



An Evaluation of Mucositis Assessment Guides for Nurses and the Use of Care Protocols.

*Gülümser Dolgun¹, Saniye Cimen² and Ayla Aslan³

1. Istanbul University Faculty of Health Science, Department of Midwifery, Istanbul, Turkey.
2. Mevlana University, Vocational School of Health Services, Head of the Department of Nursing, Konya, Turkey.
3. President of the Association of Hematology, Hematologic Oncology and Bone Marrow Transplantation Nursing Society (HOKIT), Istanbul, Turkey.

*Corresponding Author's E-mail: gulumser6@hotmail.com

Accepted September 15th, 2014

ABSTRACT

Oral mucositis, known as stomatitis, is a common complication of cancer treatments. This study was planned to determine whether nurses use a standard diagnostic questionnaire for oral mucositis and ascertain their knowledge about assessing and managing mucositis. The study design was descriptive and correlational. The research included nurses working at the adult and pediatric clinics, oncology, hematology, intensive care and transplantation service and polyclinics of 2 university and 2 state hospitals in Istanbul. Data was collected with an Oral Mucositis Diagnostic Form and an Oral Care Practices Assessment Form. 69% of the nurses working at the university hospitals and of 5.4% of those working at the state hospitals were using the oral mucositis diagnostic questionnaire. Those making correct diagnoses were 65.7% at Grade 0, 42.5% at Grade 1, 36.9% at Grade 2, 49.7% at Grade 3 and 53.5% at Grade 4. Of the nurses, 65.3% made a correct assessment of oral care management at Grade 0, 44.1% at Grade 1, 28.9% at Grade 2, 30.3% at Grade 3 and 59.9% at Grade 4. It is revealed that, Standard oral cavity mucosa assessment forms at the university and Ministry of Health hospitals are not at the desired level and mucositis care protocols do not even exist. This implies that nurses in Turkey need education on using diagnostic forms and standard practice guidebooks and applying these in their practice.

Key words: mucositis, diagnostic form, maintenance protocol, nursing care.

INTRODUCTION

Oral mucositis, also known as stomatitis, is a common complication of cancer treatments. Stomatitis involves inflammatory conditions in the mouth. The term "mucositis" however is used to define the inflammation of any mucous membrane (Rubenstein et al., 2004; Brown and Yoder, 2002). Oral mucositis significantly affects speech, swallowing, creates alimentary disorders and has an impact on the patient's quality of life. It has been shown that 25%-50% of cases of severe septicemia have an oral focus (Peterson and Lalla, 2010; Sonis et al., 2001; Scully et al., 2006). Additionally, nasogastric catheters or total parenteral feeding may necessitate venous access, increasing the likelihood of resorting to opioids (Lalla et al., 2008; Sonis et al., 2001). The severity of the side effects that develop causes termination or postponement of the treatment, while prolonging the hospital stay (Çavuşoğlu, 2007; Elting et al., 2003; Sonis et al., 2004).

Treatment is generally palliative and close monitoring, assessment and educating the patient is of extreme importance in preventing mucositis (Lalla, 2006; Stonea et al., 2005). The most important task in this context falls upon the shoulders of nurses. There is evidence-based data that has shown that the use of standard diagnostic forms and care protocols in mucositis assessment and treatment significantly reduces the incidence of mucositis as well as the frequency of oral complications (Eilers, 2004; Miller and Kearney, 2001; Keefe et al., 2007; Çubukçu and Çınar, 2012). Various grading scales are used in the identifying of oral mucositis. The two most commonly used scales are the WHO (World Health Organization) Oral Toxicity Score and the NCI-CTC (National Cancer Institute) Common Toxicity Criteria (Sonis et al., 2004). WHO scores encompass objective (erythema, ulceration, etc.), subjective (oral pain, etc.), and functional (the patient's ability to eat, etc.) evaluation criteria (WHO 1979). The scale is shown in Table 1.

