International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2015): 78.96 | Impact Factor (2015): 6.391

Impact of Instructional Intervention Program upon Women's Skin and Nail Health Who Candidates Radiation Therapy for Breast Cancer

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Abstract: ***Background: Radiation therapy is treatment with high-energy rays that destroy cancer cells. It is also affects healthy tissue in the area being treated. There are two main types of radiation therapy that can be used to treat breast cancer external beam radiation this type of radiation comes from a machine outside the body and internal radiation, for this treatment, a radioactive source is put inside the body for a short time. Normal tissues neighboring to the tumor are going to receive variable quantities of radiation, which may result in damaging of these tissues and consequently emergence of adverse effects. Objectives: To assess physical health status before and after instructional intervention and information about skin radiation treatment. Methods: The sample consisted of (100) women, (50) considered as study group, and another (50) the control group. A pretest was done for both groups (study and control), and then the study samples were exposed to an instructional intervention and three-dimensional post tests and the length of time between each test 21 days in Al- Amal National Hospital for Cancer Managementand Oncology Teaching Hospital. Results: shows that physical sub domains regarding "Skin and Nail changes " items at the three post-periods (1,2,3) for study group after the implementation of the educational program with comparisons had highly significant differences are at P<0.001. Analysis of data was performed through the application of descriptive and inferential statistical data analysis approach. Recommendations: the study recommended that the radiation and nuclear medicine hospital must include an instructional intervention program concerning the skin care in women Candidates Radiation Therapy for Breast Cancer.***

Keywords: Breast Cancer, SkinChange, Radiotherapy

1. Introduction

Cancer is an important factor in the global burden of disease. The estimated number of new cases per year is expected to rise from 10.2 million 2002 to 15 million by 2025, 60 % of those cases exist in the developing countries [1].Globally, Cancer is among the most common causes of morbidity and mortality worldwide, with an estimated 14 million new cases and 8 million deaths in 2012, projected to rise by at least 70% by 2030 breast cancer is the second most common cancer overall, and by far the most common cancer in women. In 2012, worldwide, there are estimated to have 1.67 million new cases (25% of all incident cancer cases) [2]. Breast cancer is one of the most common diseases in which abnormal or malignant cancer cells form in the tissues of the breast [3]. It is not a single disease, but rather a group of diseases that can develop in the ducts, and lobules or other parts of the breast. Breast cancer is the second most common prevalent and diagnosed cancer that affects women and the leading cause of cancer death and disability in world-wide [4] [5]. In Iraq, Breast cancer is the commonest malignancy among women in countries within the Eastern Mediterranean Regions (EMR). In Iraq, it comprises approximately one third of the registered female cancers. Other features that justify increasing efforts for breast cancer control in the EMR include the obvious rise in the incidence rates, the higher frequencies of younger ages and advanced stages at the time of presentation and the likely prevalence of more aggressive tumors resulting in high mortality/incidence ratios [6]. Radiation treatment is based on different kinds of radiation and depends on the different kinds of interaction between the radiation and body tissue [7].

Radiotherapy can be used before or after surgery; before surgery to reduce tumor size and after it to destroy the remaining cells in the breast, chest wall, and axilla (underarm) regions. Normal tissues neighboring to the tumor are going to receive variable quantities of radiation, which may result in damaging of these tissues and consequently emergence of adverse effects [8]. Radiation is a local, targeted therapy designed to kill cancer cells that may still exist after surgery and it is given to the area where the cancer started or to another part of the body to which the cancer spread. But the radiation itself may cause some discomfort over time in the area where are receiving radiation, skin can turn pink, red, or tan, and may be sensitive and irritated. Creams and other medicines can soothe these symptoms. Skin has a specific tolerance to radiation; its effects on the skin may continue to get worse for another week or so, and then the skin then to get well or better. In smoker women, stop smoking may help the skin to recover more quickly [9] [10].

2. Methodology

A quasi-experimental design was carried out throughout the present study with the application of a pre- post tests approach for the study group and control group after implementation of instructional intervention program. The study was conducted Al- Amal National Hospital for Cancer Management, and Oncology Teaching Hospital is located at the center of Baghdad city, in Al-Rasafa sector. A

convenient "Non-probability" sampling technique was used consisting of (100) women Candidates Radiation Therapy for Breast Cancer. Fifty (50) Women considered as (study group) and another (50) women were considered as (control group). The study group was exposed to instructional intervention program; the criterion of this sample was seeking treatment for their skin problem. Data for such assessment was collected from (50) women who were present at Al- Amal National Hospital for Cancer Management, and Oncology Teaching Hospital who women Candidates Radiation Therapy for Breast Cancer An open-ended questionnaires was used, structured interviews by investigator, and group discussion were employed for the benefits of assessing the needs of women's for suchknowledge to reduce their skin problems during one month period before starting construction of program from 8st of Juan 2016to 6st April 2017).

