European Annals of Dental Sciences
Official Publication of Ankara University, Faculty of Dentistry

EADS, 2023, 50 (1), 47–51

e-ISSN : 2757-6744
Article Received/Accepted : June, 10 2022 / January, 23 2023
doi : 10.52037/eads.2023.0010

ORIGINAL RESEARCH ARTICLE

Evaluation of Readability and Content of Patient Information Texts on Turkish Websites about Pediatric Dentistry under Sedation

Tuğçe Nur Şahin [1,*] and Elif Esra Özmen [2]

[1]Department of Pediatric Dentistry, Karamanoğlu Mehmetbey University Ahmet Keleşoğlu Faculty of Dentistry, Karaman, TURKEY and [2]Department of Oral Surgery, Karamanoğlu Mehmetbey University Ahmet Keleşoğlu Faculty of Dentistry, Karaman, TURKEY

*Corresponding Author; tnsahin@kmu.edu.tr

Abstract

Purpose: Disability status, fear, and anxiety can pose an obstacle to planned dental treatment in children. In such cases, the delivery of dental treatment with sedation is a very common treatment method and more comfortable for both pediatric patients and physicians. This study aims to evaluate the readability and content of patient information texts on websites related to the delivery of dental treatments with sedation in pediatric patients.
Materials and Methods: The first 60 Turkish websites were scanned in Google (Google LLC, MountainView, California, USA) search using the keywords "pediatric dental treatment under sedation" in Turkish. After the first 60 websites were evaluated according to the exclusion criteria, a total of 31 websites were included in the study and the information texts were evaluated according to the Ateşman Readability Index (ARI). Their contents were also examined in terms of whether or not they provided sufficient information about the procedure.
Results: The texts examined in the study were moderately difficult (52,9±9,4) according to the ARI and at 11th – 12th grade level, most of the websites examined were owned by private clinics (64,5%), and the texts were prepared by pediatric dentists. The content of information on the examined websites could be deemed sufficient in terms of the definition of sedation (100%), the indications (100%), and the benefits (83,8%); however, the complications (29,1%), possible procedure-related complications (16,2%), its difference from general anesthesia (54,8%) and the cost (29,1%) were not addressed sufficiently.
Conclusions: The results of the study suggested that the relevant patient information texts on Turkish websites need to be organized in a more understandable manner. For this purpose, readability tests may be used before publishing the text. The reason why most of the texts did not mention contraindications, complications, and cost of sedation may be intending not to create fear or prejudice about the procedure among readers. However, when preparing an information text on an interventional medical procedure, it is legally and ethically required to inform the reader about that procedure fully and clearly.

Key words: patient information texts; pediatric dentistry; readability; sedation

Introduction

Patient's anxiety and fears are among the factors complicating the treatment in dental practices. Especially in the case of severe anxiety, fear, disability status, behavior disorders or severe gag reflex in pediatric patients, it is very difficult to perform the treatment, even if the known methods are used to communicate[1]. Such situations necessitate sedation or general anesthesia[2].

In the sedation method, the patient's level of consciousness is reduced using different agents and techniques; however, the patient may respond to physical stimuli and verbal commands and retains the ability to maintain his/her airway independently and continuously[3]. It is divided into three groups: conscious, moderate and deep. However, general anesthesia is another method that can be applied in cases where sedation is not deemed sufficient or appropriate. Depending on the drugs given during the sedation procedure, depression may occur in the patient's spontaneous ventilation and neuromuscular functions. In such a situation, the patient cannot respond to verbal or physical stimuli, and a general anesthesia procedure may be required.[3,4]. The American Dental Association's

How to cite: Sahin TN, OZmen EE. Evaluation of Readability and Content of Patient Information Texts on Turkish Websites about Pediatric Dentistry under Sedation. EADS. 2023;50(1):49-54

guidelines on sedation and general anesthesia practices suggested that at least 3 healthcare professionals (dentist, anesthesiologist and anesthesia technician) should be present during the procedure [5]. Furthermore, the American Academy of Pediatric Dentistry (AAPD) reported that it is more reliable to perform the aforementioned procedures in hospital settings with sufficient equipment for an effective intervention to any possible complications [6,7].

Sedation is a highly preferred method for dental treatments since it allows for performing medical interventions more safely by immobilizing the patient. It is also a known fact that it reduces the likelihood of dental treatments causing psychological trauma in children because of its ability to minimize physical pain and discomfort as well as its amnesic activity [8].

In addition to the benefits of sedation, its complications should be also known. The patient may aspirate blood/debris in the mouth or materials used during the treatment or develop an allergy to the drugs used for sedation. In the course of a sedation procedure at deeper levels where the airway reflexes may be impaired, some complications such as respiratory, circulatory depression, suppression of vital functions, and even cardiopulmonary arrest and death may occur. Since dental interventions with sedation are usually performed with the patient sitting in a dental unit, the patient may develop hypotension due to the sedation drugs [8,9].

