

An Investigation of Pediatric Nurses' Oral Care Practices

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ABSTRACT

Aim: Oral care is a standard practice used to reduce ventilator-associated pneumonia in intensive care units and in the treatment of chemotherapy-induced oral mucositis. This research examines the oral care practices of pediatric nurses.

Materials and Methods: This is a descriptive and cross-sectional study. Its sample was composed of 90 nurses working in the pediatric services of a university hospital in western Turkey from March to December 2016. The research data was collected using a sociodemographic data form and the Oral Care Practices Information Form.

Results: Of the nurses, 62.2% had received oral care education. There were statistical differences in oral diagnosis by clinic, work shift, doing an oral diagnosis before each oral care practice, oral care frequency and number of patients with impaired oral mucosal integrity ($p < .05$).

Conclusion: Nurses need training about oral care that is current with the literature to manage oral care practices more effectively.

Keywords: Pediatric nurses, oral care, nursing practices

Introduction

Children need oral care for strong and healthy tooth development and to reduce the risk of infections (1). Oral care is an important part of daily hygiene and is conducted to clean the mouth, prevent infections and provide a sense of comfort and hygiene (2,3).

Dryness of oral mucosa in children, especially in intubated infants who cannot be fed orally, infections due to bacterial and fungal infections of dry membranes, mucus injuries due to long-term endotracheal intubation and even ulcers may develop (2). One of the most important ways to prevent oral mucositis and thus oral infections is good, regular and consistent oral care. The number of the microorganisms can be reduced by increasing the quality and frequency of oral

care, thus delaying oral mucositis and its complications (4). Oral care is a standard practice used to reduce ventilator-associated pneumonia in intensive care units (5) and in the treatment of chemotherapy-induced oral mucositis (6) and it must be conducted by nurses or family members for infants and children who are hospitalized and cannot perform it on their own (3). Nurses have three important roles in the management of mucositis: to diagnose and monitor the oral cavity accurately, to provide the most appropriate oral care for patients' current conditions and to educate patients (7,8).

Using soft bristled toothbrushes to prevent mucositis, training patients and health care providers about health care protocols and using valid scales to evaluate mouth ulcers and oral pain are recommended in the guidelines

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prepared by the Multinational Association for Supportive Care in Cancer (MASCC) and the International Society for Oral Oncology (ISOO) based on the opinion of experts in the field of chemotherapy and limited evidence regarding basic oral care (7,9). Nurses' evaluation of patients' mouths at regular intervals using current scales will help to determine both the presence and degree of mucositis and oral care frequency (7,9). The Oral Assessment Guide, the Mucositis Evaluation Index of the World Health Organization, the National Cancer Institute Toxicity Criteria (NCI), the International Child Mucositis Assessment Scale (ChIMES) and the Oral Assessment Guide for Children and Young People (GOSH OAG) can be used to evaluate mucositis (4,10,11,12,13,14,15).

The literature includes studies of nurses' oral diagnoses, using scales for oral diagnosis, determining oral care frequency, and using toothbrushes, suction toothbrushes and sponge swabs as oral care materials (16,17,18,19,20,21,22). It has also been reported that the solutions that nurses used for oral care were: sodium bicarbonate, chlorhexidine, salty water, fluoride toothpaste, nystatin, tap water, hydrogen peroxide and sterile water (16,18,19,20,21,23). Some studies have done randomized controlled trials with oral care solutions made to prevent ventilator-associated pneumonia (VAP). They emphasize that oral care is important for preventing VAP (24,25,26,27). Oral care is both the care practice that pediatric nurses should practice on sick children most often and the one that is neglected most frequently (28).

The aim of the study is examines the oral care practices of pediatric nurses.

Material and Methods

Study Population and Design

This is a descriptive and cross-sectional study. Its sample was composed of 90 pediatric nurses in the pediatric services of a university hospital in western Turkey between March 2016 and December 2016. Having worked in the pediatric clinic for at least a month and voluntary participation were the inclusion criteria.