3. Results

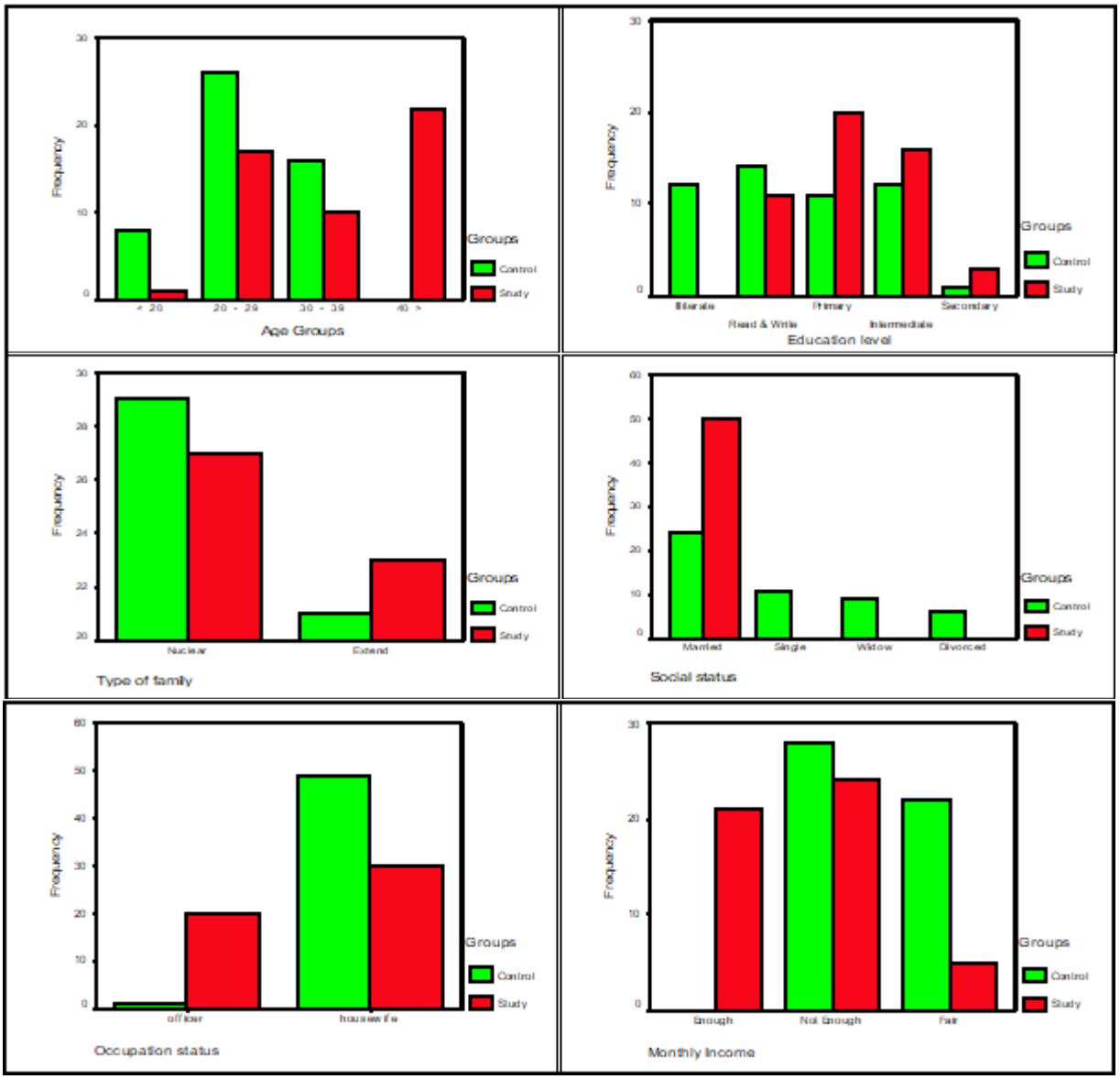

Figure 1: Represented graphically distributions of socio-demographic variables in the studied groups.

