Original Research Article

Level of Education Provided by Nurses to the Parents of Children with Chemotherapy-Induced Mucositis

Mohammad Arshadi Bostanabad¹, *Tahereh Alvandnezhad², Amirataollah Hiradfar³, Asghar Mohammadpoorasl⁴, Bagher Khalvati⁵

¹Department of Nursing, School of Nursing and Midwifery, Tabriz University of Medical Sciences, Tabriz, Iran ² Tabriz University of Medical Sciences, Tabriz, Iran ³Department of Pediatrics, Tabriz University of Medical Sciences, Tabriz, Iran ⁴Health Services and Management Research Center, Tabriz University of Medical Sciences, Tabriz, Iran ⁵IT Department, School of Nursing and Midwifery, Tabriz University of Medical Sciences, Tabriz, Iran

ABSTRACT

Introduction: Mucositis is a side effect of chemotherapy, which affects patients' quality of life. Nurses are the main care providers for cancer patients. Choosing a suitable care strategy is a challenge faced by oncology nurses. Educating patients about management of cancer therapy complications results in optimal use of healthcare services and improves quality of life of patients. The aim of this study was to evaluate level of health education provided by nurses to the parents of children with chemotherapy-induced mucositis.

Materials and methods: This descriptive study was conducted in 2016 on 60 children (mean age 86.7 ± 39.16 months) with chemotherapy-induced mucositis at the Children's Hospital of Tabriz, Iran. Demographic information and health education offered in conjunction with the mucositis clinical records were obtained through interviews with the parents. The data were analyzed in SPSS 12, using chi-square test and t-test.

Results: Only 3.3% of the subjects received appropriate training in relation to mucositis, whereas 56.6% received no training and 40% received partial training.

Conclusions: Our results suggest that the level of training provided for children with chemotherapy-induced mucositis is not satisfactory. Therefore, nursing authorities and planners should prepare the nursing personnel to provide care and special support to these patients.

KEYWORDS: Education, Nursing, Mucositis, Cancer

*Correspondence: Tahereh Alvandnezhad, Address: Tabriz University of Medical Sciences, Tabriz, Iran, Telephone: +98-4114796770, Email: nurs.alvand@gmail.com

INTRODUCTION

Nowadays, cancer is considered as one of the most important health challenges [1]. Although the number of childhood cancers are limited, these malignancies are the most common causes of death in children [2]. The experience of cancer patients overlaps with nursing care since the difficulties and complications caused by the disease and therapy, discriminate these patients who require specialized care [3].

Systemic therapies for cancer such as chemotherapy are often accompanied with some side effects, including oral mucositis. This complication is defined as the inflammation and ulceration of the oral mucosa and occurs in more than 75% of adult patients under chemotherapy, while some studies have reported the incidence of oral mucositis to be 52-80% in children [1, 4, 5]. Chemotherapy is performed either as a primary or adjuvant therapy for cancer, aiming to eradicate the rapidly growing tumor cells. However, chemotherapy is often toxic to other cells that divide normally, including the oral mucosa. Management of oral health during cancer therapy includes identifying at-risk patients, patient education, appropriate pretreatment interventions and timely management of complications. Appropriate preventive and therapeutic measures will improve treatment outcomes as well as the patients’ quality of life and help minimize the risk of oral and other complications of systemic therapy [6].

Mucositis also refers to functional lesions of the oral cavity and associated problems, and may affect survival and treatment outcomes in cancer patients [1,5,7]. Since mucositis may cause disability in children undergoing chemotherapy, they should be properly
managed to prevent further intensification and complication [8]. Nurses play a critical role in management and control of the symptoms, resulting in decreased costs and improved quality of life of patients [8]. Patient education is an essential aspect of patient care, which is based on the needs of the patient, and assists the healthcare team in collaborative and informed decision making [9]. As a main part of healthcare services, the need for patient education is raised during the hospitalization period [10]. Patient education is based on the use of knowledge and skills that help patients better cope with the illness and achieve maximum health and ability [9]. Among other benefits of patient education are health promotion, reduced cost of care, increased patient satisfaction, improved quality of life, ensuring continuity of care, reduced patient anxiety, reduced incidence of disease complications and shortened hospitalization [9]. Nurses and nursing care are important parts of management and care of cancer patients undergoing chemotherapy [3]. In addition, nurses have more frequent access to patients and their families as well as the means and knowledge to provide patient education [10]. Therefore, this study was carried out to investigate the level of education provided by nurses about oral care and management of chemotherapy-induced mucositis in children with cancer.

