

NURSES' KNOWLEDGE, ATTITUDE AND PRACTICE TOWARD MOUTH HYGIENE AMONG CRITICAL ILL PATIENTS

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Abstract: Background: Mouth cleanliness is very important for critical patients in hospital; it is usually the accountability of nurses with adequate information for mouth hygiene, guiding principle and rate of performance oral needed to prevent spread of infection. **Aim:** The aim of this study was to assess nurses' knowledge, attitude and practice toward oral care among critical ill patients. **Subjects & méthode:** Research design: Descriptive research was utilized. **Setting:** intensive care units at Menoufia University Hospital. **Subjects:** convenience sample of all nurses working in intensive care units; 100 nurses at Menoufia University. **Tools:** One tool was utilized for data collection: 1-Structure interview questionnaire schedule: It consists of 5 parts. **Part I:** demographic characteristics, **Part 2:** knowledge questionnaire sheet, **Part 3:** - mouth hygiene practice sheet, **Part 4:** - attitudes regarding mouth hygiene, **Part 5:** Types and frequency of oral care: **Results:** more than half of the group had lack of time to practice of mouth hygiene. More than half (64%) of nurses had good knowledge and (16%) of the nurses had not any knowledge about oral care. The higher majority of nurses were agreeing that mouth hygiene was very important to ventilate patients. The higher majority of nurses was strongly agreed about adequate training of oral care. The majority (84.0%) of the nurses had a negative attitude toward oral care and the majority (100.0%) of nurses had poor practice toward oral care. The attitude had a positive correlation and was significantly correlated with their knowledge of oral care ($p = 0.018$). However practice score did not correlate significantly with their knowledge of oral care. **Conclusion:** Majority of the nurses had good knowledge, however the majority of them had poor practice and attitudes about oral care in the intensive care unit. There was no statistically significant difference between knowledge and practice. Also attitude had positive correlation and significantly with their knowledge of oral care.

Keywords: Knowledge, Attitude, Practice, Critical ill patient.

I. INTRODUCTION

Mouth hygiene is an essential component of a nursing job that has consequences on the patient's safety and comfort in intensive care units. As effective mouth hygiene is very important to a patient's health, it has implications for identification, interventions and treatment. Critically ill patients had a lack of ability to perform own mouth hygiene. Because most patients had the presence of gastric tube; end tracheal tube, and a lot of equipments essential for the assessing and supervision of a critically ill patient that complicates the practice of oral hygiene. Mouth hygiene is vital for critical ill patients in hospital. So all nurses must recognize the hazard factors that effect on oral safety and associated with general disease, dental Caries (tooth decay) and Gingivitis and gum disease (Jones, Newton& Bower. 2004).

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Seriously ill patients in critical units (ICUs) need stable continuous monitoring and sufficient nursing care. In the state of dangerous disease, more attention is frequently compensated to other aspects of nursing care, even as oral hygiene is ignored, inadequately and inappropriately applied can lead to the spread of infection and disease. Some potential causes prevent the practice of oral hygiene in ICU. The most common are the nursing staff's observation that other aspects of nursing care are more important than constantly applying mouth hygiene, inadequate and lacking information about the importance of mouth cleanliness in seriously ill patients, deficient in of consistent protocols and recommendations for oral hygiene in critically ill and lacking resources appropriate for oral hygiene in ICUs. The results of inadequate oral hygiene in ICUs are a higher incidence of caries, disease and oral mucosal infection (**Craven & Duncan 2006**). Mouth hygiene is a necessary aspect of a nurse's job. There are many differences in the quality and frequency of the oral care that is delivered to patients by nursing staff, such as mouth hygiene given a low precedence when compared to other nursing responsibility (**Salamone, k., Yacoub, E., Mahoney, A., & Edward, k., 2013**)

Poor mouth hygiene has been known as a critical problem. So every hospital must be created and application a regular mouth hygiene protocol among critical ill patients. So new efforts produced standardized oral care protocols for critical patients that resulted in several evidence-based practices. Mouth wellbeing is influenced by dental plaque, the presence and type of oral microbial flora, and oral immunity. The major aerobic oral organism in well adults is *Streptococcus viridians*. Residual flora lead to changes in mouth enzyme levels and the oral flora of a critically ill patient changes to primarily gram-negative organisms within approximately 48 hours. This represents a more virulent flora that may include agents with the potential to cause ventilator-associated pneumonia (VAP). It is a risk factor for increase mortality rate among ventilated patients. (**Heck, 2012**).

Critically ill patients are at great risk of bad mouth hygiene, especially among elderly patients because they suffer from malnourishment, dehydration and decreased immunity. Other causes include prevention of the practice of oral care and contributing factors such as maintenance of good oral hygiene with smoking, alcohol history, incubation or patients on oxygen therapy. Mouth hygiene is an essential element of nursing care, and is useful for all patients, particularly those with a difficult disease. Maintaining good oral hygiene in the critically ill patient as it is very important in reducing the risk of nosocomial infection. So mouth care for critical patients prevents spread of infections and improving patient comfort (**Terezakis, Needleman, Kumar, Moles, & Agudo, 2011**).