Figure 1: Bar Charts for Distribution of Socio-demographic Variables for the Studied Groups

Table 1: Distribution of the Studied SamplesAccording to (Information about Breast Cancer) Variables with Comparisons Significant

Information about breast cancer	Groups	Control		Study		C.S. P-value
	Classes	No.	%	No.	%	
Period where they had been diagnosed with the disease(Months):	1 m.	4	8	6	12	C.C.=0.438 P=0.000 (HS)
	2 m.	9	18	29	58	
	3 m.	21	42	13	26	
	4 m.	16	32	2	4	
Type of breast cancer	Ductal carcinoma in situ	10	20	33	66	C.C.=0.540 P=0.000 (HS)
	lobular carcinoma in situ	12	24	17	34	

	Infiltrating ductal carcinoma	9	18	0	0	
	Infiltrating lobular carcinoma	11	22	0	0	
	Ductal carcinoma in situ	8	16	0	0	
Method of radiation management	Internal radiation	50	100	50	100	-
	External radiation	0	0	0	0	
The duration to give radiation treatment (Hr.)	≤ 1 h.	50	100	50	100	-
	> 1 h.	0	0	0	0	
Numberof sessions set to take radiation therapy	7	7	14	0	0	C.C.=0.490 P=0.000 (HS)
	8	17	34	0	0	
	9	26	52	50	100	
Do you have information about radiation therapy and it's side effects?	Yes	10	20	37	74	C.C.=0.476 P=0.00 (HS)
	No	40	80	13	26	
If yes: From where you get information?	Family and friend	7	14	0	0	C.C.=0.707 P=0.000 (HS)
	Internet	3	6	0	0	
	Lecture	0	0	28	56	
	Media	0	0	5	10	
	Doctor	0	0	4	8	
In which stage of cancer the breasts removed?	Early stage	26	52	6	12	C.C.=0.394 P=0.000 (HS)
	Late stage	24	48	44	88	
Is a family member suffering from breast cancer?	Yes	38	76	21	42	C.C.=0.327 P=0.001 (HS)
	No	12	24	29	58	

(*) HS: Highly Sig. at P<0.01; NS: Non Sig. at P>0.05; Testing based on a contingency coefficient

Table (1) presented that the highest percentage (42%) in control samples were diagnosed in period of (3) months of disease occurrence, while (58%) for study samples were diagnosed in period of (2) months of disease occurrence, (24%)of control samples were diagnosed with Ductal carcinoma in situ, while (66%) for study samples were diagnosed with Lobular carcinoma in situ, (100%) for both groups managed by internal radiation, (100%) for both samples the duration of radiotherapy session was more the one hour, (52%) (100%) respectively their sessions number were (9), (80%) of control sample have no information about radiation and its side effects, while (74%) of study sample have information about radiation and its effects, (52%) of control samples were in early stage of breast cancer, while (88%) of study samples were in late stage of breast cancer, and (76%) (42%) respectively in both groups have family history of breast cancer.

Table (2A): Skin & Nail Changes Items in Different Periods (Pre, and Post) of Applying Educational Program

