

Creating Awareness and Self – Efficacy among Patients with Chemotherapy Induced Oral Mucositis

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Abstract

Aim: This study aimed to evaluate the effect of creating awareness and self – efficacy among patients with chemotherapy induced oral mucositis. **Subjects and Method:** A quasi-experimental design was utilized for the conduction of this study in Chemotherapy Outpatients` Clinics at at Radiotherapy and Nuclear Medicine Department affiliated to Ain Shams University. **Sample :** A purposive sample including 80 adult age patients from both genders with oral mucositis undergoing chemotherapy were constituted this study sample. **Tools** of data collection were : 1) Patients` interviewing questionnaire (pre / post tests) to assess the studied patients` knowledge as regards chemotherapy induced oral mucositis. 2). An observation checklist (pre / post tests) to evaluate studied patients` practices in relation to care activities of oral mucositis. 3) Numerical pain scale (pre / post tests) to measure pain severity among the studied patients. 4) Patient-Reported Oral Mucositis Symptoms Scale (pre / post tests). 5) General self-efficacy scale (pre / post tests) to assess a general sense of perceived patients self-efficacy. **Results :** More than three fifths of studied patients were not working, married and from rural area. In addition, mean percent of satisfactory knowledge and practices added to pain reduction level were higher in post tests compared to pre. **Conclusion :** On light of the current study results, it can be concluded that educational guidelines had a positive effect on improving awareness and self – efficacy among studied patients with chemotherapy induced oral mucositis. Moreover, patients` reported oral mucositis symptoms post chemotherapy were satisfactory in post and follow – up tests. **Recommendations :** Further studies should be carried out on a large number of patients with chemotherapy induced oral mucositis for evidence of results and generalization.

Key words: Chemotherapy induced oral mucositis - Creating awareness and self – efficacy.

Introduction

Oral mucositis (OM) is recognized as inflammation and ulceration reactions in oral cavity due to chemotherapy cytotoxic effects on epithelial cells of oral mucosa. It result from direct effect of chemotherapy by interfering actual cell production, maturation and replacement, added to bone marrow depression in which neutropenia

and thrombocytopenia lead to increased risk of bleeding and infection. It manifests as erythema, edema or ulceration that can be accompanied by a mild burning sensation. Extreme presentations in turn are characterized by large and painful ulcers that have a strong impact upon patient quality of life limiting basic functions such as speech, eating or the swallowing saliva, added to these manifestations appear shortly after the start of treatment (Cidon, 2018 &Al-Azri et al., 2013)).

Frequency of chemotherapy induced oral mucositis varies differently among different studies. The first signs of mucositis for patients being treated with chemotherapy usually begin with a feeling of mucosal irritation which is accompanied by ulcer development about 3-4 days after infusion with a peak on the 7th -14th day after chemotherapy and normally lasts for 3 weeks. The oral mucosa and normal saliva activity are two major barriers that prevent the invasion of microorganisms. Mucosa is affected by many chemotherapeutic agents because of its high mitotic activity (Shankar et al., 2017 & Epstein et al., 2012).

Risk factors for developing OM have been attributed to both therapy and patient characteristics. Treatment variables that may affect the incidence and the severity of OM include the type, dose, and schedule of systemic cytotoxic drugs delivered, radiation dose and field, and concomitant use of chemotherapy and radiation. Studies have shown that the risk of OM increases as the intensity of therapy increases (Nasry et al., 2016 & Watters et al., 2011). Among patient-associated factors, age, malnutrition, gender, pre-existing medical conditions, alterations in salivary production and composition, poor oral health, and mucosal trauma have been reported to influence the risk of OM. Poor dental health, particularly periodontal disease, has been identified as an environmental factor that may increase the severity of OM (Zecha et al., 2015 & Watters et al., 2011).

Many patients go on to develop the more severe and classic form of mucositis which is characterized by ulcerative lesions. The ulcers of mucositis tend to be deeper and markedly more painful. Ulcer development is associated with increased pain and inability to tolerate normal foods. It is not unusual for patients with significant mucositis to exclude solid foods completely. Ulcers may be focal and localized or consolidated and diffuse. Their borders are generally poorly defined (Sung

et al., 2017 and Khan & Gupta, 2013). In addition, there are no sentinel sites for lesions of mucositis, any part of the movable mucosa can be involved, although the buccal mucosa, floor of the mouth, lateral and ventral borders of the tongue and soft palate are most frequently involved. Interestingly, the more heavily keratinised mucosa is usually not involved in mucositis. Thus in cancer patients with ulcerative lesions of the hard palate, dorsal surface of tongue, and gingiva, an etiology other than mucositis should be suspected (Peterson et al., 2015 & Boers-Doets et al., 2013).