Useful mouth hygiene can be implemented by using a small, soft-bristled toothbrush and toothpaste and using water and an elastic suction catheter to cleanse the mouth after brushing. The teeth, gums and tongue should also be softly cleaned. Providing patients with a small toothbrush as part of their admission to the critical care unit should be investigated as a strategy to assist in preventing complications that may develop from poor mouth hygiene. It may result in good health and decrease cost of treatment. (**Ross & Crumpler, 2007**).

Mouth hygiene is difficult among mechanically ventilated patients. The initiation of oral hygiene is limited and evidence suggests that oral care protocols may not be followed. Furthermore, the sponge commonly used in ICUs appears to have limited efficacy complete oral hygiene compared with a toothbrush. We were interested in investigating powered toothbrushes might be advantageous for oral hygiene in ICU. Powered toothbrushes and other advanced methods have shown some advantages for oral hygiene compared with manual toothbrushes. So the most important strategies were investigated paying attention to clean the mouth and oro-pharynx using anti-bacterial or anti-septic applications (**Needleman, Hirsch, Leemans, et al., 2011**)

Rate and performance of mouth hygiene were based on the results of the mouth assessment. Nurses providing mouth hygiene were instructed to apply the mouth hygiene when patients suffering from many complications (**Nancy, 2012**). Most nurses often have lack evidence-based information to deliver appropriate mouth hygiene (**Chan et al., 2011**). Many nurses view oral care in the care-dependent adult simply as a comfort measure and performing of mouth hygiene have a low clinical priority. Changing the perception of the providers from viewing mouth hygiene as a comfort measure to oral care as a necessity serves to advance nursing performance, create positive social change by improving the quality of care provided to patients, and improve patient outcomes by providing comfort and decreasing the risk of aspiration. Additionally the use of oral assessment tools and evidence-based oral care practice guidelines has been shown to result in significantly improved patient mouth hygiene (**Dickson, 2012**).

Mouth hygiene performances in critical units are not dependable or consistent. Lack of using a consistent oral decision tool and oral evaluations decreases the rate and performance of mouth hygiene in critical units (Chan et al., 2011). Implementing consistent, evidence-based assessment tools, mouth hygiene performance strategy, and educating staff to increase their information helped them improve the quality, of mouth intervention (Brady, 2011& Dickson, 2012). So complete a mouth care risk assessment, care plan, report any mouth condition (depending on local protocols) are indicated, Identification techniques and strategies that may help patients with difficult to change behavior or who refuse to accept oral care will help nurses recognize the need for specialized mouth care and support for patients who require assistance. So the oral hygiene is very important to every individual in particular in the home or hospital care of the dentition and oral cavity. This care is the integral part of individual hygiene and its importance is the same in both primary and secondary, or tertiary, prevention of diseases, in particular of teeth and parodontium (Talianova, 2008). As long as mouth hygiene is an important procedure in critical units, oral assessment scales are needed to evaluate the effectiveness of oral care among critical patients. So the aim of the study assesses nurses' information, attitude and performance towards mouth hygiene among critical ill patients.

Significance of the study:

Mouth hygiene includes a mixture of nursing actions that are often placed very low on the main concern care list for a serious patient. In response to this problem there has been improved focus on oral care issues (WHO, 2010). Recent researches have highlighted the importance of oral hygiene in the prevention of ventilator-associated pneumonia. That is the second nosocomial infection in the ICU, affecting 27% of ICU patients and associated with increased morbidity and mortality rate. Poor oral hygiene is well known to be connected with painful and unpleasant diseases. Recently, it is the cause of chest infections and pneumonia (Ministry of Health, 2004). So insufficient mouth hygiene has negative effects on patient's social and emotional well-being (Rawlins and Trueman, 2001).

Aim of study:

The aim of this study was to assess nurses' knowledge, attitude and practice towards oral care among critical ill patients.

Research question:

What is nurses' information, attitude and performance toward oral hygiene among critical ill patients?

II. SUBJECTS AND METHOD

Research design:

The descriptive research plan was utilized.

Setting:

The research applied in intensive care units in Menoufia University Hospital

Subjects:

A convenience sample (nurses working in intensive care units); 100 nurses at Menoufia University. The study was conducted over about a 4 month period. The researcher visited the hospital 3 days weekly until the sample was completed.

Tools of data collection:

One tool was utilized for data collection: **1- Structure interview questionnaire schedule:** It consists of 5 parts.

Part I:-

This questionnaire covered the social-demographic characteristics it compromised: - information about age, gender, years of experiences, nursing education, position in the critical care unit and barriers to practice the oral hygiene in the critical care unit.

Part 2:-

Knowledge questionnaires sheet: that developed by the researchers after reviewing of the related literature (Heck et al., 2012 & Ross, Crumpler, 2007) that contains twenty items to assess nurses' knowledge regarding to assessment of

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patient about oral care, recognize hazard factors that donate to poor oral healthiness , identify risk factors associated with gingivitis , mouth care risk assessment, care plans and records forms, identify techniques and strategies that help nurses to change performance oral care , report any oral health concerns and recognize the require for specialized mouth care for patients.