		Items	Period	Pre - Period					Post – Period					W-test	P-value
			Response	No.	%	MS	SD	RS%	No.	%	MS	SD	RS%		
Skin and nail change	1	The effect of radiotherapy lasts in the skin of 1-3 weeks after treatment	Never	0	0	2.72	0.45	90.7	0	0	2.68	0.47	89.3	-0.63	0.527 NS
			Some times	14	28				16	32					
			Always	36	72				34	68					
	2	Skin area exposed to radiation have become insensitive about other areas of the body that are not exposed to radiation	Never	31	62	1.38	0.49	46.0	38	76	1.24	0.43	41.3	-2.65	0.008 HS
			Some times	19	38				12	24					
			Always	0	0				0	0					
	3	Wash my skin with warm water after treatment to avoid overheating and causing thermal shock	Never	0	0	2.62	0.49	87.3	0	0	2.52	0.50	84.0	-2.24	0.025 S
			Some times	19	38				24	48					
			Always	31	62				26	52					
	4	Use soap and shampoo that does not contain chemically manufactured products such as soap or baby shampoo avoid dry skin	Never	0	0	2.62	0.49	87.3	0	0	2.88	0.33	96.0	-3.36	0.001 HS
			Some times	19	38				6	12					
			Always	31	62				44	88					
	5	Use Deodorant that does not contain chemicals irritating to the skin manufactured	Never	0	0	2.62	0.49	87.3	0	0	2.94	0.24	98.0	-4.00	0.000 HS
			Some times	19	38				3	6					
			Always	31	62				47	94					
	6	Use of medical creams maintains the lack of dry skin four times a day	Never	0	0	2.60	0.49	86.7	0	0	2.40	0.49	80.0	-2.89	0.004 HS
			Some times	20	40				30	60					
			Always	30	60				20	40					
	7	Use powder children cause fungal skin infections	Never	0	0	2.84	0.37	94.7	0	0	3.00	0.00	100.0	-2.83	0.005 HS
			Some times	8	16				0	0					
			Always	42	84				50	100					
	8	The use of adhesive tape wound on the treatment area cause skin damage when removed	Never	19	38	1.94	0.84	64.7	34	68	1.32	0.47	44.0	-4.49	0.000 HS
			Some times	15	30				16	32					
			Always	16	32				0	0					

Continue …

Items			Period	Pre - Period					Post – Period					W-test	P-value
			Response	No.	%	MS	SD	RS%	No.	%	MS	SD	RS%		
Skin and nail change	9	The use of cosmetics (make-up and perfume) increases skin irritation	Never	1	2	2.36	0.53	78.7	1	2	2.06	0.31	68.7	-3.87	0.000 HS
			Some times	30	60				45	90					
			Always	19	38				4	8					
	10	Way of keeping the skin continuously leads to redness	Never	35	70	1.30	0.46	43.3	35	70	1.30	0.46	43.3	0.00	1.000 NS
			Some times	15	30				15	30					
			Always	0	0				0	0					
	11	Radiation therapy causes skin peel	Never	0	0	2.70	0.46	90.0	0	0	2.88	0.33	96.0	-2.71	0.007 HS
			Some times	15	30				6	12					
			Always	35	70				44	88					
	12	Radiation therapy causes itching of the skin	Never	0	0	2.58	0.50	86.0	0	0	2.28	0.45	76.0	-3.87	0.000 HS
			Some times	21	42				36	72					
			Always	29	58				14	28					
	13	Radiation therapy causes sores in the skin	Never	24	48	1.52	0.50	50.7	46	92	1.08	0.27	36.0	-4.69	0.000 HS
			Some times	26	52				4	8					
			Always	0	0				0	0					
	14	Radiation therapy causes hair loss in the treated area	Never	0	0	2.48	0.50	82.7	0	0	3.00	0.00	100.0	-5.10	0.000 HS
			Some times	26	52				0	0					
			Always	24	48				50	100					
	15	Use cotton caps and clothing that covers all parts of the body from the sun 's light	Never	0	0	2.50	0.51	83.3	0	0	2.50	0.51	83.3	0.00	1.000 NS
			Some times	25	50				25	50					
			Always	25	50				25	50					
	16	Knit region that suffered radiation treatment irritation	Never	0	0	2.20	0.40	73.3	0	0	2.00	0.00	66.7	-3.16	0.002 HS
			Some times	40	80				50	100					
			Always	10	20				0	0					

(*) HS: Highly Sig. at P<0.01; S: Sig. at P<0.05; NS: Non Sig. at P>0.05;MS: Mean Score; RS: Relative Sufficiency; SD: Standard Deviation;

Testing based on a Wilcoxon Sign Rank (WSR) test. Red color items are reversed to the scoring scales assessment

Table (2A) Results shows that all studied items are successful at the post period of time concerning study group, since a significant differences are accounted in at least at P<0.05, and as follows: Regarding subjects sub domain "Skin and nail change", all items had reported highly significant differences at P<0.01 in light of decreasing effectiveness, which had resulted by the effectiveness of applying the suggested instructional program, except three items(1,10,15) "the effect of radiotherapy lasts in the skin for 1-3 weeks after treatment, way of keeping the skin continuously leads to redness, and use cotton caps and clothing that covers all parts of the body from the sun 's light", since no significant differences at P>0.05are obtained.

