

Effect of Three Selected treatment modalities on Mucositis among Children with Leukemia

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Abstract: Children diagnosed with and on treatment for leukemia face multiple health-related problems and explicit needs that call for complex and individualized care. This complication within the oncology pediatric setting requires a multidisciplinary collaboration for the comprehensive support of the children and their family study aimed to draw a comparison between the effects of three therapeutic modalities (honey, honey plus coffee and olive) on children suffering from oral mucositis. **Research Design:** Randomized Control Trial with three blinding method design was used to accomplish this study. **Setting:** The study was conducted at the oncology department of the Pediatric Hospital affiliated to Ain Shams University in Cairo. **Subjects:** A convenience sampling of 60 children was engaged in the study. Children were assigned into three groups (Group I: received mucositis care by honey, Group II: received mucositis care by honey plus coffee and Group III: received mucositis care by olive oil) based on using a simple random sample approach. **Tools:** Four tools were used. The tools: Children characteristics and mothers characteristics, Tool II: The Pre/Post Oral Mucositis Reporting of symptoms (PROMS) scale. Tool III: The World Health Organization (WHO) Oral Mucositis Grading Scale. Tool IV: Children international mucositis evaluation scale ChIMES Results. Post-intervention after two the week, there was highly significant difference pre/post-intervention of three modalities on the different grade of mucositis improvement, transported the better progress in children condition and subside in all complaints. It was surprising that all children (100.0%) who established honey plus coffee presented earliest recovered completely before the other groups at week three. The majority of them (90.0%, 100.0%, and 85.0%) respectively shifted to grade 1 and honey plus coffee group was the best one. All children (100.0%) completely recovered in the fourth week. **Conclusion** The present study highlight and has provided further support for the significant correlation between the three types of treatment modalities as well as the evidence of the positive effect of a combined effect of honey and coffee in earlier alleviation of the severity of mucositis. The beneficial properties of honey alone are manifested clearly than olive oil in the field of oral ulcers care. **Recommendations** Increase public awareness on how to achieve and preserve good oral health, what facilities they can practically expect, and what tasks they have in return.

Further well-designed studies in this life-threatening area are highly needed can be applied to numbers of children and in different settings to have generality.

Keywords: Effect -Treatment modalities- Honeny –Coffee-Olive oil - Mucositis -Children –Leukemia.

1. INTRODUCTION

[1] Specialists announced that leukemia, brain cancer, and lymphoma are the most prevalent cancers and developing as the second leading cause of death in Asia, Central and South America, North America and the Middle East among children aged from 5 to 14 years old. They endorse that cancers in children and adolescents should be treated in specialized cancer centers to meet children and their family's needs by specialized multidisciplinary teams comprising medicine and nursing.

Egypt was completely lacking leukemia incidence rates at national level until the results given in the current report were obtained of international agency for research on cancer[2] who reported that incidence rate of leukemia is 4.8%, where mortality rate 4.3% according to Age-standardized (the world) incidence and mortality rates, top 10 cancers, and the rate is in boys is 5.3%, 4.4% in girls, as Age-standardized (the world) incidence rates per sex, top 10 cancers. Moreover [3] reported that children who receiving chemotherapy are more at risk of developing mucositis and may reach 90% in children under 12 years of age. In adding to [4] mention that 30 to 40% of children who on chemotherapy drugs develop the different grade of oral mucositis within 5 to 10 days after the beginning of the treatment regimen.

Oral mucositis one of the unfortunate consequences secondary to cancer therapy to