Ulcer lesion of oral mucositis usually lead to a significant decrease in quality of life, since they can prolong hospital stay, affect the nutritional status of the patient, increase the risk of infections and prescription of opioids. For these reasons, guidelines and treatment of OM is extremely necessary, with the aim of relieving symptoms, accelerating tissue repair and controlling infections of oral origin. (Shimamura et al., 2018 & Dewit et al., 2016).

Management of mucosal lesions associated with targeted therapies begins with assessment and oral hygiene measures, diet modifications and pain management. In most cases, pain can be controlled with locally applied products containing lidocaine or doxepin and mucosal coating agents. In persistent cases, treatment with local or systemic corticosteroids can be considered. Secondary candidiasis is a common side effect of topical steroid therapy. If this occurs, topical antifungal therapy should be initiated (Lewis et al., 2018 and Hinkle & Cheever, 2014).

Self-efficacy is considered as one of the major components for successful self-management in chronic diseases. Social Cognitive Theory labels the individual's confidence or belief in own ability to succeed at chosen tasks; to achieve set goals as self-efficacy. It influences

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health status and care utilization. Patients need to participate actively with their health care and lifestyle choices to manage effectively. Self-efficacy may be expected to affect the amount of stress and anxiety that individuals experience when engaging in a task and the degree of accomplishment they realize. In a heterogeneous sample of cancer patients self-efficacy correlated positively with QOL and mood. Education and self-efficacy will help patients management with chronic conditions (Foster et al., 2015 & Al-Azri et al., 2013).

Significance of the study :

Oral mucositis represents significant burden of antineoplastic therapies and its treatment still remains a challenge. The understanding of epidemiology of oral mucositis is incomplete, however significant progress has been made in understanding the pathogenesis of oral mucositis and some preventive measures have been identified. It is one of the most debilitating and painful side effects of cancer therapy. Approximately 40-80% of patients receiving chemotherapy endure oral mucositis. In a prospective study involving 298 patients treated with chemotherapy for solid tumors, 120 patients (40.3 %) developed WHO grade 1 oral mucositis, 15 patients (5 %) showed WHO grade 2, and only 3 patients (1 %) had severe WHO grades 3–4 (Shimamura et al., 2018 & Shankar et al., 2017).

In addition, it occurs in approximately 80% of patients who receive high-dose chemotherapy, particularly with conditioning regimens containing high-dose melphalan. Chemotherapy medications that lead to the development of oral mucositis include methotrexate; antimetabolites such as 5-fluorouracil, dactinomycin, adriamycin; antibiotics such as bleomycin and alkaloids like vinblastine. The management of oral mucositis is a challenge due to its complex biological nature and over the last 10 years, different

strategies have been developed for the management. Patients should receive instructions pre the infusion to prevent, or reduce the severity of oral mucositis (Sung et al., 2017 & Zecha et al., 2015).

Aim of the study

The aim of this study was to evaluate the effect of creating awareness and self – efficacy among patients with chemotherapy induced oral mucositis. This aim was achieved as follows :

- Assess patients' awareness (knowledge and practices) as regards chemotherapy induced oral mucositis.
- Assess patients` levels of oral dysfunction
- Identify patients` self – efficacy level
- Develop and implement educational guidelines for the studied patients.
- Evaluate its effect on their awareness and self – efficacy level added to health condition outcomes.

Hypothesis:

It was hypothesized that, creating awareness and self – efficacy had a positive effect on patients with chemotherapy induced oral mucositis.

Subjects and Methods:

Operational definitions:

Awareness: means patients` knowledge and practices

Creating: means educational guidelines through theoretical and practical sessions.

Design: A quasi-experimental design was used in the conduction of this study.

Setting:

The current study was conducted in the Chemotherapy Outpatients` Clinics at Radiotherapy and Nuclear Medicine Department affiliated to Ain Shams University.

