Effect of Post Radiation Instruction on Skin Outcomes among Patients Receiving Radiotherapy

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ABSTRACT

Background: Head and neck cancer is considering one of the most aggressive diseases that require extensive radiotherapy. This type of treatment modalities has a lot of side effect the more prevalence at the skin manifestation therefore it was crucial to try to minimize such disturbing side effect, **Aim:** The effect of post-radiation instruction on skin outcomes among patients with head and neck cancer receiving radiotherapy. **Subject and Methods: Design**: Quasi-experimental, time series design. **Setting:** study was conducted in Clinical Oncology Department at Kasr El Eini. **Sample**: A convenient nonprobability sample of 80 patients with head and neck cancer, divided into two groups. **Tools of data collection.** Tool A: demographic data sheet, Tool B: RTOG, skin assessment tool. **Results:** There is an increase in patients' compliance among study group after application of educational instruction compared to control group with statistical significant at p value (0.05*) X^2= 0.86, as well as, highly statistical significance differences between case and control group as to ROTG2 the maximum 17.5% to 47.0% between study and control group consecutively Conclusion: the patients who received skin management instruction have less main score of skin assessment from patient with routine care and the mean score of patient compliance relate negatively with the total mean score of skin assessment tool. **Recommendations:** Replication of the study on a larger probability sample selected from different geographical areas. The educational instruction for skin management during radio therapy should become an integrated part of the total management regimen.

Keywords: Radiation instructions- - skin outcomes- radiotherapy

Introduction

Head and neck cancer (HNC) can be distinguished from other types of cancer by targeting the mouth cavity, pharynx, larynx, paranasal sinuses, nasal cavity, salivary glands, or head and neck lymph nodes. Cancer disturbs anatomical sites that represent corn stone role in speech, swallowing, taste, and smell. More than

90% of cancer are squamous. Numerous arrangements of surgery, chemotherapy, and radiotherapy (RT) can be used to treat HNC (Kusampudi & Konduru, 2021).

Radiotherapy (RT) is one of the fundamental treatment modalities for cancer patients with head and neck (HNC), it has a significant role in the treatment of HNC and it is used in about 78% of HNC patients. The aim of RT is to destruct cancer cells; unfortunately it also destruct the normal tissues that fund in the area of radiation as well, resulting of a lot of side effects or complications (Ortigara, Bonzanini, Schulz & Ferrazzo, 2021).

Skin reactions are a communal side effect of radiotherapy, and about 95% of patients suffer from some skin problem through treatment. Most of the skin side effects are assessed by clinicians/ nurses and categorized by the shared toxicity criteria adverse effects. Such as Radiation Therapy Oncology Group (RTOG). Patients suffer from mild symptoms, grade 1 (60% erythema) and grade 2 itchy flaky skin (32% dry desquamation). Those who experience serious radiation-induced skin reactions (RISR), which are graded as 3, have blisters and tissue loss (8% moist desquamation). Patients receiving treatment for head and neck cancer have a higher incidence, with 25% of them evolving severe RISD (Wang, Yang, Liu, Liao, Fu, Zhou & Zhou, 2022).

Radiation-induced skin reactions (RISR) have the potential to postponed radiotherapy treatment

and have a harmful impact on patient outcomes, especially on (patient experience and quality of life). It is critical to capture patient reported outcomes of RISR because radiation side effects can hinder quality of car, body self-image, cause extreme pain, and undesirably affect management. This happened as an outcome of a multifaceted interaction between patient-related factors, such as body mass index (BMI), nutritional status, smoking, genetic susceptibility , and pre-existing skin disease (Meixner, et al,2023).

Also treatment dynamics as entire and daily dose of radiotherapy, treatment techniques, extent / position of the radiation area and concomitant chemotherapy also effect severity, Inflammation appear indoors the first 24 hr. after the beginning of radiation, makes alteration in endothelial cells and endorses inflammation. Within 2-4 weeks a persistent erythema appear in additional to localized edema and infiltration of leukocytes (Plaza, et al 2022).

Radiotherapy demolition accumulates during the course of treatment resulting to hindered healing of the skin and may continue up to four weeks post treatment. Chronic side effects to the skin like, changes to the vasculature and connective tissue of the cutaneous and subcutaneous layers causing, telangiectasia, atrophy and hyperpigmentation of the skin. In spite of numerous practice references and guidelines there is still diversity in what cancer centers

recommend for RISR. While the research published between 2015 and 2022 recommendations were potentially valuable to the radio-treatment community, only 30% of the research reread for these guidelines was assessed as good quality (i.e., assessed as having limited opportunity for bias that may affect the research results) (Baic et al., 2022).

Significance of the Study:

The 6th most common cancer globally is head and neck cancer, with 890,000 newly diagnosed case and 450,000 mortality in 2018. The frequency of HNC endures to increase and is anticipated to growth by 30% (that is, 1.08 million new cases annually) by 2030 (Johnson et al., 2020).

