

**Research Article**

The relationship between pressure ulcers and palliative care patient caregivers' knowledge levels



Palyatif bakım hastalarında basınç ülserleri ile bakım verenlerin bilgi düzeyleri arasındaki ilişki

Yesim Karakaya^a, Hilal Özkaya^b, E. Zeynep Tuzcular Vural^b, Isik Gonenc^b

^a Basaksehir District Health Directorate, Istanbul, Turkey

^b Department of Family Medicine, Haydarpaşa Training & Research Hospital, University of Health Sciences, Istanbul, Turkey

ABSTRACT

Introduction: The need for care and palliative care increased with the prolongation of mean life expectancy. One of the most frequently observed symptoms in palliative care is pressure ulcers. We aimed to measure the knowledge levels of caregivers serving hospitalized patients in the palliative care service and to investigate their relationship with socio-demographic characteristics, especially the knowledge levels.

Methods: This study enrolled 109 people providing care to patients who received inpatient palliative care between November 1 and December 31, 2018. A questionnaire including questions about socio-demographic characteristics and knowledge about pressure ulcers was administered. The pressure ulcer status of the patients was evaluated by a physician.

Results: The mean age of the caregivers was 49.49 ± 10.91 years (22-69). The mean knowledge level of the participants was $70.09 \pm 18.58\%$. The minimum score was 0, and the maximum score was 100. It was found that 62.4% of the caregivers received information about pressure ulcers in the past, 30.3% of them didn't receive any information about pressure ulcers, and 7.3% received partial information.

Conclusion: The knowledge level of the caregivers who were informed about pressure ulcers was significantly higher than those who were not informed ($p=0.005$). Therefore, we think that continuous education has an essential place in preventing pressure ulcers.

Keywords: Pressure ulcer, caregiver, health knowledge

ÖZ

Giriş: Ortalama yaşam süresinin uzamasıyla bakıma ihtiyaç duyan bireyler ve palyatif bakım ihtiyacı artmıştır. Palyatif bakımda en sık değerlendirilen semptomlardan biri bası yarasıdır. Araştırmamızda palyatif bakım servisinde yatmakta olan hastaya bakım veren kişilerin bası yarası ile ilgili bilgi düzeylerini ölçmeyi ve bilgi düzeyleri başta olmak üzere diğer sosyodemografik özellikleriyle ilişkisini araştırmayı amaçladık.

Yöntem: Çalışmamıza palyatif bakım servisinde 1 Kasım ile 31 Aralık 2018 tarihleri arasında yatarak tedavi alan hastalara bakım veren 109 kişi dahil edildi. Bakım verenlere sosyodemografik özellikleri ve bası yarası ile ilgili bilgi düzeyini değerlendiren soruları içeren anket formu uygulandı, bakım verenlerin baktıkları hastaların yara evresi hekim tarafından değerlendirildi.

Bulgular: Çalışmaya katılan bakım verenlerin yaş ortalaması $49,4 \pm 10,9$ (22-69) idi. Katılımcıların bilgi düzeyi puan ortalaması $70,1 \pm 18,5$ 'dir. Minimum puan 0 maksimum puan 100'dür. Bakım verenlerin %62,4'ünün bası yarası ile ilgili bilgilendirme aldığı, %30,3'ünün bası yarası ile ilgili bilgilendirme almadığı, %7,3'ünün ise kısmen bilgilendirme aldığı bulunmuştur.

Sonuç: Bası yarası ile ilgili bilgilendirme alan bakım verenlerin bilgi düzeyi değerleri, bilgilendirilmeyenlerden istatistiksel olarak anlamlı düzeyde yüksek bulunmuştur ($p=0.005$). Bu yüzden bu eğitimlerin devamının, bası yarasını önlemede önemli yer tuttuğunu düşünmekteyiz.

Anahtar kelimeler: Bası yarası, bakıcı, sağlık bilgisi

Received	Accepted	Published Online	Corresponding Author	E-mail
January 3, 2020	March 23, 2020	March 24, 2020	Hilal Özkaya, MD	ozkaya2012@gmail.com
Correspondence	Haydarpaşa Numune EAH. Palyatif Bakım Servisi, Selimiye Mah. Üsküdar İstanbul, Türkiye			

Introduction

Advances in medicine had positive results in the treatment of chronic diseases and cancer, and the human lifespan has been prolonged. With prolonged life, the need for palliative care has emerged [1].