Scoring system:-

Each item was given a score 1 for right responses and make 0 for wrong responses, All scores were summed and the range of score was from 2 to 12. The higher score indicated good knowledge as follows:

The scoring system was categorized as follows:

- Bad information (who had scored from 2-5 score means (< 50%).
- Fair information (who had scored from 6-8 scores mean (50 - <75%).
- Good information (who had scored from 9-12 score means (≥75%).

Part 3:-

Oral care practice sheet:- that contains 4 items:-

- 1- Frequency of practice oral care through respond 5 answers (not at all, once per day, twice, three times and more than three times per day).
- 2- How long oral care lasts through respond3 answers (less than 1, between 1- 5, between 5- 10 minutes).
- 3- Tools used in oral care through respond5 answers (mature tooth brush, pediatric toothbrush, electric tooth brush, foam swab and gauze tongue depressors).
- 4- Part of oral care through respond4 answers (brushing of teeth only, brushing of the gum only, brushing of the tongue only and total oral cavities).

The scoring system was categorized as follows:

- Poor practice (< 60%).
- Good practice (≥60%).

Part 4:-

Attitudes regarding to oral care: - consists of 5 items. Nurses respond on a five point as to whether they strongly agree, somewhat agree, either agree or disagree, somewhat disagree and strongly disagree.

Scoring system: every item was given a score, 5 for strongly agree, 4 for somewhat agree, 3 for neither agree or disagree, 2 to somewhat disagree and 1for strongly disagree. All scores were summed then ranged from 2 to 5. The higher scores indicated a negative attitude as follows: -

- ≥60%: negative attitude
- <60%: positive attitude

Part 5:-

Types and frequency of oral care: - it consists of 7 items. The nurse answered with a seven dot from first to last, never, once a day, each 12 hours, each 8hours, each 4 hours and each 1- 3 hours.

Validity and reliability of the tool:

The tool was developed by the researchers after reviewing of the related literature and tested for its content validity. Validity indicated the degree to which the tool measures what it is expected to measure. The questionnaire validity was determined by a panel of three experts. Modifications were carried out according to the panel's judgment on the clarity of the sentences and appropriateness of the contents. Reliability of the tool was established through test re-test method at a

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15-day interval with a group of 15 nurses not participating in the study. Chronbach's alpha was applied for the reliability of the questionnaire and was found to be 0.84.

Pilot study:

A pilot study passed with 10% of a total number of nurses in ICU, to evaluate clarity in addition to the applicability of the tool and estimate the time needed to fill each part. The necessary modification was done as revealed from the pilot study. The sample of the pilot study was excluded from the total sample to assure the stability of the result.

Ethical considerations:

Written approval was obtained from the deans of the nursing colleges to collect data from the students, they were informed that they had the right to accept or refuse to participate in the study and that their information will be used for the purpose of research only. The study was conducted with careful attention to ethical standards of research and the rights of the participants.

- **Informed consent:** The respondents' rights were protected by ensuring voluntary participation; so that informed consent was obtained by explaining the purpose, nature, time of conducting the study, the potential benefits of the study and how data will be collected.
- **Anonymity and Confidentiality:** The respondents were assured that the data will be treated as strictly confidential; furthermore, the respondents' anonymity was maintained as they weren't required to mention their names.

Estimated sample size:

Based on previous studies examining the nurses' knowledge, attitude and practice toward mouth hygiene among critically ill patients, a conservative effect size of 0.40 was estimated. 29, 20 using the statistical software, the statistical power of 0.81 and statistical significance 0.05, the estimated sample size required to perform one sample t tests were 100 subjects.

Field work: Data collection for this study was carried out from the first of February 2016 to end of May 2016. Once permission was granted to conduct the study, the researchers were initiated collection.

Data collection:-

- Before distributing the questionnaire the researchers introduced themselves and a brief explanation about the objective of the study was given to the nursing in intensive care unit. Questionnaires were distributed to the study group that agrees to share in the research. The researchers presented during data collection to make any required clarifications about questionnaires to the subjects.
- The average time taken for completing questionnaires was around 20-30 minutes. After completion of the questionnaires, the researchers collect it and make sure that questionnaires were being filled fully.
- All study subjects received the tool sheet to estimate five parts for demographic data, knowledge, practice, and attitude and frequency of oral care.
- Knowledge assessment sheet filled by the nurses.
- Attitude sheet was filled by nurse to show their attitude related to oral care.

Statistical analysis:

The results were statistically analyzed by SPSS version 20 (SPSS Inc., Chicago, IL, USA). T-test used for parametric data. Kruskal-Wallis was used for non-parametric data. Chi-Squared (χ^2) and Fisher's exact tests used for qualitative variables. Pearson's Correlation analysis was used to show strength and direction of association between two quantitative variables. P value <0.05 is set to be significant.