Skin reactions develop to some extent in over 90% of patients those receive radiotherapy through or post treatment. Erythema (ER), which is characterized by reddened skin that may be edematous and feel hot, irritable, and dry desquamation (DD), which is characterized by reddened skin that is dry, flaky, or peeling and may be itchy, are the initial phases of these responses. More serious reactions include moist desquamation (MD), exudate production, ulceration, and painful skin peeling that reveals the dermis could result from this. In certain patient groupings, less than 10% of patients have MD. In radiation oncology, skin responses seldom proceed to the ulceration stage thanks to megavoltage linear accelerators. Nevertheless, skin responses

can still disrupt the intended course of treatment and diminish the quality of life for patients (Le Reun, 2022).

A multidisciplinary approach is necessary to manage skin reactions, and nurses are a significant part of it. Nursing care goal is to create an superlative environment that promotes healing and patient comfort, while also reducing the potential for pain and infection. Traditional practice has had a strong influence on this domain of nursing care, rather than relying on clinical research results. Even though there have been more clinical studies on skin care in radiotherapy recently, the literature indicates that most of the manuscripts are based on expert opinion rather than reporting the wide range of strategies and recommendations available for managing and preventing skin reactions during radiotherapy. This, along with the dearth of clinical research findings, suggests a wide variety of their use in routine clinical practice.

Aim of study:

The aim of the study was to evaluate the effect of post-radiation instruction on skin outcomes among patients with head and neck cancer receiving radiotherapy.

Research Hypothesis

To attain the aim of this study, the subsequent hypotheses were hypothesized to be verified:

H1: the patients who are going to receive skin management instruction will have less main

score of skin assessment tool from patient with routine care.

H2; the mean score of patient compliance will relate negatively with the total mean score of skin assessment tool.

Operational Definitions

The following definitions were used in the current study:-

Radiation instruction:

The instruction developed by Canterbury Regional Cancer and Hematology Service (CRCHS), which the study researchers will utilize in the form of brochures, will be given orally and in writing to the patients receiving radiotherapy before, during, and after treatment. The (CRCHS) instructions will be implemented through a series of instructional sessions by the researcher to achieve the aim of the study.

Patients

Patients with head and neck cancer (resent diagnosis) who are conscious and scheduled to receive fractionated radiation therapy (also known as external beam radiation therapy) will have 30 sessions spread over six weeks.

Skin outcomes:

A collection of signs and symptoms assessed by RTOG skin assessment international tool

Theoretical Framework

The theoretical framework that will be used is the Theory of Goal Attainment, which was created by Imogene King in the early 1960s. It explains the dynamic, interpersonal relationship that helps a patient reach their goals in life. This nursing theory, according to Araújo et al. (2018), emphasizes the dynamic interaction between two or more people in order to achieve a certain goal in a specific amount of time. Like practically all nursing theories, King's theory's metaparadigm includes the individual, settings, nursing, and health (Bender, 2018).

In order to improve the patient's health status, nurses must take into account all four of these met paradigms. Although a person is a personal system that interacts with interpersonal systems and the internal and external environment, King's theory states that a patient's health is determined by their life experiences, including how they cope with stressors in both the internal and external environment. Additionally, nursing is the process of human interactions aimed at assisting patients in reaching their goals (Fronczek, Rouhana & Kitchin, 2017).

King's theory of goal attainment was chosen by the researcher because it emphasizes the dynamic interaction between the nurse and the patient in order to accomplish a specific goal at a specific time across a variety of phases (perception, judgment, action, interaction, and

transaction); making decisions with the patient rather than for the patient; decisions, alternatives, and nursing care outcomes; and differentiating nursing practice from other healthcare professions based on what nurses do for and with patients (Tesh, 2019). Therefore, this theory is consistent with our study and can assist in reaching the shared objective of applying nursing guidelines for patients undergoing radiation therapy in order to achieve an acceptable degree of patient discharge.

Figure (1) The succession of actions, reactions, and interactions that occur between the nurse and

