

Effect of Implementing Oral Care Guideline on the Degree of Oral Mucositis among Children Receiving Chemotherapy

Omayma M. OKby¹, Amal A. El-Abbassy²

Assistant Professor of Pediatric Nursing¹, lecturer of Community health nursing², Faculty of Nursing-
Menoufia University^{1&2} -Egypt

Abstract

Background: Oral mucositis is an important and common consequence of chemotherapy and children may be at higher risk than adults. It is important to prevent and treat mucositis because this complication is associated with pain, inability to maintain hydration and nutrition. The aim of this study is to determine the effect of implementing oral care Guideline on the degree of Mucositis among children receiving chemotherapy.

Design: A quasi experimental (Pre-test and post-test) design was used to test the study hypothesis.

Setting: This study was conducted at out-patient clinic of Oncology Institute at Menoufia University at Shebin El-Kom City, Menoufia Governorate, Egypt.

Sample: A convenience sample of 30 children diagnosed as cancer, and treated with chemotherapy that was attends to the out-patient clinic of Oncology institute.

Tools for data collection: Three tools were used for data collection;

1) **Interviewing Questionnaire.** It was used to assess the demographic data on; age, sex, and medical history, which includes; diagnosis, medication use and chemotherapy.

2) **WCCNR scale:** It was used to assess children oral health before and after chemotherapy radiotherapy to identify chemotherapy complications "Oral Mucositis",

3) **Oral Assessment Guide Scale (OAGS).** It was used to evaluate the effect of oral mucositis guide-line implementation on the quality of life of the patient after intervention. Results revealed that; concerning mucous membrane, healthy mucous membrane accounted 73.3% in the first intervention compared to 80% in the second intervention. Regarding signs of infections, no signs of infection reported in the majority of cases 76.7% in the first intervention compared to 83.3% in the second intervention. More than half of patient (53.3%) had severe effect on swallowing and largest percent of the cases had moderate effect on talking and voice (56.7% and 70% respectively).

Conclusions: There were statistical significant differences between the first and second intervention. The implementation of oral care guideline for children had direct severe effect on the degree of oral Mucositis than before the intervention.

Recommendations: Continued use of standardized assessment tool to assess the oral cavity throughout the chemotherapy treatment is necessary. Nurses should instruct patient to perform oral care at least three times per day

Keywords: Guideline-Oral Care- Oral Mucositis-Chemotherapy.

I. Introduction

Oral mucositis is a significant problem in patients undergoing chemotherapeutic management for solid tumors. Mucositis is a major side effect induced by chemotherapy and radiotherapy. Incidence of mucositis ranges from 30-40% of patients receiving chemotherapy and increases to 50-80% of that receiving high dose radiation or chemotherapy [1]. A study, reported that 303 of 599 patients (51 %) receiving chemotherapy for solid tumors or lymphoma developed oral and /or gastrointestinal (GI) mucositis [2]. Oral mucositis developed in 22% of 1236 cycles of chemotherapy, gastrointestinal (GI) mucositis in 7% of cycles and both oral and GI mucositis in 8% of cycles. Even higher percentages (approximately 75-80%) of patients who receive high-dose chemotherapy prior to hematopoietic cell transplantation develop clinically significant oral mucositis [3]. Patients treated with radiation therapy for head and neck cancer typically receive an approximately 200 cGy daily dose of radiation, five days per week, for 5-7 continuous weeks. Almost all such patients will develop some degree of oral mucositis. Studies showed that, severe oral mucositis occurred in 29-66% of all patients receiving radiation therapy for head and neck cancer[4,5]. They added that the incidence of oral mucositis was especially high in 1) patients with primary tumors in the oral cavity, oropharynx or nasopharynx, 2) those who also received concomitant chemotherapy, 3) those who received a total dose over 5000 cGy, and 4) those who were treated with altered fractionation radiation schedules (e.g. more than one radiation treatment per day). Oral mucositis refers to erythematous and ulcerative lesions of the oral mucosa observed in patients with cancer being treated with chemotherapy, and/or with radiation therapy to fields involving the oral cavity. Lesions of

oral mucositis are very painful and compromise nutrition and oral hygiene as well as increase risk for local and systemic infection. Mucositis can also involve other areas of the alimentary tract; for example, gastrointestinal mucositis can manifest as diarrhea. Thus, mucositis is a highly significant and sometimes dose-limiting complication of cancer therapy [6,7].

Oral mucositis is a clinically important and sometimes dose-limiting complication of cancer therapy. Mucositis lesions can be painful, affect nutrition and quality of life, and have a significant economic impact. The pathogenesis of oral mucositis is multifactorial and complex [8]. Oral complications may include pain, mucositis, oral ulcerations, bleeding, taste dysfunction, secondary infections (eg, candidiasis, herpes simplex virus), dental caries, salivary gland dysfunction [9,10]. Symptoms of chemotherapy-induced mucositis are first seen 3-5 days after initiation of treatment cycle and reach their peak in 7-14 days. The course of this complication normally takes 3 weeks [11]. Chemotherapy induced mucositis may cause some complications. Mucositis and its related pain adversely affect nutrition, speaking, function and quality of life of patients under cancer treatment. Mucositis also make patient susceptible to septicemia especially in neutropenic conditions. Mucositis adversely affects the quality of life of the patient and the family members and precipitates the development of various infections. Additionally, mucositis-related complications increase the duration of hospitalization, the cost of inpatient treatment, the use of narcotics to manage pain, and parenteral feeding. Similarly, mucositis has also been thought to cause delays in chemotherapy or radiotherapy, as well as reductions in doses and interruptions in treatment [12,13, 14].