III. RESULTS

Table (1): Reveals that the mean age of the study group was 32.10 ± 6.72 and range from 22.42 years, More than three fourths (76%) was female, almost half (49%) was bedside nurses and (45%) had a diploma education. The men of working experience as nurse 8.13 ± 4.84 and 6.13 ± 3.50 had experience in ICU.

Table (2): illustrated that more than half of the group (56%) had lack of time is the most common cause to practice of oral hygiene.

Table (3): showed that more than half (64%) of nurses had good knowledge and (16%) of the nurses had not any knowledge about oral care.

Table (4): Reveals that there were highly significance differences between knowledge score of nurses and each of primary position in the ICU and education of nurses P value (<0.001).

Figure (1): Illustrates that each higher education (doctorate degree) and critical care educator (12.0 ±0. 0& 10.53 ±1. 10) approximately had higher scores of knowledge.

Table (5): illustrated that almost half (49.0%) of nurses had not performed oral care, less than half (32.0%) perform oral care twice per day and a high majority of nurses perform oral care within one to less than five minutes. Also the high majority of nurses (100.0%) brushing the gum only and the most common tool used gauze and tongue depressor for cleaning.

Table (6): illustrated that less than half (36.0%) of nurses strongly disagreed that cleaning the oral cavity was an unpleasant task, but (69.0%) of nurses were somewhat agreed that oral cavity was difficult to clean. The majority (88.0%) of nurses was agreed that oral care was very important to ventilate patients. The high majority (90.0%) of nurses was strongly agreed about adequate training of oral care. There were highly significant differences between the attitude of and sex distribution p value (<0.001). The majority (84.0%) of the nurses had a negative attitude toward oral care

Table (7): reveals that that high majority of nurses (92.0%, 91.0%, 100.0%, 100.0% and 71.0%) approximately were not used any types of oral care (foam swab, manual toothbrush, electric tooth brush, tooth paste and mouth wash) approximately. Also more than half of total nurses (64.0%) of nurses were used to moisturizing agent every twelve hours for oral care. There were highly significance differences between moisturizing agent and sex distribution p value (<0.001). The majority (100.0%) of nurses had poor practice toward oral care.

Table (8): Reveals that there were highly significant differences between the attitude score of nurses and each of primary position in the ICU and education of nurses P value (<0.001).

Figure (2): Illustrated that each higher education (master degree) and critical care educator (19.20 ±1. 01& 20.0 ±0. 0) approximately had higher scores of attitude.

Table (9): found that there was statically significant positive relationship between attitude score and knowledge about oral care p value (**0.018**). However practice score did not correlate significantly with their knowledge of oral care.

Table 1: Distribution of socio-demographic data of the studied groups of ICU

Nurses' Characteristics	(n=100)	%
Age (years)		
Mean ±SD	32.10±6.72	
Range	22-42	
Sex		
Male	24	24.0
Female	76	76.0
Section		
Medical ICU	34	34.0
Surgical ICU	29	29.0
Cardiothoracic ICU	16	16.0
Trauma ICU	14	14.0
Other ICUs	7	7.0
Primary position in ICU		
Bedside nurse	49	49.0
Critical care educator	12	12.0
Nurse practitioner	30	30.0

Nurse manager	9	9.0
Education		
Diploma	45	45.0
Bachelor degree	26	26.0
Master degree	20	20.0
Doctorate degree	9	9.0
Working experience as a nurse / years	8.13±4.84 2-15	
Working experience in ICU/ years	6.13±3.50 1-13	

Table (2) Distribution of the study group, according to factors that prevent the practice of Oral hygiene

Variables	Study group	%
	No = (100)	
Lack of equipment	40	40.0
Lack of knowledge	4	4.0
Lack of time	56	56.0

Table 3: distribution of Nurses' knowledge towards the oral hygiene

Variables	(n=100)		%	
	Correct		Wrong	
	No	%	No	%
Identify patients with an oral assessment	88	88.0	12.0	12
Able to perform oral Assessment	88	88.0	12	12.0
Show why oral health is important for patients in hospital	88	88.0	12	12.0
Recognize hazard factors that add to poor oral hygiene.	80	80.0	20	20.0
Identify danger factors associated with Dental Caries	70	70.0	30	30.0
Identify risk factors associated with gum disease.	80	80.0	20	20.0
Recognize the forms of mouth care	96	96.0	4	4.0
Complete a mouth care risk assessment	56	56.0	44	44.0
Process and report any oral health concerns	65	65.0	35	35.0
Identify techniques and strategies of oral care	72	72.0	28	28.0
Recognize patient need specialized mouth care	88	88.0	12	12.0
Establish plan for observation by the nurse	56	56.0	44	44.0
Total score: NO,%				
Poor	16		16.0	
Fair	20		20.0	
Good	64		64.0	
Total score:				
Mean ±SD	9.23 ±2.98			
Range	2-12			