patient based on mutual perception and judgment are illustrated in the article named "Imogene King's theory of goal attainment."
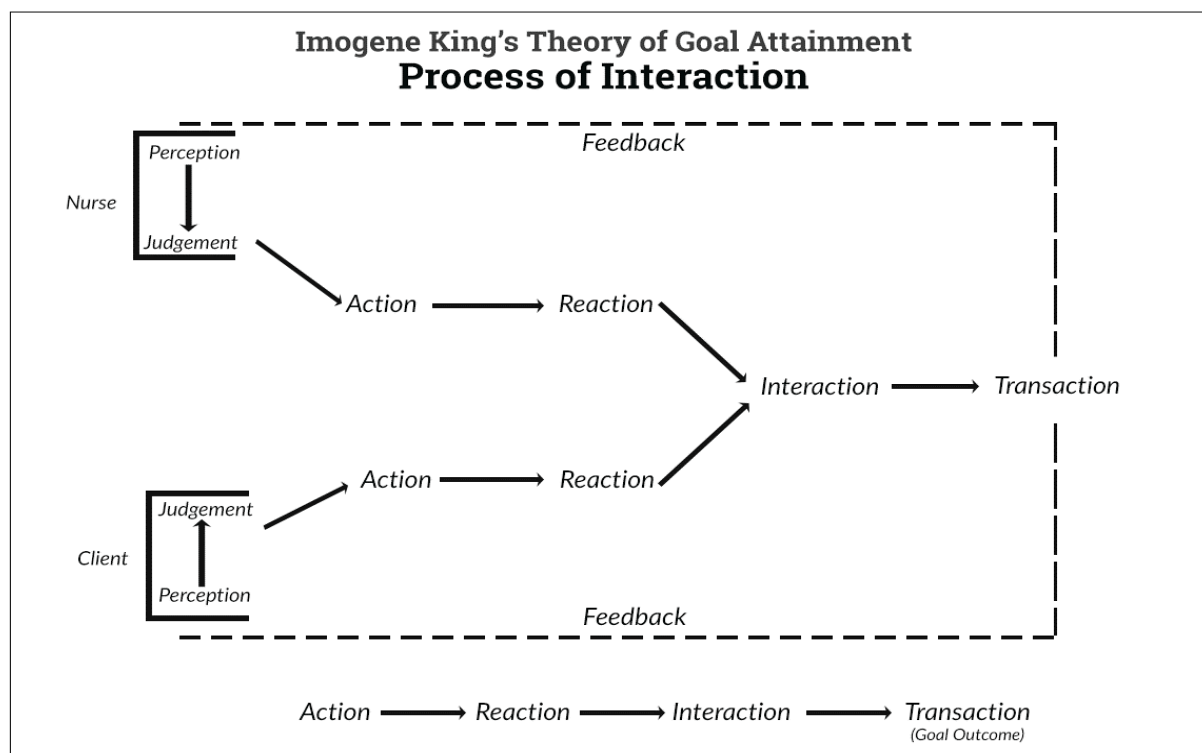

Figure 1. King's theory of goal attainment - nursing theory (2021). Available at: www.nursing-theory.org/theories...models/king-theory-of-goal-attainment. Accessed at 22/3/2024 4:00pm

Subjects and Methods

Research Design

The current study will use a time series, quasi-experimental design. It serves as a blueprint or roadmap outlining the researcher's intended methodology. An empirical study that uses a quasi-

experimental design is one that does not use randomization to determine the causal influence (skin result) of an intervention (instructions) on its target population (radiotherapy patients). The basic time-series design is a type of quasi-experimental research design where a dependent variable is

measured at multiple points in time in a single group both before and after the researcher administers a modified treatment (Madadizadeh, 2022).

Setting

This study was carried out in Cairo, Egypt's El Kaser Al Ainy Oncology Unit, which is affiliated with Cairo University. The apartment is on the lower level. There are 20 seats in the waiting area, a laboratory, asimulation room, a brachy treatment room, a linear acceleration (1, 2, 3) simulator, and an X-ray machine.

Sample

Eighty patients with head and neck cancer were selected from a purposeful sample and split into two groups: the study group (1) received nursing instructions, while the control group (2) received standard hospital treatment. Using the sample calculation equation, the following inclusion and exclusion criteria were used to choose the sample.

$$N = \frac{(r+1)(Z_{\alpha/2} + Z_{1-\beta})^2 \sigma^2}{rd^2}$$

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Inclusion criteria. Following a new diagnosis of head and neck cancer, both male and female adults who are aware are anticipated to get fractionated radiation therapy, also known as external beam radiation therapy. Each patient will have 30 to 33 sessions over a 6-week period.

Exclusion criteria

The patients suffered from any skin problem, pregnant and lactating mother will be excluded from the study.

Tools:

The tool will be in the form of:-

Tool A: part 1: demographic data which include (code, age, gender, diagnosis, date, ……etc.) part 2: medical data sheet for study sample (diagnosis, comorbid disease …..etc) part 3: knowledge assessment for study sample (about sun exposures, type of clothes, usage of cream……etc)which is developed by researchers Tool B: Radiation Therapy Oncology Group RTOG, skin assessment tool) which contain 4 stages of skin reaction standardized tool, first developed 2014 then revised every 3 years lastly revised at May, 2023 with reliability 0.97

Scoring system : RTOG, skin assessment tool) Scoring Criteria to classify radiotherapy effects. It identifies degree 1 (no reaction), 2 (dry desquamation, vesiculation and pruritus), 3 (moist desquamation and ulceration), and 4 (exfoliative dermatitis and necrosis)

Tool C: patient's compliance to nutritional instruction, Skincare for patients receiving radio-therapy upon Canterbury Regional Cancer and Hematology Service_guidelines : which developed by the researchers, the check list will be filled for

each patient from the study group at the 2nd and the 3rd meeting

The scoring system: 3 will be given for always follow the instruction, 2 for some times follow the practice and 1 for relay following practice then the mean score will be calculated and compare to RTOG total score to identify the relation

Tools Validity and Reliability

five experts at the medical filed ––three from medical surgical nursing and two from nuclear medicine–– examined the content validity of the produced study tools to ensure that they are thorough, clear, relevant, and easy to use. Cronbach's Alpha.0.82 reliability for tool B, and 0.79 for tool C.