. It is not an infectious process, so it cannot be prevented with antibiotics or antiviral. Medications and cannot be passed to another person. It is an acute inflammation of the oral mucosa in response to systemic chemotherapy and/or radiation to fields involving the mucous membrane that covered from the oral cavity to the rectum. In the earliest stages, symptoms of discomfort and pain often precede the redness (erythema) visible tissue changes in the mouth and throat. General erythematous stomatitis soon progresses to form painful ulcerations ranges from to erosive lesions and overt ulceration. The insides of the cheeks and lips and the sides and underside of the tongue are the most commonly affected site. The children quality of life will be affected due to very painful lesions, may compromise their nutrition and oral hygiene, and can increase the risk of local and systemic infection as a consequence to that. They will suffer from infections caused by both Gram-positive and negative bacteria as well as fungi like Candida. Furthermore, mucositis is a highly significant complication of cancer therapy, with a potential impact on the patient outcome [5] [6] [7] and [8]. Honey is one of the oldest known natural treatments and since ancient times has been regarded as a health-giving substance[9]. Its medical use is recorded from around 3000 B.C. onward and is addressed as a curative substance in the Holy Bible. Honey has been highly valued in the Middle East region, and it was mentioned as a curative material for human illnesses more than 1400 years ago in the Holy Quran [10]. Now, researchers have informed the antibacterial activity of honey and found that natural unheated honey has some broad-spectrum antibacterial activity when tested against pathogenic bacteria, oral bacteria as well as food spoilage bacteria [11] and [12]. The honey, when applied topically, rapidly clears wound infection to facilitate healing of deep surgical wounds with infection. The removal of exudate in wounds dressed with honey is of help in managing inflamed wounds[13]. Furthermore, the ability of honey to reduce (reactive intermediates release) may well limit tissue damage by activated macrophages during wound healing. Thus, the immunomodulatory property of honey is relevant to wound repair [14] In cancers, honey may be used for radiation-induced mucositis. Honey also has a positive effect on mouth ulcers and other problems of oral health[15].

Caffeine is considered anti-oxidant and anti-inflammatory effects. In[16] founded that combination of honey and coffee as an alternative medicine had a positive effect in treated oral mucositis in a short period.

Olive oil prevents the formation of various cancer types as intestine, prostate, and breast, neurological disorders, and cardiovascular and thrombotic diseases via its phenolic contents[17]. Phenolic compounds in the olive fruits such as oleuropein, tyrosol, hydroxytyrosol, caffeic acid, gallic acid, syringic acid, p-coumaric acid, p-hydroxybenzoic acid, protocatechuic acid, quercetin, and luteolin show antimicrobial activity against viruses, bacteria, yeasts, and fungi[18] and [19].

Nursing has an exceptional opportunity in all aspects of managing mucositis to influence children outcomes through an organized approach of effective therapeutic communication coupled with routine use of a valid and reliable instrument for the assessment of functional components the oral mucositis cavity grade, administering no pharmacologic interventions with diligent attention to evidence-based oral care, assisting parents and their children to cope with symptoms suffering, and training on oral care modalities, all these to provide the optimum oral care program.

Significance & justification

Oral mucositis affects more than 75% of children and adolescents undergoing chemotherapy and places a significant burden on them [20] Unfortunately, effective standardized protocol for the prevention or treatment of oral mucositis has not been yet. Prophylactic measures begin with an increased emphasis on improved children quality of life oral health status. In this context, using three treatment modalities (honey, honey plus coffee, and olive) a cheap, and non-

pharmacological an attempt is taken to provide preventative, comfort measures and readily applicable method in reducing the development and the severity of oral mucositis to cope with this side-effect.

AIM:

The study aimed to draw a comparison between the effects of three therapeutic modalities (honey, honey plus coffee and olive oil) on children suffering from oral mucositis through:

1. Assessment of the grade of oral mucositis among children undergoing chemotherapy.
2. Evaluation of the effectiveness of three therapeutic modalities (honey, honey plus coffee and olive oil) on relieving pain severity and reducing the oral ulcers progress.

RESEARCH HYPOTHESIS:

- 1 - Children who received oral care by honey exhibit fewer signs of mucositis and shorter time of recovery than those in honey plus coffee and olive oil.
- 2 - Children who received oral care by honey plus coffee exhibit fewer signs of mucositis and shorter time of recovery than those in honey and olive oil
- 3 - Children who received oral care by olive oil exhibit fewer signs of mucositis and shorter time of recovery than those in honey and plus coffee.
4. There is a significant difference between mean pretest level of oral mucositis and mean posttest level of oral mucositis among experimental groups during using three treatment modalities.

II. SUBJECTS AND METHOD

Research Design:

Randomized Control Trial with three blinding method design was used to accomplish this study.