Table 1: World Health Organization (WHO) scale for oral mucositis

| Grade 0 | Grade 1 | Grade 2 | Grade 3 | Grade 4 |
|---------|----------------------------|---|---|---|
| None | Oral erythema and soreness | Oral erythema, ulcers, solid diet tolerated | Oral ulcers, requires liquid diet only (due to mucositis) | Oral alimentation not possible (due to mucositis) |

The use of diagnostic forms and care protocols by nurses in the clinical setting is effective in not only preventing and treating mucositis, but also in terms of achieving a standard of professionalism, evaluating the effectiveness of healthcare, providing a common language, ensuring the rational utilization of effort, labor, time and resources, as well as reducing patient costs (Gibson et al., 2006; Wohlschlaeger, 2004; Yıldırım, 2001; Yılmaz, 2007; Çubukçu and Çınar, 2012). The "Evidence-Based Practice Guidelines" of the Working Group and the Multinational Association of Supportive Cancer Care in Cancer (MASCC), International Society of Oral Oncology (ISOO), first put together in 2004, was later updated in 2005 (Rubenstein et al.; 2004; Keefe, 2006). The prevention and treatment of mucositis, the standard diagnostic questionnaire and the use of care protocols, as well as advice and recommendations, were included in both guidelines.

The European Blood, Bone Marrow Transplantation Nurses Group has reported in a study that a standard assessment instrument is being used in 59% of the 46 transplantation centers in 16 European countries in which the study was conducted (Stonea, 2005). Furthermore, it was declared that because of its facility of use, 74% of these centers use the WHO assessment questionnaire. As Miller (2001) has said, Graham et al., found in a study conducted in 1993 that the use of oral cavity assessment scales and nursing initiatives appropriate to assessment findings has reduced the incidence of mucositis. Aslan in 2003 showed that oral complications developing as a result of chemotherapy were problems that could be prevented with nursing care. In addition, studies conducted with patients receiving chemotherapy have indicated that patients who are not adequately informed about chemotherapy and its side effects are unsuccessful in symptom control and experience side effects more severely, thus suffering lowered quality of life due to uncontrolled symptoms (Aslan, 2003; Gibson et al., 2006; Wohlschlaeger, 2004; Yılmaz, 2007).

No study was encountered in the Turkish literature on the use by nurses of a standard assessment instrument for oral mucositis or about whether or not oral care protocols have been put into practice. This study was planned to determine whether or not nurses working in adult and child oncology, hematology, transplantation and intensive care units use a standard diagnostic questionnaire for oral mucositis and also their level of knowledge about assessing and managing mucositis.

MATERIALS AND METHODS

The study was planned as descriptive and correlational research

The study universe and sample

The study universe consisted of all of the nurses working in the adult and pediatric clinics, oncology, hematology, intensive care and transplantation services and polyclinics of 2 university and 2 state hospitals, a total of 4 hospitals, in Istanbul, over the period May 2012 – December 2012.

When it was learned that there were about 400 nurses in the university hospitals and 200 in the state hospitals, a total of 600 forms were distributed. The response rate was 57% in the university hospitals and 47% in the state hospital. A special selection method was not used for the sample and instead all nurses wishing to volunteer for the study were included. A total of 346 forms were collected; of these, 27 were cancelled because the forms had not been fully filled out; the research was therefore completed with data from 319 nurses, of whom 70.8% (226) were from the university and 29.2% (93) from the state hospital. The rate of response to the mucositis diagnostic form and the care protocol questions was over 90%.

Data Collection Instruments

The sociodemographic and working conditions questionnaire: This contained questions on independent variables such as the age of the nurses, how long they worked at their units, whether they worked night or day at the clinics, their educational status regarding oral mucositis, and whether there were any mucositis assessment forms and care protocols in their units. The nurses were also asked the grade of mucositis that was most commonly observed at their clinics.

