWB, 7 questions), Social/Family Well-Being (SWB, 7 questions), Emotional Well-Being (EWB, 5 questions), Functional Well-being (FWB, 7 questions) and Head and Neck Specific Concerns (11 questions).

Scoring system:

Each item was scored using a 5 point rating scale ranging from zero to four in which zero denoted not at all to , a score of one denoted a little bit , while a score of two denoted somewhat , a score of three denoted quite a bit and a score of four denoted Very much). Each subscale was scored and a total score for the FACT-H&NS was obtained by adding each of the subscale scores. Subscales were as the following:

1. **Physical Well-Being** has a score from zero to twenty-eight.
2. **Social/Family Well-Being** has a score from zero to twenty-eight.

3. **Emotional Well-Being** was having a score from zero to twenty.

4. **Functional Well-being** has a score from zero to twenty-eight.

5. **Additional Concerns** has a score from zero to forty-four.

All scores were summed to give a score ranged from zero to one hundred and forty-eight. The score was categorized as:

- A score less than 50% denoted low quality of life (from zero to seventy-three marks).
- A score from 50 % to less than 70% denoted fair quality of life (from seventy-four to one hundred and three marks).
- A score of 70% or more denoted high quality of life (from one hundred and four to one hundred and forty-eight marks).

N.B: This score was the same for the subscales.

III. Procedure

- **Written approval:** An official letter from the Faculty of Nursing was delivered to the responsible authorities of the hospital (chief executive and the director of oncology department) to conduct the study then a written approval was obtained after explaining the aim of study.

- **Instruments development:** The first instrument was developed by the researcher, while the second instrument was developed by Webster and Kimberly⁽¹⁸⁾. The first instrument was tested for face and content validity by five academic staff (four experts in the field of Medical Surgical Nursing and one expert in the field of Medicine, Faculty of Medicine, Tanta University). Modifications were done accordingly to ascertain relevance and completeness.

- **Reliability:** The first instrument was tested using a test retest method and a person correlation coefficient formula was used. The period between both tests was two weeks. The results were 0.97 for first instrument and 0.91 for the third one. While the reliability was demonstrated with the Functional Assessment of Cancer Therapy by two procedures: test–retest reliability and internal consistency. The Pearson’s correlation coefficient for test–retest reliability was 0.83. The Cronbach’s α for internal consistency was 0.73⁽¹⁹⁾.

- **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 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. Subjects were also informed that they can withdraw from the study at any time without penalty and refusal to participate wouldn't affect their care. Moreover, they were assured that the nature of the questionnaire didn't cause any physical or emotional harm to them.

- Data collection:

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

- This session took about 20-30 minutes for each subject.
- During this phase the researcher interviewed each subject of both groups before starting radiotherapy sessions to collect base line data by using first and second instruments as follow:
 - All subjects of both groups were assessed for sociodemographic data, medical data and knowledge about head and neck cancer, treatment modalities, radiation therapy and its associated problems by utilizing the first instrument part one, two and three.
 - All subjects of both groups were assessed for quality of life using Functional Assessment of Cancer Therapy: Head and Neck Scale (tool II) before starting radiation therapy (pretest).

2) Planning phase:

- Based on the gathered information and knowledge level of subjects gathered during assessment phase a colored booklet supported with illustrative pictures was prepared that included information 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 improve quality of life:** (general and local side effects).

3) Implementation phase

- The researcher interviewed each subject of 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 subject 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 added.
- The sessions were started from the physician decision of radiotherapy for the subject and ended before starting radiotherapy. This took about from one to two weeks.
- The researcher distributed the prepared booklet for every subject of group 1 (study group) or his/her accompanying person before starting session I.
 - **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 subjects 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 intervention using instrument I part three and instrument II.

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).

Table (1): Distribution of both study and control groups according to their sociodemographic characteristics (n=100).

Sociodemographic characteristics	Studied subjects (n=100)				χ^2	P
	Study group (n=50)		Control group (n=50)			
	N	%	N	%		
•Age years:						
18-<25	2	4.0	2	4.0	1.605	0.808
25-<35	6	12.0	4	8.0		
35-<45	8	16.0	11	22.0		
45-<55	13	26.0	16	32.0		
55-65	21	42.0	17	34.0		
Range	24-64		22-64		t-test =0.405	0.686
Mean±SD	49.12±11.25		48.24±10.45			
•Sex:					0.219	0.640
Male	37	74.0	39	78.0		
Female	13	26.0	11	22.0		
•Marital status:					1.392	0.707
Single	2	4.0	3	6.0		