MATERIALS AND METHODS
This descriptive-analytical research was carried out on 60 children with cancer suffering from chemotherapy-induced mucositis in children’s hospital of Tabriz (Iran) from August to November 2016. After obtaining consent, eligible children were enrolled in the study using simple and available sampling method. Inclusion criteria were hospitalization in hematology ward or blood clinic, consciousness, history of chemotherapy, oral mucositis and age range of 3-14 years. Cases not willing to continue participation in the study and those connected to ventilator and/or suffering from recurrent oral infectious were excluded from the study.

The study received approval from the ethics committee of the Tabriz University of Medical Sciences (approval code: IR.TBZMED.REC.1395.282).

Data collection
Data were collected using a questionnaire. Accordingly, demographic information and medical history were separately recorded for each patient through interviews with the subject’s healthcare provider. The World Health Organization oral mucositis scale was used to study the severity of mucositis. The scale classifies the severity of lesions into 4 grades (0: no symptom, 1: erythema and partial sensitivity without ulcer, 2: oral ulcer, erythema and ability to eat solid food, 3: oral ulcer, erythema and inability to eat solid food, 4: bleeding and inflammation of the mucus and inability to drink fluids and take medications). Intraoral examination was also carried out for each subject to determine the severity of mucositis. The content validity of the questionnaires was approved by experts in hematology and oncology, and accuracy of the English-to-Persian translation of the questionnaires was confirmed. We examined level of training on mucositis including mucositis prevention, mucositis reduction, use of mouthwash cocktail (containing MgS syrup, diphenhydramine syrup and lidocaine gel), oral healthcare and nursing education in specific mucositis. Collected data were analyzed in SPSS software (version 12) using chi-square test and t-test. A p-value of less than 0.05 was considered as statistically significant.

RESULTS
In this study, 20 children (33.3%) from the oncology clinic and 40 children (66.7%) from the oncology ward were selected. There was no significant difference in the mean age of children admitted to the ward (82.43 ± 37.65 months) and those admitted to the clinic (95.25 ± 41.61 months). The mean severity of mucositis at the time of admission was significantly higher in patients in the ward (2.03 ± 0.620) compared to patients in the clinic (1.45 ± 0.470) (P<0.001). There
was no significant difference in terms of other demographic characteristics between the two groups (Table 1).

**Table 1. Demographic characteristics of children with chemotherapy-induced mucositis**

|                      | Ward (n=40) | Clinic (n=20) | Statistical test results |
|----------------------|-------------|---------------|--------------------------|
|                      | Number      | Percent       | Number                   | Percent       | X² | Df  | P-value |
| Mother’s education   |             |               |                          |              |    |     |         |
| Illiterate/elementary| 10          | 25.0          | 7                        | 36.8          | 7.011 | 2 | 0.135  |
| Intermediate/ high school diploma | 21          | 52.5          | 12                       | 63.2          | 0.653 | 3 | 0.884  |
| University degree    | 9           | 22.5          | 0                        | 0.0           | 4.653 | 2 | 0.497  |
| Father’s employment status |     |               |                          |              |    |     |         |
| Employee             | 7           | 17.5          | 2                        | 10.5          | 0.653 | 3 | 0.884  |
| Self-employed        | 16          | 40.0          | 8                        | 42.1          | 3.740 | 2 | 0.587  |
| Worker               | 10          | 25.0          | 6                        | 31.6          | 0.038 | 1 | 0.846  |
| Other                | 7           | 17.5          | 3                        | 15.8          | 0.038 | 1 | 0.846  |
| Birth order          |             |               |                          |              |    |     |         |
| First                | 20          | 50.0          | 8                        | 40.0          | 3.740 | 2 | 0.587  |
| Second               | 12          | 30.0          | 10                       | 50.0          | 0.038 | 1 | 0.846  |
| Third and higher     | 8           | 20.0          | 2                        | 10.0          | 0.038 | 1 | 0.846  |
| Gender               |             |               |                          |              |    |     |         |
| Female               | 13          | 65.0          | 7                        | 35.0          | 0.038 | 1 | 0.846  |
| Male                 | 27          | 67.5          | 13                       | 32.5          | 0.038 | 1 | 0.846  |

Evaluation of the nurse’s training on mucositis for children revealed that only 3.3% of the subjects received appropriate training in relation to mucositis, whereas 56.6% received no training and 40% received Partial training. The results also showed that patients in the ward received more education on mucositis mitigation techniques than those admitted to the clinic (Table 2).