One of the symptoms that should be evaluated most frequently in palliative care is pressure ulcers [2]. The pressure ulcer is a finding that has been known since ancient times [3]. It is a clinical condition that occurs due to the decrease in blood supply and oxygenation of the tissue as a result of exposure to pressure in the body parts with decreased mobilization [4]. Although the etiology of pressure ulcers cannot be clearly stated, it is known that it is caused by tissue ischemia resulting from prolonged exposure to pressure [5].

In the United States (USA), there were about 115,000 deaths due to pressure ulcers between 1990 and 2001, and more than 21,000 people were reported to be at risk of death due to pressure ulcers. Each patient has a treatment cost of \$37,800 to \$70,000 [6]. Preventing pressure ulcers from occurring is the most beneficial treatment approach. Treatment is laborious and costly once pressure ulcers occur [7]. Preventing pressure ulcers is one of the essential indicators of health quality all over the world. To provide effective care to patients, it is crucial to educate healthcare personnel and to create quality data about pressure ulcers [8].

Training of patient relatives and caregivers who serve the patient is as essential as the education of health personnel in preventing pressure ulcers. Even patients whose treatment ends at the health institution are at risk for pressure ulcer development when they are discharged.

When we look at the literature, studies examining the knowledge levels and attitudes of the healthcare personnel serving patients with pressure ulcers were found. Still, studies evaluating the knowledge levels of the caregivers or patient relatives who care for the patient other than the healthcare personnel were not found.

This study aimed to evaluate the rate of receiving pressure ulcer training and the adequacy of the knowledge level of the people who care for hospitalized patients in the palliative care service.

Methods

Our study is a single-center and cross-sectional survey. Between the dates of November 1 and December 31, 2018, 109 people aged 18-70, who spoke Turkish at a communication level, agreed to participate in the study, and gave care to patients hospitalized at the Haydarpaşa Numune Training and Research Hospital Palliative Care Service, were included in the study. Those who cared for their patients for less than 1 week were not included. The study was based on voluntary participation.

A questionnaire including questions about the socio-demographic characteristics such as age, nationality, gender, knowledge of Turkish, place of residence, and knowledge levels related to pressure ulcers was applied. Ten questions were prepared with 3-point Likert type responses, including yes, no, and no idea, as stated in Table 2. Each correct answer, specified as yes or no, was scored as 10 points, and a knowledge score over 100 was calculated. The questions were prepared from the high level of evidence information in the guidelines about pressure ulcers. Because this was a survey study, no cut-off score was used. As the number of correct answers increased, the knowledge score increased, and, thus, the level of knowledge was thought to increase. The wound staging of the patients was done by a physician. The wound phase was staged according to the NPUAP staging system (https://cdn.ymaws.com/npupap.site-ym.com/resource/resmgr/npupap_pressure_injury_stages.pdf Accessed on January 5, 2020.).

Ethical Approval

Approval was obtained from the Turkish Ministry of Health, University of Health Sciences, Haydarpaşa Numune Training and Research Hospital Clinical Research Ethics Committee with the decision number 2018/69, dated 22.10.2018.

Statistical Analysis

The SPSS (IBM SPSS Statistics for Windows, Version 22.0, NY, USA) program was used for statistical analysis. While evaluating the study data, the appropriateness of the parameters to normal distribution was assessed with the Shapiro-Wilk test. When analyzing the study data, descriptive statistical methods (mean, standard deviation, frequency) as well as the Kruskal-Wallis test for the between-group comparison of the variables that did not show a normal distribution, and the Mann-Whitney U test for determining the groups that caused the difference was used. Mann Whitney U test was used for comparisons between two groups that did not show normal distribution. Pearson correlation analysis was used to examine the relationships between parameters that show normal distribution. Statistical significance was evaluated at the level of $p < 0.05$.

Results

Our study was conducted with 109 participants meeting the inclusion criteria. The mean age of the participants was 49.4 ± 10.9 years (min: 22, max 69). The socio-demographic characteristics of the participants are summarized in Table 1.

Table 1. Socio-demographic characteristics of the participants

		n	%
Nationality	Turkish	85	78
	Other	23	21.1
	Not responded	1	0.9
Sex	Female	75	68.8
	Male	34	31.2
Turkish knowledge	Low	5	4.6
	Moderate	7	6.4
	Good	97	89
Educational status	Illiterate	3	2.8
	Primary education	51	46.8
	High school	39	35.8
	University	15	13.8
	Post graduate	1	0.9
Residency	Town	5	4.6
	City	102	93.6
	Village	2	1.8

Of the patients, 33.9% (n: 37) came from home, 11.9% (n: 13) from a nursing home, and 54.1% (n: 59) from another hospital. Of the transferred patients, 30% (n: 18) came from the anesthesia and reanimation department, 28.3% (n: 17) from the internal medicine department, and 10% (n: 6) from the emergency clinic.