All patients with cancer should have an oral examination prior to initiation of the oncology therapy [9]. Prevention and treatment of pre-existing or concomitant oral disease is essential to minimize complications in this population [15]. The key to success in maintaining a healthy oral cavity during cancer therapy is patient compliance. The children and the parents should be educated regarding the possible acute side effects and the long-term sequelae of cancer therapies in the oral cavity [10,15&16]. Because there are many oncology and protocols, every patient should be managed on an individual basis; consultations with the patient's physicians and, when appropriate, other dental specialists should be sought before dental care is instituted [17]. Guidelines to the treatment of oral mucositis are often contradictory so that there is no evidence based standard treatment protocol [18]. Current clinical management of oral mucositis is largely focused on palliative measures such as pain management, nutritional support and maintenance of good oral hygiene. However, several promising therapeutic agents are in various stages of clinical development for the management of oral mucositis. These agents are discussed in the context of recently updated evidence-based clinical management guidelines [8]. The most common prescriptions for management of mucositis include good oral hygiene, analgesics, non-medicated oral rinses (eg, 0.9 percent saline or sodium bicarbonate mouth rinses four to six times/day), and parenteral nutrition as needed [9,19,20].

More and more clinical guidelines for health care professionals are being developed. Although the development of guidelines for medical staff, nursing staff and/or other health care professionals has gained momentum in recent years, this does not necessarily mean that the recommendations described in the guidelines are actually followed [21,22,23]. The term "implementation of" guidelines are sometimes replaced by terms like "use of", "adherence to" or "compliance with" (depending on the terminology used in the publications we are referring to). A multidisciplinary approach involving oncologists, nurses, social workers, dieticians, dentists and other related health professionals is essential in caring for the child before, during and after any cancer therapy [9]. The oral cavity is highly susceptible to the effects of chemotherapy and radiation and is the most frequently documented source of sepsis in the immunosuppressed cancer patient. For these reasons, early and definitive dental intervention, including comprehensive oral hygiene measures, reduces the risk for oral and associated systemic complications [9, 10, 24]. Nurses perform an essential function in health promotion and, therefore, providing education for patients and healthy people alike is a substantial part of their job. It appears to be fundamentally significant to utilize appropriate nursing theories and teaching methods to attain the desired outcomes in education. Nurses play a substantial role in evaluating oral mucositis, monitoring patients, and providing mouth care education [13]. Educating the patient and parents about the importance of optimal oral care to minimize oral problems/ discomfort before, during, and after treatment and about the possible acute and long-term effects of the therapy in the oral cavity and the craniofacial complex. Gupta [25] reported that there is a lack of dental awareness among the parents of children receiving chemotherapy, the child and the parents should be educated regarding the possible acute side effects and the long-term sequelae of cancer therapies in the oral cavity. Studies have reported that interventions and mouth care education reduce oral mucositis (OM) severity in children undergoing chemotherapy [26,27]. Educating Patient/parent includes the importance of optimal oral care in order to minimize oral problems/discomfort before, during, and after treatment and the possible acute and long-term effects of the therapy in the craniofacial complex [28]. To draw attention to this area of needs the guidelines on 'Nursing Management of Oral Hygiene' as evidence based guidelines serves to guide healthcare providers in caring for patients who require assistance with oral hygiene. They emphasize to make good use of it and incorporate it into nursing practice [29].

Oral hygiene includes brushing of the teeth and tongue two to three times daily with regular soft nylon brush or electric toothbrush, regardless of the hematological status [16,17,20]. Ultrasonic brushes and dental floss should be allowed only if the patient is properly trained. Patients with poor oral hygiene and/or periodontal disease may use chlorhexidine rinses daily until the tissue health improves or mucositis develops [30].

Aim of the study

The aim of this study is to determine the effect of implementing oral care Guideline on the degree of Mucositis among children receiving chemotherapy.

Research Hypothesis

1. Patients undergoing chemotherapeutic management who will receive Oral Care Guideline intervention are more likely to have reduced degree of Mucositis than before the intervention.
2. Patients undergoing chemotherapeutic management who will receive Oral Care Guideline intervention are more likely to have better health status and quality of life of the Children than before the intervention.

Subjects and Method

Research Design:

A quasi experimental (Pre-test and post-test) design was used to test the study hypothesis.

Setting:

The study was conducted at out-patient clinic of oncology Institute at Menoufia University at Shebin El-Kom City, Menoufia Governorate, Egypt. The oncology Institute at Menoufia University was selected because; it is considered the only Hospital that had oncology department at Menoufia University.

Sample:

A convenience sample of 30 children diagnosed as cancer, and treated with chemotherapy that was attends to the out-patient clinic of Oncology institute. These patients met the following inclusion criteria:

- (a) Children up to 18 years old,
- (b) Both sexes.
- (c) Confirmed diagnosis of cancer,

Sample size and power of the study:

Thirty patients were recruited based on the following assumptions: with the power of 80 %, $\alpha = 0.05$ and the ratio of exposed to cancer risk factors to those who were not exposed = 1:1. The required sample size was determined using Epi info software.

Tools for data collection: Three tools were used for data collection;

1) Interviewing Questionnaire. It was used to assess the demographic data on; age, sex, and medical history, which includes; diagnosis, medication use and chemotherapy. These variables were collected through the patient face-to-face interview developed by investigator.