Subjects:

A purposive sample including 80 adult age patients from both genders with oral mucositis undergoing chemotherapy were constituted this study sample. They were selected according to the sensitive analysis in relation to the number of patients with chemotherapy induced oral mucositis within the year 2017 in the previous setting, according to the statistical department which affiliated to the settings. The sample was allocated randomly to the following criteria:

Inclusion criteria:

- Patients with newly mucositis (from Outpatients' Clinics and inpatients department) and ordered for chemotherapy
- Conscious patients without co-morbid conditions
- Patients who agreed to participate in the study and to complete the treatment sessions
- Oral mucositis in grade I (oral soreness and erythema) and grade II (oral erythema, ulcers and solid diet tolerated)
- Same treatment protocol

Tools of data collection:

- I. Patients' interviewing questionnaire (pre / post tests)** that was designed and filled by the researchers. It was designed in the light of relevant references to

assess patients' knowledge regarding chemotherapy induced oral mucositis. It was written in simple Arabic language. Data obtained were related to:

- Demographic characteristics of patients which included (age, gender, occupation, medical diagnosis, treatment type and hospital stay duration).
- Patients' knowledge regarding oral mucositis (definition, causes, characteristics, medications, pain management, complications, health education, oral hygiene, diet, follow up visits and immediate calling physician.

Scoring system:

Responses of the studied patients' were scored as (1) for correct answer and (zero) for incorrect answer. The total score was categorized into either satisfactory level (from 60% and more) or unsatisfactory level (less than 60%).

II. An observation checklist (pre/post tests):

It was adapted from (Dewit et al., 2016 and Hinkle & Cheever, 2014), developed and filled by the researchers to evaluate studied patients' practices in relation to oral mucositis (oral hygiene, infection control measures, mouth care with prescribed treatment and pain management)

Scoring system:

A correct practice was scored as (1) while the incorrect (zero). It was scored into either inadequately done (less than 70%) or adequately done (70% and more). The total score was categorized as satisfactory = 70 – 100, or unsatisfactory = less than 70.

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III. Numerical pain scale : (Pre / post tests). It was based on **Jacques (2011)** to measure pain severity. It was composed of a line divided by numbered points from (0-10). Patients' responses were classified as follows : no pain (zero), mild pain (0 - less than 4), moderate pain (4-less than 7) and severe pain (7 - 10).

IV. Patient-Reported Oral Mucositis Symptoms scale (PROMS) (pre / post / follow up tests). It was developed by Kushner et al. (2008), translated into Arabic by the researcher to assess symptoms of oral mucositis that threaten quality of life. It was completed by interviewing of the study patients to identify their perception regarding 10 complaints as follows : (1) mouth pain, (2) difficulty of speaking, (3) restriction of speech, (4) difficulty of eating hard foods, (5) difficulty of eating soft foods, (6) restriction of eating, (7) difficulty drinking, (8) restriction of drinking, (9) difficulty of swallowing and (10) change in taste.

Patients` answers were scored as follows : non= 1, mild= 2, moderate =3. sever=4.

Alpha Cronbach test was used to test scale reliability = 0.93

V - General self-efficacy scale (pre / post / follow up tests). It was developed by Schwarzer & Jerusalem (1995) to assess a general sense of perceived self-efficacy with the aim to predict coping with daily hassles as well as adaptation after experiencing all kinds of stressful life events among patients with chemotherapy induced oral mucositis.

Scoring system:

Responses are made on a 4-point scale. Sum up the responses to all 8 items to yield the final composite score with a range from 8 to 32. Rating scales as follows : 1 = Not at all true, 2 = Hardly true, 3 =

Moderately true and 4 = Exactly true). Level of self-efficacy was considered high if the score 60% or more and low if it less than 60%.

Content validity:

It was ascertained by a group of experts including staff of : Oncology and Medical -Surgical Nursing Departments at Ain Shams University. Their opinions were elicited regarding to the tools format layout, consistency and scoring system. The tools were tested regarding to the knowledge accuracy, relevance and competence.

Ethical considerations :

In the planning stage, approval was obtained from Director of Oncology Center affiliated to Ain Shams University. The studied patients were informed about the procedure and their rights according to medical research ethics to withdraw from the study at any time, then, written informed consent was obtained from them.

Pilot study:

A pilot trial was carried out on 10% of the total study sample to test the clarity and practicability of the tools, in addition to subjects and settings. Pilot subjects were later included in the study as there were no radical modifications in the study tools.