Ethical Considerations

Before starting the study, permission was obtained from the Ethics Committee of Ege University's Nursing Faculty (IRB No: 2016-43) and from the health institution where the research was conducted. The nurses who agreed to participate expressed their consent verbally.

Instruments

Instruments were created based on literature by researchers.

The Sociodemographic Data Form

The sociodemographic data form consists of 6 questions about the pediatric nurses' age, work experience, work experience in the pediatric clinic, number of the patients given care, education level, the clinic where they are currently working and number of patients with impaired oral mucosal integrity.

The Oral Care Practices Information Form

The Oral Care Practices Information Form was prepared by the researchers according to the literature. It consists of 24 questions about the pediatric nurses' use of oral diagnostic scales in oral diagnosis, the materials and solutions they use for oral care, percentages of using and dilution ratios of sodium bicarbonate ampoule, oral care frequency, mouthwash and use of chlorhexidine.

Data Collection

The research data was collected using a Sociodemographic Data Form and the Oral Care Practices Information Form in face-to-face interviews with the pediatric nurses. Each form took approximately 15 minutes by researchers.

Statistical Analysis

SPSS for Windows 16.0 software was used for statistical analyses. Descriptive statistics (frequency distributions, means, standard deviations, etc.) were used for socio-demographic information. Normal distribution was assessed using the Shapiro-Wilk test. The chi-square and ANOVA tests were used to evaluate the difference between dependent and independent variables. The results were assessed at a 95% confidence interval and a significance level of $p < 0.05$ (29).

Results

The mean age of the pediatric nurses was 32.44 ± 7.20 , and their mean work experience was 9.24 ± 7.61 years. Their mean work experience in pediatric services was 6.65 ± 6.87 years, and the mean number of the patients given care was 11.26 ± 6.01 . Of the pediatric nurses, 82.2% had bachelor's degrees, 7.8% had master's-doctoral degrees, 6.7% were graduates of vocational health schools, and 3.3% had associate's degrees. Of the pediatric nurses, 44.4% were working in pediatric services, 18.9% in pediatric oncology-hematology, 15.6% in pediatric intensive care, 14.4% in pediatric surgery and 6.7% in neonatal intensive care (Table I).

Oral Care Practices

Of the pediatric nurses, 66.7% read the literature on oral care, and 62.2% had received education on oral care (n=56). Of the pediatric nurses who had received oral care education, 85.7% did so in in-service programs (n= 48), and 14.3% did so at congresses or in courses (n=8). Of the nurses, 91.10% did oral diagnosis before doing oral care, and only 3.8% used the Oral Assessment Guide for oral diagnosis (n=3) and 52.2% did oral diagnosis before shift changes (n=47).

Of the pediatric nurses, 17.8% used toothbrushes in oral care, none used suction toothbrushes, all of them used tongue depressors and gauze, and 11.1% used prepackaged oral care sets. Of them, 57.8% used mouthwash, 12.2% used chlorhexidine. Of them, 20.0% used nystatin (n=18), 47.8% used tantum verde (n=43), 7.8% used pheniramine mouthwash (n=7), and 6.7% used chlorhexidine mouthwash (n=6). For oral care practices with tongue depressors and gauze: 21.1% used sodium bicarbonate ampoules, 75.6% used diluted sodium bicarbonate ampoules, 4.4% used powdered sodium bicarbonate, 20.0% used saline solution, and 12.2% used distilled or boiled water (Table II). To dilute

sodium bicarbonate ampoules: 35.6% of the pediatric nurses used a rate of one-to-one (n=32), 20.0% used one glass to one ampoule sodium bicarbonate (n=18), 14.4% used 1 ml sodium bicarbonate to 9 ml water (n=13), 4.4% used one to three (n=4), and 1.1% used 1 ml sodium bicarbonate to 4 ml water (n=1). Of the pediatric nurses, 3.3% did oral aspiration after oral care.