2) WCCNR [Western Consortium for Cancer Nursing Research] scale:

This instrument was adopted from Western Consortium for Cancer Nursing Research scale, (1998) [31]. It was used to assess children oral health before and after chemotherapy radiotherapy to identify chemotherapy complications "Oral Mucositis". Each child and or teenagers were assessed by using WCCNR scale. This scale consisted of 4 grades of Oral Mucositis. Each of 4 stages had descriptors related to mucosal color, lesions, bleeding, moisture, edema, infection, ability to eat/drink, and discomfort:-

Grade 0 means that the mucous membrane healthy and normal in color, there is no signs of infection, edema and bleeding, eating normal. Also, there is no discomfort and normal saliva.

Grade 1 means mild mucositis, the mucous membrane was thin and slight increase in redness, no signs of infection and bleeding, mild edema was present and avoid hot and spicy food in eating. Also the degree of discomfort is mild and normal saliva.

Grade 2 means moderate mucositis in which the mucous membrane was drier than normal with moderate redness and presence of more than 4 lesions, white or yellow patches and moderate edema. Also, the mucosa tends to bleed. The patient is unable to eat except bland soft food but is able to drink. The degree of discomfort is moderate and the saliva is slightly thicker than normal.

Grade 3 means severe mucositis; the mucous membrane is dry and severely red with white or yellow ulcer or purulent patches and severe edema or bleeding spontaneously. The Patient is unable to eat or drink or even swallow his/her own saliva. Also, There was severe discomfort and require analgesia for pain and the saliva was thicker.

3) Oral Assessment Guide Scale (OAGS)

It was used to evaluate the effect of oral mucositis guide-line implementation on the quality of life after intervention. It was adopted from Eilers et al., (1988) [32].

It consisted of 8 items. The OAG comprises 8 categories that reflect oral health. Mucositis severity was evaluated after the implementation of Guideline according to Oral Assessment Guide Scale; the Parents, children and teenagers were asked to rate their opinion of understandability and overall acceptability of OAGS on a three-point ordinal scale (Mild Effect, Moderate Effect, and Severe Effect).

Procedure for data collection:

- Study period: This study was collected over a 10-month period started during the period starting from January 2015 to the end of October 2015.
- An official letter from the Faculty of Nursing was delivered to the Director of the Oncology Institute-Menoufia University in Menoufia Governorate- Egypt, where the data were collected to conduct the study after an explanation of the purpose of the study.
- Ethical consideration: for the purpose of protection of children's rights, oral consent was obtained from children's parents or teenagers. The researchers introduced themselves to every participant; the researchers explain the purpose of the study and assured them that confidentiality would be maintained throughout the study. They were notified about the right to refuse to participate in the study. Anonymity and confidentiality of the information gathered was ensured.
- Validity; Instruments were reviewed and tested for validity by 5 experts in pediatric nursing, modification were done accordingly to ascertain relevance and completeness.
- Reliability: The internal consistency of the questionnaires was calculated using Cronbach's alpha coefficients. Test-retest was used. The Cronbach's alpha of the WCCNR scale was 0.91 indicate good reliability. Whereas, Cronbach's alpha of the Oral Assessment Guide Scale (OAGS) was 0.89 indicate good reliability.
- Pilot study, a pilot study was conducted on 3 children to evaluate the developed tools before starting the actual data collection. The pilot sample was not included in the total sample of the research work to ensure stability of the answers. Based on the results of the pilot study, modifications, and rearrangement of some questions were done. It also helped to estimate the time needed to fill in the questionnaire.
- Children who agreed to participate in the study are requested to complete the required tools. The researchers introduced themselves to the respondents, and explained the aim and objectives of the study to the children in the study settings.
- Children were approached in the inpatient or clinic setting before the start of the chemotherapy cycle procedure.
- The designed questionnaire was distributed to them, with instructions about its filling. The researchers were present all the time to clarify any ambiguity.
- The time taken for questionnaire to be filled out about 10-15 minutes for each child.
- The WCCNR scale was distributed to assess the baseline assessment occurred before initiation of chemotherapy by researcher and/or children /parents measured oral mucositis "at baseline" (conducted between day -2 to day 5 when mucositis was not expected) and then between Days 10 and 15 (when mucositis was expected) following start of chemotherapy). It took an average of 5 to 10 minutes to complete the overall evaluation of mucositis severity and pain for each child. Two groups of participants were included:-

For children aged <8 years, the parent completed all tools and the child did not participate. On Day 15, the parent answered the following three additional questions: (a) reported whether their child was experiencing any mouth pain or sores that day (yes or no); (b) reported whether oral mucositis had changed since the previous day (Day 13) on a four-point scale.

-For children aged ≥ 12 years, the child completed all tools although he/she could request assistance from the parent if necessary. These older children also completed the questions.

- The implementation guideline of Oral Hygiene, with detailed procedures for mouth wash "oral hygiene"; with booklet that was circulated to all participants (children). The booklet included the guidelines with descriptions and pictures of erythema and ulcers. The children were first asked to show how they normally brushed their teeth, and the researchers explained to the children that the best way to brush their teeth. The researchers practiced the technique by demonstrating it for each child on a model tooth. Next, the children were asked to practice the technique on the model, and then they were observed while brushing their teeth with the correct. The frequency of oral hygiene should be determined; it should be performed at least twice a day. The researcher gave each child and their parents verbal and written instruction about routine Daily Oral care according to American Academy of Pediatric Dentistry (2016)[28]guide as following:

Brushing: Brush teeth using appropriate tooth brush after every meal and at bedtime. Use soft toothbrush for all risk patients. Use a fluoride containing toothpaste. Brush at a degree 45 angle using an elliptical motion rather than back and forth for 2-3 minutes.