Setting:

The study was conducted at the Oncology department of the Pediatric Hospital affiliated to Ain Shams University in Cairo.

Subjects:

A convenience sampling of 60 children and accompanied mothers who fulfilled the following criteria were included in the study: Children diagnosed with Acute Leukemic Leukemia ALL during the consolidation phase of treatment and with chemotherapy-related oral mucositis grades 2 and 3, absence of prophylactic local treatment for mucositis. Simple random sample technique was used for dividing the study sample into three groups (20 children in each group) as follows: Group I: It included 20 children who used honey,

Group II It included 20 children who used honey plus coffee.

Group III It included 20 children who used olive oil.

TOOLS: Four tools were used to collect the required data: Tools of the study were developed by the researcher after reviewing the related national and international literature.

The tool I: It included two parts.

Part 1: Children characteristics and mothers characteristics :

It involved children characteristics as age, sex, the order in the family, level of education and clinical data as an oral mucositis grade level.

Mother characteristics as age, level of education, employment and residence.

Part 11: Clinical Data Interview Schedule:

It was developed by the researcher after reviewing recent international literature, it was used to collect data about the study subjects;

Tool II: The Pre /Post Oral Mucositis Reporting of symptoms (PROMS) scale. It developed by [21]: It consists of 10, 100-mm horizontal visual analog scales addressing oral functions affected by oral mucositis.

Participants were asked to mark on the 100-mm line what best represented their present intra-oral condition pre and post-intervention.

It included 10 criteria of the mucositis symptoms as mouth pain, difficulty of speaking because of mouse sores, restriction of speech because of mouse sores, difficulty eating hard food, difficulty eating soft food, restriction of eating because of mouth sores, difficulty in drinking because of mouse sores, restriction of drinking because of mouth sores, difficulty swallowing because of mouse sores and change in taste. Sores were given for children on three levels (mild range from zero % to 35% moderate from 35 %to 70% and severe from 70% to 100%).

Tool III: The World Health Organization (WHO) [22] Oral Mucositis Grading Scale

It is developed based on clinical appearance and the functional status of children. The WHO scale is a grading system for mucositis dependent on both objective and subjective variables, and measures anatomical, symptomatic as well as functional components of oral mucositis. Scoring includes five grades (0 for Nones I (mild) for Oral soreness, erythema - II (moderate) for Oral erythema, ulcers, solid diet tolerated - III (severe) for Oral ulcers, liquid diet only - IV (life-threatening) for Oral alimentation impossible). Based on (WHO) scale [23] modified (The Radiation Therapy Oncology Group) (RTOG) grading is reliant on a clinician's ability to judge the anatomical changes associated with oral mucositis.

IV: Children international mucositis evaluation scale(ChIMES):It developed by [24] It consists of seven elements: (1)Amount of mouth or throat pain (ChIMES1), (2) Effect of mouth or throat pain on swallowing (ChIMES2), (3) Effect of mouth or throat pain on eating (ChIMES3), (4) Effect of mouth or throat pain on drinking (ChIMES4), (5) Receipt of pain medication (ChIMES5), (6) Receipt of pain medication for mouth or throat pain (ChIMES6), and (7) Presence of ulcers (ChIMES7). The scoring system Each item received a score of zero–5 where 5 is the worst degree of symptoms. Any question that was scored as missing or, 'I can't tell' was excluded from the total possible score. If all the questions were answered, the maximum score would be 23. Total Score over the total maximum score taking into account multiplied by 100. Higher scores correspond to worse mucositis size and characteristics of ulceration).

PAIN

1. Which of these faces best describes how much pain you feel in your mouth or throat today? Tap one.

0 No Hurt 1 Hurts a little bit 2 Hurts a little more 3 Even harder 4 Hurts a whole lot 5 Hurts worst

FUNCTION

2. Which of these faces shows how hard it is for you to SWALLOW your saliva/spit today because of mouth or throat pain? Tap one.

