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Evidence Based Practice for Oral Care in Children

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Abstract**—**As far as is known, general nursing care practices do not include specific evidence-based practices related to oral care in children. This study aimed to evaluate the evidence based nursing practice for oral care in children. This article is planned as a review article by searching the literature in this field. According to all age groups and the oral care in various specific situations located evidence in the literature were examined. It has been determined that the methods and frequency used in oral care practices performed by nurses in clinics differ from one hospital to another. In addition, it is seen that different solutions are used in basic oral care, oral care practices to prevent ventilator-associated pneumonia and evidence-based practice in mucositis management in children. As a result, a standard should be established in oral care practices for children and education for children is recommended.

Keywords**—**Children, evidence based practice, nursing, oral care.

I. Introduction

EVIDENCE-based nursing and the concept of evidence-based practice has begun to change since last 20 years [1]-[3]. Evidence is a tool that can be used to assure that patients can get the best available care [3]-[5]. Evidence-based practice is a period of gathering the clinical expert views and external clinical evidence which were obtained from scientific studies together in order to introduce the best care to the patients and to support resources, patient choices and clinical decisions [1], [2], [6]. It is expected from professional nurses to provide safe and efficient health care and account for the society, health staff and the colleagues. The health care should be based on the scientific knowledge. The relationship between the knowledge and decision making is the crucial factor in the professionalization of nursing [7]. Classification that has been accepted by Joanna Briggs Center can be given as an example to the classification for evidence level assessment in nursing;

Evidence Level Classifications in Nursing—Evidence Level Classifications of Joanna Briggs Institute

- I. The evidence obtained from the systematical analyses made by RKC
- II. The evidence obtained from at least one well-designed RKC
- III.1. Evidence obtained from a non-randomized and well-designed controlled studies
- III.2. Evidence obtained from well-designed cohort or case-control studies performed by more than one center or groups
- III.3. Evidence obtained from multi-time series that are initiative or non-initiative. Remarkable results of unchecked experimental studies.
- IV. Prestigious authorities' views based on clinical experiences, descriptive studies or expert committee reports [7].

Nursing evaluates the person physically, psychologically and socially as a whole. Evidence-based studies relating to nursing practices should be planned in this direction. Predicating the investigations on evidence and using the results in nursing practices have importance in terms of the nursing profession and the validity of the practices [5], [7].

II. Review Literature

A. Basic Oral Care

The purpose of oral care is to reduce the effect of oral microbial flora and avoid the occurrence of opportunistic infections. Therefore, the following procedures need to be applied; redressing the fluid-electrolyte balance, healthy and adequate nourishment, hydration, periodontal assessment before treatment, regularly brushing teeth with a fluoride toothpaste [8].

Based on the result of a previous meta-analysis, conventional mouth care trainings given to the children were found to be effective in decreasing the formation of plaques [9]. In another study, it was detected that use of brochures and visual-auditory instruments along with verbal instructions during mouth care trainings was effective in the improvement of knowledge and plaque scores of the children [10].

In the previous studies, it was reported that mouth care performed by soft toothbrush decreased microorganisms occurring in the mouth significantly compared to the mouth care with sponges [11], [12]; and also in another study, it was reported that both practices were found to be effective equally in the elimination of plaque and prevention of gingivitis [13].

In a study performed in Turkey, it was observed that intensive care nurses implemented oral care without an oral care protocol and an evaluation guideline; and method used for oral care and its frequency varied between one institution to another [14].

B. Solutions Used in Oral Care

Chlorhexidine**:** It is a broad spectrum antimicrobial and antiseptic agent. It is effective on gram-positive and gram-negative bacteria and fungi. Taste is not nice. The color of the teeth can change when used for a long time [15].

In the studies performed with adult patients, oral care with 0.12% solution as 5 ml/2 day was reported to decrease Ventilator-Associated Pneumonia (VAP) [16]. There is not a conclusive evidence about the use of chlorhexidine mouth wash for mucositis; however, it has been reported to decrease

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tooth plaque in patients [16], [17].

With reference to clinical practice guidelines of Mucositis Research Group that is the sub-group of Multinational Association of Supportive Care in Cancer and The International Society of Oral Oncology (MASCC=ISOO); chlorhexidine is not offered in avoiding the mucositis for cancer patients who receive chemotherapy, patients with hematological malignancies and also the patients undergoing radiotherapy because of head and neck neoplasms [18]

A study was conducted on 90 children (between 3-17 years old) who receive treatment under general anesthesia that uses the materials that include chlorhexidine and fluoride together for routine oral care. As a result of this RCT, this implication improves the oral hygiene and reduces the general anesthesia need [19]. It is observed in an RKC study (40 children with ALL, between 2 and 10 years old) that there is a decrease in oral mucositis and ulceration incidence in children who gargle with chlorhexidine [20].

***Serum Physiological*:** It is a solution which has a safe and economic use in oral care. With limited studies regarding its use in oral care, serum physiological was found to be more effective in oral care compared to hydrogen peroxide [21]. 0.9% NaCl does not irritate oral mucosa and does not change the salivary pH. It is believed that sodium chloride helps the formation of granulation tissue and provides healing [22].

There was conducted a quasi-experimental study on 60 children between 1 and 12 years old and who stayed in the pediatric intensive care unit for at least 48 hours. Oral care was provided for experiment group for 4 times a day for 3 days within the scope of oral care protocol. It is determined at the end of the research that the oral health of the children in an experimental group is better and some of the microorganisms decreased in the same group [23].