It is known that people consider the internet as a valuable tool to obtain health information and search on the internet about their health conditions and medical interventions before applying to a health institution [10]. There is neither a regulation for the sources of information on the internet nor a mechanism to check the reliability or sufficiency of such information [11]. In this regard, it is essential that texts accessed by patients via the internet should contain sufficient and correct information and be accessible and understandable for citizens with a lack of knowledge on health [12].

The concept of readability first appeared in America in the 1800s [13], which refers to the reader's understanding of a text in a particular language [14]. Readability is a mathematical concept that represents the level of readability and understandability of a text piece by the reader and yields objective evaluation results. In the readability analysis, measurements and various formulas are used. For this, formulas such as Smog-Simple measurement, Gunning-Fog value, Flesch-Kincaid value, etc. were developed and there is also the Ateşman Readability Index (ARI) consisting of a formula that was created with mathematical values based on mean word and sentence lengths, by adapting into Turkish from Flesch's Reading Ease Formula in accordance with the language structure of Turkish [15–17]. A text in English should be written in short sentences with few syllables so that it can be easily read by a reader with 8 years of education [14]. In Turkish, which is an agglutinative language, the readability level does not only depend on the length of sentence and the syllable count of words [15].

The insufficient readability level of a text restricts the usefulness of available information. If a text has no sufficient content on the relevant subject, this may prevent the reader from have sufficient knowledge [18]. This study aims to evaluate Turkish patient information texts on the websites about pediatric dentistry under sedation, in terms of readability and content.

Material and Methods

This study did not require ethics committee approval because it used only public information. On July 9, 2022, the first 60 Turkish websites accessed through a Google search using the keywords "pediatric dental treatment with sedation" were examined. Texts shorter than 20 sentences (3), repetitive websites (2), lecture notes and articles written for academic purposes (5), forum sites (1), sites with unrelated content (5), and commercial sites (13) were excluded. The information of a total of 31 websites that did not meet the exclusion criteria was obtained and transferred to Microsoft Excel (Microsoft Corporation, Redmond, Washington, USA). While recording the author information of the patient information texts, if the clinic was belonged to a single physician, it was noted as such. If the website was belonged to a polyclinic, the author of the text was not specified and if there was a pediatric dentist in the polyclinic, the author was accepted as a pediatric dentist; if there was no pediatric dentist who worked in the polyclinic, the author was accepted as a dentist.

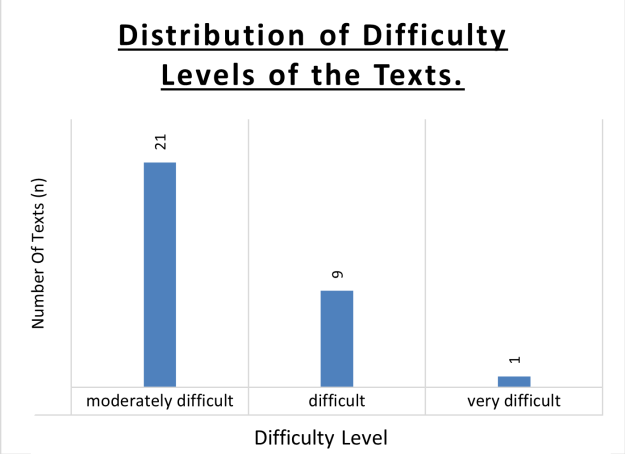

Figure 1. Distribution of difficulty levels of the texts.

The ARI formula used to determine the readability of the texts (the free online ARI program was accessed from http://okunabilirlikindeksi.com/). The text to be examined was copied from its own website and pasted into the relevant section of the online program, and readability was evaluated according to the results automatically generated. The obtained data such as readability index, number of words, difficulty level etc. were transferred to Microsoft Excel. According to ARI, a text is classified as very easy if the readability index is 90-100, as easy if it is 70-89, as moderately difficult if it is 50-69, as difficult if it is 30-49, and as very difficult if it is 1-29. According to the Reading Ease Classification, a text with readability index between 90-100 is considered easily understandable by 4th grade and below students, that is, the readability level of the text is 4th grade. Similarly, the readability level of the text with the readability index between 80-89 is 5th-6th grade, between 70-79 is 7th- 8th grade, between 60-69 is 9th- 10th grade, between 50-59 is 11th- 12th grade, between 40-49 is 13th- 14th grade (associate degree), between 30-39 is bachelor's degree and 29 and below is postgraduate degree [15,17].