For oral care frequency, the results were: 2.2% of the pediatric nurses performed oral care once a day, 26.7% did so twice a day, 23.3% did so 3 times a day, 24.5% did so 4 times a day, and 23.3% did so when needed.

The number of patients with impaired oral mucosal membrane integrity by clinic were: pediatric oncology-hematology (1.94±1.43), pediatric clinics (0.95±1.10), neonatal intensive care unit (0.66±1.03), pediatric surgery (0.30±0.48) and pediatric intensive care (1.07±1.20) (Table III).

Oral Care Practices and Sociodemographic Characteristics

There were statistically significant differences by the clinic where the pediatric nurses worked and doing oral diagnosis at each shift change ($X^2=15.561$, $p=.004$), doing oral diagnosis before each oral care practice ($X^2=10.97$, $p=.027$), oral care frequency ($X^2=51.82$, $p=.000$) and number of patients with impaired oral mucosal integrity ($F=4.32$, $p=.003$) ($p<.05$).

Table I. Distribution of the pediatric nurses according to their descriptive characteristics (n=90)

| Socio-demographic Characteristics | M ± SD (Min-Max) | |
|---|--|------------|
| Mean age | 32.44±7.20 (min: 15, max: 54) | |
| Work experience | 9.24±7.61 years (min: 3 months, max: 32 years) | |
| Work experience in the pediatric clinic | 6.65±6.87 years (min: 3 months, max: 31 years) | |
| Number of the patients given care | 11.26±6.01 patients (min: 2, max: 30) | |
| Education status | n (%) | |
| Graduate of high school | - | 6 (6.70) |
| Associate's degree | - | 3 (3.30) |
| Bachelor's degree | - | 74 (82.20) |
| Post-graduate degree | - | 7 (7.80) |
| Units | n (%) | |
| Pediatric Clinic | - | 40 (44.40) |
| Pediatric Oncology-Hematology | - | 17 (18.90) |
| Pediatric Intensive Care | - | 14 (15.60) |
| Pediatric Surgery | - | 13 (14.40) |
| Neonatal Intensive Care | - | 6 (6.70) |
| Total | - | 90 (100.0) |

M: mean, SD: standard deviation

| Materials and solutions the nurses used in oral care | Yes | No |
|--|------------|------------|
| | n (%) | n (%) |
| Toothbrush | 16 (17.8) | 74 (82.2) |
| Suction toothbrush | - | 90 (100.0) |
| Tongue depressor | 90 (100.0) | - |
| Gauze | 90 (100.0) | - |
| Prepackaged oral care set | 10 (11.1) | 80 (88.9) |
| Toothpaste | 3 (3.3) | 87 (96.7) |
| Mouthwash | 52 (57.8) | 38 (42.2) |
| Glutamine | 4 (4.4) | 86 (95.6) |
| Chlorhexidine | 11 (12.2) | 79 (87.8) |
| Sodium bicarbonate ampoule | 19 (21.1) | 71 (78.9) |
| Diluted sodium bicarbonate ampoule | 68 (75.6) | 22 (24.4) |
| Powdered sodium bicarbonate | 4 (4.4) | 86 (95.6) |
| Saline solution | 18 (20.0) | 72 (80.0) |
| Distilled water/boiled water | 11 (12.2) | 79 (87.8) |

Table III. Distribution of patients with impaired oral mucosal membrane integrity by clinic

| Clinics | M ± SD (Min-Max) |
|-------------------------------|----------------------------|
| Pediatric Oncology-Hematology | 1.94 ± 1.43 (min:0, max:5) |
| Pediatric Clinic | 0.95 ± 1.10 (min:0, max:4) |
| Neonatal Intensive Care | 0.66 ± 1.03 (min:0, max:2) |
| Pediatric Surgery | 0.30 ± 0.48 (min:0, max:1) |
| Pediatric Intensive Care | 1.07 ± 1.20 (min:0, max:4) |