Table 4: Distribution of the Knowledge score and nurses' characteristics

	Knowledge score	Test	P value
	Mean ±SD		
Sex		T	
Male	8.83 ±3.14	0.60	0.548
Female	9.35 ±2.94		
Section		Kruskal-	
Medical ICU	9.11 ±3.07		
Surgical ICU	9.79 ±2.52		

Cardiothoracic ICU Trauma ICU Other ICUs	9.50 ±2.75 8.50 ±3.29 8.28 ±4.30	Wallis 3.02	0.554
Primary position in ICU Bedside nurse Critical care educator Nurse practitioner Nurse manager	7.93 ±3.75 10.53 ±1.10 9.20 ±1.50 12.0 ±0.0	Kruskal- Wallis 43.52	<0.001
Education Diploma Bachelor degree Master degree Doctorate degree	7.93 ±3.59 8.0 ±0.0 11.0 ±0.0 12.0 ±0.0	Kruskal- Wallis 29.09	<0.001

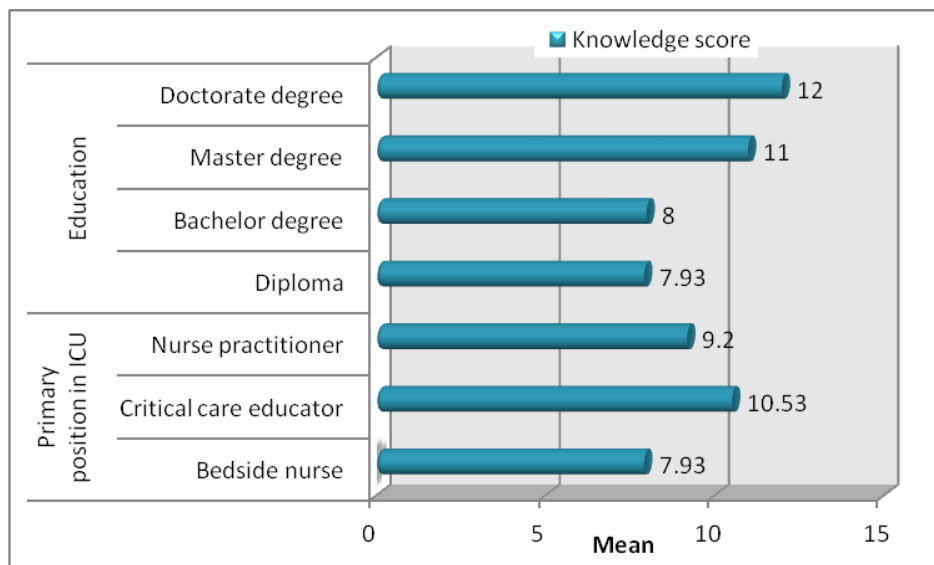


Fig 1: Distribution of the Knowledge score and nurses' characteristics (primary position and education)

Table 5: Distribution of Oral care practice among nurses

Frequency per day	(n=100)		How long it lasts /min		Part of the mouth		Tools	
	No	%	Time	%	Type	%	Type	%
None	49	49.0					Hard tooth brush	0.0
							Soft tooth brush	0.0
Once/day	12	12.0	< 1	0.0	Clean teeth	0.0	Electric tooth brush	0.0
			1 - <5	100.0	Cleans gum	100.0		
Twice /day	32	32.0	5 - 10	0.0	Clean tongue	0.0	Foam swab	0.0
			< 1	16.3	Clean teeth	0.0		
Three/day	7	7.0	1 - <5	34.7	Cleans gum	71.4	Gauze and tongue depressor	100.0
			5 - 10	49.0	clean tongue	28.6		
					Total oral cavity clean	0.0		
					Total oral cavity clean	0.0		

Table 6: Attitude towards oral care, according to gender

	Total		Sex				Test (P value)
	No	%	Male (N=24)		Female (N=76)		
			No	%	No	%	
Oral care is a very high priority							
Strongly agree	81	81.0	20	83.3	61	80.3	χ^2 3.46 (0.176)
Somewhat agree	11	11.0	4	16.7	7	9.2	
Neutral	0	0.0	0	0.0	0	0.0	
Somewhat disagree	8	8.0	0	0.0	8	10.5	
Strongly disagree	0	0.0	0	0.0	0	0.0	
Oral cavity is an unpleasant task							
Strongly agree	8	8.0	0	0.0	8	10.5	χ^2 49.17 (<0.001)
Somewhat agree	16	16.0	0	0.0	16	21.1	
Neutral	28	28.0	20	83.3	8	10.5	
Somewhat disagree	12	12.0	0	0.0	12	15.8	
Strongly disagree	36	36.0	4	16.7	32	42.1	
The mouth is hard to clean among critical patient							
Strongly agree	8	8.0	0	0.0	8	10.5	χ^2 61.22 (<0.001)
Somewhat agree	69	69.0	8	33.3	61	80.3	
Neutral	16	16.0	16	66.7	0	0.0	
Somewhat disagree	0	0.0	0	0.0	0	0.0	
Strongly disagree	7	7.0	0	0.0	7	9.2	
The mouth of ventilated patients unable to clean.							
Strongly agree	88	88.0	24	100.0	64	84.2	Fisher's exact 4.30(0.065)
Somewhat agree	0	0.0	0	0.0	0	0.0	
Neutral	0	0.0	0	0.0	0	0.0	
Somewhat disagree	12	12.0	0	0.0	12	15.8	
Strongly disagree	0	0.0	0	0.0	0	0.0	
Have to enough training to provide oral care							
Strongly agree	90	90.0	24	100.0	66	86.8	Fisher's exact 3.50 (0.112)
Somewhat agree	0	0.0	0	0.0	0	0.0	
Neutral	0	0.0	0	0.0	0	0.0	
Somewhat disagree	10	10.0	0	0.0	10	13.2	
Strongly disagree	0	0.0	0	0.0	0	0.0	
Attitude Score							
Negative	84	84.0	24	100.0	60	78.9	Fisher's exact 6.15(0.011)
Positive	16	16.0	0	0.0	16	21.1	