Rinsing: Rinse mouth after meals and before bedtime with either saline or a baking soda solution or a combination of both. Dental Clinic recommends a mixture of ½ tsp. of baking soda to 8 Oz of warm water. Rinse and swish for 30 second then spit the rinse out into sink or emesis basin.

- Oral assessment was done for patients to measure the degree of oral mucositis using (WCCNR). Each patient was assessed three times;

* The pre intervention: before starting the intervention.

** The first intervention on 10 days of starting chemotherapy.

** The Second intervention after 17 days of starting chemotherapy to measure the degree of stomatitis and the effectiveness of oral care in minimizing the degree of mucositis by using the same WCCNR scale.

- Lastly the Oral Assessment Guide Scale (OAGS) was filled out in the last visit. It was used to evaluate the effect of oral care guideline implementation on the degrees of Mucositis in the patient's health.

Statistical analysis

Up on completion of data collection, the data collected were coded, data entry, tabulated and statistically analyzed by personal computer and statistical package SPSS version 16. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables and means and standard deviations for quantitative variables. Variables were compared using chi-square test. Correlation analysis was used for assessment of the inter-relationships among quantitative variables. Statistical significance was considered at p-value <0.05 and P < 0.001.

II. Results

Table (1) represents the distribution of the children according to their general characteristics it revealed that the more than half of sample (56.7%) was ranged between 10-18 years. Whereas, 43.3% of the studied sample represents the age group of less than 10 years. The more than half of sample of the studied sample (53.3%) were males.

Figure (1) shows the distribution of the children according to their diagnosis. The majority percentage (46.70%) of the children had leukemia. Wilms tumor accounted for 20%. Hodgkin disease represents 13.30%. However, Non Hodgkin disease and brain tumor reported 10%.

Figure (2) clarifies chemotherapy cycle of the studied sample; less than half (40%) of cases get chemotherapy 4-8 time while 36.7% get it more 8 times.

Table (2) shows oral assessment before and after the first intervention. The results revealed that there was highly significant difference between before and after first intervention. Regarding mucous membrane, healthy mucous membrane accounted 73.3% in the first intervention compared to 53.3% who had dry of mucous membrane before intervention. While, in relation to color of mucous membrane, normal color of mucous membrane accounted 83.3% compared to 50% who had severely red before intervention. No bleeding was reported by 67.7% compared to 46.7% who had tendency to bleed before intervention. In addition, no comfort accounted 66.7% in the first intervention compared to 26.7% who had severe discomfort before intervention.

Table (3) represents the comparison of oral assessment between the first and second intervention. There were highly significant differences between the first and second intervention. Concerning mucous membrane, healthy mucous membrane accounted 73.3% in the first intervention compared to 80% in the second intervention. Regarding signs of infections, no signs of infection reported in the majority of cases 76.7% in the first intervention compared to 83.3% in the second intervention. In addition to bleeding, no bleeding accounted to 76.7% in the first intervention compared to 90% in the second intervention. Also, no discomfort reported in the majority of cases in the first and second intervention (66.7% and 83.3% respectively).

Table (4) clarifies the effect of implementing oral care guideline on the health status of children. The majority of sample (63.7%) had severe effect on feeding taste and appetite. While, more than half of patient (53.3%) had severe effect on swallowing. The results showed that the largest percent of the cases had moderate effect on talking and voice (56.7% and 70% respectively). Also, more than half of patient (53.3%) had severe pain

Table (1) Distribution of the children according to their demographic data

Demographic Data	No.	%
Age		
< 10	13	43.3
10-18	17	56.7
X ± SD	11.4 1 ±3.56	
Sex		
Male	16	46.7
Female	14	46.7
Total	30	100.0