When the pressure-ulcers of the patients were evaluated according to the NPUAP staging system, 55% (n: 55) had no pressure ulcers, 9% (n: 9) had stage 1, 14% (n: 14) had stage 2, 14% had (n: 14) stage 3, and 8% (n: 8) had stage 4 pressure ulcers.

Of the participants, 62.4% (n: 68) stated that they received information, 30.3% (n: 33) indicated that they did not receive information, and 7.3% (n: 8) expressed that they received partial information about pressure ulcers. The mean knowledge score of the caregivers was 70.1 ± 18.5 (minimum 0, maximum 100). The distribution of the answers given by the participants to the knowledge questions is summarized in Table 2.

Table 2. Distribution of answers to knowledge questions

	Yes	No	No idea
	n (%)	n (%)	n (%)
There is a risk of recurrence even if pressure ulcers heal after treatment.	87 (79.8%)	6 (5.5%)	16 (14.7%)
Pressure ulcers are more common in malnourished patients.	91 (83.5%)	12 (11%)	6 (5.5%)
Pressure ulcers are more common in patients who are fed with insufficient protein.	90 (82.6%)	11 (10.1%)	8 (7.3%)
Inadequate patient care and inadequate cleaning increase the risk of pressure ulcers.	100 (91.7%)	5 (4.6%)	4 (3.7%)
Pressure ulcers are more common in patients with chronic diseases.	42 (38.5%)	11 (10.1%)	56 (51.4%)
Pressure ulcers are only seen in bedridden patients.	78 (71.6%)	18 (16.5%)	13 (11.9%)
Pressure ulcers can also occur in infants and children.	65 (59.6%)	26 (23.9%)	18 (16.5%)
It is important to moisten the skin in preventing pressure ulcers.	100 (91.7%)	5 (4.6%)	4 (3.7%)
Position change has no effect in preventing pressure ulcers.	7 (6.4%)	97 (89%)	5 (4.6%)
Pressure ulcers cannot be prevented.	22 (20.2%)	74 (67.9%)	13 (11.9%)

No statistically significant relationship was found between the age of the caregivers and their knowledge level ($p=0.092$). The relationship between the age of the caregivers and the level of knowledge is described in Table 3.

Table 3. Relationship between knowledge level and age

	Age
Knowledge score	r
	-0.170
	p
	0.092

Pearson correlation analysis

It was seen that the knowledge level of those who were informed about pressure ulcers was significantly higher than those who were not informed ($p=0.005$). The relationship between the knowledge score of the caregivers, the nationality, education level, the place of residence, and being informed about pressure ulcers are shown in Table 4. The number of hospitalizations, length of care given to the patient, and wound stage were not related to the pressure ulcer knowledge score (Table 5).

Table 4. Relationships between the level of pressure ulcer knowledge and nationality, educational status, place of residence, and the status of being informed

		Knowledge Score
		Mean \pm SD (median)
Nationality	Turkish	69.76 \pm 19.39 (70)
	Other	71.3 \pm 16.04 (70)
		p^1 0.885
Educational Status	Primary education	69.63 \pm 15.66 (70)
	High school	72.05 \pm 22.15 (80)
	University	66.88 \pm 18.87 (70)
		p^2 0.338
Residency	Town/Village	67.14 \pm 12.54 (70)
	City	70.29 \pm 18.96 (70)
		p^1 0.404
Status of being informed about pressure ulcers	Yes	73.68 \pm 16.65 (80)
	No	63.33 \pm 18.98 (60)
	Partially	67.5 \pm 26.05 (75)
		p^2 0.019*

¹Mann-Whitney U test ²Kruskal-Wallis test * $p<0.05$ SD: Standard deviation

Table 5. Relationship of pressure ulcer information score and some parameters

		Knowledge Score
		Mean \pm SD (median)
		p^1 0.404
Number of hospitalizations of the patient	First time hospitalized	71.76 \pm 17.04 (70)
	Hospitalized more than once	70.27 \pm 19.07 (70)
		p^1 0.983
Care period given to the patient	Less than 1 month	71.58 \pm 18.09 (70)
	1-6 months	66.21 \pm 22.27 (70)
	More than 6 months	71.43 \pm 16.17 (70)
Ulcer stage	0	72.73 \pm 20.5 (80)
	1	68.89 \pm 16.16 (70)
	2	65.71 \pm 14.53 (70)
	3	67.14 \pm 18.58 (70)
	4	68.75 \pm 14.58 (70)
		p^2 0,349