Ethical consideration

An official permission taken from the ethical committee at the faculty of Nursing- Cairo University. And from the patients who met the criteria of research and interviewed individually to explain the nature and purpose of the study assuring to them; that participation or not ensured to not affect their treatment, emphasize that the participation in the study is entirely voluntary and they have the right to withdraw at any time without any effect on them. Anonymity and confidentiality always assured through coding the data.

Procedure

The study will be carried out through the following phases:

Preparatory phase. Following a thorough literature analysis, the researchers created the study tools and nursing instructions. Every week, the researcher called the accelerator room's radiotherapy technicians to get a list of patients who would be starting radiation treatments. The study participants were questioned one-on-one in the waiting area to explain the nature and goal of the current investigation. The patients who met the inclusion criteria and agreed to take part in the trial were then asked to sign a written consent form. To prevent contamination, the researchers collected data from the control group first, followed by the study group, from a total of 80 patients (40 in each group). The hospital skin care regimen was the same for the research and control groups.

Following the signing of the consent, the researchers filled out the Demographic and Medical Background Information Form, evaluated the participant's skin condition using the RTOG assessment tool in well-lit conditions, and determined the participant's grade. Patients must not have complained of any skin issues during the initial interview. In addition to answering any questions and providing clarification on any information, the researchers let the patients know when follow-up appointments were anticipated noted that researcher also assess the knowledge

and skin condition to control group in the same way for the control group.

Implementation phase.

The study group and their family members received nursing instructions from the researchers for two sessions in a row during this phase. A tutorial that provides information while continuously ensuring that the patient has understood the instructional content—which will be tailored to the patient's needs, lifestyle, level of education, and expectations—was offered throughout each session, which lasted between thirty and forty-five minutes.

In the first appointment, patients received nurse instructions in the form of a booklet with clear language and images regarding radiotherapy and its skin adverse effects. The researchers gave the patients and their families the opportunity to ask questions for more clarification at the conclusion of each session. The study group will receive a booklet at the conclusion of the session that includes all nursing instructions and is augmented by illustrative photographs.

In order to make sure the patient understood and followed nurse directions, the researchers assessed patient compliance using the devised checklist at the start of the second session. They also went over the knowledge and practical portions of the first session. Patients and their families had the chance to ask questions that needed to be addressed..

Any queries or worries would be welcome during the discussion. For six weeks, the researchers will call patients twice a week to ensure that nurse recommendations are followed. In the oncology unit, a six-month data collection phase will be carried out. To ensure fairness, the control group will be given nursing instructions at the conclusion of their evaluation.

Evaluation phase. Assessment of skin outcomes will be done for the control group as well as the study group after providing the nursing instructions through two times at 3 weeks to follow compliance of patient to educational instructions and 6 weeks, which mainly close to the end of the radiotherapy sessions. the date chosen upon the data published by Cancer Research Institute, (2023) that revealed that most of the skin manifestation appear after 4 week of treatment and for researcher to ensure accurate measurement of skin reaction major and minor the 6 week evaluation is settled.

Statistical Analysis

The statistical package for the social sciences (SPSS) software, version 20, was used on a personal computer to score, tabulate, and analyze the data that had been gathered. Data relevant to the study were analyzed using descriptive statistics (frequency distribution, percentage, means, and standard deviations) and inferential statistics (t-test and Chi square). $p \leq 0.05$ was chosen as the significance threshold, and $p \leq 0.001$ as the extremely significant level.

Result

Table 1 The frequency and percentage distribution of the study and control groups' patients' demographic characteristics (study = 40, control = 40)

Variable	Study group		Control group		Test	P
	No	%	No	%		
Age						
- 20 <30	1	2.5	1	2.5		
- 30<45	8	20	7	17.5	0.12	0.9 NO
- 46≤60	17	42.5	20	50		
- ≥ 60	14	35	12	30		
Gender						
- Male	30	75	27	67.5	0.54	0.45 NO
- Female	10	25	13	32.5		
Mean± SD	51.5± 10.9		51.8± 10.6			
Marital status						
- Single	30	75	27	67.5	0.54	0.45 NO
- Married	10	25	13	32.5		
- Widow	30	75	27	67.5	0.54	0.45 NO
Level of education						
- Can't read and write	33	82.5	32	80	4.9	0.17 NO
- Primary education	3	7.5	4	10		
- Secondary education	3	7.5	0	0		
- Bachelor	1	2.5	4	10		
Occupation						
- Employee	2	5	3	7.5	11.5	0.06 NO
- Hand craft	23	57.5	16	40		
- Housewife	3	7.5	5	12.5		
- Not working	0	0	1	2.5		
- Farmer	9	22.5	13	32.5		
- Retired	3	7.5	2	5		