Married	37	74.0	37	74.0		
Divorced	3	6.0	5	10.0		
Widow	8	16.0	5	10.0		
•Educational level:						
Illiterate	18	36.0	17	34.0	0.960	0.811
Basic education	14	28.0	11	22.0		
Secondary education	12	24.0	16	32.0		
University & higher education	6	12.0	6	12.0		
•Occupation:						
Housewives	9	18.0	5	10.0	3.276	0.351
Employee	16	32.0	14	28.0		
Worker	19	38.0	19	38.0		
Not working	6	12.0	12	24.0		
•Residence:						
Rural	24	48.0	28	56.0	0.641	0.423
Urban	26	52.0	22	44.0		

Table (1): This table shows that, the greatest percentage of both study and control groups (42.0 % and 34.0% respectively) were in age group from 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 regard residence, more than half of study group (52.0%) were from urban areas where more than half of control group (56.0%) were from rural areas. There were no statistically significant differences between both groups regarding all sociodemographic characteristics.

Table (2): Distribution of both study and control groups regarding 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						
Appendectomy	8	38.1	5	33.3	0.396	0.821
Hemiorrhaphy	8	38.1	5	33.3		
Section	5	23.8	5	33.3		
Number of previous hospitalizations						
One time	10	47.6	12	80.0	4.918	0.086
Two times	7	33.3	3	20.0		
More than two times	4	19.0	0	0		
-The last treatment period (days):						
< 3	13	61.9	8	53.3	0.264	0.607
3 & more	8	38.1	7	46.7		
•Other chronic diseases:						
Hypertension	9	18.0	13	26.0	0.932	0.627
Bronchial asthma	10	20.0	9	18.0		
No	31	62.0	28	56.0		
• Previous surgery						
Cosmetic	0	0	1	2	2.154	0.142
Obstetric	5	10	4	8		
General surgery	16	32	9	18		
No	29	58	36	72		
•Family history of cancer						
Yes	18	36.0	15	30.0	0.407	0.523
No	32	64.0	35	70.0		
Type of family cancer:						
Liver	3	16.7	2	13.3	1.819	0.611
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						
First degree	11	61.1	8	53.3	0.203	0.653
Second degree	7	38.9	7	46.7		
•Used treatment method:						
Radiotherapy	38	76.0	41	82.0	0.542	0.461
Surgery and radiotherapy	12	24.0	9	18.0		

•Cancer site:						
Oral cavity	14	28.0	12	24.0	1.986	0.921
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:						
< 2 months	42	84.0	45	90.0	0.796	0.372
2-6 months	8	16.0	5	10.0		

Table (2): This table reveals that more than half of both study and control groups (58.0% and 70.0% respectively) did not be hospitalized 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 previous surgery. As regard family history, about one third of both groups (36.0% and 30.0% respectively) have 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) have 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, the majority 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 all medical history.

Table (3): Distribution of total knowledge level among studied head and neck cancer patients (study and control groups) 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*).

Part II: The functional assessment of quality of life among studied subjects:

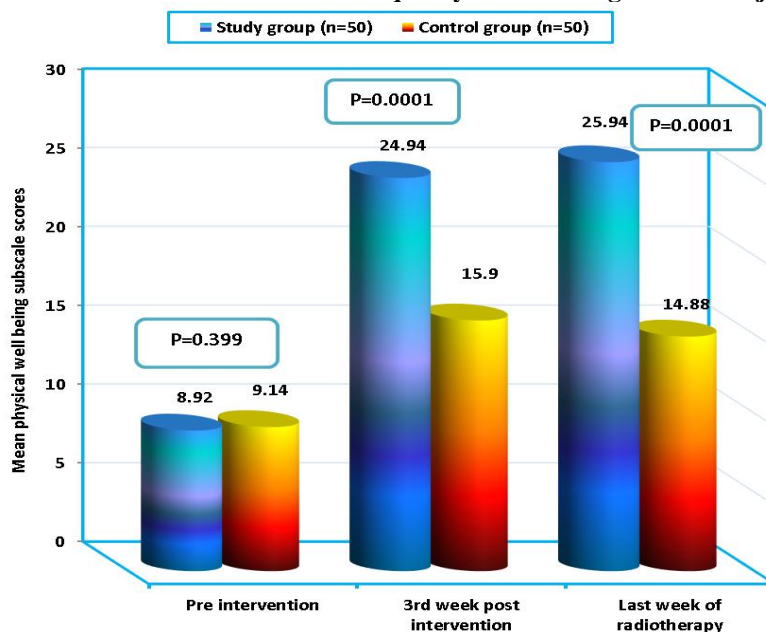


Figure (1): Mean physical well-being score among studied head and neck cancer patients (study and control groups) pre and post intervention (n=100).