**Table 2. Comparison of nurses' training on mucositis for children admitted to the ward and the clinic**

| Type of training                        | Total (n=60) | Ward (n=40) | Clinic (n=20) | Statistical test between ward and clinic |
|-----------------------------------------|--------------|-------------|---------------|----------------------------------------|
|                                        | Number (%)   | Number (%)  | Number (%)    |                                         |
|                                        | X² | Df  | P-value |
| Training on how to perform routine mouthwash |     |  |
| Yes                                     | 19 (31.7)    | 12 (30)     | 7 (35)        | 1.004                                   |
| Somewhat                                | 33 (55.0)    | 20 (50)     | 13 (65)       |                                         |
| No                                      | 8 (13.3)     | 8 (20)      | 0             |                                         |
| Training on reducing mucositis          |     |  |
| Yes                                     | 0 (0)        | 0 (0)       | 0 (0)         |                                         |
| Somewhat                                | 20 (33.9)    | 14 (35.9)   | 6 (30)        | 1.014                                   |
| No                                      | 39 (66.1)    | 25 (64.1)   | 14 (70)       |                                         |
| Yes                                     | 0 (0)        | 0 (0)       | 0 (0)         |                                         |
DISCUSSION

Oral mucositis is a frequent and potentially severe complication of chemotherapy and radiation therapy. Mucositis is painful and can result in impaired nutrition, infection and treatment delay. Pediatric oncology nurses should provide the most appropriate oral care regimen for each patient [11]. Definitive treatment of cancer focuses not only on long-term survival, but also on reduction of the treatment side effects. Nonetheless, many children still suffer from long-term complications of cancer. The side effects caused by cancer therapy considerably reduce the quality of life of patients and increase the risk of mortality among survivors [12]. Nurses have a special role in promotion of cancer care. Nonetheless, no instruction has been defined for determining nurses’ role based on clinical standards [3]. Nurses are often the health care providers which patients and their families rely on when making treatment decisions[13]. Wells et al. (2008) demonstrated that nurses can help manage mucositis [14]. A study carried out by Mason et al. showed that nurses play a role in management and control of symptoms, leading to decreased treatment cost [8].

Oncology nurses have an important role in management of cancer patients and can provide health care to minimize disease- and treatment-related complications, such as mTOR inhibitor-associated stomatitis [15]. Nurses play a key role in identification and management of patients at risk of chemotherapy-induced mucositis [16]. Providing proper oral care is another challenge faced by oncology nurses [11]. In 2017, Yüce and Yurtsever examined the effect of education on mucositis and the quality of life of cancer patients undergoing chemotherapy. They showed that quality of life patients who had received training was higher than that of the control group [17]. Yavuz and Yılmaz studied the effect of dental care education on the incidence of oral mucositis in children with cancer and reported a significant difference between the incidence rate of mucositis before and after the education. Mean pain intensity was significantly different before and after the education. Moreover, both the degree of mucositis and pain intensity decreased when children were given a planned mouth care education before chemotherapy [18].

Oral care is of utmost importance in patients undergoing high-dose chemotherapy due to the high incidence of mucositis [19]. Nurses can educate patients or their families about the complications associated with therapies, resulting in improved quality of life of patients [20]. In our study, the
majority of patients had not received proper training for management of oral mucositis. Therefore, nursing authorities and planners should prepare the nursing personnel to provide care and special support to children with cancer. On the other hand, various barriers of providing such services for patients from the nurses’ viewpoint need to be further investigated.

CONCLUSION
Given the close relationship between nurses and patients, nurses play an important role in oral health education and promotion for patients. Our results suggest that the level of training provided for children with chemotherapy-induced mucositis is not satisfactory. Therefore, nursing authorities and planners should prepare the nursing personnel to provide care and special support to these patients.

ACKNOWLEDGEMENTS
This study was part of a research project approved by the Tabriz University of Medical Sciences for completion of a Master’s degree in paediatric nursing. The authors are grateful to the deputy of research at the Tabriz University of Medical Sciences for the financial support. We also would like to thank all participants and the authorities of hospitals in Tabriz, especially Dr. Huseinpour Feizi and Mrs. Jalili.

CONFLICT OF INTEREST
The authors declare that there is no conflict of interest.

REFERENCES
1. Ghadiri K, Farokhi A, Akramipour R, Rezaei M, Razaghei R. The Effect of honey on the prevention and reduction of chemotherapy-induced mucositis in children with cancer. Journal of Kermanshah University of Medical Sciences. 2014;18(2):74-9.