***Benzidamine hydrochloride*:** This is a nonsteroid, antimicrobial and antifungal mouthwash with anesthetic features and decreases pain. In a previous study, it was concluded that benzydamine was acceptable and well-tolerated among children above 6 years old [24]. Although there is not any conclusive evidence regarding the use of benzydamine, it was seen that 0.15% benzydamine hydrochloride was less effective than 0.2% chlorhexidine in the formation and severity of oral lesions among pediatric population [25], [26].

***Sodium bicarbonate*:** Sodium bicarbonate decreases mucus accumulation within the mouth, prevents the growth of aciduric bacteria by increasing oral pH; and decreases colonization. In a study performed on adults with head and neck cancer who were undergoing radiotherapy, it was detected that mouthwash with sodium bicarbonate was effective in preventing oral mucositis [27].

The studies regarding sodium bicarbonate, which is commonly used in clinical practice, and performed in pediatric intensive care units are inadequate; and it is required to carry out randomized controlled studies with a high evidence level.

C. Oral Care in VAP

In a patient with no clinical evidence supporting pneumonia or pneumonia during intubation, VAP is a pneumonia that occurs at least 48-72 hours after the invasive mechanical ventilation support. The incidence of pneumonia in an enrolled patient is 4 to 21 times higher [28], [29].

VAP is a hospital infection that is most commonly observed among ventilated patients; and its mortality rate is between 40-80%. Patients are under high risk for VAP at 72 hours after intubation [30].

In a systematic review, there was no evidence of a difference in the use of chlorhexidine and placebo in oral care for children aged 0-15 years who developed VAP [31].

160 pediatric patients who underwent surgery because of congenital heart disease were randomly divided into chlorhexidine (n=87) and control (n=73) groups. With reference to the findings of the research, the oral care that is provided by 0.12% chlorhexidine does not stop the progress of nosocomial pneumonia and VAP [32]. Entirely 96 children who were mechanically ventilated were divided into two groups in RKC. Chlorhexidine group was composed of 46 children; placebo group consisted of 50 children. Within this sample, VAP progressed in 15 (32.6%) children in chlorhexidine group, 16 (32.0%) children in the placebo group. It is determined that 0.12% chlorhexidine use cannot substantially change VAP incidence [33]. According to the finding of another research, there is a decrease in VAP cases in a pediatric patient who is applied flow diagram for oral hygiene [34].

D. Mucositis

It is important to prevent intensive care units before they develop oral mucositis. For this reason, oral cavity (teeth, gums, tongue, mucous membranes and lips) should be evaluated daily. However, the lack of standardized scales for use in intensive care units makes these assessments difficult [35].

Oral mucositis is depending on dose and is one of the frequent toxic effects of chemotherapy. The frequency of oral mucositis in pediatric cancer patients is approximately 65% [36], [37].

There are several classifications for grading oral mucositis lesions as well as World Health Organization (WHO) Index is preferred in pediatric cancer patients because of ease of use and suitability to the clinical picture [38].

The foremost component of avoiding mucositis is the primary oral care. The chief goal of oral care is to reduce the effect of oral microbial flora and avoid opportunistic infections. Primary oral care is to brush teeth, floss, gargle the mouth with sterile water, normal saline or baking soda [10].

With reference to clinical practice guidelines of Mucositis Research Group that is the sub-group of Multinational Association of Supportive Care in Cancer and The International Society of Oral Oncology (MASCC=ISOO), there are three basic components in supportive care towards the mucositis in cancer patients. These components are primary oral care, oral care protocols & patient education, palliative care in pain management [10], [38]. It is suggested in the guideline that was renewed in 2005 that regularly

changed soft toothbrush should be used for oral care (Evidence Level 4, Recommendations Grade D) [38].

There was conducted a study to analyze oral mucositis status in children (127 children, between 5-15 years) with acute lymphoblastic leukemia during antineoplastic treatment. Status of oral mucositis was determined by using WHO scale. The pain was found as the primary symptom. According to other findings, 10% of the children have local erythema, 5% of them have ulcerative lesions and finally, 85 of the children cannot eat anything because of pain and ache [39].

There was provided a planned oral care education to 16 pediatric oncologic patients whose ages are between 8 and 18 in Turkey. Those patients were receiving chemotherapy treatment. Oral mucositis level was evaluated before and after the training. It is found that there is a decrease in both oral mucositis level and pain level of the children before and after the treatment [40].

The nurses who are the most important members of the staff that plays a primer role in patient care are responsible for the oral care and avoiding the mucositis. The nurses need to have the fund of knowledge and potential to follow the developments about the subject to avoid the progression of mucositis and provide efficient care for the treatment if the mucositis progresses [41].

III. Conclusion

The studies on this subject were usually conducted on adults. Literature has limited number of studies on children. However, also pediatric intensive care units need procedures on oral care; needs and problems of the children are different from adults. It is quite wrong to apply a protocol that is valid for adults in children intensive care unit.

It is thought that performing nursing practices toward oral care in pediatric patients in line with evidence-based practices can positively affect the patient's results. Increasing the number of evidence-based studies and using care standards in patient care in line with evidence-based studies can decrease the stay time in intensive care unit and also contribute to the country economy.

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