This figure presents that mean physical well-being score at pre intervention were 8.92 ± 0.96 and 9.14 ± 1.15 among study and control groups respectively. While mean scores of physical well-being showed higher statistically significant improvement among study group versus control group recording 24.94 ± 1.93 and 15.90 ± 3.02 respectively at 3rd week post-intervention and 25.94 ± 1.80 versus 14.88 ± 3.01 last week post-intervention.

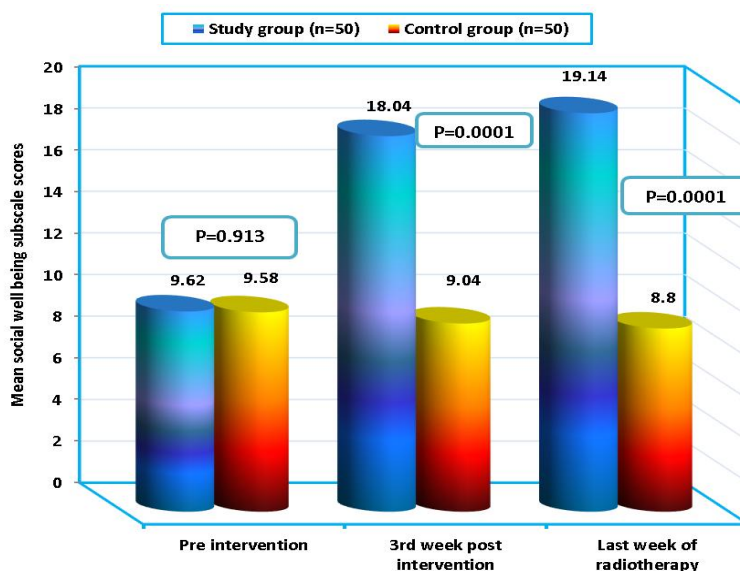


Figure (2): Mean social/Family well-being score among studied head and neck cancer patients (study and control groups) pre and post intervention n=100.

This figure presents that mean social and family well-being scores at pre intervention were 9.62 ± 2.59 and 9.58 ± 2.95 among study and control groups respectively. While mean scores of social and family well-being showed higher statistically significant improvement among study group versus control group recording 18.04 ± 4.84 and 9.04 ± 2.35 respectively at 3rd week post-intervention and 19.14 ± 3.51 versus 8.80 ± 2.31 last week post-intervention.

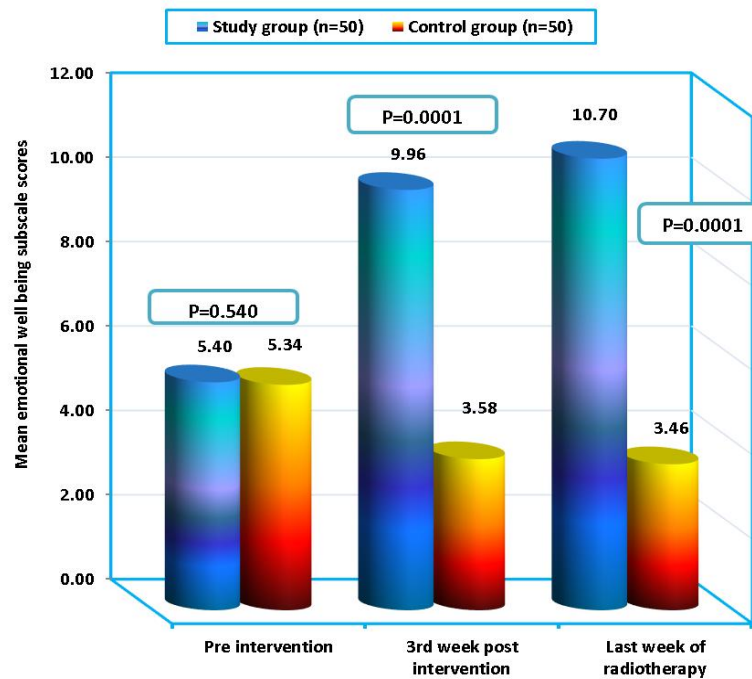


Figure (3): Mean emotional well-being score among studied head and neck cancer patients (study and control groups) pre and post intervention (n=100).

This figure presents that mean emotional well-being scores at pre intervention were 5.40 ± 1.59 and 5.34 ± 0.77 respectively among study and control groups. While mean scores of emotional well-being showed higher statistically significant improvement among study group versus control group recording 9.96 ± 2.34 and 3.58 ± 0.97 respectively at 3rd week post-intervention and 10.70 ± 2.14 versus 3.46 ± 1.03 last week post-intervention.