Table 7: Distribution of types, frequency and practice of oral care among study group

	Total		Sex				Test (P value)
	%	No	Male (N=24)		Female (N=76)		
			No	%	No	%	
Foam swabs							
Never	92	92.0	24	100.0	68	89.5	Fisher's exact 2.47(0.193)
Every 12h	8	8.0	0	0.0	8	10.5	
Manual toothbrush							
Never	91	91.0	24	100.0	67	88.2	Fisher's exact 3.1(0.109)
Once a day	9	9.0	0	0.0	9	11.8	

Electric toothbrush							
Never	100	100.0	24	100.0	67	100.0	-
Moisturizing agent							
Never	8	8.0	0	0.0	8	10.5	χ^2 48.11 (<0.001)
Every 12h	64	64.0	4	16.7	60	78.9	
Every 8h	28	28.0	20	83.3	8	10.5	
Toothpaste							
Never	100	100.0	24	100.0	67	100.0	-
Mouthwashes							
Never	71	71.0	24	100.0	47	61.8	χ^2 12.98 (<0.001)
Once a day	29	29.0	0	0.0	29	38.2	
Practice Score							
Poor	100	100.0	24	100.0	76	100.0	-
Good	0	0.0	0	0.0	0	0.0	
Practice Score	Mean \pmSD		8.66 \pm0.74		8.83 \pm0.38		T
					8.60 \pm0.81		1.87(0.065)

Table 8: Distribution of the attitude score and nurses' characteristics:

	Attitude scores	Test	P value
	Mean \pm SD		
Sex		T	
Male	16.83\pm0.91	1.21	0.226
Female	16.42\pm2.45		
Section		F	
Medical ICU	16.85 \pm 2.59	0.76	0.554
Surgical ICU	16.44 \pm 1.37		
Cardiothoracic ICU	16.56 \pm 2.03		
Trauma ICU	16.42 \pm 2.62		
Other ICUs	15.28 \pm 2.36		
Primary position in ICU		F	
Bedside nurse	15.36 \pm 2.08	38.08	<0.001
Critical care educator	20.0 \pm 0.0		
Nurse practitioner	17.46 \pm 0.50		
Nurse manager	15.0 \pm 0.0		
Education		F	
Diploma	15.13 \pm 2.01	42.30	<0.001
Bachelor degree	17.38 \pm 0.49		
Master degree	19.20 \pm 1.01		
Doctorate degree	15.0 \pm 0.0		

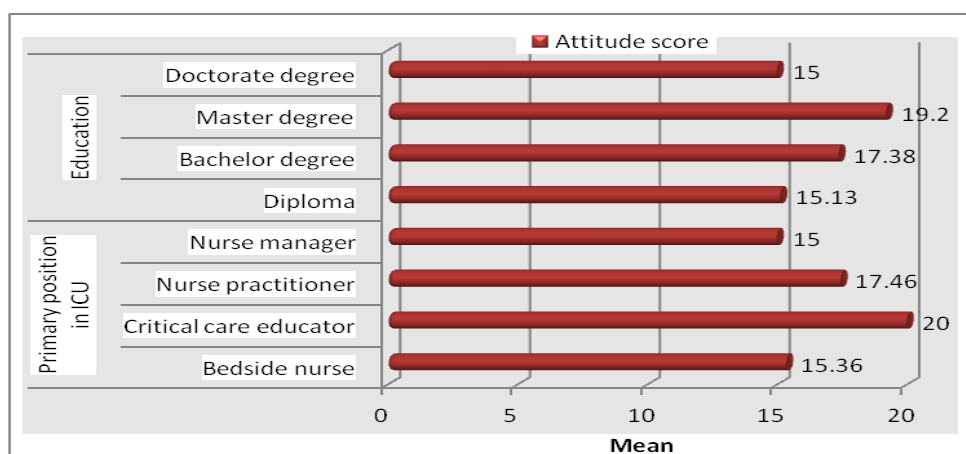


Fig 2: Distribution of the attitude score and nurses' characteristics (primary position and education)