0 No Hurt 1 Hurts a little bit 2 Hurts a little more 3 Even harder 4 Hurts a whole lot 5 Can't swallow Can't tell

3. Which of these faces shows how hard it is for you to EAT today because of mouth or throat pain? Tap one.

0 No Hurt 1 Hurts a little bit 2 Hurts a little more 3 Even harder 4 Hurts a whole lot 5 Can't eat Can't tell

4. Which of these faces shows how hard it is for you to DRINK today because of mouth or throat pain? Tap one.

0 No Hurt 1 Hurts a little bit 2 Hurts a little more 3 Even harder 4 Hurts a whole lot 5 Can't drink Can't tell

PAIN MEDICATION (You will need some help from your parent or another adult to answer these questions).

5. Have you taken any medicine for any kind of pain today? Yes No

If yes, did you need the medicine because you had a sore mouth or throat?

APPEARANCE (The photos shown on [questionnaire instructions](#) are examples of what mouth sores may look like).

6. Please ask an adult to look in your mouth. Can he or she see any mouth sores in your mouth today?

Yes No I can't tell

ETHICAL CONSIDERATIONS

An official letter was obtained from Faculty of Nursing Ain Shams University and acquiesced to the hospital administrative authority and the head of oncology department in the Pediatric Hospital to obtain their agreement for data collection after clarifying the objective of the study. Contribution in this study was voluntary; parents were informed about the purpose of the study, intervention assistances nature and procedure of the study. Confidentiality and anonymity of each participant were assured through the coding of all data.

Content Validity:

The researcher developed the study tools after extensive reviewing of relevant literature. The content of the tools revised by seven experts in the pediatric nursing field to test content validity, completeness, and clarity of items. Comments and suggestions were considered, and the tools were modified accordingly.

Reliability

The tool II, III and IV was determined by measuring the internal consistency of its items using Cronbach's Alpha test which was 0.98.

Pilot study:

A pilot study was carried out by the researcher on six children (10% of the sample) who fulfilled the described criteria to ascertain the clarity and feasibility and applicability of the tool. Accordingly, necessary modifications and oversights of some facts were done and then the final forms were developed. The children who included in the pilot study were excluded from the study subjects.

Procedures:

Approval was obtained from the Head of oncology of the study setting and nurses working in the units to avoid mistakes and gain their help. The study was conducted in the period from January to December 2018.

DATA COLLECTION:

Three Selected treatment modalities on Mucositis was carried out on 3 phases namely:-

1 -Preparatory phase:

Every child's mother was interviewed and welcomed individually by the researcher on the first day of study at the hospital in the oncology department to obtain the necessary data. The researcher explains to her the benefits of the intervention. Informed consent was obtained from at least one parent of each child. Afterwards, the researcher collected mothers and children socio-demographic characteristics. The interview was taken 20 minutes for each mother.

II. Implementation Phase:

The researcher was available during morning, afternoon and night shifts alternatively. Before distribution, the children into the three groups ensured from diagnoses of ALL and mucositis grade and the date of onset by using (WHO) Oral mucositis Grading Scale. Also, pre-assessment of oral mucosa was done to children to assess the level of oral hygiene. Then children were randomly allocated into 1 of the three groups, 20 children each based on a systematic way of a simple random sample method, every second one, allocated to one group. The children beds labeled with certain cards that indicate the type of modalities known by the research and nurses. The researcher clarifies to the mothers and the nurses how to practice and demonstrate mucositis care, then they re-demonstrate it. Group 1 received 0.5 g honey/kg (maximum 15g), pure honey from Ministry of agriculture, Group 2 received 0.5 g honey/kg plus 1gm coffee ratio 1:5, Turkish coffee and Group 3 received pure olive oil 0.5 g from Sinai governorate, all three modalities applied topically to the affected oral mucosa 3 times daily until healing appear (for 2 weeks). The researcher before administration of the three modalities, delivered routine oral care for all children in the three groups using a soft toothbrush followed by oral normal saline rinse 3 times daily, finished by an oral rinse with tap water and slowly swallow the given solution three times per daily i.e. 15 g. The oral mucosa was assessed after week 2, 3 and four for the three modalities in the planned group to identify the development rate of mucositis and to find out its severity by using (WHO) Oral Mucositis grading scale and the pre /post-oral mucositis reporting of symptoms (PROMS) scale. During the first assessment of children and prior to their completion of the actual PROMS scale questionnaire, participants were learned visual analog scale assisted measurements. The participants completed a PROMS questionnaire each week for 4 weeks.