2. Alijani Renani H, Keikhai B, Ghadimi Mahani H, Latifi M. Effect of chamomile mouthwash for preventing chemotherapy-induced ostematitis in children. Journal of Mazandaran University of Medical Sciences. 2012;21(86):19-25.

3. Araújo SN, Luz MH, Silva GR, Andrade EM, Nunes LC, Moura RO. Cancer patients with oral mucositis: challenges for nursing care. Revista latino-americana de enfermagem. 2015;23(2):267-74.

4. Miller MM, Donald DV, Hagemann TM. Prevention and treatment of oral mucositis in children with cancer. The Journal of Pediatric Pharmacology and Therapeutics. 2012;17(4):340-50.

5. Sarvizadeh M, Hemati S, Meidani M, Ashouri M, Roayaei M, Shahsanai A. Morphine mouthwash for the management of oral mucositis in patients with head and neck cancer. Advanced biomedical research. 2015;4:44.

6. Jones DL, Rankin KV. Management of the oral sequelae of cancer therapy. Texas dental journal. 2012;129(5):461-8.

7. Emami A. Esmaeili javid G.R., Foshtom Atai L., Safaei S.R., Montazeri A., Fatih M., Mehrzad V. Laser therapy in the prevention of chemotherapy-induced oral mucositis: a randomized clinical trial Medical laser. 2005;4(1):6-12.[In Persian]

8. Mason H, DeRubeis MB, Foster JC, Taylor JM, Worden FP. Outcomes evaluation of a weekly nurse practitioner-managed symptom management clinic for patients with head and neck cancer treated with chemoradiotherapy. In Oncology nursing forum 2013 Nov (Vol. 40, No. 6, p. 581). NIH Public Access.

9. Adib-Hajbaghery M, Zare M. The barriers to patient education from the viewpoint of nurses in iran: a systematic review. Journal of Nursing and Midwifery Urmia University of Medical Sciences. 2017;15(7):544-58.[In Persian]

10. Ye Y, Carlsson G, Agholle MB, Wilson J, Roos A, Henriques-Normark B, et al. Oral bacterial community dynamics in paediatric patients with malignancies in relation to chemotherapy-related oral mucositis: a prospective study. Clinical Microbiology and Infection. 2013;19(12):E559-E67.

11. Wohlschlaeger A. Prevention and treatment of mucositis: a guide for nurses. Journal of Pediatric Oncology Nursing. 2004;21(5):281-7.
12. Rieber JG, Kessel KA, Witt O, Behnisch W, Kulozik AE, Debus J, et al. Treatment tolerance of particle therapy in pediatric patients. Acta Oncologica. 2015;54(7):1049-55.

13. Head BA, Song M-K, Wiencek C, Nevidjon B, Fraser D, Mazanec P. Palliative Nursing Summit: Nurses Leading Change and Transforming Care The Nurse’s Role in Communication and Advance Care Planning. Journal of Hospice & Palliative Nursing. 2018;20(1):23-9.

14. Wells M, Donnan PT, Sharp L, Ackland C, Fletcher J, Dewar JA. A study to evaluate nurse-led on-treatment review for patients undergoing radiotherapy for head and neck cancer. Journal of Clinical Nursing. 2008;17(11):1428-39.

15. Pilotte AP, Hohos MB, Polson KM, Huftalen TM, Treister N. Managing stomatitis in patients treated with Mammalian target of rapamycin inhibitors. Clinical journal of oncology nursing. 2011;15(5).

16. Eilers J, Million R. Clinical update: prevention and management of oral mucositis in patients with cancer. In Seminars in oncology nursing; 2011 (Vol. 27, No. 4, pp. e1-e16). WB Saunders.

17. Yüce UÖ, Yurtsever S. Effect of Education About Oral Mucositis Given to the Cancer Patients Having Chemotherapy on Life Quality. Journal of Cancer Education. 2017:1-6.

18. 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):47-56.

19. Ghanbari Khonqah A., Baghaiee Lake M. Priorities of Nursing Research in Caring for Cancer Patients from Nurses' Viewpoints. Iranian Journal of Nursing. 2009;22(57):87-97. [In persian]

20. Grenon NN. Managing toxicities associated with antiangiogenic biologic agents in combination with chemotherapy for metastatic colorectal cancer. Clinical journal of oncology nursing. 2013;17(4).