Procedure:

- Sampling was started and completed within 6 months.
- The study purpose was simply explained to patients who agreed to participate in the study prior to any data collection.
- The researchers started to collect data from the studied patients 2days /week at morning shifts in the Outpatients`

Clinics and Inpatients Department at Oncology Center.

- At the beginning, demographic data were collected by interviewing patients, while medical information was obtained from patients medical records.

The guidelines were designed based on analysis of the actual patients' needs in pre test.

- Patients were divided into small groups including 4 – 5 and repeated sessions included all patients, each group obtained 2 sessions (1 theory and 1 practice). Moreover, each patient was guided by simple written instructions and then orientation about objectives and outline was done.

The content was written in simple Arabic language and consistent with the related literature, as well as met patients' needs and their level of understanding. They were presented in theoretical and practical sessions

Theoretical part was implemented through lecture and group discussion using data show. It was taken in 1 session for 60 minute about oral mucositis: definition, causes, characteristics, medications, pain management, complications, health education, oral hygiene, diet, follow up visits and unusual signs of immediate doctor advice.

- Practical part was done through demonstration and re- demonstration. It was taken in 1 session for two hours and covers the following items : oral hygiene, infection control measures, mouth care with prescribed treatment and pain management.
- All patients were contacted by telephone for any explanation.

- Patients were assessed either individually or in groups that entail 4-5 according to their readiness.

- Evaluation for the effect of guidelines on the studied patients using the pre constructed tools as follows :

- knowledge and practices through post – test immediately after guidelines sessions and follow- up test (2 months later).

- levels of pain, oral mucositis symptoms and self-efficacy using post – test immediately after guidelines sessions and follow- up test (2 months later).

Statistical Design:

The data collected were organized, sorted, tabulated and analyzed using Statistical Package for Social Sciences (SPSS). They were presented in tables and charts using numbers, percentages, means, standard deviations and T –test. Level of significance was threshold at 0.05.

Results

Table (1) : Reveals characteristics of patients under the study. It was found that more than three fifths of them were not working, married, from rural area and had the age of 35 - 50 yrs (71.3, 66.3, 65.0 & 63.7 respectively). Concerning educational level, nearly one third (32.5) of them had university level.

Table (2) : Reveals studied patients' satisfactory knowledge about chemotherapy induced oral mucositis pre/post guidelines. Results indicated significant improvement in patients' knowledge regarding post and follow – up assessment compared to pre (Mean = 61.4 ± 2.8, 65.6 ± 2.5 & 20.1 ± 4.8 respectively with t – test = 66.5 & 10.0 respectively, $p < 0.05$).

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Table (3): Reveals patients` satisfactory practices regarding chemotherapy induced oral mucositis care pre/post guidelines. Results showed significant improvement in patients` practices regarding post and follow – up assessment compared to pre (Mean = 61.4 ± 3.7 , 67.0 ± 1.6 & 17.6 ± 3.0 respectively with t – test = 82.6 & 12.4 respectively, $p < 0.05$).

Table (4) : Shows studied patients` reported oral mucositis symptoms post chemotherapy. Results showed significant improvement regarding assessment of taste, pain and difficulty of speaking, eating, drinking and swallowing in post and follow - up assessment (Mean = 16.8 ± 5.4 & 14.4 ± 5.6 respectively) compared to pre – assessment (30.6 ± 10.5), with t – test = 10.5 & 2.8 respectively), $p < 0.05$.

Table (5): Reveals studied patients` pain level in pre/post- tests. Concerning pain level, significant improvement was indicated in post test then follow – up test (Mean % = 36.0 ± 11.5 & 39.0 ± 20.1 respectively) compared by pre test 34.0 ± 23.3 .

Table (6): Reveals a statistically significant difference between the studied patients` high self efficacy level in pre/post tests whereas more improvement was indicated in post and follow up tests compared to pre test (mean = 71.8 ± 6.6 , 82.4 ± 3.9 & 43.6 ± 6.2 respectively), with t – test = 27.9 & 12.4 respectively), $p < 0.05$.