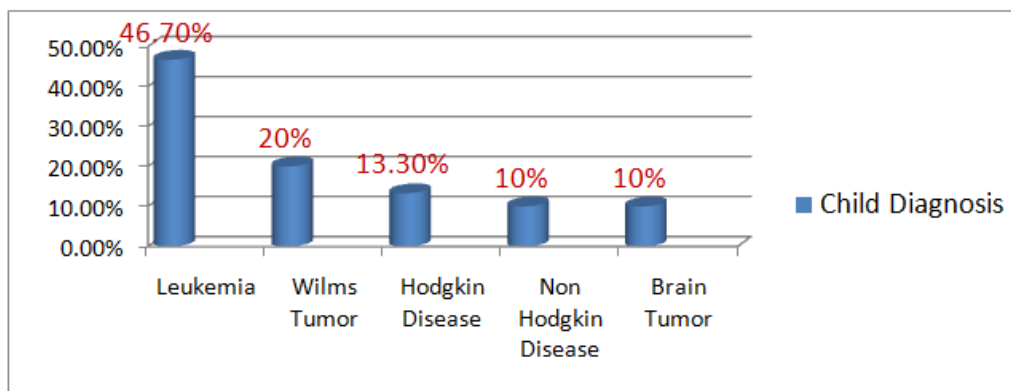


Figure (1). Shows the distribution of the children according to their diagnosis

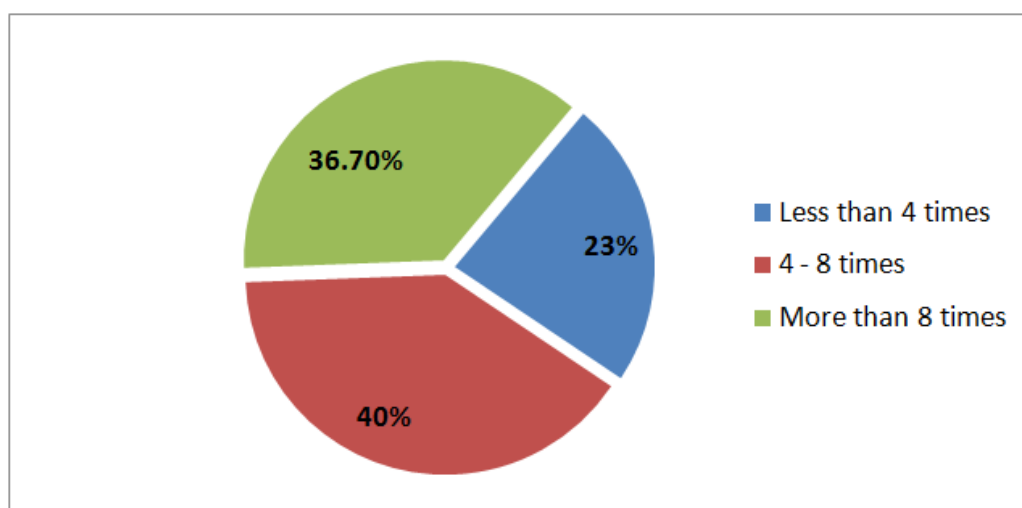


Figure (2). Clarifies chemotherapy cycle of the studied sample

Table (2) Oral assessment before and after the first intervention

Items	Grade	Before intervention		After Intervention		χ^2	P
		No	%	No	%		
Mucous Membrane							
- Healthy	0	0	0.0	22	73.3	24.73	<0.001
- Moist	1	4	13.3	6	20		
- Drier than normal	2	10	33.3	2	6.7		
- Dry	3	16	53.3	0	0.0		
Color of Mucous Membrane							
-Normal	0	0	0.0	25	83.3	30.00	<0.001
-Thinning and Redness of mucosa	1	5	16.7	3	10		
-Moderate Redness	2	10	33.3	2	6.7		
-Severely Red	3	15	50	0	0.0		
Signs of Infection							
-No	0	0	0.0	23	76.7	10.44	<0.05
-Mild	1	2	16.7	4	13.3		
-White or yellow patches	2	14	46.7	3	10		
-Ulcer	3	14	46.7	0	0.0		
Edema							
-No	0	0	0.0	25	83.3	12.00	<0.05
-Mild	1	4	13.3	3	10		
-Moderate	2	16	53.3	2	6.7		
-Severe	3	10	33.3	0	0.0		
Bleeding							
-No	0	0	0.0	23	76.7	25.11	<0.001
- Mild	1	8	26.7	5	16.7		
- The mucosa tend to bleed	2	14	46.7	2	6.7		
- Spontaneous bleeding	3	8	26.7	0	0.0		
Eating							
-Normal	0	0	0.0	24	80	12.96	<0.05
-Avoid hot and spicy food	1	5	16.7	4	13.3		
-Unable to eat but able to drink liquid	2	14	46.7	2	6.7		
-Unable to eat or drink or even to swallow own saliva	3	11	36.7	0	0.0		
Degree of discomfort							
-No	0	0	0.0	20	66.7	22.80	<0.001
- Mild discomfort	1	2	6.7	7	23.3		
- Moderate discomfort	2	20	66.7	3	10		
-Severe discomfort and require analgesic for pain	3	8	26.7	0	0.0		
Saliva							
-Normal	0	0	0.0	22	73.3	9.55	<0.001
-Mild saliva	1	0	0.0	5	16.7		
-Slightly thicker than normal	2	14	46.7	3	10		
-More thicker	3	16	53.3	0	0.0		

Table (3) Oral assessment after the first intervention and second intervention

Items	Grade	First Intervention		Second Intervention		χ^2	P
		No	%	No	%		
Mucous Membrane							
-Healthy	0	22	73.3	24	80	3500	<0.001
-Moist	1	6	20	3	10		
-Drier than normal	2	2	6.7	3	10		
-Dry	3	0	0.0	0	0.0		
Color of Mucous Membrane							
-Normal	0	25	83.3	20	66.7	25.67	<0.001
-Thinning and Redness of mucosa	1	3	10	6	20		
-Moderate Redness	2	2	6.7	4	13.3		
-Severely Red	3	0	0.0	0	0.0		
Signs of Infection							
- No	0	23	76.7	25	83.3	27.53	<0.001
-Mild	1	4	13.3	3	10		
-White or yellow patches	2	3	10	2	6.7		
-Ulcer	3	0	0.0	0	0.0		
Edema							
-No	0	25	83.3	23	76.7	19.71	<0.001
-Mild	1	3	10	7	23.3		
- Moderate	2	2	6.7	0	0.0		
- Severe	3	0	0.0	0	0.0		
Bleeding							
-No	0	23	76.7	27	90	24.16	<0.001
- Mild	1	5	16.7	2	6.7		
- The mucosa tend to bleed	2	2	6.7	1	3.3		
- Spontaneous bleeding	3	0	0.0	0	0.0		
Eating							
- Normal	0	24	80	24	80	45.00	<0.001
- Avoid hot and spicy food	1	4	13.3	3	10		
- Unable to eat but able to drink liquid	2	2	6.7	3	10		
- Unable to eat or drink or even to swallow own saliva	3	0	0.0	0	0.0		
Degree of discomfort							
-No	0	20	66.7	25	83.3	27.33	<0.001
- Mild discomfort	1	7	23.3	3	10		
- Moderate discomfort	2	3	10	2	6.7		
- Severe discomfort and require analgesic for pain	3	0	0.0	0	0.0		
Saliva							
- Normal	0	22	73.3	21	70	41.69	<0.001
- Mild saliva	1	5	16.7	7	32.3		
- Slightly thicker than normal	2	3	10	2	6.7		
- More thicker	3	0	0.0	0	0.0		