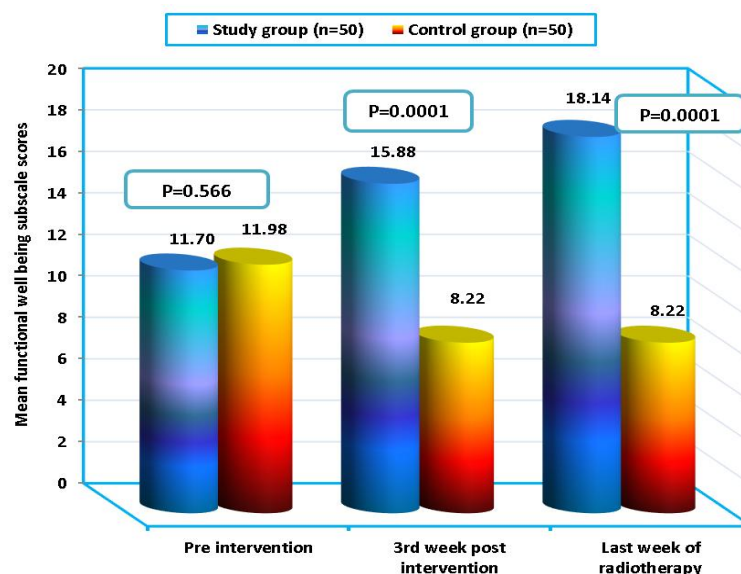


Figure (4): Mean functional well-being score among studied head and neck cancer patients (study and control groups) pre and post intervention (n=100).

This figure presents that mean functional well-being scores at pre intervention were 11.70 ± 2.37 and 11.98 ± 1.48 among study and control groups respectively that were highly statistically significantly improved among study group versus control group recording 15.88 ± 2.18 and 8.22 ± 1.39 respectively at 3rd week post-intervention and 18.14 ± 2.17 versus 8.22 ± 1.39 respectively last week of radiotherapy.

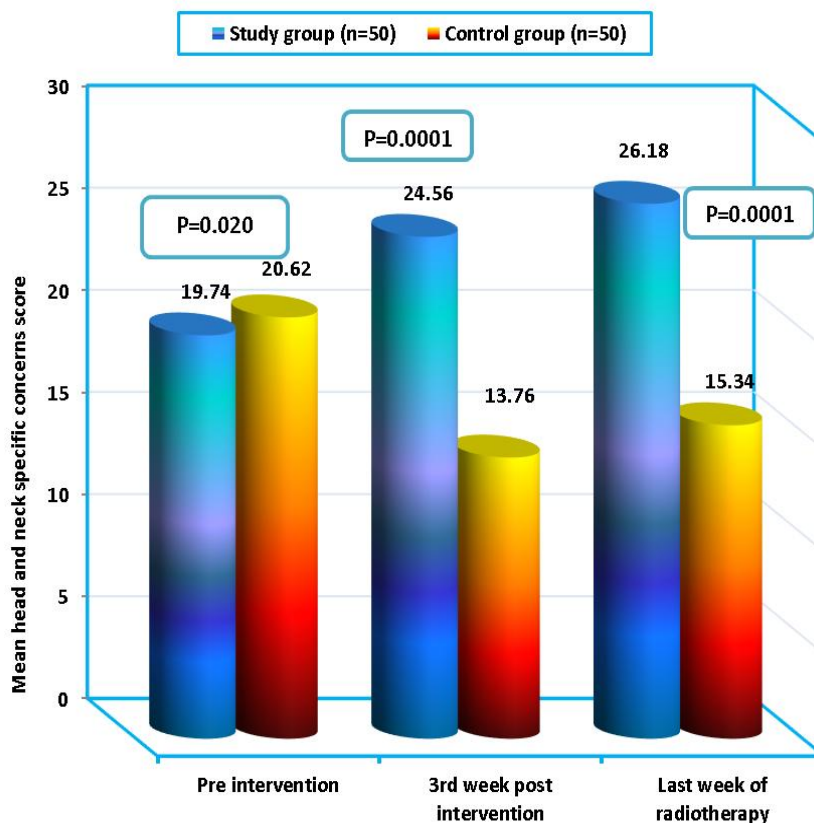


Figure (5): Mean Additional head and neck specific concerns score among studied head and neck cancer patients (study and control groups) pre and post intervention (n=100).