Table (1): Characteristics of the studied patients

Items	Studied patients (n=80)	
	No	%
Age / years		
<35 -<50	51	63.7
50 & more	29	36.3
Gender		
Male	39	48.7
Female	41	51.3
Marital status		
Single	27	33.7
Married	53	66.3
Education		
Illiterate /Read and write	25	31.2
Secondary	29	36.3
University	26	32.5
Occupation		
Working	23	28.7
Not working	57	71.3
Residence		
Rural	52	65.0
Urban	28	35.0
Frequency of chemotherapy		
• Every 2 weeks	41	51.3
• Every 3 weeks	39	48.7
Hospital stay/ days		
• 1	37	46.3
• 3	43	53.7

Table (2):Presentation of satisfactory knowledge about chemotherapy induced oral mucositis among studied patients in pre / post tests

Items	Studied patients		
	Pre (n=80)	Post (n=80)	Follow – Up (n=80)
	No (%)	No (%)	No (%)
Definition/ Causes	18 (22.5)	58 (72.5)	69 (86.3)
Signs & symptoms	13 (16.3)	60 (75.0)	67 (83.7)
Traditional treatment	19 (23.8)	63 (78.7)	65 (81.2)
Alternative treatment	18 (22.5)	65(81.3)	68 (85.0)
Complications	19 (23.8)	61 (76.3)	64 (80.0)
Smoking	28 (35.0)	59 (73.8)	61 (76.3)
Pain / anxiety control	18 (22.5)	66 (82.5)	68 (85.0)
Diet regimen	25 (31.2)	62 (77.5)	65 (81.2)
Oral hygiene	20 (25.0)	64 (80.0)	67 (83.7)
Sleeping style	11 (13.7)	58 (72.5)	64 (80.0)
Work adjustment	22 (27.5)	61 (76.3)	68 (85.0)
Educational guidelines	25 (31.2)	57 (71.2)	61 (76.3)
Immediate doctor visit	27 (33.7)	62 (77.5)	65 (81.2)
Follow – up schedule	19 (23.8)	64 (80.0)	67 (83.7)
\bar{X} No \pm SD	.1 \pm 4.820	.4 \pm 2.861	.6 \pm 2.565
% of Mean	25.1 %	76.7 %	82.0 %
T test, P value	T1 between pre & post tests = 66.5* (Sig. T2 between post & follow up tests = 10.0*		

Table (3):Presentation of satisfactory practices as regards chemotherapy induced oral mucositis among the studied patients in pre / post tests

Items	Studied patients		
	Pre (n=80)	Post (n=80)	Follow – Up (n=80)
	No (%)	No (%)	No (%)
Hand washing	22 (27.5)	56 (70.0)	66 (82.5)
Oral care technique	19 (23.7)	60 (75.0)	68 (85.0)
Mouth wash with traditional treatment	17 (21.3)	63 (78.8)	65 (81.2)
Methods of alternative treatment	14 (17.5)	66 (82.5)	69 (86.2)
infection control measures	16 (20.0)	62 (77.5)	67 (83.7)
\bar{X} No \pm SD	.6 \pm 3.017	.4 \pm 3.761	.0 \pm 1.667
% of Mean	22.0 %	76.8 %	83.7 %
T test, P value	T1 between pre & post tests = 82.6* T2 between post & follow up tests = 12.4*		

Sig. = Significant (*)

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Table (4): Distribution of the studied patients as regards reported oral mucositis symptoms in pre / post tests

Items	Studied patients		
	Pre (n=80)	Post (n=80)	Follow - up (n=80)
	No (%)	No (%)	No (%)
Change in taste	35 (43.7)	19 (23.8)	17 (21.3)
Mouth pain	45 (56.2)	13 (16.2)	10 (12.5)
	Difficulty of :		
Speaking	20 (25.0)	11 (13.7)	8 (10.0)
Eating hard foods	43 (53.7)	27 (33.8)	25 (31.3)
Eating soft foods	27 (33.7)	19 (23.8)	16 (20.0)
Drinking	24 (30.0)	16 (20.0)	14 (17.5)
Swallowing	20 (25.0)	13 (16.2)	11 (13.7)
\bar{X} No \pm SD	30.6\pm10.5	16.8 \pm 5.4	14.4 \pm 5.6
of Mean %	38.2%	21.0%	18.0%
T test, P value	T1 between pre & post tests = 10.5* T2 between post & follow up tests = 2.8*		

Sig. = Significant (*)