Oral Mucositis Diagnostic Form: This form was developed by the researchers on the basis of the WHO oral mucositis diagnostic scale. The form consisted of 5 questions and 5 grade levels corresponding to the questions. The diagnostic questions were not offered in order but mixed to avoid an easy automatic response. The nurses were expected to mark the appropriate symptoms, checking to see if there was an absence of erythema in the oral cavity, no inflammation, ulceration, soreness or bleeding but a pink color, marking this as Grade 0; noting oral erythema, inflammation, soreness, no ulceration as Grade 1; inflammation in the mouth, bleeding and ulceration and the patient's tolerance of both liquids and solids as Grade 2; painful erythema in the mouth, edema and inflammation, bleeding and ulceration and the patient's tolerance of only liquids as Grade 3; and inability of oral alimentation due to pain and ulceration (parenteral or enteral feeding) as Grade 4. Oral Care Practices Assessment Form: This form, developed in line with the literature on the subject (Can, 2007; Gibson et al., 2006; Wohlschlaeger, 2004; Yılmaz, 2007, Cawley and Benson, 2005), consisted of 10 questions. The nurses were asked to mark which practice would be appropriate for each grade level. The questions were asked out of order to avoid automatic responses.

The opinions of 6 academics and 4 clinical nurses in pediatric and adult nursing were taken to test the validity of both questionnaires. After the needed changes were made, a pilot study was performed on 15 nurses working in the pediatric and adult hematology oncology clinics to test the comprehensibility of the questions. Accordingly, questions that seemed hard to comprehend were revised.

Ethical Perspective of the Study

Written permissions were obtained for the research from the Istanbul University Ethics Board, the Istanbul Health Directorate and the other hospitals where the research was conducted. The nurses were told the purpose of the research and their written consent was obtained. Questionnaires were passed out to the nurses who were willing to participate and collected back from them 1-2 weeks later. The limitation of the research was that it was restricted to the hospitals where it was carried out. The SPSS package program was used in the analysis of the data.

RESULTS

A total of 319 nurses participated in the research; their demographic characteristics are given in Table 2.

Table 2: Nurse Demographics (N=319)

| Variables | n | % |
|--|----------|----------|
| Age Groups | | |
| Below 25 | 102 | 32.0 |
| 26-34 years | 141 | 44.2 |
| Over 35 | 76 | 23.8 |
| Education | | |
| Health vocational school | 22 | 6.9 |
| Associate degree | 45 | 14.1 |
| Bachelor's | 225 | 70.5 |
| Master's degree | 27 | 8.5 |
| Hospital where Nurses work | | |
| State hospital | 93 | 29.2 |
| University hospital | 226 | 70.8 |
| Department where Nurses Work | | |
| Pediatrics | 110 | 34.5 |
| Adult | 209 | 65.5 |
| Position | | |
| Administrative Nurse | 11 | 3.4 |
| Service Nurse | 268 | 84.0 |
| Service Supervisor | 26 | 8.2 |
| Chemotherapy Nurse | 14 | 4.4 |
| Unit Where Nurses Work | | |
| Hematology Oncology | 90 | 28.2 |
| Intensive care | 126 | 39.5 |
| Transplantation | 16 | 5.0 |
| Other | 87 | 27.3 |
| Duration Worked in Unit | | |
| More less 2 years | 141 | 44.2 |
| 3-5 years | 85 | 26.6 |
| 6-10 years | 39 | 12.2 |
| More than 10 years | 54 | 16.9 |
| Has mucositis questionnaire? | | |
| Yes | 161 | 50.5 |
| No | 158 | 49.5 |
| Has had education on diagnosing and caring for mucositis? | | |
| Yes | 143 | 44.8 |
| No | 176 | 55.2 |