¹Mann Whitney U test ²Kruskal Wallis test* $p<0.05$ SD: Standart Deviation

Discussion

Of the participants, 68.8% in our study were women, and the mean age of all participants was 49.4 \pm 10.9 years. Hosseinpoor et al. examined the socio-demographic characteristics of the caregivers of elderly people in low and middle-income countries, where the rate of female caregivers was found higher [9]. It was claimed that when the caregiver is young, they will understand the training better and make it easier to perform tasks that require physical effort such as the carrying and repositioning of the patient [10]. The reason for the lack of a significant difference between age and knowledge scores in our study may be the high mean age.

In our study, no significant relationship was found between pressure ulcer knowledge and nationality. In a study where Dilworth-Anderson et al. investigated the effect of race of caregivers, it was found that African-Americans were caring for their cultural characteristics by a higher rate than whites. These differences may originate from the geographical features of the countries, the parameters may change depending on the variety of ethnic structures in the country, and may produce different results [11]. In our study, it is known that caregivers from non-Turkish nationalities are usually full or semi-professional caregivers who are expatriates in Turkey.

When the education levels of the caregivers are analyzed, it is found that 46.8% of them are primary school graduates. In the study in which Oliveira and friends evaluated the relationship between the well-being of the persons who care for cancer patients and the socio-demographic characteristics, 54.2% of the caregivers were primary school graduates [12]. The educational level of caregivers was similar to that of our research.

In our study, no significant relationship was found between educational status and pressure ulcer knowledge. Education is achieved not only at the school level but also with increasing experience with age. Indeed, the mean age of the caregivers was high. These results may have emerged with the effect of social learning.

In the study in which Aathi investigated the knowledge level of the nurses regarding the prevention of pressure ulcers, they stated that pressure ulcer was a severe health problem in patients who were cared for in the hospitals, at home, and in the nursing homes. He explained that the incidence of pressure ulcers ranged from 1% to 11% in hospitalized patients, with the highest rate in intensive care patients [13]. In our study, 30% of the transferred patients came from the anesthesia and reanimation clinic. If the pressure ulcer rate in intensive care is reduced, caregivers may become more aware of their responsibility in preventing this condition.

While traditional wound care is aimed at a quality life by ensuring wound healing and closing, in palliative care, other symptoms related to the wound, comorbidities, and the psychosocial status of the patient are also evaluated [14]. Of the caregivers, 56% who participated in our study did not have information about the medical branch responsible for pressure ulcers. If the significance of palliative care is emphasized in wound management, caregivers may also actively participate in the treatment process and perceive more responsibility for the prevention of pressure ulcers.

In the study conducted by Gálvao et al., considering the criteria related to preventing pressure ulcers, the knowledge level of nurse trainers was found significantly higher than nurses [15]. In the study in which Simonetti et al. evaluated nursing students' attitudes and knowledge towards preventing pressure sores, the knowledge level of the second and third-grade students was higher than the first-grade students [16]. According to these studies, as the level of education of the health worker increases, the pressure ulcer knowledge level also increases. In our study, no significant relationship was found between the educational level of caregivers and the pressure ulcer knowledge. But most of the caregivers are not health professionals. Nevertheless, the level of pressure ulcer knowledge of people who received training on pressure sore was significantly higher.

In the study of Tweed et al., the effect of receiving training on the prevention of pressure ulcers in intensive care nurses was evaluated. After the training, the scoring in which the level of knowledge was assessed increased, but there was no statistically significant difference [17]. In our study, the mean pressure ulcer knowledge score was 70.1 ± 18.5 , and the information levels of those who were informed about pressure ulcers were significantly higher than those who were not informed. Similar results were reported in the literature. The education received increased the level of knowledge.

In the retrospective case analysis in which they described the inevitable conditions of pressure ulcers, Levine et al. found that comorbid conditions such as nutritional deficiency, diabetes, malignancy, gastrointestinal system diseases, anemia, renal diseases, hypoxia, and hypotension contributed to the development of pressure ulcers [18]. Of the caregivers in our study, 51.4% had no idea that pressure ulcer was more common in patients with chronic disease. Caregivers should be educated about the relationship between chronic illness and pressure ulcers. Most caregivers have one or more chronic conditions. If caregivers are aware of this situation, it may be easier to notice and take care of pressure ulcers.