Table 9: Correlation between knowledge score and scores of attitude and practice

	Knowledge score	
	R	P value
Attitude scores	0.24	0.018
Practice score	-0.11	0.236

IV. DISCUSSION

Most patients in critical units are completely dependent on nurse to perform all care even the oral care. So the nurse must be an arrangement of activities that are frequently introduced to patients to be able to provide high priority for oral care among critically ill patient, oral care seems to be alienated from other nursing actions and is not discussed when nursing procedure are applied (Tygerberg, et al., 2007). At the same line the present study found that extra than half of the study group had not enough time to perform oral hygiene. It has been illustrious that oral hygiene had a low main concern in relationship with other actions among critically ill patients in ICU. Furthermore the researcher found that lack of equipments was the second factor that prevents the practice of oral care. This finding is supported by (Berry AM, Davidson, 2007) who found that most of study group frequently have insufficient equipments for mouth hygiene. When mouth wash and equipments are accessible, the procedure provided to patients had poor performance. Also Orlandini and Lazzari (2012) who investigated nursing staff's information about oral care in serious patients. They found that nurses and others are in agreement that oral hygiene is essential among critically ill patients. However, more than half of nurses are in agreement that the usual care of the hospital is adequate to provide all nursing care. This suggests that oral hygiene in hospitalized has not been a clear distress, regarding to teaching practices. Furthermore Osman & Aggour (2014) who assess mouth hygiene performance in critical care units. They found that study group reported that causes that preventing proper mouth hygiene among intubated patients are inadequate time to provide oral hygiene.

It was noticed from the results of the present study that more than half nurses had good information toward oral hygiene. Also the current study showed that the majority of nurses had ability to perform oral assessment, important of oral care and ability to identify risk factors of poor oral care. These results relate to basic nursing education was concentrate on nursing care procedure toward critical ill patients. Similar findings were reported by Lin, et al., (2011) who assessed serious care nurses' information, attitudes and practices of mouth care among patients with oral end tracheal intubation. He found that elevated scores about oral care information. Furthermore Ying, et al., (2011) They showed that nurses who have a lot of resources for education about mouth care have better information about oral care and able to provide mouth hygiene to critical patients regularly. At the same line Ibrahim, et al., (2015) found that the majority of nurses had high information about mouth hygiene in ICU.

The current research revealed that primary position and education of nurses in the intensive care unit had statistically significant difference between knowledge score. This result was not agreeing with Ee-Yuee Chan, et al., (2012) that assessed oral hygiene performance among critical care nurses. They reported that oral health information increase with teaching level, but the nurses' information did not statistically differences with changed specialties of the job. These differences in the results because the postgraduate nurses had a continuing education program and participated in program training. Also at same line Labeau et al. (2008) showed that the increase nurse's information about oral procedures because most nurses in ICU participated in a program for improving infection control and provide oral care. These factors effect on nurses' knowledge. Also Ross and Crumpler (2007) who showed that the rate of oral care increased by teaching which improved oral care in patients and decrease the incidence of ventilated associated pneumonia. Furthermore Ibrahim, et al., (2015) who assessed nurses' information, manner and perform of oral care for critical Patients. They found that the frequency of nurses confirmed that condition of oral hygiene in ICU is essential for infection control, while less of them did not recognize why mouth hygiene is essential for critical patient.

As regards to oral care practice among nurses the current study found that most of the nurses had not performed oral care, poor practice and the most frequent duration was less than one minute. Also the majority of nurses performed the oral care to gum that's a very important part of the mouth. Moreover pad, tongue depressors were the major tool needed for mouth hygiene among nurses in ICU. At the same line Ibrahim, et al., (2015) found that every type and rate of oral hygiene between nurses. So they found the majority of the nurses applied mouth care twice daily and mainly regular time was less than five minutes among nurses. Pad tongue depressors with saline were the major equipment used. Mouth swabs where

the majority used. Also **Osman & Aggour (2014)** found that only six from thirty units reported that oral hygiene the patients on mechanical ventilation by using a toothbrush and toothpaste. Moreover, all units in hospital were used antimicrobial agent for mouth hygiene. Additionally **Atay & Karabacak (2014)** who assessed mouth care in patients on mechanical ventilation in critical unit. They found that there is no standard of oral assessment and no clearness on oral care practice and frequency, for oral care.

Also **Abidia, et al., (2007)** who evaluated the mouth care among the critical unit. They found that mouth hygiene performed between two to four hours, according to the patient's condition. **Mary, et al., (2003)** who evaluated mouth care evaluation in critical unit: rate and recording. They showed that majority nurses were providing mouth care two or three times every day for non intubated patients, and was introduced mouth care five times daily or increase for a patient with intra tracheal tube and use a cotton sponge. This results because had a protocol about oral hygiene; also had a lot of time and equipments. Furthermore **Ganz et al. (2009)** they found that most nurses used gauze only for patients during oral hygiene even as about half of study group used padded tongue depressors. So the nurses in the current study had not set rules for mouth care in the ICU. Also current research found that the majority of nurses had poor practice about oral care. This result supported by **Ferda et al., (2009)** they assess nurses' mouth care performances in a critical unit. So they found that practicing oral care in ICU were not adequate and not contact with evidence based performance, therefore the practice require to improve it.