IV: Evaluation:

Progression to different grades was noted. Children progress was monitored for complete oral healing. Each child was followed up and monitored daily by nurses staff and twice weekly by the researcher for signs of healing and improvement using (PROMS) scale. Comparison was made between the three groups, to determine which modalities were effective on the subject of signs of healing and recovery as crucial consequence ratio for each modality whichever comes first and the number of days from the beginning of each treatment modality to when whole healing of all ulcers occurred.No signs or fewer signs of infection and shorter time of recovery using Children international mucositis evaluation scale ChIMES . The percentage of pain levels pre/post-intervention for the three modalities after the three weeks.

Statistical Data Analysis: The collected data were coded, analyzed and tabulated using frequencies and percentage, mean, standard deviation & chi-square tests. Data entry and analysis were done by using the statistical package for the social sciences (SPSS Version 20).

III. RESULT

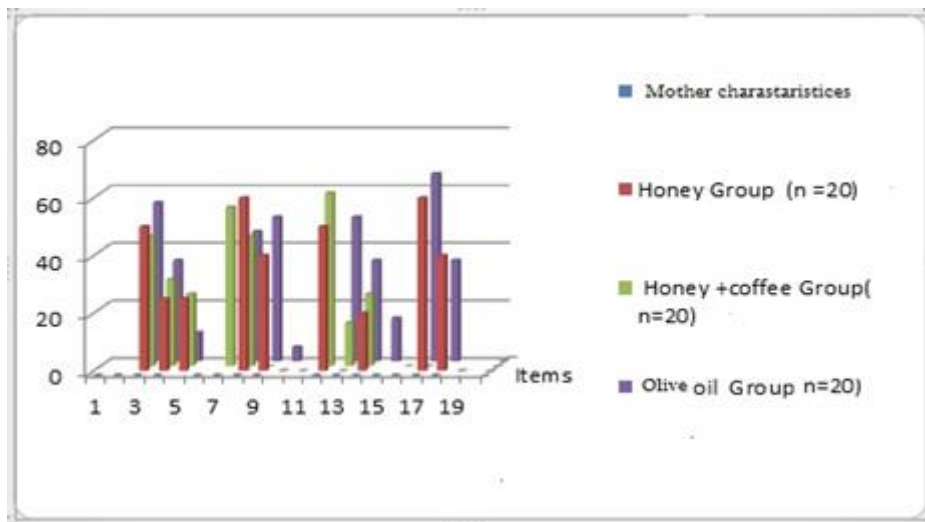


Fig.1: DISTRUBUTION OF MOTHERS GROUPS.CHARACTERISTICS

No significant difference between the mother's characteristics in the three groups. The nearly half of mothers (50.0%, 45.0% and 55.0%) their age were ranged from 20-25 years, more than half or less about half (60.0%, 55%, 45.0%) got diploma degree, they were from rural area.