In a study conducted in Minnesota hospitals in 2010, it was determined that 26% of the pressure ulcers in the hospital were caused by medical devices. Cervical collars, oxygen cylinders, nasogastric tubes, and catheters can cause pressure ulcers [19]. There is a lack of information for caregivers about the appearance of the pressure ulcers outside the usual places. In our study, 71.6% of caregivers think that pressure ulcer is seen only in bedridden patients. The caregivers should also be informed about the pressure of the patient's medical devices. It should also be emphasized that patients mobilized in a wheelchair should be carefully evaluated for pressure ulcers.

The incidence of pressure ulcers can vary from 3% to 28% in infants and children [20]. The structural features of the skin in a child differ according to the [21]. Since the head/body ratio is higher in children under the age of three, the occipital region is a risky area for pressure ulcer development [22]. Although our study is performed in an adult palliative service, more than half of the caregivers think that pressure ulcers may occur in babies and children, which suggests a good level of knowledge.

In the study of Kurtuluş et al., it was found that patients with pressure ulcers had more extended hospitalizations than patients without pressure ulcers [23]. In the study in which Tosun et al. examined the prevalence of pressure ulcers in elderly patients in intensive care units and the affecting factors, it was found that the hospitalization period of the patient with pressure ulcers was higher. When compared with the studies in the literature, they mentioned that there were more errors in the evaluation of stage 1 pressure ulcers, which affected the rates [24]. In our study, no relationship was found between the number of hospitalizations, duration of care given to the patient, and ulcer stage with the level of knowledge.

Due to the holistic approach to the treatment brought by our study in the palliative care service and the relatives of the patients joining the process, we believe that the provided training increases the level of pressure ulcer knowledge of the caregivers regardless of the socio-demographic characteristics.

Limitations

The lack of a validated instrument to assess the studied topic and the general restrictions of questionnaire studies are some limitations of this study.

Conclusion

Palliative care includes a holistic approach to improve the quality of life in patients with reduced possibilities for curative treatments. Pressure ulcers lessen the quality of life of patients. However, they are highly preventable. In our study, the pressure ulcer knowledge levels of the caregivers

were measured, which was compared with the presence of pressure ulcers. In our research, it was observed that 62.4% of the caregivers received previous information about the pressure ulcer, 30.3% did not receive information, and 7.3% received partial information. The level of knowledge about the pressure ulcer of those receiving information was considered as high. It is thought that providing training that increases the knowledge level of caregivers in palliative care centers may contribute to the quality of life of patients.

Conflict of interest: There is no conflict of interest in our study.

Financial support: No financial support has been received for the study.