This figure presents that mean head and neck specific concerns scores at pre intervention were 19.74 ± 2.15 and 20.62 ± 1.47 among study and control groups respectively compared to 24.56 ± 2.46 and 13.76 ± 1.49 respectively 3rd week post-intervention and 26.18 ± 2.33 versus 15.34 ± 1.33 respectively last week of radiotherapy.

Table (4): Total and subtotal quality of life level among study and control groups pre and post intervention (n=100).

Level of total and subtotal quality of life	Studied 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	
n	%	n	%	N	%	n			%	n	%	n	%	n			%
Physical well-being																	
Low	18	36.0	0	0	0	0	74.913	15	30	50	100	50	100	150.000	0.407	100.000	100.000
Fair	32	64.0	15	30.0	27	54.0	0.0001*	35	70.0	0	0	0	0	0.0001*	0.523	0.0001*	0.0001*
High	0	0	35	70.0	23	46.0		0	0	0	0	0	0				
Social / Family well-being																	
Low	47	94.0	8	16.0	3	6.0	98.446	40	80.0	47	94.0	48	96.0	8.444	3.180	62.039	81.321
Fair	3	6.0	23	46.0	24	48.0	0.0001*	10	20.0	3	6.0	2	4.0	0.015*	0.074	0.0001*	0.0001*
High	0	0	19	38.0	23	46.0		0	0	0	0	0	0				
Emotional well-being																	
Low	50	100	25	50.0	15	30.0	54.367	50	100	50	100	50	100	0.000	0.000	33.333	53.846
Fair	0	0	19	38.0	28	56.0	0.0001*	0	0	0	0	0	0	1.000	1.000	0.0001*	0.0001*
High	0	0	6	12.0	7	14.0		0	0	0	0	0	0				
Functional well-being																	
Low	35	70.0	7	14.0	0	0	82.913	41	82.0	50	100	50	100	19.149	1.974	75.439	100.000
Fair	15	30.0	41	82.0	36	72.0	0.0001*	9	18.0	0	0	0	0	0.0001*	0.160	0.0001*	0.0001*
High	0	0	2	4.0	14	28.0		0	0	0	0	0	0				
Head and neck specific concerns																	
Low	39	78.0	7	14.0	2	4.0	74.081	36	72.0	50	100	50	100	30.882	0.480	75.439	92.308
Fair	11	22	43	86.0	48	96.0	0.0001*	14	28.0	0	0	0	0	0.0001*	0.488	0.0001*	0.0001*
Total quality of life level																	
Low	46	92.0	5	10.0	0	0	113.547	50	100	50	100	50	100	0.000	2.340	81.818	100.000
Fair	4	8.0	45	90.0	50	100	0.0001*	0	0	0	0	0	0	1.000	0.125	0.0001*	0.0001*

*statistically significant (P<0.05)

χ^2 value of Kruskal Wallis test, Z value of Mann-Whitney U test

NB: The pre intervention results of both study and control groups related to all items are considered good results because patients still didn't be exposed to radiotherapy so the researcher didn't involve it in comments of results.

Table (4): This table shows that about one third of study group had fair level of physical well-being (30.0%) 3rd week post-intervention compared to none of control group (0%) that was significantly increased among study group last week of radiotherapy (54.0%) compared to non-change among control group. More than one third of study group had high level of social/ family well-being (38.0%) 3rd week post-intervention compared to none of control group (0%) that was significantly increased among study group last week of radiotherapy (46.0%) compared to non-change among control group. Minority of study group had high levels of emotional and functional well-being (12.0% and 4.0%) 3rd week post-intervention compared to none of control group (0%) that was significantly increased among study group last week of radiotherapy (14.0% and 28.0%) compared to non-change among control group. more than three fourths of study group had fair levels of head and neck specific concerns and total quality of life(86.0% and 90.0%) 3rd week post-intervention compared to none of control group (0%) that was significantly increased among study group last week of radiotherapy (96.0% and 100.0%) compared to approximately non control group(0% and 1%).

IV. Discussion

Head and neck cancer treatments are associated with frequently irreversible physical issues including impairments in speech, swallowing and saliva production, prolonged pain and fatigue. Also, individuals with HNC experience social and psychological issues associated with disfigurement/body image, inability to return to work, resistance to eating in public and stigma associated with having a disease that is increasingly transmitted through sexual practices⁽²⁰⁾.

Biosociodemographic characteristics of the studied sample:

The present study revealed that the percentage of studied group were increased with the increase of age group. This result coincides with World health organization (2019) which showed that the risk of cancer increases significantly with age. Also, the finding is in line with the study done by **Majid et al.**,⁽²¹⁾ who stated that the age group of the patients in their study ranged from forty one years to sixty years. Moreover, these results are in the same line with **Rogers et al.**,⁽²²⁾ who found that about half the participants were older. This is might be explained by that, immune-senescence errors are accumulated in DNA over a lifetime.