NO = Not Significant.   ** Significant at p≤ 0.05*   *** Highly Significant at p≤ 0.01*

B. Medical Background Data
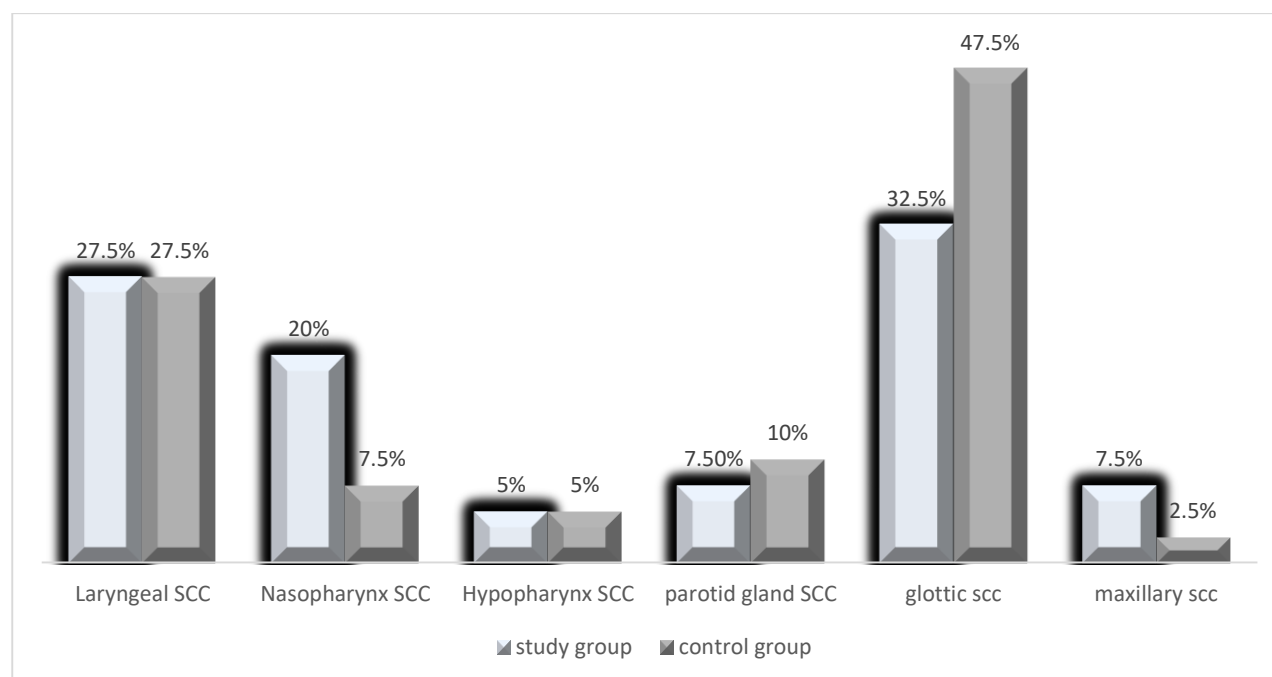
Figure 2. Medical diagnosis percentages for the study and control groups (N = 80)
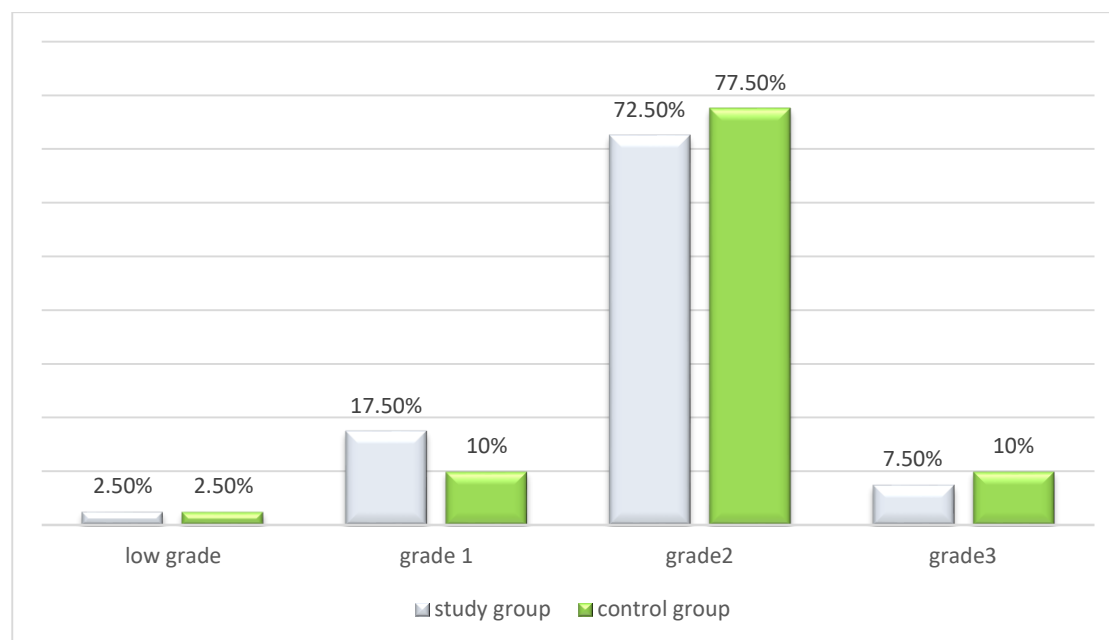
Figure 3. Percentage and distribution of head and neck cancer stages among the study and control groups (n=80)