M: mean; SD: Standard deviation

There were also statistically significant differences by the clinic where the pediatric nurses worked and using tooth brushes ($X^2=10.74$, $p=.030$), mouthwash ($X^2=38.40$, $p=.000$), diluted sodium bicarbonate ampoules ($X^2=14.30$, $p=.006$), powdered sodium bicarbonate ($X^2=17.97$, $p=.001$), saline solution ($X^2=24.94$, $p=.000$) and distilled or boiled water ($X^2=11.31$, $p=.023$). However, there were no statistically significant differences by the clinic where the pediatric nurses worked and using toothpaste ($X^2=1.88$, $p=.757$), prepackaged oral care sets ($X^2=5.74$, $p=.219$), chlorhexidine ($X^2=2.46$, $p=.651$) and sodium bicarbonate ampoules ($X^2=6.67$, $p=.154$) ($p>.05$).

There were no statistically significant differences by the pediatric nurses' education level and doing oral diagnosis at shift changes ($X^2=2.97$, $p=.395$), doing oral diagnosis before each oral practice ($X^2=4.28$, $p=.233$), oral care frequency ($X^2=10.83$, $p=.543$) and number of the patients with impaired oral mucosal integrity ($F=0.67$, $p=.572$).

There were statistically significant differences by having received education about oral care and doing oral diagnosis before each shift change ($X^2=4.28$, $p=.038$) and oral care frequency ($X^2=12.20$, $p=.016$). However, education about oral care did not make a statistically significant difference in doing oral diagnosis before each oral care ($X^2=2.28$, $p=.131$).

Discussion

One of the most basic nursing roles of nursing is providing patients with oral care. The first stage of oral care in pediatric oncology and pediatric hematology clinics is doing oral diagnosis before and after the treatment (4). Most of the nurses did oral diagnosis before oral care practice, but few of those who did oral diagnosis used the Oral Assessment Guide for oral diagnosis, and half of them did oral diagnosis before each shift change. Özveren et al. (2015) report that 77.8% of nurses did oral diagnosis, and Ganz et al. (2009) report that 95.0% did so (16,19). Ganz et al. (2009) found that 71.0% of the nurses did oral diagnosis before oral care, and 33.0% did so at each shift change (19).

Feider et al. (2010) and Ganz et al. (2009) also found that nurses did not use a standard oral diagnostic scale (18,19). However, Southern (2007) found that nurses used two different oral assessment guides (those developed by Eilers et al. and Andersson et al.) (6). Training nurses about the use of scales that are valid for oral diagnosis will increase scale utilization rates.

The American Dental Association recommends that oral care be started a few days after birth. Infants' gums should be cleaned with a piece of gauze after they are fed to protect the teeth from plaque and bits of food. The infants' mouths should be aspirated after oral care, and cleanliness of the lips and moistness of the oral mucosa should be maintained using a sponge swab dipped into an alcohol and oxygen-free water solution (27). In this study, all the pediatric nurses used tongue depressors and gauze, few used prepackaged oral care set and toothbrushes, and none used suction toothbrushes. Studies have reported high rates of using sponge swabs (18,20,21), gauze (17,19) and gauze with tongue depressors (16,20). Toothbrush use varied, with low use of suction toothbrushes and high use of suction (18,19,20,21). It is thought that the difference between the rates of using oral care materials is related to the institutions and clinics where the nurses worked.

In their oral care practices with tongue depressors and gauze, the nurses mostly used diluted sodium bicarbonate ampoules, sodium bicarbonate ampoules, saline solution, distilled or warm water, chlorhexidine, powdered sodium bicarbonate, respectively. In addition, more than half of them used mouthwash in oral care practices. The nurses mostly used sodium bicarbonate, chlorhexidine and salty water, respectively (16,18,19,20,21). It is thought that the difference between the rates of using oral care solutions is related to the institutions and clinics where the pediatric nurses worked.