(2B): Summary Statistics of Skin & Nail changes Items in Different Periods (Pre, Post1, Post2, and Post3) of Applying Educational Program with Comparisons Significant

Skin & Nail changes			No.	Period	MS	SD	RS%	MR	P-value
Skin and nail change	1	The effect of radiotherapy lasts in the skin of 1-3 weeks after treatment	50	Pre	2.72	0.45	90.7	3.40	0.000 HS
				Post-1	2.68	0.47	89.3	3.35	
				Post-2	1.82	0.60	60.7	1.89	
				Post-3	1.44	0.50	48.0	1.36	
	2	Skin area exposed to radiation have become insensitive about other areas of the body that are not exposed to radiation	50	Pre	1.38	0.49	46.0	2.83	0.000 HS
				Post-1	1.24	0.43	41.3	2.55	
				Post-2	1.12	0.33	37.3	2.31	
				Post-3	1.12	0.33	37.3	2.31	
	3	Wash my skin with warm water after treatment to avoid overheating and causing thermal shock	50	Pre	2.62	0.49	87.3	2.33	0.000 HS
				Post-1	2.52	0.50	84.0	2.13	
				Post-2	2.84	0.37	94.7	2.77	
				Post-3	2.84	0.37	94.7	2.77	
	4	Use soap and shampoo that does not contain chemically manufactured products such as soap or baby shampoo avoid dry skin	50	Pre	2.62	0.49	87.3	2.03	0.000 HS
				Post-1	2.88	0.33	96.0	2.55	
				Post-2	2.96	0.20	98.7	2.71	
				Post-3	2.96	0.20	98.7	2.71	
	5	Use Deodorant that does not contain chemicals irritating to the skin manufactured	50	Pre	2.62	0.49	87.3	1.96	0.000 HS
				Post-1	2.94	0.24	98.0	2.60	
				Post-2	3.00	0.00	100.0	2.72	
				Post-3	3.00	0.00	100.0	2.72	
	6	Use of medical creams maintains the lack of dry skin four times a day	50	Pre	2.60	0.49	86.7	2.48	0.000 HS
				Post-1	2.40	0.49	80.0	2.08	
				Post-2	2.60	0.49	86.7	2.48	
				Post-3	2.84	0.37	94.7	2.96	

	7	Use powder children cause fungal skin infections	50	Pre	2.84	0.37	94.7	2.26	0.000 HS
				Post-1	3.00	0.00	100	2.58	
				Post-2	3.00	0.00	100	2.58	
				Post-3	3.00	0.00	100	2.58	
	8	The use of adhesive tape wound on the treatment area cause skin damage when removed	50	Pre	1.94	0.84	64.7	3.26	0.000 HS
				Post-1	1.32	0.47	44.0	2.36	
				Post-2	1.32	0.47	44.0	2.36	
				Post-3	1.12	0.33	37.3	2.02	
	9	The use of cosmetics (make-up and perfume) increases skin irritation	50	Pre	2.36	0.53	78.7	3.03	0.000 HS
				Post-1	2.06	0.31	68.7	2.43	
				Post-2	1.98	0.14	66.0	2.27	
				Post-3	1.98	0.14	66.0	2.27	
	10	Way of keeping the skin continuously leads to redness	50	Pre	1.30	0.46	43.3	2.75	0.000 HS
				Post-1	1.30	0.46	43.3	2.75	
				Post-2	1.06	0.24	35.3	2.27	
				Post-3	1.04	0.20	34.7	2.23	
	11	Radiation therapy causes skin peel	50	Pre	2.70	0.46	90.0	3.16	0.000 HS
				Post-1	2.88	0.33	96.0	3.45	
				Post-2	1.98	0.59	66.0	2.07	
				Post-3	1.50	0.51	50.0	1.32	
	12	Radiation therapy causes itching of the skin	50	Pre	2.58	0.50	86.0	3.27	0.000 HS
				Post-1	2.28	0.45	76.0	2.83	
				Post-2	1.92	0.44	64.0	2.18	
				Post-3	1.68	0.47	56.0	1.72	