Table (4) Effect of Oral Care Guideline on General Health and quality of life of the Children

General Health and quality of life of the Children	Effect of Oral Care Guideline					
	Mild effect		Moderate effect		Severe effect	
	No	%	No	%	No	%
-Communication	24	80	6	20	0	0.0
-Talking	9	30	17	56.7	4	13.3
-Voice	9	30	21	70	0	0.0
-Swallowing	5	16.7	9	30	16	53.3
-Feeding Taste	3	10	8	26.7	19	63.7
-Appetite	3	10	8	26.7	19	63.7
-Pain	3	10	11	36.7	16	53.3
-Weight	3	10	15	50	12	40

III. Discussion

Oral mucositis is one of the most debilitating side effects of chemotherapy. In order to assess whether interventions have a meaningful impact and to facilitate clinical care, feasible, psychometrically sound and clinically useful outcome measures are required [33]. The Oral Assessment Guide as pointed out by [34]

Is a measure such an outcome for oral mucositis, is critically important to improve quality of life during treatment for children with cancer who receive chemotherapy [35], who studied “Prevention and treatment of oral mucositis in patients receiving chemotherapy”. They stated that it is important to emphasize the importance of correct oral hygiene in cancer patients. There is scientific evidence demonstrating that oral hygiene measures can reduce the duration and severity of Oral Mucositis as well as help prevent the development of dental problems during the cancer treatment cycles. The aim of this study is to determine the effect of implementing oral care guideline on the degree of Mucositis among children receiving chemotherapy.

The current research study hypothesized that children undergoing chemotherapeutic management who will receive Oral Care Guideline intervention are more likely to have reduced degree of oral Mucositis than before the intervention. The results of the current study demonstrated that there was significant difference between before and after first intervention; regarding mucous membrane, healthy mucous membrane accounted two third in the first intervention compared to more than half who had dry of mucous membrane before intervention. While, in relation to color of mucous membrane, normal color of mucous membrane accounted for most of cases compared to half who had severely red before intervention. No bleeding was reported by two third compared to approximately half who had tendency to bleed before intervention. In addition, no comfort accounted two third in the first intervention compared to one quarter who had severe discomfort before intervention (Table 2). This result was similar to [36] who studied “Assessment of Oral Mucositis in Adult and Pediatric Oncology Patients: An Evidence-Based Approach”. They reported that data identified that 87% of patients had abnormal oral mucositis assessments, including all components or variables in the oral mucositis assessment tool. In addition, 62% of patients had changes in oral mucositis assessment. They added that the use of an evidence-based oral mucositis assessment tool is the a comprehensive to reduce the impact of this highly distressing side effect of cancer treatment, which may affect cancer therapy, risk for infection, pain, and other side effects.

The results of the current study demonstrated that there were significant differences between the first intervention at 10th day of chemotherapy initiation and second intervention at 17th day of chemotherapy concerning mucous membrane, healthy mucous membrane, signs of infection, sign of infection, bleeding, and discomfort (Table 3). These results were consistent with the [28] who studied “Guideline on Dental Management of Pediatric Patients Receiving Chemotherapy, Hematopoietic Cell Transplantation, and/or Radiation Therapy”. They reported that oral mucositis usually begins seven to 10 days after initiation of conditioning, and symptoms continue approximately two weeks after the end of conditioning. The patient should be followed closely to monitor and manage the oral changes and to reinforce the importance of optimal oral care. Dental procedures usually are not allowed in this phase due to the patient’s severe immunosuppression. Patients should be encouraged to optimize oral hygiene and topical application of neutral fluoride or desensitizing toothpastes helps reduce the symptoms.

The current research study hypothesized that children undergoing chemotherapeutic management who will receive Oral Care Guideline intervention are more likely to have better health status than before the intervention. The result of current study clarified the effect of implementing oral care guideline on the health status of children. The majority of sample had severe effect on feeding taste and appetite. While, more than half of patient had severe effect on swallowing. The results showed that the largest percent of the cases had moderate effect on talking and voice, (Table 4). This result was in-line with [37] who studied; “Oral management of the Cancer Patient; a Professional Guide for the Management of Patients Undergoing Chemotherapy and Head and Neck Radiation Therapy. They reported that positive significance differences were found between the oral status assessment before, and after and after 10 days from first intervention. Also they stated that, although a sore mouth may be seen like side effect, it may lead to much discomfort and serious problems such as pain, inability to eat, decreased oral intake and secondary infection, interfere with swallowing, and speech. Whereas, [28] added that routine periodic examinations are necessary to provide comprehensive oral healthcare. Careful examination of oral cavity is important. Dental treatment may require a multidisciplinary approach.