Concerning the sex, the present study found that about three fourths of both study and control groups were males. This is in line with **Rady**⁽²³⁾ who showed that, there was male predominance among their patients. This result coincides with **National Cancer Institute**⁽²⁴⁾ which reported that males are affected by head and neck cancer twice as often as females. Moreover, these results are in the same line with **Shalini, Mamatha & Linu**,⁽²⁵⁾ who found that the sample of their study were with male preponderance.

Regarding marital status, about three fourths of both groups were married. This finding is expected with the age group. The result was supported by **Seung**⁽²⁶⁾ who reported that more than half of their sample was married. Also, **Chen et al.**,⁽²⁷⁾ found that more than three fourths of the sample were married.

Regarding educational level, the present study found that the minority of both study and control groups were University & higher education. This is in line with **Soliman & Shehata**⁽²⁸⁾ who showed that the minority of their samples was high education. This may be due to high percentage of Egyptians were illiterate.

Regarding occupation, the current study found that about one third of both groups (38.0%) were workers. These results are in the same line with **Hsiu-Ling**⁽²⁹⁾ who documented that about one third of his sample were workers and this may be in line with their age group.

Regarding treatment method, the current study found that more than three fourths of both study and control groups were treated by radiotherapy for cancer. These results are in the same line with **Schwartz et al.**,⁽⁵⁾ who reported that radiotherapy is the main treatment for head and neck cancer.

The current study found that about one fourth of both groups had oropharyngeal cancer and more than half of both groups did not have previous surgery. These results coincide with **Juliana & Paula**⁽³⁰⁾ who reported that cancer site of one fourth of their sample was oropharynx and that more than half of their sample did not have previous surgical procedures.

Regarding Previous exposure to radiotherapy, the current study found that majority of both groups didn't previously expose to radiotherapy. These results are coincide with **Hsiu-Ling**⁽³⁰⁾ who documented that most of his sample didn't previously receive radiotherapy.

As regard smoking history, the current study found that more than two thirds of both study and control groups were nonsmokers. This result agrees with **Shalini et al.**,⁽²⁵⁾ who documented that one third of the studied sample were smokers. Also this result is in the same line with **Liang et al**⁽³¹⁾ who reported that not all

smokers and alcohol users develop HNSCC, suggesting that individual variation in genetic susceptibility plays a critical role.

In relation to frequently eaten foods, the current study found that more than one third of both groups received high fat diet. This result is in line with **Bravi** ⁽³²⁾ who documented that un healthy diet as consumption of dietary lipids has been regarded as important risk factor for cancer of oral cavity has been reported to be associated with cancer risk.

Regarding mouth care, the current study reported that about three fourths of both groups didn't perform daily mouth care. This result agrees with **Guha et al.**, ⁽³³⁾ who 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. This may be in line with their educational level.

Knowledge about head and neck cancer and radiotherapy treatment:

It is stated that sufficient information must be provided for patients receiving radiotherapy before the first treatment session as an orientation and educational programme ⁽³⁴⁾. 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 ⁽³⁵⁾. This explains the result of present study which showed that the majority of both groups had poor total knowledge score before intervention about head and neck cancer and radiotherapy treatment. While there was significant improvement in total knowledge score among study group than control group 3rd week post intervention and last week of radiotherapy. These findings are in agreement with **Kisuya , et al;** ⁽³⁶⁾ who reported that there is a considerable improvement in the level of knowledge after providing educational sessions for cancer patients .Also, **Berger et al;** ⁽³⁷⁾ stated that after receiving information about cancer and its treatment , the average knowledge level of the patients was significantly increased . On the same line these results agree with **Deeb, Shehata & Fareed** ⁽³⁸⁾ who reported that there was a significant improvement between the study group 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** ⁽³⁹⁾ reported that health education resulted in improvement of patients' knowledge about cancer and its treatment.

Quality of life:

The results of the current study explained that level of total and subtotal quality of life for most of the study and control group at pre intervention were low. These findings agree with **Melo et al;** ⁽⁴⁰⁾ who stated that there was a reduction in the QOL of their sample. **Malathi et al** ⁽⁴¹⁾ also found that about 80% of the cancer patients had below average QOL.