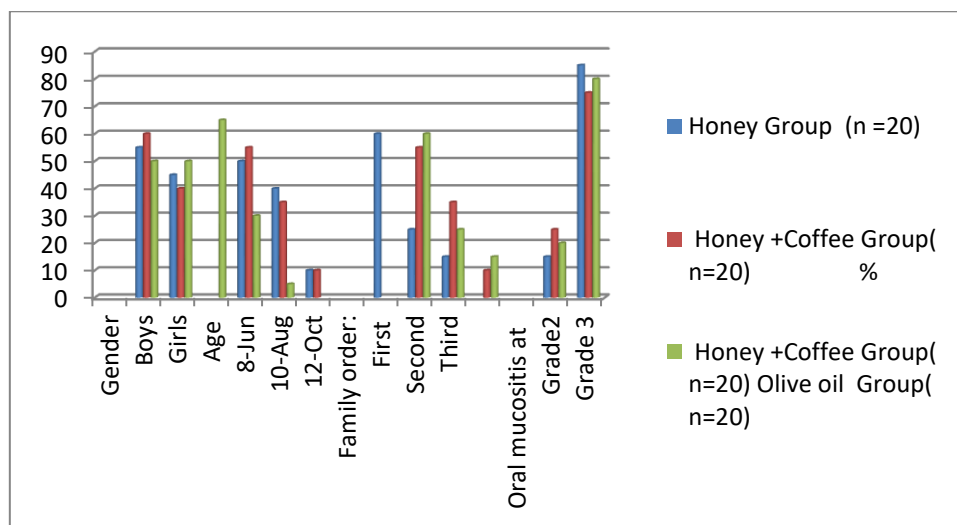


FIG.2 Children Charactersits and Grade of mucositis

No significant difference between the children characteristics in the three groups. The half and more of children were boys (50.0%, 55.0 %and, 65.0 %) and two-third or less of them (50.0%,55.0%,and 65.0%) their age was ranged from 6-8 years, two-third (60.0%,55.0% and 65%) was the first child in their families. The majority of children (85.0%,75.0%, and 80%) were at grade three of mucositis.

Table (1) Demonstrate that there was no significant difference between the three groups of study at the beginning. Post-intervention after two the weeks, there was highly significant difference pre and post-intervention of three modalities on the different grade of mucositis and ulcers improvement transported the better progress in children condition and subside in all complaints. It was surprising that all children (100.0%) who established honey plus coffee presented earliest recovered completely before the other groups at week three and graded in nothing level. On the other group, the grade of ulcers started at grade to2 (moderate) and 3(severe)as assessed by(PROMS) scale. None of the groups categorize grade 3 at week 3, the majority of them(90.0%,100.0%, and 85.0%) respectively shifted to grade 1 and honey group was the best one. All children (100.0%) completely recovered in the fourth.

TABLE (1) THE WHO GRADES And (PROMS) SCALE FOR THE THREE MODALITIES AT DIFFERENT WEEKS

WHO Grading at different times Tested drugs P value	Three treatment modalities						P value
	Honey No=20		Honey + Coffee No=20		Olive oil No=20		
Oral mucositis at week1	The beginning of study before intervention						
Grade 2 (moderate)	3	15.0	5	25.0	4	20.0	P< 0.05
Grade 3 (severe)	17	85.0	15	75.0	16	80.0	
	Post intervention						
week 2							P< 0.001
Grade 2 (moderate)	12	60.0	16	80.0	10	50.0	
Grade 3(severe)	8	40.0	4	20.0	10	50.0	
After 3 week							P< 0.001
Grade 1(mild)	18	90.0	20	100.0	17	85.0	
Grade 2(moderate)	2	10.0	0	0.0	3	15.0	
After 4week							P< 0.001
Grade 0(noting)	20	100.0	20	100.0	20	100.0	
Grade 1(mild)	0	0.0	0	0.0	0	0.0	

As shown in (table 2), there was highly significant difference pre and post-intervention of three modalities on different parameters of pain scale score conveyed the better progress in children condition and subside in all complaints. It was surprising that children received honey and coffee completely earliest recovered before the other groups. None of the groups categorize mouth pain, difficulty eating soft food, restriction of eating, difficulty in drinking, restriction of drinking as compared to only (15.0%) was still in the mild grade of suffering from difficulty of speaking, and restriction of speech in olive oil group correspondingly. Regarding the honey group, only (10.0%) of children remain suffering from difficulty eating.

TABLE (2) THE PERCENTAGE OF PAIN LEVEL PRE/POST INTERVENTION FOR THE THREE MODALITIES AFTER THE THREE WEEKS.

Symptoms of scores	Levels of Pain	Pre intervention			Post intervention			P value
		Honey	Honey + Coffee	Olive oil	Honey	Honey + Coffee	Olive oil	
		No=20	No=20	No=20	No=20	No=20	No=20	
Mouth pain	Mild	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	P< 0.001
	Moderate	20%	35%	25%	0.0%	0.0%	0.0%	