Also similar to MOH Nursing Clinical Practice Guidelines, [38, 34] who confirmed that oral hygiene has significant impact on patients’ general well-being and their quality of life. Patients need adequate oral care to eat and talk comfortably, feel happy with their appearance, maintain self-esteem and normal standards of hygiene. However, the circumstances surrounding hospitalization and ill-health can lead to neglect of oral hygiene. Sung [29] indicated that care of the mouth is one of the most basic nursing activities. It is an important aspect of care that needs to be carried out consistently. Nurses play a vital role in providing effective oral care and promoting oral hygiene. Also, [34] pointed out that nurses in the clinical setting are facing an ever-increasing number of challenges and are expected to do more. This review adds support to the use of oral care as the foundation for mucositis prevention and treatment. Nurses have a primary role to relay that importance to patients and families and to provide instruction regarding oral care. Nurses should recommend the use of sodium bicarbonate mouth rinses as an essential component of the routine oral care guideline.

IV. Conclusions

The implementation of oral care guideline for children had direct severe effect on the degree reduction of oral Mucositis than before the intervention:-

- The results of the current study demonstrated that there was significant difference between before intervention and after first intervention regarding; healthy mucous membrane, color of mucous membrane, No bleeding.
- The majority of sample had severe effect on feeding taste and appetite, on swallowing, moderate effect on talking and voice, after second intervention.

V. Recommendations

- Continued use of standardized assessment tool to assess the oral cavity before and throughout the chemotherapy treatment is necessary.
- Nurses should instruct patient to perform mouth care at least three times per day.

References

- [1]. Michelle L., (2006). Identification of Oral Assessment Tool and Development of a patient Education Guide to Oral Mucositis.
- [2]. Elting LS, Cooksley C, Chambers M, Cantor SB, Manzullo E, Rubenstein EB. (2003). The burdens of cancer therapy. Clinical and economic outcomes of chemotherapy-induced mucositis. *Cancer*, 1:98 (7):1531-1539.
- [3]. Vera-Llonch M, Oster G, Ford CM, Lu J, Sonis S. (2007). Oral mucositis and outcomes of allogeneic hematopoietic stem-cell transplantation in patients with hematologic malignancies. *Support Care Cancer*. 15(5):491-496.
- [4]. Vera-Llonch M, Oster G, Hagiwara M, Sonis S. (2006). Oral mucositis in patients undergoing radiation treatment for head and neck carcinoma. *Cancer*. 15:106(2):329-336.
- [5]. Elting LS, Cooksley CD, Chambers MS, Garden AS. (2007). Risk, outcomes, and costs of radiation-induced oral mucositis among patients with head-and-neck malignancies. *Int J Radiat Oncol Biol Phys*. 28.
- [6]. Lalla RV, Peterson DE. (2005). Oral mucositis. *Dent Clin North Am*. 49(1):167-184.
- [7]. Treister N, Sonis S. (2007). Mucositis: biology and management. *Curr Opin Otolaryngol Head Neck Surg*. 15(2):123-129.
- [8]. Lalla, R. V. Sonis, S. T. and Peterson, Douglas E. (2016). Management of Oral Mucositis in Patients with Cancer. *Dent Clin North Am*. 52(1): 61-viii. doi: 10.1016/j.cden.2007.10.002.
- [9]. National Cancer Institute: (2013). Oral Complications of Chemotherapy and Head/Neck Radiation. Bethesda, MD: National Cancer Institute. Modified February 28, Available at: "http://cancer.gov/cancertopics/pdq/supportivecare/oralcomplications/HealthProfessional."
- [10]. Hong CH, Brennan MT, Lockhart PB. (2009). Incidence of acute oral sequelae in pediatric patients undergoing chemo-therapy. *Pediatr Dent* 31(5):420-5.
- [11]. Pahloosye A, Hashemi AS, Mirmohammadi SJ, Atefi A. (2011). Presenting Clinical and Laboratory Data of Childhood Acute Lymphoblastic Leukemia. *Iranian journal of Pediatric Hematology Oncology*. 1(3):71-7.
- [12]. Kansoy S., Kadioğlu B. (2006). Kanser Tedavisinin Yol Açtığı Mukozal Hasarlar [Mucosal damage caused by cancer treatment]. In Uyar M., Uslu R., Kuzeyli-Yıldırım Y. (Eds.), *Kanser ve Palyatif Bakım [Cancer and palliative care]* (pp. 265-270). İzmir, Turkey: Meta Basım Matbaacılık.
- [13]. Sevinir B. (2009). Mukozit [Mucositis]. In Özkan A. (Ed.), *Pediyatrik Onkoloji [Pediatric oncology]* (pp. 1283-1300). İstanbul, Turkey: Nobel Tıp Kitabevleri.
- [14]. Yılmaz Ç.M. (2007). Mukozit Yönetiminde Kanıta Dayalı Uygulamalar [Evidence-based practices for managing mucositis]. *Uluslararası Hematoloji-Onkoloji Dergisi [International Journal of Hematology and Oncology]*, 4(17), 241-246.
- [15]. Elad S, Thierer T, Bitan M, Shapira MY, Meyerowitz C. (2008). A decision analysis: The dental management of patients prior to hematology cytotoxic therapy or hematopoietic stem cell transplantation. *Oral Oncol* 44 (1):37-42.
- [16]. Hong CH, daFonseca M. (2008). Considerations in the pediatric population with cancer. *Dent Clin N Am*; 52(1):155-81.
- [17]. Lalla RV, Brennan MT, Schubert MM. (2011). Oral complications of cancer therapy. In: Yagiela JA, Dowd FJ, Johnson BS, Marrioti AJ, Neidle EA, eds. *Pharmacology and Therapeutics for Dentistry*. 6th ed. St. Louis, Mo: Mosby-Elsevier; 782-98.
- [18]. Feller LI, Essop R, Wood NH, Khammissa RA, Chikte UM, Meyerov R, Lemmer J. (2010). Chemotherapy- and radiotherapy-induced oral mucositis: pathobiology, epidemiology and management. *SADJ*. 65(8):372-4.
- [19]. Stiff PJ, Emmanouilides C, Bensinger WI, et al. (2006). Palifer-min reduces patient-reported mouth and throat soreness and improves patient functioning in the hematopoietic stem-cell transplantation setting. *J Clin Oncol* 24(33):5186-93.
- [20]. Peterson DE, Bensadoun RJ, Roila F, ESMO (2012). Guidelines Working Group. Management of oral and gastrointestinal mucositis: ESMO Clinical Practice Guidelines. *Ann Oncol* 22(Suppl 6):vi78-84. Erratum in *Ann Oncol* 23(3):810.
- [21]. World Health Organization (WHO) (2003). Global Programme on Evidence for Health Policy. Guidelines for WHO Guidelines Geneva: WHO World Health Organization.
- [22]. Grol R, Grimshaw J: (2003). From best evidence to best practice: effective implementation of change in patients' care. *Lancet* 362:1225-1230.
- [23]. Fretheim A, Schunemann HJ, Oxman AD: (2006). Improving the use of research evidence in guideline development: 15. Disseminating and implementing guidelines. *Health Res Policy Syst*, 4:27.
- [24]. Little JW, Falace DA, Miller CS, Rhodus NL. (2012). Cancer and oral care of the cancer patient. In: Little and Falace's *Dental Management of the Medically Compromised Patient*, 8th ed. St. Louis, Mo: Elsevier-Mosby; 459-92.
- [25]. Gupta A., Marwaha M., Bansal K., Sachdeva A., Gupta A. (2016). Dental Awareness among Parents and Oral Health of Paediatric Cancer Patients Receiving Chemotherapy. *Journal of Clinical and Diagnostic Research*. Vol-10(5): ZC92-ZC95. DOI: 10.7860/JCDR/2016/17412.7819.
- [26]. Chen C. F., Wang R. H., Cheng S. N., Chang Y. C. (2004). Assessment of chemotherapy-induced oral complications in children with cancer. *Journal of Pediatric Oncology Nursing*, 21, 33-39.
- [27]. Cheng K. K. F., Chang A. M., Yuen M. P. (2004). Prevention of oral mucositis in paediatric patients treated with chemotherapy: A randomized crossover trial comparing two protocols of oral care. *European Journal of Cancer*, 40, 1208-1216.