The percentages of nurses using the oral mucositis diagnostic questionnaire were 69% (156) of the nurses working at the university hospitals and 5.4% (5) of those working at the state hospital. There was a significant difference between the institutions

in terms of the use of the form ($p = .00$). The nurses of both types of institutions said that they did not have a standard protocol in their units for oral mucositis management and that treatment was carried out on doctor's orders. Of the nurses, 79% responded to the question, "Which stage of mucositis do you encounter most commonly in the department you work in?" and among the respondents, 38.5% marked this as Grade 1, 36.1% as Grade 2, and the least percentage of nurses (4.4%) marked Grade 4. In terms of how accurately the nurses in the study were able to make their assessment of oral care management, 65.3% and 47.6% of the nurses identified Grade 0, 44.1% and 41.4% identified Grade 1. The percentages of accuracy were 28.9% and 31.1% in Grade 2, 30.3% and 47.8% in Grade 3, and 59.9% and 43.2% in Grade 4. (Table 4)

DISCUSSION

The results of the research showed that the average use of the standard oral mucositis form was 50.5%, the prevalence being 69% among university hospital nurses and 5.4% among state hospital nurses. Stone (2005) reports a 59% prevalence of use of the standard mucositis diagnostic form at 46 transplantation centers in Europe. These percentages are very much below desired levels. It has been accepted as an evidence-based fact in the literature that the use of standard diagnostic forms is important in identifying the course of mucositis and the effectiveness of treatment (Jaroneski, 2006; Gibson et al., 2006; Wohlschlaeger, 2004; Yılmaz, 2007; Estabrooks et al., 2008; Yava, 2007). The fact that diagnostic forms are not used as frequently as desired may be explained perhaps by nurses' lack of experience in nursing care practices and their failure to make use of either information available to them in the social realm or the results of relevant research.

In both types of hospitals in the present study, it was determined that standard nursing care protocols were not used in oral mucositis management. The MASCC/ISOO evidence-based guidebooks refer to oral cavity care protocols as the second component of care (Rubenstein et al., 2004; Keefe, 2006). These protocols, which help to prevent and manage oral mucositis, are defined as systematic approaches that clinical health professionals may use in the management of the condition. It is stressed in the guidebooks that patient education is important in ensuring that patients adapt to oral care practices and the use of these protocols is recommended to reduce the severity of the condition (evidence level III, recommendation level B) (Çavuşoğlu, 2007). Furthermore, it is also asserted that care of the oral cavity is an important part of nursing practices and that related protocols should be used both in patient education and for improving the process of developing quality (McGuire, 2006; Rubenstein et al., 2004; Keefe, 2006; Stone et al., 2005; Çubukçu and Çınar, 2012). We believe that the reason

the use of the protocols is not widespread in Turkey is because there has as yet been no standardization developed in nursing care and that there is no independence in performing nursing functions. This in turn we believe is because the number of nurses per patient at the hospitals is insufficient.

It is a positive finding that 69% of the nurses report the existence of a mucositis diagnostic form at the university hospitals. On the other hand, there was no difference found in identifying the grade level of mucositis between those who said they had and those who said they did not have standard diagnostic forms in their clinics. This result suggests that the evaluation forms in the clinics are not being used regularly. Meta-analyses on this subject around the world report that the first and most important step in preventing and treating mucositis is using an assessment scale that has been proved valid and reliable in the clinical environment and corresponds to a level of evidence of IV (Jaroneski, 2006; Gibson et al., 2006; Wohlschlaeger, 2004; Yılmaz, 2007; Estabrooks et al., 2008; Yava, 2007).

It was found in the research that the nurses were able to correctly identify oral mucositis at the top grade 0 (65.7%) and at grade 4 (53.5%); the other grade levels had correct diagnosis percentages of below 50% (Table 3).