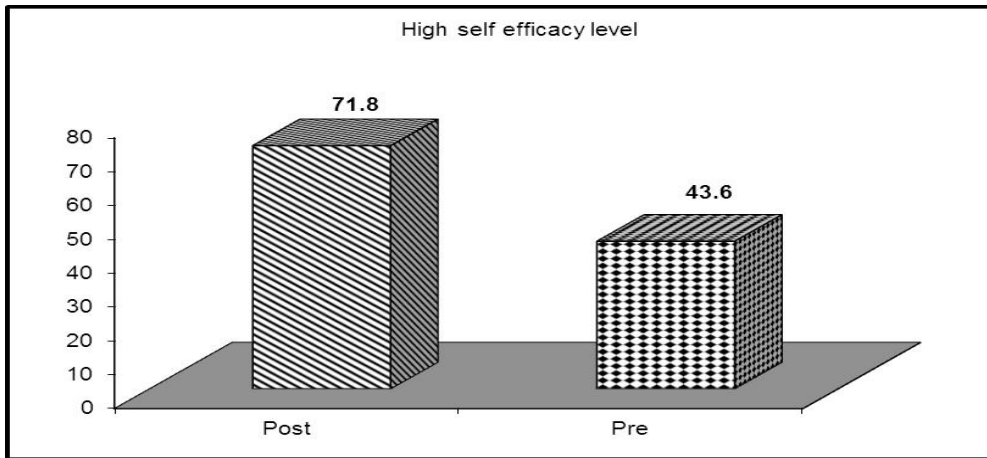
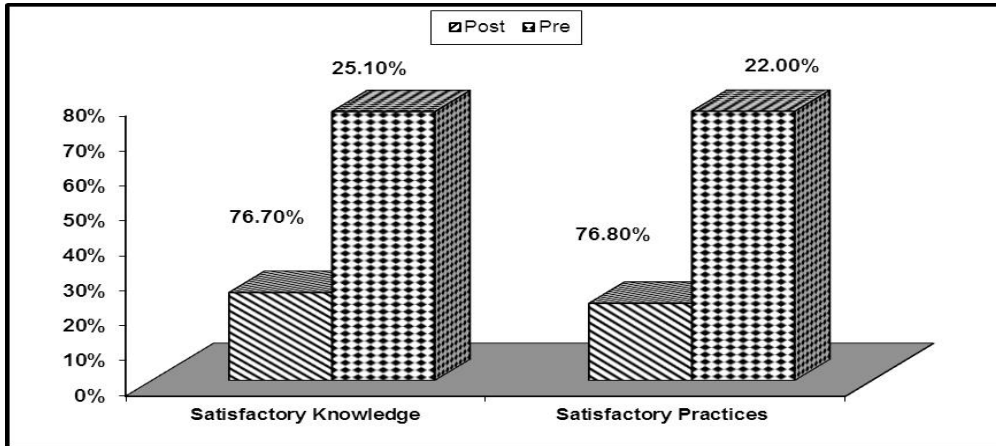
Table (5): Presentation of pain levels among the studied patients in pre/post – tests

Pain Level	Studied patients		
	Pre (n=80)	Post (n=80)	Follow - up (n=80)
	%	%	%
Mild	15.0	37.0	48.0
Moderate	27.0	47.0	53.0
Sever	60.0	24.0	16.0
\bar{X} % \pm SD	34.0 \pm 23.3	36.0 \pm 11.5	39.0 \pm 20.1

Table (6) : Presentation of high self efficacy level among the studied patients in pre / post tests

Item	Studied patients		
	Pre (n=80)	Post (n=80)	Follow - up (n=80)
	%	%	%
Coping with medical treatment	43.7	74.1	85.0
Communication	35.2	66.5	81.2
Daily activity	40.3	73.8	86.7
Personal management	54.1	79.4	83.5
Affective state	45.2	65.5	75.3
Self satisfaction	43.6	71.3	82.6
\bar{X} % \pm SD	43.6 \pm 6.2	71.8 \pm 6.6	82.4 \pm 3.9
T – value	T1 between pre & post tests = 27.9* T2 between post & follow up tests = 12.4 *		

Sig. = Significant (*)



Discussion

Oral Mucositis (OM) is among the most common and dreaded toxicities of cancer therapy. It occurs in almost all patients who receive chemo / radio therapy in which areas of oral and oropharyngeal mucosa are included in the treatment field (Zecha et al., 2015 & Watters et al., 2011). The present study aimed to evaluate the effect of creating awareness and self – efficacy among patients with chemotherapy induced oral mucositis.