Nurses can determine oral care frequency using scores on an oral assessment guide (12). In this study, the frequencies were: 2 times a day (26.7%), 4 times a day (24.4%), 3 times a day (23.3%), when needed (23.3%) and once a day (2.2%). Özveren et al. (2015) found these frequencies: when needed (37.8%), 3 times a day (18.4%), 2 times a day (17.3%) and once a day (9.2%) (16). However, Ibrahim et al. (2015) found the results: 2 times a day (61.0%), once a day (27.9%), more than 3 times a day (5.8%) and 3 times a day (5.2%) (17). Feider et al (2010) found that almost all the nurses did oral care 4 times a day or more (18). It is thought that oral care frequency will be defined more clearly by making the use of oral assessment guide more common.

Evaluation of Oral Care Practices in Respect of Some Variables

There was a statistical difference by the clinic where the pediatric nurses worked and doing oral diagnosis on their work shifts, oral diagnosis before each oral care, oral care frequency and number of patients with impaired oral mucosal integrity ($p < .05$). Feider et al. (2010) reported a statistically significant difference in the frequency of oral care practices by work experience of 7.1 years or more (18). Türk et al. (2012) found a statistically significant difference in oral care frequency by the clinic where the nurses worked (20).

Although saline solution, sodium bicarbonate and chlorhexidine mouthwashes are most commonly recommended, there is not a broad consensus over which solution could be used in oral care or which solution is more effective in the literature (12). There was a statistically significant difference by the clinic where the pediatric nurses worked and the use of toothbrushes, mouthwash, diluted sodium bicarbonate ampoules, powdered sodium bicarbonate, saline solution, distilled or boiled water in oral care practices, but no such difference in their use of toothpaste, prepackaged oral care sets, chlorhexidine and sodium bicarbonate ampoules. Türk et al. (2012) reported a statistically significant difference by the clinic where the nurses worked and use of chlorhexidine, sponge swabs, gauze wound around tongue depressors and toothbrushes (20). In a study of oral care practices at four different hospitals, Özveren et al. (2015) reported statistically significant differences between the hospitals' uses of swabs, suction toothbrushes, mouthwashes and toothpaste; however, there were no statistically significant differences between the hospitals' use of gauze wound around tongue depressors. They also found a statistically significant difference between the hospitals' use of oral care solutions (sodium bicarbonate, chlorhexidine and distilled water) (16).

There was a statistically significant difference between having received education about oral care and doing oral diagnosis before each shift change and oral care frequency. However, the difference between having received education about oral care and doing oral diagnosis before each oral care was not statistically significant. Educating nurses about doing diagnosis and determining oral care frequency using valid scales and administrative encouragement to do so will be effective.

Conclusion

All the pediatric nurses in this study:

- Used tongue depressors and gauze in oral care practices as stated in the literature.

- Most of the pediatric nurses did oral diagnosis but did not use valid assessment tools to do so or to determine oral care frequency.

- Their levels of education about oral care practices are low.

The most patients with impaired oral mucosal membrane integrity were in these clinics (from high to low): pediatric hematology/oncology, pediatric intensive care, pediatric clinic, neonatal intensive care and pediatric surgery.

All the pediatric nurses should use valid scales for oral diagnosis before oral care practices and for determining oral care frequency. Educational programs based on standardized oral care protocols and evidence-based studies, and quasi-experimental research to increase knowledge about oral care should be organized.

Conflict of Interest: No conflict of interest has been declared by the authors.