Table 3: Status of Nurses' Knowledge about Assessing Oral Mucositis

| Assessing Oral Mucositis | Total n (%) | Grade 0 n (%) | Grade 1 n (%) | Grade 2 n (%) | Grade 3 n (%) | Grade 4 n (%) |
|--|----------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| No erythema, inflammation, ulceration, soreness or bleeding in the oral cavity, color pink | 315 (98.7) | 207 (65.7) | 66 (21.0) | 18 (5.7) | 14 (4.4) | 10 (3.2) |
| Erythema, inflammation and soreness but no ulceration in the mouth | 315 (98.7) | 25 (7.9) | 134 (42.5) | 118 (37.5) | 27 (8.6) | 11 (3.5) |
| Erythema, inflammation, bleeding and ulceration in the mouth but the patient tolerates liquids or solids | 314 (98.4) | 9 (2.9) | 35 (11.1) | 116 (36.9) | 107 (34.1) | 47 (15.0) |
| Erythema, inflammation, bleeding and ulceration in the mouth and the patient tolerates only liquids | 314 (98.4) | 1 (0.3) | 18 (5.7) | 39 (12.4) | 156 (49.7) | 100 (31.8) |
| Oral alimentation impossible because of pain and ulceration in the mouth (parental or enteral feeding) | 299 (93.7) | 11 (3.7) | 50 (16.7) | 35 (11.7) | 43 (14.5) | 160 (53.5) |

No association was found between accurately identifying the grade level and educational level, the institution the nurse worked in, the department, the duration of time worked, or whether or not the unit had the standard diagnostic form. Of the nurses participating in the research, 44% said that they had attended an in-house program on diagnosing and caring for mucositis after graduation. There was however no difference found between nurses who attended or who did not attend the program in terms of identifying grade levels. The literature on patients receiving chemotherapy reports that patients who have not been adequately

informed about chemotherapy and side effects are more unsuccessful in symptom control, feel the adverse effects of the treatment more severely, and experience a lowered quality of life due to uncontrolled symptoms (Aslan, 2003; Gibson et al., 2006; Wohlschlaeger, 2004; Scully et al., 2006). These results show that whatever the level of education of nurses (university or vocational high school graduates), or their working status (nurse supervisor, ward nurse), nurses tend to avoid independent assessment and practice and instead exhibit a treatment-focused approach based on orders from the doctor.

It was found that 65.3% of the nurses in the study were able to accurately identify prevention and care practices in oral mucositis at the best grade 0 (achieving daily oral cavity care) and that 53.5% identified grade 4 (debriding necrotic areas); it was seen that the percentage correctly identifying practices in the other grades was less than 50% (Table 4).

Table 4: Nurses' Knowledge about Assessing Oral Care Practices

| Oral Care Practices | Total n (%) | Grade 0 n (%) | Grade 1 n (%) | Grade 2 n (%) | Grade 3 n (%) | Grade 4 n (%) |
|---|-------------|---------------|---------------|---------------|---------------|---------------|
| Grade (0) | 303 | 198 | 64 | 12 | 15 | 14 |
| Daily mouth care is practiced | (95.0) | (65.30) | (21.1) | (4.0) | (5.0) | (4.6) |
| Grade (0) | 292 | 139 | 97 | 30 | 14 | 12 |
| Teeth are flossed once a day | (91.5) | (47.6) | (33.2) | (10.3) | (4.8) | (4.1) |
| Grade (1) A soft toothbrush is recommended | 295 | 51 | 130 | 66 | 32 | 16 |
| | (92.5) | (17.3) | (44.1) | (22.4) | (10.8) | (5.4) |
| Grade (1) Diagnosis is attempted every 12 hours | 290 | 69 | 120 | 68 | 19 | 14 |
| | (90.9) | (23.8) | (41.4) | (23.4) | (6.6) | (4.8) |
| Grade (2) The patient's intake of irritants and solid foods is prevented | 301 | 19 | 47 | 87 | 111 | 37 |
| | (94.4) | (6.3) | (15.6) | (28.9) | (36.9) | (12.3) |
| Grade (2) Patient is fed soft and liquid foods | 289 | 11 | 47 | 90 | 118 | 23 |
| | (90.6) | (3.8) | (16.3) | (31.1) | (40.8) | (8.0) |
| Grade (3) On doctor's orders, a culture is taken from doubtful zones | 290 | 10 | 23 | 54 | 88 | 115 |
| | (90.9) | (3.4) | (7.9) | (18.6) | (30.3) | (39.7) |
| Grade (3) Diagnosis is attempted every 4 hours | 295 | 9 | 22 | 97 | 141 | 26 |
| | (92.5) | (3.1) | (7.5) | (32.9) | (47.8) | (8.8) |
| Grade (4) Necrotic areas are derided | 299 | 9 | 20 | 34 | 57 | 179 |
| | (93.7) | (3.0) | (6.7) | (11.4) | (19.1) | (59.9) |
| Grade (4) Enteral or parenteral feeding | 296 | 11 | 35 | 42 | 80 | 128 |
| | (92.8) | (3.7) | (11.8) | (14.2) | (27.0) | (43.2) |