Table 2 Frequency and Percentage Distribution of patient's compliance to educational instruction among the Study and Control Groups Patients (Study =40 Control = 40)

knowledge of skin care	Study (n=40)				Control (n=40)				P-value
	2nd meeting		3rd meeting		2nd meeting		3rd meeting		
	N	%	N	%	N	%	N	%	
Use soap with perfume									
Yes	24	60	6	15	32	80	28	70	
No	16	40	34	85	8	20	12	30	
Use perfume									
Yes	28	70	12	30	28	70	18	45	
No	12	30	28	70	12	30	22	55	
Use rigid towel to dry skin by fraction method									
Yes	20	50	8	20	20	50	22	55	
No	20	50	32	80	20	50	18	45	
Use cream or lotion in radiation area without doctor order									
Yes	16	40	4	10	24	60	16	40	
No	24	60	36	90	16	40	24	60	
Use cream or sweet to remove hair in radiation area									
Yes	10	25	4	10	16	40	10	25	
No	30	75	36	90	24	60	30	75	
Use razor to remove hair in radiation area									
Yes	12	30	4	10	12	30	4	10	
No	28	70	36	90	28	70	36	90	
Rub in radiation area									
Yes	32	80	6	15	32	80	6	15	
No	8	20	34	85	8	20	34	85	
Exposure to extreme heat or cold									$X2=$
Yes	16	40	2	5	16	40	8	20	0.86
No	24	60	38	95	24	60	32	80	
Wear woolen garments or industrial textiles									0.05*
Yes	36	90	14	35	36	90	14	35	
No	4	10	26	65	4	10	26	65	
Wear tight clothes									
Yes	24	60	8	20	24	60	14	35	
No	16	40	32	80	16	40	26	65	
Radiation area exposed to sun									
Yes	12	30	2	5	12	30	8	20	
No	28	70	38	95	28	70	32	80	

Table 3 Frequency and Percentage Distribution of patient's compliance to nutritional instruction among the Study and Control Groups Patients (Study =40 Control = 40)

	Study (n=40)				Control (n=40)				P-value
	2nd meeting		3rd meeting		2nd meeting		3rd meeting		
	N	%	N	%	N	%	N	%	
Drink water 2-3 L/day									
Yes	14	35	32	80	18	45	30	75	
No	26	65	8	20	22	55	10	25	
Eating fruit and vegetable									
Yes	12	30	32	80	16	40	16	40	
No	28	70	8	20	24	60	24	60	
Eating protein									
Yes	8	20	20	50	14	35	30	75	X2=
No	32	80	20	50	26	65	10	25	٠٫78 0.05*
Low fat diet									
Yes	14	35	36	90	12	30	28	70	
No	26	65	4	10	28	70	12	30	
Avoid eating before and after radiation therapy session 30 minutes									
Yes	8	20	34	85	14	35	32	80	
No	32	80	6	15	26	65	8	20	
voidance all stimulant for nausea and vomiting at meal time									
Yes	10	25	36	90	20	50	26	65	
No	30	75	4	10	20	50	14	35	

Table (4): The Radiation Therapy Oncology Group (RTOG) related to case versus control group after receiving the education program

Items	Study (n=40)		Control (n=40)		P value
	No	%	No	%	
RTOG					
RTOG 0 No change over the baseline	4	10.0	-	-	
RTOG 1 Follicular, faint or dull erythema/epilation/dry desquamation /decreased sweating	27	67.5	5	12.5	
RTOG 2 Tender or bright erythema, patchy moist desquamation / moderate edema	7	17.5	19	47.0	<0.001**
RTOG 3 Confluent, moist desquamation other than skin fold , pitting edema	1	2.5	14	35.5	
RTOG 4 Ulceration, hemorrhage, necrosis	1	2.5	2	5.0	

***Significant difference at p value<0.01*

Table 5 Correlation between patient's compliance to educational instruction to skin condition side effect assessed by RTOG among the Study and Control Groups Patients (Study =40 Control = 40)

	Total (RTOG) score			
	Study		Control	
	R	P	R	P
Compliance to nursing instruction	0.945-	.000**	.961	.000**

<u>First section represents demographic / medical data of patient which included at table 1 and figure 2& 3</u>

Table (1) shows that, with mean ages of 51.5 ± 10.9 and 51.8 ± 10.6 years, respectively, 42.5% of the study group and 50% of the control group are between the ages of 46 and 60. In terms of gender, men made up 67.5% of the control group and 75% of the study group. Regarding occupation, 40% of the control group and 57.5% of the research group are employed in manual labour. Eighty present of the control group and eighty-two present of the study group were illiterate. Regarding every demographic feature, there were no statistically significant differences between the two groups.