References

1. Kivanc MM. [Palliative care services in Turkey] (in Turkish). HSP. 2017;4(2):132-5. <https://doi.org/10.17681/hsp-dergisi.316894>
2. Gulhan M. [Palliative care] (in Turkish). Available at: <http://file.lookus.net/TGHYK/tghyk.39.pdf>. (Access Date: February 12, 2019).
3. Yucel A. [Pressure Sores] (in Turkish). Turk J Intense Care. 2008;6(2):73-82. http://cms.galenos.com.tr/Uploads/Article_4250/73-82.pdf
4. Demirel M, Demiralp CO, Yormuk E. [Clinic experiences for pressure sores: years between 2000 and 2005] (in Turkish). J Ankara Univ Fac Med. 2007;60(2):81-7. https://doi.org/10.1501/Tipfak_00000000229
5. Costa MP, Sturtz G, Costa FPP, Ferreira MC, Filho TEPB. Epidemiological profile and treatment of pressure sores: experience with 77 cases. Acta Ortop Bras. 2005;13(3):124-32. <http://dx.doi.org/10.1590/S1413-78522005000300005>
6. Qaseem A, Mir TP, Starkey M, Denberg TD. Risk assessment and prevention of pressure ulcers: a clinical practise guideline from the American College of physicians. Ann Intern Med. 2015;162(5):359-69. <https://doi.org/10.7326/M14-1567>
7. Sonmez A. [Pressure Sores] (in Turkish). TJFMPC. 2003;7(2):57-62. <http://www.turkailehekderg.org/wp-content/uploads/2014/07/c07-s02-01.pdf>
8. Cowan L, Garvan C, Rugs D, Barks L, Chavez M, Orozco T. Pressure injury education in the department of veterans affairs. J Wound Ostomy Continence Nurs. 2018;45(5):419-24. <https://doi.org/10.1097/WON.0000000000000468>
9. Hosseinpour AR, Bergen N, Chatterji S. Socio-demographic determinants of caregiving in older adults of low- and middle- income countries. Age Ageing. 2013;42:330-8. <https://doi.org/10.1093/ageing/afs196>
10. Mersal FA, Mersal NA, Hussein HA. Effect on educational guidelines for prevention of immobilization complications on caregivers' performance and patients' functional condition. Am J Nurs Res. 2017;5(2):32-41. <https://doi.org/10.12691/ajnr-5-2-1>
11. Dilworth- Anderson P, Brummett H, Goodwin P, Williams SW, Williams RB, Siegler IC. Effect of race on cultural justifications for caregiving. J Gerontol B Psychol Sci Soc Sci. 2005; 60(5):257-62. <https://doi.org/10.1093/geronb/60.5.S257>
12. Oliveira WT, Matsuda LM, Sales CA. Relationship between wellness and socio-demographic characteristics of caregivers of people with cancer. Invest Educ Enferm. 2016; 34(1):128-36. <http://dx.doi.org/10.17533/udea.ieu.v34n1a15>
13. Aathi MK. Knowledge of nurses regarding prevention pressure ulcer. RRJoM. 2013;3(2):12-6.
14. Woo KY, Krasner DL, Kennedy B, Wardle D, Moir O. Palliative wound care management strategies for palliative patients and their circles of care. Adv Skin Wound Care. 2015; 28(3):130-40. <https://doi.org/10.1097/01.ASW.0000461116.13218.43>
15. Galvao NS, Serique MAB, Santos VLCG, Nogueira PC. Knowledge of nursing team on pressure ulcer prevention. Rev Bras. 2017;70(2):294-300. <http://dx.doi.org/10.1590/0034-7167-2016-0063>
16. Simonetti V, Comparcini D, Flacco ME, Giovanni P, Cicolini G. Nursing students' knowledge and attitude on pressure ulcer prevention evidence-based guidelines: a multicenter cross-sectional study. Nurse Educ Today. 2015; 35(4):573-9. <https://doi.org/10.1016/j.nedt.2014.12.020>
17. Tweed C, Tweed M. Intensive care nurses' knowledge of pressure ulcers: development of an assessment tool and effect of an educational program. Am J Crit Care. 2008;17(4):338-46. <https://doi.org/10.4037/ajcc2008.17.4.338>
18. Levine JM, Humphrey S, Lebovits S, Fogel J. The unavoidable pressure ulcer: a retrospective case series. JCOM. 2009;16 (8):359-63.
19. Nix D. Implementing and sustaining urinary catheter securement. Perspectives recovery strategies from the orto Home. Vol. 10, No.3. Available at: https://www.mnhospitals.org/Portals/0/Documents/patientsafety/PU_Med_dev/device_prevention_article.pdf. Access Date: (March 2, 2019).
20. Duzkaya DS, Terzi B, Yakut T, Kizil N. [Where we are on pressure ulcers? Data of last year in pediatric intensive care unit] (in Turkish).J Ata Uni Hem. 2014;17(4):239-44. <https://dergipark.org.tr/tr/pub/ataunihem/issue/2667/34775>
21. Freundlich K. Pressure injuries in medically complex children: a review. Children (Basel). 2017; 4(4): 25. <https://doi.org/10.3390/children4040025>
22. Parnham A. Pressure ulcer risk assessment and prevention in children. Nurs Child Young People. 2012;24(2):24-9. <https://doi.org/10.7748/ncyp2012.03.24.2.24.c8976>
23. Kurtulus Z, Pinar R. [Relation between Albumin Levels and Pressure Sore in High-Risk Patients Defined with Braden's Risk Assessment Tool] (in Turkish). Cumhuriyet Univ J Sch Nurs 2003;7(2):1-10. Available at: <http://eskidergi.cumhuriyet.edu.tr/makale/624.pdf> Access Date: March 24, 2020)
24. Tosun ZK, Boluktas RP. [Pressure Ulcer prevalence and effecting factors among elderly patients in intensive care units]. J Turk Soc Crit Care Nurs. 2015;19(2):43-53. <https://dergipark.org.tr/en/download/article-file/260163>