	severe	80%	65%	75%	0.0%	0.0%	0.0%	
Difficulty of speaking	Mild	10%	5%	10%	00.0%	0.0%	15.0%	P< 0.001
	Moderate	30%	35%	40%	0.0%	0.0%	0.0%	
	severe	60%	60%	50%	0.0%	0.0%	0.0%	
Restriction of speech	Mild	0.0%	0.0%	0.0%	0.0%	0.0%	15.0%	P< 0.001
	Moderate	30%	25%	30%	0.0%	0.0%	0.0%	
	severe	70%	75%	70%	0.0%	0.0%	0.0%	
Difficulty eating hard food	Mild	0.0%	0.0%	0.0%	10.0 %	0.0%	15.0%	P< 0.001
	Moderate	20%	50%	45%	0.0%	0.0%	0.0%	
	severe	80%	50%	55%	0.0%	0.0%	0.0%	
Difficulty eating soft food	Mild	30%	25%	30%	0.0%	0.0%	0.0%	P< 0.001
	Moderate	60%	55%	55%	0.0%	0.0%	0.0%	
	severe	10%	20%	15%	0.0%	0.0%	0.0%	
Restriction of eating	Mild	0.0%	0.0%	0.0%	10.0%	0.0%	10.0%	P< 0.001
	Moderate	80%	75%	85%	0.0%	0.0%	0.0%	
	severe	20%	25%	15%	0.0%	0.0%	0.0%	
Difficulty in drinking	Mild	50%	50%	50%	0.0%	0.0%	0.0%	P< 0.001
	Moderate	30%	25%	35%	0.0%	0.0%	0.0%	
	severe	20%	25%	15%	0.0%	0.0%	0.0%	
Restriction of drinking	Mild	40%	45 %	45 %	0.0%	0.0%	0.0%	P< 0.001
	Moderate	40%	35%	40%	0.0%	0.0%	0.0%	
	severe	20%	20%	15%	0.0%	0.0%	0.0%	
Difficulty swallowing	Mild	0.0%	0.0%	0.0%	0.0%	0.0%	15.0%	P< 0.001
	Moderate	50%	60%	55%	0.0%	0.0%	0.0%	
	severe	50%	40%	45 %	0.0%	0.0%	0.0%	
Change in taste	Mild	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	P< 0.001
	Moderate	15%	10%	20%	0.0%	0.0%	0.0%	
	severe	85%	90%	80%	0.0%	0.0%	0.0%	

IV. DISCUSSION

The appraisal of the literature directed that a systematic approach to oral mucositis should be followed. The present study proved the burden of oral mucositis in children quality of life that enforce the dramatic psychosocial consequences on children and In Egypt, their families added to the economic costs for care providers. A few studies were conducted to assess the effect of treatment modalities on children suffering from oral mucositis. Therefore the present study carried out with the objective to draw a comparison between the effects of three therapeutic modalities (honey, honey plus coffee and olive) on children suffering from oral mucositis hops to alleviate children and parents suffering from easy and cheap modalities decrease the length of hospital stay, and costs of treatment. The results of intervention using three modalities were promising hopefully one day may be effectively succeeded.

Concerning application of scales (PROMS) SCALE, the mothers not recommended any problems with understanding the PROMS questionnaire and these were accomplished quickly because the researcher explained it clearly at many of times over the course of the study so they adopted quickly. These are responding with the contract with [25] who detailed that patient involvement in clinical assessment of PROMS scale revealed to its was reasonable substitute for in situations where patients cannot endure oral examinations. The results presented that the mixture of honey and coffee is the best treatment modality for oral mucositis as compared with honey alone and olive oil. The honey and coffee are natural, harmless, accessible and cheap modality. The test of honey and coffee accepted by children, they were happy due to its effect on decreasing pain, they were able to eat and drink easily and they gain weight. As displayed in the table (1) It was surprising that all children (100.0%) who established honey plus coffee presented earliest recovered completely before the other groups in the week three and graded in nothing level of complaint and there was highly significant difference (P < 0.001) pre /post -intervention of three modalities on different grade of mucositis and ulcers improvement .Instead , the grade of ulcers started at grade two (moderate) and 3(severe) as assessed by(PROMS) scale. None of the groups categorize grade 3 at week 3, and the majority of them(90.0%, 100.0% and 85.0%) respectively shifted to grade 1 and the honey group was the best one. All children (100.0%) completely recovered in the fourth week.

This indicated that honey plus coffee was very functioning and proved recovery in a short period.