continue

Skin & Nail changes			No.	Periods	MS	SD	RS%	MR	P-value
Skin and nail change	13	Radiation therapy causes sores in the skin	50	Pre	1.52	0.50	50.7	3.24	0.000 HS
				Post-1	1.08	0.27	36.0	2.36	
				Post-2	1.00	0.00	33.3	2.20	
				Post-3	1.00	0.00	33.3	2.20	
	14	Radiation therapy causes hair loss in the treated area	50	Pre	2.48	0.50	82.7	1.72	0.000 HS
				Post-1	3.00	0.00	100	2.76	
				Post-2	3.00	0.00	100	2.76	
				Post-3	3.00	0.00	100	2.76	
	15	Use cotton caps and clothing that covers all parts of the body from the sun 's light	50	Pre	2.50	0.51	83.3	2.14	0.000 HS
				Post-1	2.50	0.51	83.3	2.14	
				Post-2	2.80	0.40	93.3	2.74	
				Post-3	2.92	0.27	97.3	2.98	
	16	Knit region that suffered radiation treatment irritation	50	Pre	2.20	0.40	73.3	3.14	0.000 HS
				Post-1	2.00	0.00	66.7	2.74	
				Post-2	1.72	0.45	57.3	2.18	
				Post-3	1.60	0.49	53.3	1.94	

(*) HS: Highly Sig. at P<0.01; S: Sig. at P<0.05; NS: Non Sig. at P>0.05;MS: Mean Score; MR: Mean Ranking ;RS: Relative Sufficiency; SD: Standard Deviation; Testing based on a Friedman's test.

Table (2B) Results shows that physical sub domains regarding "Skin and Nail changes " items at the three post period (1,2,3) for study group after the implementation of the educational program with comparisons had highly significant differences are at P<0.001.

Table 3: Summary Statistics for Skin & Nail changes before and after Applying the Suggested of Instructional Program

Periods	Pre			Post-1			Post-2			Post-3		
No.	GMS	PSD	GRS %	GMS	PSD	GRS %	GMS	PSD	GRS %	GMS	PSD	GRS %
50	2.311	0.15	77.0	2.255	0.11	75.2	2.133	0.08	71.1	2.065	0.08	68.8

GMS: Grand Mean of Score; PSD: Pooled Standard Deviation; Grand Relative Sufficiency.

Table (3) shows summary statistics of study group in light of pre, and post periods, to assess the core responding levels along pre and the three post periods according to applying of the suggested instruction intervention program upon women **Skin & Nail** health status who candidates radiation therapy. Results shows that the studied sub domains are successful at the post period concerning study group, especially at the last post (3).

Table 4: The Relationship of Studied Groups at Pre Period of Time with Comparisons Significant

Sub-domain	Groups	No.	GMS	SD	SE	GRS%	t-test	P-value
Skin and nail changes	Control	50	2.31	0.15	0.02	77.0	0.032	0.975 NS
	Study	50	2.31	0.15	0.02	77.0		

(*) NS: Non Sig. at P>0.05; S: Sig. at P<0.05; Testing based on two independent samples t-test

Table (4) shows summary statistics, to assess **Skin and nail changes** in control, and study groups in pre period of time before applying instruction intervention program upon women's who candidates radiation therapy.Results shows no significant differences at P>0.05 are accounted between studied groups at pre period, rather than two groups having the same responding, according to their grand mean of score, or their relative sufficiency's.

Table 5: The Relationship of Studied Groups at Post-3 Period of Time with Comparisons Significant

Sub and Main Domains	Groups	No.	GMS	SD	SE	RS%	t-test	P-value
Skin and nail changes	Control	50	2.31	0.15	0.02	77.1	10.274	0.000 HS
	Study	50	2.07	0.08	0.01	68.8		

(*) THS: Too Highly Sig. at P<0.001; Testing based on two independent samples t-test

Table (5) shows summary statistics, to assess the core responding levels along post3 period after applying the suggested instruction intervention program on women concerning **Skin and nail** health status who candidatesradiation therapy.Results shows that too highly significant differences at P<0.01 are accounted between studied groups (study & control) at post3 period.

Table 6: Pearson Correlation Results Before and After Applying the Suggested Instruction Intervention Program for study group

Pre – Post	N	Corr.	Sig.	C.S.
Skin and nail changes	50	0.602	0.000	HS

(*) HS: Highly Sig. at P<0.01; S: Sig. at P<0.05; Non Sig. at P>0.05

To predict/or to find out relationship between an assessments of **Skin and nail changes** before and after applying the instruction intervention program, results shows that strong relationships are proved due to before and after applying the suggested of instruction intervention program upon women **Skin and nail changes**.