Silver ⁽⁴²⁾ reported that it is important to identify and manage symptoms and impairments among patients recently diagnosed with cancer. Also, assessment of an individual's needs and interventions tailored to these needs from the time between diagnosis and the start of cancer treatment can offer significant physical and psychological relief for patients. This explain the results of the current study which reported that there were significant improvement of quality of life among study group than control group 3rd week post-intervention and last week of radiotherapy. Moreover, **Nigam & Prakash** ⁽¹³⁾ found that providing instruction for management of side effects of radiation therapy is significantly effective in improving quality of life of head and neck cancer patients undergoing radiation therapy.

Gandhi et al; ⁽⁴³⁾ documented that head and neck cancer patients who were receiving radiation suffered from many physical symptoms such as pain, nausea and lack of energy, swallowing, drinking, speaking and sleeping. These symptoms had affected the normal functioning of the patients miserably. While the study group who were received nursing intervention about management of the side effects of radiotherapy had high QOL scores after nursing intervention than control group. Also, **National Center for Complementary and Integrative Health** ⁽⁴⁴⁾ reported that providing non -pharmacological measures was proved to be effective in improving the patients' well-being. This supported the results of the present study which showed that none of both study and control groups reported high quality before intervention while 3rd week post intervention about three fourths of study group reported high quality compared to none of control group.

Moreover, these results are in the same line with **Burstrom & Gerdtham** ⁽⁴⁵⁾ who reported that the great majority of patients who had been informed about the management of radiotherapy have preserved QoL.

In addition, **Eltिंग et al.**, ⁽⁴⁶⁾ documented that pain that is mainly caused by mucositis is frequently a major problem for patients, often leading to difficulties with eating, drinking and swallowing which affects nutritional intake and leads to a worsening in physical QOL is greatly relieved by non-pharmacological measures educated by nurses. These results are also in the same line with **Hsiu-Ling** ⁽²⁹⁾ who reported that clinical practice guidelines of oral mucositis hold strong potential for improving physical and total QOL of

HNC patients. This may be due to proper oral hygiene can alleviate severity of mucositis which improve eating, drinking, swallowing and speaking.

Moreover, **Jensen & Peterson**⁽⁴⁷⁾ reported that detailed description and illustration on how oral hygiene should be performed as the ideal times and tools needed for brushing as well as the step-by-step for the correct performance present the highest evidence levels to prevent oral mucositis in cancer patients and improving physical quality of life. So **Peng , Chen, Liu & Tang**⁽⁴⁸⁾ reported that local approaches to prevent oral mucositis should be encouraged.

Previous studies have reported that nutritional counseling has a positive influence on nutritional intake and clinical outcomes in patients with HNSCC undergoing radiotherapy⁽⁴⁹⁾. Also, a study done by **Helena et al;**⁽⁵⁰⁾ documented that nutritional counseling was as effective way for preventing deterioration of nutritional status and incidence of malnutrition during radiotherapy that affect quality of life. Moreover, **Sian**⁽⁵¹⁾ 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.

Jones et al.,⁽⁵²⁾ documented that anxiety about radiation therapy is the most significant stressor for cancer patients. It was found that anxiety level was highest among cancer patients before RT planning and at the first RT session which results in low emotional and total quality of life.

Hansson et al;⁽⁵³⁾ reported that psychoeducation is one of the most frequently investigated psychological interventions for patients with HNC. Moreover, **Georgia Moira & Michael**⁽⁵⁴⁾ 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 which showed that all both study and control group reported low emotional quality of life pre intervention while post intervention there was improvement in study group than control group.

Quitting smoking has specific benefits for cancer patients. Several studies have reported improvements in the prognosis of patients with a cancer diagnosis following smoking cessation⁽⁵⁵⁾. **Florou , Gkiozos & Tsagouli**⁽⁵⁶⁾ reported that quitting smoking in patients with cancer has been associated with less pain, higher quality of life scores and better performance status.

Andriths⁽⁵⁷⁾ documented that the frequency of severe radiodermatitis was significantly lower in the intervention group who receive skin care plans. This finding is supported by **Seité, Bensadoun & Mazer**⁽⁵⁸⁾ who reported that providing skin care is effective and induce a better quality of life for cancer patients that support the results of the current study. This may be due to following designed proper skin care help patients to avoid factors that aggravate skin reactions as use of chemicals and direct exposure to sun rays.

Moreover, several studies reported that swallowing exercises during radiation are effective in improving dysphagia and hence quality of life. Also, speech language therapies are effective in preventing and reducing radiation-associated dysphagia that improve quality of life⁽⁵⁹⁾. These findings are in agreement with **Perry , Lee , Cotton**⁽⁶⁰⁾ who documented that pretreatment swallowing exercises are helpful in increasing physiological reserve, reducing disuse atrophy and possibly delaying the onset of fibrosis and improving swallowing for patients with HNC cancer which result in improving quality of life.