References

1. Thomson, WM, Ayers KMS, Broughton JR. Child oral health inequalities in New Zealand: A background paper to the public health advisory committee. National Health Committee. 2003;30-94.
2. Cimete G, Kuşuoğlu S, Dede Çınar N. Çocuk, hastalık ve hastane ortamı. (Child, disease and hospital environment) In: Conk Z, Başbakkal Z, Bal Yılmaz H, Bolşık B. (eds.). *Pediatric Hemşireliği*. (Pediatric Nursing) (1st ed) Ankara, Turkey, Akademisyen Tıp Kitabevi, 2013;148-49.
3. Brown TL. Pediatric variations of nursing interventions. In: Hockenberry MJ, Wilson D. (eds). *Wong's essentials of pediatric nursing* (7th ed) Canada, Mosby&Elsevier, 2009;701.
4. Dağdemir A. Ağız bakımı (Oral care). In: İlhan İ, Kutluk T. (eds). *Pediatric Onkoloji El Kitabı* (Pediatric Oncology Hand Book). 1. Baskı (1st ed) Ankara, Güneş Tıp Kitabevleri, 2009;59-68.
5. Johnstone L, Spence D, Kozioł-McLain J. Oral hygiene care in the pediatric intensive care unit: Practice recommendations. *Pediatric Nursing*, 2010;36(2):85-97.
6. Southern H. Oral care in cancer nursing: Nurses' knowledge and educations. *Journal of Advance Nursing*, 2007;57(6):631-638. <https://doi.org/10.1111/j.1365-2648.2006.04159.x>
7. Keefe DM, Schubert MM, Elting LS, Sonis ST, Epstein JB. et al. Updated Clinical Practice Guidelines for The Prevention and Treatment of Mucositis. *Cancer*, 2007;109(5):820-831. <https://doi.org/10.1002/cncr.22484>
8. Stone R, Fliedner MC, Smiet, ACM. Management of oral mucositis in patients with cancer. *European Journal of Oncology Nursing*, 2009;9:24-32. <https://doi.org/10.1016/j.ejon.2005.08.004>
9. Eilers J, Million R. Clinical update: prevention and management of oral mucositis in patients with cancer. *Seminars in Oncology Nursing*, 2011;27(4):e1-e16. <https://doi.org/10.1016/j.soncn.2011.08.001>
10. Eilers J, Berger A, Petersen M. Development, testing and application of the oral assesment guide. *Oncology Nursing Forum*, 1988;15(3):325-330.