In the present study as regards patients' characteristics, more than three fifths of them were not working, married, from rural area and had the age of 35 - 50 yrs. Concerning education, nearly one third of them had university level. **Awidi et al. (2011)** recognized that, patients with 50 years of age may develop severe stomatitis, because of insufficient DNA repair and their low capacity of mucosa repair. **Sheblet al. (2014)** stated that, more than half of the study patients with oral mucositis had university level of education.

Concerning satisfactory knowledge and practices in relation to

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chemotherapy induced oral mucositis among studied patients in pre/post tests. Findings revealed more improvement in post test. This result interpreted as education has a vital role in improving patients` awareness and their satisfaction. **Shimamura et al. (2018)** recommended that, patients need for correct and enough information before the treatment sessions of chemotherapy to safe their life and prevent complications. **Lewis et al. (2018) & Zakaria, 2017** cleared that patients required additional information about their management expectations, follow up and drug management. Significant number of patients did not have enough knowledge chemotherapy induced oral mucositis treatment, precautions, hospitalization period and infection prevention so patients should be provided with better instructions pre treatment

On the same line **Dewit et al. (2016) & Peterson et al. (2015)** reported that patients should be educated on the value of good oral health relative to cancer therapy. Oral hygiene instructions should be given which includes tooth brushing, flossing, and rinsing with bland (saline or sodium bicarbonate) solutions. Regular oral assessment during therapy is therefore an important component of a program to assure maximum oral health. **Sung et al. (2017) & Hinkle & Cheever (2014)** stated that diet plays a role in oral health. Therefore, patients should be advised on food selection that promote or which could interfere with oral health. Since patients may experience modification of taste, changes in appetite and dysphagia, food recommendations need to balance the need to maintain intake with the increased risk of oral disease. **Khan & Gupta (2013)** mentioned that avoidance of foods containing processed sugar particularly those of a sticky consistency should be discussed. Acidic and spicy foods may exacerbate the discomfort of mucositis and should be avoided.

As regards reported oral mucositis symptoms among the studied patients` post chemotherapy. Results showed significant improvement regarding assessment of taste, pain and difficulty of speaking, eating, drinking and swallowing in post and follow - up assessment. The previous finding may be attributed to patients` compliance with educational guidelines about oral mucositis management. **Hashemi et al. (2015)** mentioned that, reduction and progress of oral mucositis was increased in patients receiving educational guidelines. In addition, mucositis symptoms progress from erythema, cracking, inflammation, pain, bleeding and ulceration. **Nasry et al. (2016) & Boers-Doets et al. (2013)** stated that oral mucositis interfere with the patient`s ability to eat and drink which can lead to weight loss in already frail patients and required initiation of total parenteral nutrition (TPN). Also mucositis ulcerations can create a portal of entry for pathogens and lead to life-threatening systemic infections`

In addition, **Shankar et al. (2017) & Al-Azri et al. (2013)** reported that oral mucositis in most advanced clinical form presents as confluent, deep and devastatingly painful ulcerations of oral mucosa. However, like most diseases, mucositis has a clinical continuum. At beginning stages or in most mild form, mucositis presents as mucosal erythema and is accompanied by a feeling of burning.

In relation to self-efficacy level among the studied patients, there was a significant improvement in post tests. **Foster et al. (2015)** stated that in several studies there was a relation between patients` self-efficacy level and their quality of life. In addition, improper patients` condition was associated with lower self-efficacy. **Cidon (2018) & Epstein et al. (2012)** mentioned that there are different factors and motivations

depending on patients` age and level of self-efficacy which is a good predictor of correct management. As well as, more intrinsic motivation help individual to engage in daily activities and have a full sense of personal control.

Conclusion

On light of the current study results, it can be concluded that, educational guidelines had a positive effect on improving awareness (knowledge and practices) and self – efficacy among studied patients with chemotherapy induced oral mucositis, whereas significant improvement was found post educational guidelines. Moreover, patients` health condition assessment which indicated in reported oral mucositis symptoms post chemotherapy, was satisfactory in post and follow – up tests.

Recommendations

○ Awareness programs should be given for patients scheduled for chemotherapy about oral hygiene procedure

○ Continuous health needs assessment for such group of patients

○ Regular visiting to dental physician pre, during and post the chemotherapy to avoid oral complications.

○ Further studies should be carried out on a large number of patients with chemotherapy induced oral mucositis for evidence of results and generalization.

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