Regarding to attitude to mouth care, the outcome of the current research that less than half of nurses were strongly disagreeing that washing, oral hygiene was unlikable duty, but more than half of nurses were somewhat agreed that oral hygiene was hard to hygienic. The larger of the study group were agreeing that mouth care was very important to ventilate patients. The higher majority of nurses was strongly agreed about adequate training of oral care. There was highly a significance difference between the attitude of and sex distribution. Also the current study showed that the majority of the study group had a negative attitude toward oral care. In contrast to this results **Ibrahim, et al., (2015)** they found that the minority of the study group had negative manner to mouth care, but the majority study group supposed mouth care as a high nursing major concern and had a positive attitude. These differences relate to the high percentage of a study group in the present study had low levels of education. So most of them had low information and attitude about oral hygiene. Furthermore **Lin, et al., (2011)** they investigated the physical activities in different groups. They agreed that oral hygiene was a higher priority physical care. When researcher evaluated nursing treatment activities, found that the study group had a positive attitude toward priority of oral care for critically ill patients. But when the oral hygiene compared with other nursing activities, it became a low priority. Also **Jones et al. (2004)** showed that the study group had a positive manner about the priority of oral hygiene.

Critical care nurses' knowledge, attitudes and practices of oral care for patients with oral endotracheal intubation: a questionnaire survey

At same line **Miranda, et al., (2016)** who study mouth hygiene performance for critically ill patients. They illustrated that is essential for healthcare workers to ask for teaching on and protocols that advance the oral care for patients in ICU. The outcomes of the present research, observe significant differences between performances and information among the nurses in ICU. So it is representing additional learning and introductory actions to develop an oral care performed in the ICU.

Ross and Crumpler (2007) found that the frequency of oral care increased once education had been introduced, which then improved oral health in patients and reduced the incidence of VAP. Sole et al. (2003) found that the main influence on nurses performing tasks such as suction and clearing the respiratory tract was their clinical preceptors and coworkers; the second most important influence was knowledge gained from their nursing education. In a study of the influence of oral care education on the quality of oral care provided by nurses to patients on ventilators, Ross and Crumpler (2007) found that the frequency of oral care increased once education had been introduced, which then improved oral health in patients and reduced the incidence of VAP.

Moreover **Soh, et al., (2012)** they showed that absence of protocol for oral hygiene lead to absence of performance in ICU. They also observe that less than half of the study group found that mouth care is an unlikable and hard duty. As the mouth of the patient contains a ventilator tube and nurses apprehension from dislodging or moving the end- tracheal tube. Also In this research, the majority of the study group needed guidance and enough time to provide oral care.

International Journal of Novel Research in Healthcare and Nursing

Vol. 3, Issue 3, pp: (1-15), Month: September - December 2016, Available at: www.noveltyjournals.com

Regarding to types and occurrence of oral hygiene between nurses, current research showed that a high majority of nurses was not used any types of oral care (foam swab, manual toothbrush, electric tooth brush, tooth paste and mouth wash. Also more than half of nurses were used to moisturizing agent every twelve hours only for oral care. These results revealed that low and bad frequency in performing oral care of critically ill patients. This result was supported by **Lin, et** with the intra tracheal tube was 2–4 hours.

The present study revealed that the primary position and education of nurses in the intensive care unit had statistically significant difference between attitude score. Also attitude had positive correlation and significantly with their knowledge of oral care. So the nurses in the current study needed high continuing education to improve the manner and perform oral hygiene. At the same line **Allen, et al., (2004)** who study factors distressing quality of oral hygiene in critical units. They found that the education and experience correlated significantly with attitude, Experience and education are very important to provide oral care. So continuing learning should maintain the importance of oral hygiene in decreasing nosocomial infections among critical patients. **Ibrahim, et al., (2015)** found that no correlations were found between knowledge and practice. These results related to a lower educational level no protocol of oral care among nurses in the current study. Also **Ying, et al., (2011)** showed that There was no significant correlation between the total scores on information and attitudes about oral care and the nurses' age or education and years of experience working in ICU.

V. CONCLUSION**The present research concluded that:**

The majority of the nurses had good knowledge, however the majority of them had poor practice and attitude about oral care in the intensive care unit. No statistically significant difference between knowledge and practice. Also attitude had positive correlation and significantly with their knowledge of oral care.

VI. RECOMMENDATIONS**The following recommendations were suggested:**

- Nurses in the ICU must be encouraging more education about oral hygiene.
- Training programs about oral hygiene to improve practice and attitude of nurses.
- Nursing directors must be established rules and protocol for oral hygiene for critical patients based on the patients' condition to enhance the quality and prevent transmission of infection.

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