Figure (2) revealed that glottic squamous cell carcinoma was diagnosed in 32.5% of the study group and 47.5% of the control group, with laryngeal squamous cell carcinoma (SCC) being diagnosed in 27.5% of both groups. Furthermore, $X2 = 4.5$, $P = 0.47$, showed no statistically significant difference between the two groups.

Figure (3) revealed that head and neck cancer stage 2 was present in 72.5% of the study group and 77.5% of the control group. Additionally, $X2 = 1.748$, $p = 0.995$, showed no statistically significant difference between the two groups.

<u>Second section will confirm the first hypothesis of the study Through table 2, 3 And 4</u>

Table (2): This table shows that, when compared to the control group, the study group's patients' compliance increased following the implementation of educational instruction regarding radiation skin care, with a statistically significant rise at p value (0.05^*) $X2= 0.86$.

Table (3) When compared to the control group, it shows that patients' compliance improved in the study group following the implementation of nutritional education, with a statistically significant $x2=.78$ p value (0.05^*).

Table (4): shows that there are very substantial variations between the case and control groups in terms of RTOG, with the largest discrepancies between the study and control groups at ROTG2 being 17.5% to 47.0% in that order.

Third section investigates the second hypothesis by table 5.

Table (5) represents the highest strong negatively statistical significant correlation between patient compliance to nursing instruction and RTOG score

The result of the current study is divided to three section the first section represent socio-demographic / medical data of patient which included at table 1 and figure 2& 3, the second section will confirm the first hypothesis of the study which is H1: the patients who are going to receive skin management instruction will have less main score of skin assessment tool from patient with routine care. Through table 2, 3 And 4, finally the third section investigate the second hypothesis of current study that state,H2; the mean score of patient compliance will relate negatively with the total mean score of skin assessment tool by table 5.

Discussion

These side effects from radiation therapy can raise financial, emotional, and physical expenses and, in certain situations, even cause death. (Zheng et al, 2021). The aim of this study is to evaluate the impact of nursing instructions on patients' skin outcomes among patients with head and neck cancer receiving radiotherapy.

Three sections make up the offered discussion, which focuses on talking about the findings relevant to the current study: The demographic details and medical-related data are shown in Section 1. Information pertaining to the first hypothesis is included in the second section. Results pertaining to the second hypothesis are presented in the third section.

Section (I): Patients' Demographic Characteristics and Medical Background Data

With a mean age of 51.5± 10.9 and 51.8± 10.6, the current study found that over one-third of the study group and nearly half of the control groups are between the ages of 46 and 60. According to this study, head and neck cancer is highly correlated with advancing age. This could be because aging causes the immune system to undergo a number of changes that impact both the innate and adaptive immune systems. With an average diagnostic age of 62 years, Vahl et al. (2021) and Kusampudi & Konduru (2021) shown that the risk of HNC increases after the age of 40.

An Egyptian study called "Prevalence of HPV infection in head and neck cancer patients in Egypt: National cancer institute experience" (Salem et al., 2020) revealed that the patients' mean age was 57.63 years, with the highest frequency occurring in those who were 60 years of age or older. Furthermore, the bulk of the study and control groups were diagnosed by Khanna et al. (2021) when they were at least 50 years old.

In terms of gender, the current study revealed that most of the participants were men, indicating that men are more likely than women to develop head and neck cancer. This is likely because men are exposed to dust at work, which can cause chronic inflammation and cause cancer because dust has chemical properties of its own or is a

carrier of other carcinogenic compounds. Additionally, practically every participant smokes or has been around smokers.. Stoyanov et la. (2021) who found that Male to female ratio of the registered HNC cases was 3.24:1. In addition Kusampudi & Konduru (2021) revealed that HNC ranks as the fifth most prevalent cancer in men, while it is the eleventh most common cancer in women.

The majority of study participants were married, according to data on patients' marital status. One explanation for these results could be that most of the study participants were over 40, which is the typical age for married people. The study "Sociodemographic correlates of head and neck cancer survival among patients with metastatic disease" by Pannu et al. (2020) found that almost two-thirds of patients were married. Additionally, Salem et al. (2020) discovered that married people made up the bulk of the cases they examined.

In terms of educational attainment, the majority of patients in both groups stated that they were illiterate. The fact that most of the participants were from rural areas may be the cause of this outcome. According to Abo Elazayem, El Agroudy, Shafiq, and Mansour (2020), illiteracy is regarded as one of the most significant issues confronting Egyptian society in general and rural areas in particular. They also noted that the rural governorates in Upper Egypt have the highest rates of illiteracy.