- [28]. The American Academy of Pediatric Dentistry (AAPD) (2016). Guideline on Dental Management of Pediatric Patients Receiving Chemotherapy, Hematopoietic Cell Transplantation, and/or Radiation Therapy. CLINICAL PRACTICE GUIDELINES. REFERENCE MANUAL V 37 / NO 6 15 / 16.
- [29]. Sung et al. (2016). Who stressed on “Guideline for the Prevention of Oral and Oropharyngeal Mucositis in Children receiving Treatment for Cancer or undergoing Haematopoietic Stem Cell Transplantation”.
- [30]. Schubert MM, Peterson DE. (2009). Oral complications of hema-topoietic cell transplantation. In: Appelbaum RF, Forman SJ, Negrin RS, Blume KG, eds. Thomas’ Hematopoietic Cell Transplantation: Stem Cell Transplantation, 4th ed. Oxford, UK: Wiley-Blackwell; 1589-607.
- [31]. Western Consortium for Cancer Nursing Research (1998). Assessing stomatitis; Refinement of the Western Consortium for Cancer Nursing Research (WCCNR) stomatitis staging system. Canadian Oncology Nursing Journal, 8 (3), 160-165.
- [32]. Eilers J; Berger A & Petersen M. (1988). Development testing and application of the oral assessment guide. Oncology Nursing Forum, 1988; 15(3):325-330.
- [33]. Broadfield L, Hamilton J., (2006). Best Practice Guidelines for the Management of Oral Complications from Cancer Therapy. Supportive Care Cancer Site Team, Cancer Care Nova Scotia.
- [34]. Eilers, J., Harris, D. Henry, K. and Johnson, L. A. (2014). Based Interventions for Cancer Treatment–Related Mucositis: Putting Evidence Into Practice. Clinical Journal of Oncology Nursing • Supplement to Volume 18, Number 6.
- [35]. Alvariño-Martín C., Sarrión-Pérez M. (2014). Prevention and treatment of oral mucositis in patients receiving chemotherapy. Journal section: Oral Medicine and Pathology, J Clin Exp Dent.;6(1):e74-80. doi:10.4317/jced.51313 <http://dx.doi.org/10.4317/jced.51313>.
- [36]. Farrington, M., Cullen, L., Dawson, C.(2010). Assessment of Oral Mucositis in Adult and Pediatric Oncology Patients: An Evidence-Based Approach. ORL – Head and Neck Nursing, summer 2010 | Volume 28 | Number 3.
- [37]. Barker, G. J. Barker, B. F. Gier, R. E. (2000). “Oral management of the Cancer Patient; a Professional Guide for the Management of Patients Undergoing Chemotherapy and Head and Neck Radiation Therapy, Thesis, Colgate Oral Pharmaceuticals, University of Missouri-Kansas.
- [38]. MOH (2004). Nursing Management of Oral Hygiene. Nursing Clinical Practice Guidelines Singapore, 1/2004.