The present study showed that there were positive correlations between total knowledge scores and total quality of life scores among study group at third week post intervention and last week of radiotherapy while there were no correlations between knowledge score and total quality of life among control group. These findings are supported by **Nigam & Prakash**⁽¹³⁾ who reported that providing instruction for management of side effects of radiation therapy is significantly effective in improving quality of life of head and neck cancer patients undergoing radiation therapy. From the researcher point of view, this may be due to having enough knowledge before starting radiotherapy prepares patients psychologically and physically which improve quality of life.

The present study showed that there were statistical significant relations between mean total quality of life score and sex for study group pre intervention and 3rd week post intervention which supported hypothesis two, that there is a relationship between quality of life and selected bio-sociodemographic data for patients with head and neck cancer who receive radiotherapy. This may be due to females are more careful to follow learned nursing intervention to improve their quality of life to complete their role with their families.

While, the present study showed that there were no statistically significant relations between mean total quality of life score pre and post intervention and all sociodemographic variables for control group which doesn't support hypothesis two. From the researcher point of view, this may be due to that quality of life can be affected by other factors as absence of knowledge about disease and its management and severity of disease. The current findings supported hypothesis one, that Patients of study group who apply the designed nursing intervention exhibit an improved quality of life than patients who don't (control group).

V. Conclusions

The present study seeks to evaluate the effect of tailored nursing intervention on quality of life among patients receiving head and neck radiation therapy. Based on the findings of this study, it can be concluded that: The total knowledge score among study group (group I) was significantly higher than control group (group II) after the tailored nursing intervention. Tailored nursing intervention has significant effect on improving quality of life among study group than control group.

II- Recommendations

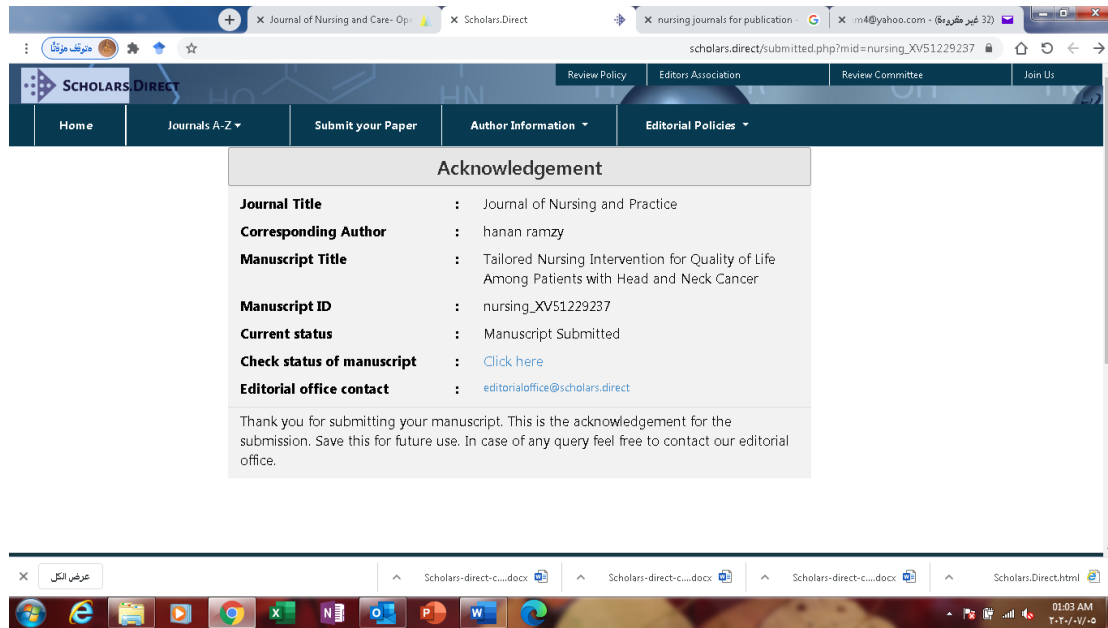
Based on the findings of the present study, the following recommendations were derived and suggested:

- The tailored nursing intervention should be considered for patients with head and neck cancer at radiotherapy unit in oncology department and a colored booklet about this intervention should be available and distributed to all patients with head and neck cancer and this booklet should also be available and distributed to all nurses working at radiotherapy unit in oncology department . of life for patients with head and neck cancer.
- Replication of the study using a larger probability sample from different geographical areas to help for generalization of the results.

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