11. Cheng KKF, Molassiotis A, Chang AM, Wai WC, Cheung SS. Evaluation of an oral care protocol intervention of chemotherapy-induced oral mucositis in pediatric cancer patients. *Eur J Oncol Nurs*, 2001;37:2056-63. [https://doi.org/10.1016/S0959-8049\(01\)00098-3](https://doi.org/10.1016/S0959-8049(01)00098-3).
12. Can G. Mukozit. (Mucositis) In: Can G. (ed). *Onkoloji Hemşireliğinde Kanıta Dayalı Semptom Yönetimi. (Evidence-based symptom management in oncology nursing)* İstanbul, Turkey, 3P Pharma Publication Planning, 2007;81-96.
13. Tomlinson D, Gibson F, Treister N, Baggott C, Judd P, Hendershot E, et al. Refinement of the Children's International Mucositis Evaluation Scale (ChIMES): child and parent perspectives on understandability, content validity and acceptability. *European Journal of Oncology Nursing*, 2010;14(1):29-41. <https://doi.org/10.1016/j.ejon.2009.10.004>
14. Yavuz B, Bal Yılmaz H, Karaman N. Kanseri çocuklarda uluslararası çocuk mukozit değerlendirme ölçeği Türkçe formunun geçerlilik güvenilirlik çalışması.[A study of reliability and validity for the Turkish version of children's international mucositis evaluation scale for children with cancer] *Türk Onkoloji Dergisi [Turkish Journal of Oncology]*, 2011; 26(4):157-162. <https://doi.org/10.5505/tjoncol.2011.688>.
15. Çiftçioğlu Ş, Efe E. Validity and reliability of oral assessment guide for children and young people receiving chemotherapy. *Türk J Oncol* 2017;32(4):133-40. <https://doi.org/10.5505/tjo.2017.1671>
16. Özveren H, Özden D. Turkish nurses' attitudes and practices regarding oral care. *International Journal of Nursing Knowledge*, 2015;26(4):163-169. <https://doi.org/10.1111/2047-3095.12060>
17. Ibrahim SM, Mudawi AM, Omer O. Nurses' knowledge, attitude and practice of oral care for intensive care unit patients. *Open Journal of Stomatology*, 2015;5(7):179-186. <https://doi.org/10.4236/ojst.2015.57023>
18. Feider LL, Mitchell P, Bridges E. Oral care practices for orally intubated critically ill adults. *American Journal of Critical Care*, 2010;19(2):175-183. <https://doi.org/10.4037/ajcc2010816>
19. Ganz FDK, Fink NF, Raanan O, Asher M, Bruttin M, Nun MB, Benbinishty J. ICU nurses' oral care practices and the current best evidence. *Journal of Nursing Scholarship*, 2009;41(2):132-138. <https://doi.org/10.1111/j.1547-5069.2009.01264.x>
20. Türk G, Kocaçal Güler E, Eşer İ, Khorshid L. Oral care practices of intensive care nurses: a descriptive study. *International Journal of Nursing Practice*, 2012;18:347-353. <https://doi.org/10.1111/j.1440-172X.2012.02045.x>
21. Chan EY, Hui-Ling NG. Oral care practices among critical care nurses in Singapore: a questionnaire survey. *Applied Nursing Research*, 2012;25(3):197-204. <https://doi.org/10.1016/j.apnr.2010.12.002>
22. Lin YS, Chang JC, Chang TH, Lou MF. Critical care nurses' knowledge, attitudes and practices of oral care for patients with oral endotracheal intubation: a questionnaire survey. *Journal of Clinical Nursing*, 2011;20(21-22):3204-14. <https://doi.org/10.1111/j.1365-2702.2011.03819.x>
23. Yavuz B, Bal Yılmaz H. Investigation of the effects of planned mouth care education on the degree of oral mucositis in pediatric oncology patients. *Journal of Pediatric Oncology Nursing*, 2015;32(1):45-57. <https://doi.org/10.1177/1043454214554011>
24. Kushara DM, Friedlander LT, Peterlini MA, Pedreira ML. Oral care and oropharyngeal and tracheal colonization by Gram-negative pathogens in children. *Nursing in Critical Care*, 2012a; 17(3):115-22. <https://doi.org/10.1111/j.1478-5153.2012.00494.x>
25. Kushara DM, Peterlini MA, Pedreira ML. Oral care with 0.12% chlorhexidine for the prevention of ventilator-associated pneumonia in critically ill children: Randomised, controlled and double blind trial. *International Journal of Nursing Studies*, 2012b;49(1):1354-63. <https://doi.org/10.1016/j.ijnurstu.2012.06.005>
26. Sebastian MR, Lodha R, Kapil A, Kabra SK. Oral mucosal decontamination with chlorhexidine for the prevention of ventilator-associated pneumonia in children - a randomized controlled trial. *Pediatr Crit Care Med*, 2012;13(5):e305-10. <https://doi.org/10.1097/PCC.0b013e31824ea119>
27. Klompas M, Branson R, Eichenwald EC, Greene LR, Howell MD, Lee G. et al. Strategies to prevent ventilator-associated pneumonia in acute care hospitals: 2014 update. *Infect Control Hosp Epidemiol* 2014;35(8):915-936. <https://doi.org/10.1086/677144>
28. Spurr S, Bally J, Ogenchuk M. Integrating oral health into pediatric nursing practice: Caring for kids where they live. *Journal for Specialists in Pediatric Nursing*, 2015;20(2):105-14. <https://doi.org/10.1111/jspn.12108>
29. Büyükoztürk Ş. Sosyal bilimler için veri analizi el kitabı istatistik, araştırma deseni SPSS uygulamaları ve yorum (Data analysis handbook for social sciences statistics, research design SPSS applications comments) (8. Baskı (8th ed.)). Ankara, Turkey: Pegem A Yayıncılık, 2014.