This result is similar to the mucositis diagnostic criteria. The level of diagnostic and practical knowledge of nurses was generally found to be low (23%-44%). We believe that the reason for this was that the standard diagnostic forms in the clinics and the standard practical protocols appropriate to the diagnosis were not being used at the clinics. In addition, it may also be suggested that another factor having an impact on this result could be the fact that since half of the nurses working at the clinics where nursing practices such as these are the most concentrated have less than 2 years of experience and the number of patients is high, nurses must rather deal with more major problems so that accordingly, mucositis may not be perceived as a significant issue and the need for intervention is not sufficiently felt. It has been shown that the use of special oral cavity care protocols during the treatment process significantly reduces the incidence of mucositis, improves the status of the oral mucosa, and diminishes the frequency of oral complications (McGuire et al., 2006; Eilers, 2004; Miller and Kearney, 2001).

Since none of the hospitals had care protocols, the responses the nurses gave regarding the care protocols that must be applied appropriate to the grade level were not analyzed in terms of their association with demographic characteristics.

CONCLUSION

It was found that the standard oral cavity mucosa assessment forms at the university and state hospitals working under the Ministry of Health are not at the desired level and that mucositis care protocols do not even exist. It was also seen that the knowledge of nurses about the criteria for diagnosing oral mucositis was not associated with whether the form was available at the clinic or not. Providing basic oral cavity care, determining the status of the oral mucosa with a standard diagnostic form according to the patient's needs, and providing the care appropriate to the protocol for the specific grade level, maintaining the integrity of the oral mucosa, and reducing oral complications are important nursing interventions. It is for this reason that increasing awareness of the use of standard diagnostic forms and practice protocols in in-house training programs as well as at congresses and conferences is so important. Increasing the level of education of nurses in this context and encouraging implementation according to research results will not only positively affect the treatment process, but also increase patient

Acknowledgment: We thank all the nurses who generously gave their time to complete a questionnaire. We would like to thank the nurses who reviewed the questionnaire.

Contributors: Study Design: GD, SC; Data Collection and Analysis: GD, SC, AA; Manuscript Writing: GS, SC,

Conflict of interest: No conflict of interest declared.