The preferred the mixture of honey and coffee because they are both revealed in complementary medicine and their combination is nontoxic and tolerable. These promising results in accordance with [26] who reported that instead of the unclear facts about the exact action of the grouping of honey and coffee, for post- infectious cough drew notable improvements in mucosal tissue healing by repairing the "nerve ending damage". This result supported the present trail and can offer possible clarification for the role of combined coffee and honey because both actively working on mucosal tissue healing.

These results supported by [27] who mentioned that the mixture of coffee and honey' as alternative treatment modality can be used effectively in the controlling of oral mucositis in a short time as matched with topical steroids.

Furthermore,[28]mentioned that Caffeine acts antagonistically on adenosine receptors, so hindering the damaging effects adenosine induces on neurotransmission, arousal and pain perception. For this reason, the children were less suffering as shown in the table (2) there was highly significant difference pre and post-intervention of three modalities on different parameters of the pain scale score.

It was amazing that children received honey plus coffee completely earliest recovered before the other groups and the children condition showed better progress faster than the other two groups.

Another interesting finding was that in both groups received honey alone and olive oil, the results also were little better in a honey group than in olive oil. By the 3rd week of intervention, it is observed that the majority of children(90.0%) in the honey, and (85.0%) in the olive oil group, the oral ulcers healed quickly, oral mucositis clinical manifestation developed grade I. By the end of the 4th week, all children (100%) were completely cured of inflammation, fever and edema reduces.Children developed good swallowing of soft food and even hard with no pain and drinking any type of sore fruits without complaint. This result was incongruent with [29]who well-versed that natural osmolality composition of honey produce anti-inflammatory substance, that can play a vital role in restoring destroyed tissue and healing of the pharyngeal mucosal irritation. This was also in the arrangement with [15] who exposes the positive effect of honey in oncology care, wound healing, burns and several skin disorders. Additional [30] further that honey is inexpensive, better tolerated with no harm effects as compared to drugs. Moreover [31]recommended that topical application of local Saudi honey was effective in dropping difficulties of oral mucositis and could be used as prophylaxis treatment of oral mucositis in pediatric cancer.Concerning olive oil [32] (Khadija, 2013) concluded that olive leaf extract is effective in diminishing the manifestation of two pro-inflammatory cytokines in patients receiving chemotherapy.

The idea of applying the three treatment modalities for the management of mucositis is because of its simplicity, effective and inexpensive agent, which is easily available, and it can be a better therapeutic agent in handling mucositis in developing countries like Egypt to overcome its morbidity. The present study highlight and has provided further support for the significant correlation between the three types of treatment modalities as well as the evidence of the positive effect of a combined effect of honey and coffee in earlier alleviation of the severity of mucositis. The beneficial properties of honey alone are manifested clearly than olive oil in the care of oral ulcers, but there is a need for the trials to be carried out to determine to what extent these results are true. Hops by this trail provide Proper oral care for children with leukemia.

V. CONCLUSION

The idea of applying the three treatment modalities for the management of mucositis is because of its simplicity, effective and inexpensive agent, which is easily available, and it can be a better therapeutic agent in handling mucositis in developing countries like Egypt to overcome its morbidity. The present study highlight and has provided further support for the significant correlation between the three types of treatment modalities as well as the evidence of the positive effect of a combined effect of honey and coffee in earlier alleviation of the severity of mucositis. The beneficial properties of honey alone are manifested clearly than olive oil in the care of oral ulcers, but there is a need for the trials to be carried out to determine to what extent these results are true. Hops by this trail provide Proper oral care for children with leukemia.

VI. RECOMMENDATIONS

Based on the present study findings, the following recommendations are suggested:

- Increase public awareness on how to achieve and preserve good oral health, what facilities they can practically expect, and what tasks they have in return.
- Further, well -designed studies in this life-threatening area are highly needed can be applied on numbers of children and in different settings to have generality.
- Oncology nurses should be prepared which sufficient evidence of practice to manage the toxicities of the chemotherapy via careful assessment, providing children and caregivers with essential information about the oral hygiene methods to minimize discomfort and maximize the chances for a successful outcome

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