4. Discussion

The current study demonstrated that all items regarding skin and nail changes had reported highly significant differences at P<0.01 in light of decreasing effectiveness, which had resulted by the effectiveness of applying the suggested instructional program, except three items(1,10,15) "the effect of radiotherapy lasts in the skin for 1-3 weeks after treatment, way of keeping the skin continuously leads to redness, and use cotton caps and clothing that covers all parts of the body from the sun 's light", since no significant differences at P>0.05are obtained. Table (4-2-4A). Skin and Nail changes " items at the three post period (1,2,3) for study group after the implementation of the educational program with comparisons had highly significant differences are at P<0.001. [11]. stated that the Postoperative radiation therapy (RT) reduces the risk of local recurrence and extends overall survival in patients with breast cancer (BC). Concerns have, however, been raised about the risk of acute and chronic side effects in breast cancer survivors as the number of treated individuals is large and their expected survival is long compared to most patients with other malignant diseases. Cardiac toxicity, reproductive dysfunction, pneumonitis (RP), arm lymph edema, neuropathy, skin changes are examples of the wide range of complications that has been associated with adjuvant treatment and that the patients received a standard course of post-surgery radiation therapy. Each patient received ultrasound scans to the irradiated breast and the untreated (contra-lateral) breast. Radio-frequency (RF) backscatter signals and B-mode images were acquired simultaneously. To quantify the severity of skin injury, two metrics were calculated from the RF signals: skin thickness and Pearson correlation coefficient of the subcutaneous layer. Comparing to the non-irradiated skin, the average thickness of the irradiated skin increased by 40% (p=0.005) and the average correlation coefficient of the irradiated hypodermis decreased by 35% (p=0.02). This study demonstrates the feasibility of using a non-invasive ultrasonic technique to detect and quantify radiation-induced skin changes. [12] Stated that the three themes were identified based on the interview responses: First, skin changes affect multiple dimensions of quality of life. They cause physical discomfort, body image disturbance, emotional distress, and impair both day-to-day functioning and satisfaction with radiation treatment. Second, individual differences affect women's experiences. Generally African-American women, younger women, women who are not currently in a relationship, women who are being treated during the summer, and women who are more invested in their appearance are more distressed by skin toxicity. Third, women use a variety of symptom management strategies including self-medication, complementary/alternative medicine approaches, and psychological strategies. [13] stated that the patients completed radiotherapy; 72% of patients presented a grade (G1) coetaneous toxicity, 18% developed a (G2) coetaneous toxicity, 10% developed a (G3) toxicity, no one presented (G4) toxicity. The corneometry study confirmed the protective role of effective creams used in radiation therapy of breast cancer and showed its usefulness to identify radiation-induced dermatitis in a very early stage.[14] stated that the Grade 0 or 4 of skin damage was observed in none of the patients. Among the evaluated patients, 58%, 35.5%, and 6.5% of the patients had grade 1, grade 2, and grade 3 of skin damage, respectively. There was no statistically significant relationship between regional skin burns and factors such as average tangential field size, internal mammary field, chemotherapy, prior history of diseases, tamoxifen use, previous radiotherapy in breast area, or skin type (p= 0.05). However, there was a significant relationship between skin burns and presence of supra-clavicular field (p=0.05).[15] Stated that the Acute radiation dermatitis is a common adverse effect in patients undergoing radiotherapy for breast cancer. However, the effects of radiotherapy on biophysical properties of the skin have rarely been investigated. In conclusion, radiation therapy for breast cancer induces measurable and significant changes in biophysical properties of the skin including hydration, pH, pigmentation, and blood flow. These findings give us a greater understanding of the effects of ionizing radiation on skin physiology, and provide non-invasive and objective methods to assess radiation

dermatitis. No significant associations were found between patient characteristics (diabetes mellitus, hypertension, type of surgery, chemotherapy, hormone therapy) and changes in skin biophysical parameters following radiotherapy.

5. Conclusion

The majority for control samples was diagnosed in period (3) months of disease and study sample were (2) months of disease, more than half of control samples were in early stage of breast cancer, while the majority of study samples were in late stage of breast cancer. Regarding "Skin and nail change", all items had reported highly significant differences at $P<0.01$ in light of decreasing effectiveness, which had resulted by the effectiveness of applying the suggested instructional program.

6. Recommendation

Before starting radiotherapy treatment an instructional intervention program about physical and psychological problem should be implemented to reduce the patient fear of the side effects after the treatment and increase their awareness about these effects and Booklet of instructions should be published and distributed to all women who have breast cancer candidate radiotherapy.

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