These findings were consistent with Gawad, Fareed, Abd El-Bary, Ramzy& Attallah (2020). Over one-third of the participants in the study "Tailored Nursing Intervention for Quality of Life among Patients with Head and Neck Cancer" were illiterate, according to the researchers. Additionally, over one-third of the participants in the study "Interaction between known risk factors for head and neck cancer and socioeconomic status: the Carolina Head and Neck Cancer Study" had only completed primary school, according to Stanford-Moore et al. (2020). This result differed from that of Melissant et al.'s study, "Body image distress in head and neck cancer patients: what are we looking at," which was published in 2021. According to Supportive Care in Cancer, over one-third had only completed secondary school.

According to the current study, over half of the study group and over one-third of the control group performed manual labor. The study participants' working age may be the cause of these results. In addition to smoking and being exposed to vehicle exhaust, many patients were also employed in the building and construction industry, where they were exposed to dust from construction sites that contained asbestos, mineral fibers, sand, metal powders, tar, bitumen, and cement dust, among other substances that can cause cancer.

The study by Deneuve et al. (2020) titled "Systematic screening for occupations and occupational exposures in head and neck squamous cell carcinoma patients" supported these findings. It was reported that over 50% of the

participants worked by hand. Gawad et al. (2020), too. Over one-third of study participants were reported to be employed.

Medical related Data of the current study revealed that the highest frequency of medical diagnosis was glottic squamous cell carcinoma. Possible explanation for these findings might referred as one third of the control group and more than half of the study group were manual labors working in polluted environmental conditions that expose them to dust which can induce a carcinogenic effect through chronic inflammation of the larynx. Williamson & Bondje (2021) noted that one of the most prevalent cancers of the head and neck is laryngeal cancer. Like other forms of laryngeal malignancies, glottic tumors originate from the actual voice cords. Additionally, Kusampudi & Konduru (2021) came to the conclusion that workers in construction and building are more susceptible to laryngeal cancer when exposed to cement dust.

These results were in line with those of Emadzadeh et al. (2020), who found that almost one-third of study participants had laryngeal cancer in their study titled "Head and Neck Cancers in Northeast Iran: A 25-year Survey." However, Gawad et al. (2020) reported that one-fourth of research participants had oropharyngeal cancer, which contradicted this finding.

Regarding head and neck cancer stage, the present study revealed that more than two thirds of study participants had grade 2 squamous cell carcinoma. This result was consistent with Luitel,

Rimal, Maharjan & Regmee. (2020) who conducted study entitled ″ Assessment of oral mucositis among patients undergoing radiotherapy for head and neck cancer″ reported that more than half of study participants had grade 2 squamous cell carcinoma. In addition, More than two-thirds of research participants had grade 2 squamous cell carcinoma, according to Salem et al. (2020). However, Caburet et al. (2020) found that over one-third of research participants had grade 3 squamous cell carcinoma, which contradicted this finding. Lastly, the current investigation found that no sociodemographic variable showed statistically significant differences between the study and control groups.

Second section will confirm the first hypothesis of the study.

Concerning patient compliance to education instruction there is significant different between study and control group as for the study group the patients compliance this could be explain by researchers, because the study group receive a structured, well organized instruction given by a lenience health care provider that make sure they understand the instruction and follow implementation not as the control group that receive instruction some time by technician or nurse, doctor, other patient or even a relative no timing or follow up or material o one to follow and sometimes they don't get the knowledge at all.

These congruent with the result Ganjali, Kiyani, Saeedinezhad, Sasanpoor, & Askari, (2020). The study states that there is significant

different between head and neck cancer patient who receive educational instruction and who not, mention worthily that assessment of compliance of study group to instruction emphasized by researcher to compare the routine process of patient education and the structured one that the study implied and for ethical reasons the researchers send copy of educational material to control group after compilations of study regardless its effectiveness

There is also significant difference between skin manifestation between study group and the control group most commonly at ROTG category 2,3,4 rather than 1 which is more importantly and this could be explained by the nature of manifestation at these category , for category 1 are minor skin reaction that disappear with time and logically expected due to exposure of skin to radiation, but for the more serious manifestation the result ensure that following educational instruction was very helpful at minimizing it's appearance the similarity of the result shown at study done by (Wang, Yang, Liu, Liao, Fu, Zhou & Zhou, 2022)

Third section investigates the second hypothesis

As expected the final part in confirmed the strongly negative correlation between compliance to educational structure that given by researchers hopefully to prevent or at least minimize the skin toxicity reaction to radiotherapy and the ROTG scores which is confirmed and that answer the second hypothesis this matching with study done by McQuestion, & Cashell, 2020 and

Dejonckheere et al, (2023) as well as a lot of other researches that confirm the effect of educational instruction at prevent/ minimize the effect of skin reaction to radiotherapy

Conclusion: the patients who received skin management instruction have less main score of skin assessment from patient with routine care and the mean score of patient compliance relate negatively with the total mean score of skin assessment tool. **Recommendations:** It is advised that the study be repeated using a bigger probability sample drawn from various regions of Egypt in order to get more broadly applicable findings. Professional nurses must follow an organized approach when providing educational training on skin management during radiotherapy. This instruction should be incorporated into the overall management regimen.

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