References

- Aslan Ö. Evaluating Symptoms Associated with Chemotherapy in Cancer Patients and the Role of Nursing Education in the Control of these Symptoms. Doctorate Thesis, Gülhane Military Medical Academy Health Sciences Institute, School of Nursing, Ankara. 2003: 7-15.
- Brown CG and Yoder L. Stomatitis. An overview protecting the oral cavity during cancer treatment. *American Journal of Nursing*. 2002; 102: 20– 23.
- Cawley MM and Bens LM. Current Trends in Managing Oral Mucositi. *Clinical Journal Of Oncology Nursing*. 2005; 9: 584-592
- Çubukçu NÜ and Çınar S. Can oral mucositis be prevented in cancer patients receiving chemotherapy? *Marmara University Health Sciences Institute Journal*. 2012; 2: 154-63
- Çavuşoğlu H. Evidence-based nursing in the management of oral mucositis. *Turkish Clinics J. Med Sci*. 2007; 2: 398-406.
- Eilers J. Nursing interventions and supportive care for the prevention and treatment of oral mucositis associated with cancer treatment. *Oncology Nursing Forum*. 2004; 13: 13-23.
- Elting LS, Cooksley C, Chambers M et al. The burdens of cancer therapy. Clinical and economic outcomes of chemotherapy-induced mucositis. *Cancer*. 2003; 98: 1531-9.
- Estabrooks CA, Scott SD, Squires JE et al. Patterns of research utilization on patient care units. *Implement Sci*. 2008; 7: 3-31.
- Gibson F, Cargill J, Allison J et al. Establishing content validity of the oral assessment guide in children and young people. *Eur. J. Cancer*. 2006; 42: 1817-25.
- Jaroneski LA. The importance of assessment rating scales for chemotherapy-induced oral mucositis. *Oncol. Nurs. Forum*. 2006; 33: 1085-90.
- Keefe DMK, Schubert MM, Elting LS et al. Updated clinical practice guidelines for the prevention and treatment of mucositis. *Cancer*. 2007; 109: 820-831.
- Keefe D, MK. Mucositis guidelines: what have they achieved, and where to from here? *Support Care Cancer*. 2006; 14: 489-491
- Lalla RV, Sonis ST, Peterson DE. Management of oral mucositis in patients who have cancer. *Dent. Clin. North. Am*. 2008; 52: 1-17.
- Miller M, Kearney N. Oral Care for Patient with Cancer: A Review of the Literatüre. *Cancer Nursing*. 2001; 24: 241-254
- Peterson DE and Lalla RV. Oral mucositis: the new paradigms. *Curr Opin Oncol*. 2010; 22: 318-322
- Rubenstein EB, Peterson DE, Schubert M et al. Clinical practice guidelines for the prevention and treatment of cancer therapy-induced oral and gastrointestinal mucositis. *Cancer*. 2004; 100: 2026-46.
- Scully C, Sonis S, Diz PD. Mucosal diseases series: Oral mucositis. *Oral Dis*. 2006; 12: 229-241
- Sonis ST, Oster G, Fuchs H et al. Oral mucositis and the clinical and economic outcomes of hematopoietic stem-cell transplantation. *Journal of Clinical Oncology*. 2001; 19: 2201-2205.
- Sonis ST, Elting LS, Keefe D et al. Perspectives on cancer therapy-induced mucosal injury, *Cancer*. 2004; 100: 1995- 2025
- Stone R, Fliedner, MC, Smiet, AC. Management of oral mucositis in patients with cancer. *Eur. J. Oncol. Nurs*. 2005; 9: 24-32.
- Wohlschlaeger A. Prevention and treatment of mucositis: a guide for nurses. *J. Pediatr. Oncol. Nurs*, 2004; 21: 281-7.
- World Health Organisation. Handbook for Reporting Results of Cancer Treatment. Geneva, Switzerland: World Health Organisation, 1979. February 26, 2014. <http://whqlibdoc.who.int/publications/9241700483.pdf>
- Yava A, Tosun N, Çiçek H, Yavan T, Terakye G, Hatipoğlu S. Validity and reliability of the Scale of obstacles in the use by nurses of research results. *Journal Gülhane Medical*. 2007; 49: 72-80
- Yıldırım A. "Hemşirelik Bakım Protokolleri", *Hemşirelik Bakım Protokolleri El Kitabı*. İstanbul Üniversitesi Basımevi, İstanbul, 2001.
- Yılmaz MÇ. Evidence-based clinical practices in the management of mucositis. *International Journal of Hematology and Oncology*. 2007; 4: 241-46