To evaluate the content of the texts, the questions "Has the definition of sedation been mentioned?", "Have the indication and contraindications of sedation been mentioned sufficiently?", "Have its advantages and complications been described sufficiently?", "Has its cost been mentioned?", and "Has its difference from general anesthesia been mentioned sufficiently" were asked and the answers were recorded to Microsoft Excel (Microsoft Corporation, Redmond, Washington, USA). The AAPD guideline [6] was used as a resource for the adequacy of the answers to the questions asked. The data were analyzed using IBM SPSS Statistics Version 23 (SPSS Inc., Chicago, IL, ABD) package program. For statistical evaluation, descriptive statistics and Shapiro Wilk' s test were used. Since all quantitative variables except the number of difficult words, the number of sentences, the number of paragraphs and the mean word length were found to be normally distributed, they were summarized by mean± standard deviation (SD) and minimum(min)-maximum(max) values. Categorical variables were reported by frequency (n) and %. $p< 0.05$ was considered statistically significant.

Table 1. Distribution of the examined websites by their sources

Authors, source of the websites	n	%
Anesthesiologist, News and media site	2	6.5
Dentist, Private clinic's site	3	9.7
Dentist, News and media site	2	6.5
Pediatric dentist, Private polyclinic's site	20	64.5
Dentist, Private medical center's site	1	3.2
Pediatric dentist, Private university hospital's site	3	9.7

Results

Table 1 shows that the physicians who prepared the information text on the examined websites included dentists (6), pediatric dentist (23) and anesthesiologist (2) and these texts could be mostly accessed through the websites of private polyclinics (64,5%).

Descriptive statistics of the linguistic outcomes used in the evaluation of the texts according to ARI are given in Table 2. The mean readability index of the examined texts was 52,9±9,4 and the mean readability level was found as 11th- 12th grade. Based on these values, the mean difficulty level of the texts can be classified as moderately difficult. The distribution of the readability levels of 31 websites is also given in Table 3.

According to the results of the evaluation of 31 websites based on the readability levels as given in Figure 1, 21 (67,8%) of the texts were classified as moderately difficult, 9 (29%) difficult, and 1 (3,20%) very difficult. As seen in Table 4, when the content of the patient information texts was examined, it was seen that sedation definition (100%), to whom it can be administered (100%) and its benefits (83,8%) were described understandably; however, only 16,2% of the websites included possible complications/ risks during and after the sedation as well as the difference between general anesthesia and sedation (54,8%) and the cost (29,1%) were not mentioned sufficiently.

Discussion

With the increasing number of internet users and the easier access to information on the internet, it has become easier to access health information, especially for patients [15,16,19]. It is a known fact individuals get information from the internet before consulting a physician when they have a health problem [20]. A study showed that 8 of 10 people use the internet to reach health information [21]. According to Turkish Statistical Institute 2019 data, searching health information (69,8%) is among the most common purposes of using the internet in Turkey [22]. Information on the internet is presented in audio or video format, but mostly in text format [23]. Thus, the readability of written patient information texts is important. It is known that people in Turkey mostly prefer Google to search on the internet [24]. In this study, the written texts of websites accessed by Google were examined.

It was found that 75% of individuals getting health information from the internet did not check the source of this information. In this respect, it is substantial to check the reliability and correctness of information on the internet [21,25]. The study is among the first studies that have evaluated patient information texts in Turkish about sedation in pediatric dentistry, in terms of both readability and content. As in other studies conducted in Turkish (11, 21, 28), since only the texts in Turkish were examined, the ARI developed for Turkish was used.

It is known that when people search about any topic on the internet, their potential to search more than 50 websites is low [26,27]. However, in the study, the number of websites to be examined was determined as 60 due to the large number of ads on the page when the keywords are entered in Google.

In a study [28] conducted in Turkey, the website containing patient information text about dental prosthesis treatment was examined via Google and it was reported that 94 websites belonged to private clinics, 4 to educational institutions and 2 to oral and dental health centers. Similarly in the current study, 87% of the websites belonged to private institutions. In addition to the purpose of informing, this situation may have been caused by the need for advertising in private institutions. The number of words is 1013,41±94,31, the number of sentences is 81,53±68,57 and the reading index is 66,48±9,69 in contrast to this study [28]; in the current study, the number of words is 597,9±452,8, the number of sentences is 52,3±41,9, the reading index is 52,9±9,4. Considering all these information, it can be said that the information texts about dental prosthetics on the internet are longer but more understandable than the information texts about dental treatment under sedation.

A study reported the mean education level in Turkey is 6,51 on grade basis [29]. When the texts on the internet about pediatric dental treatment with sedation are examined, the mean readability level was found 11th- 12th grade and the readability level of the lowest-level website was found 9th- 10th grade. According to these data, it can be said the texts about pediatric dentistry under sedation examined in the study are difficult to understand in terms of informing patients and their relatives in Turkey.

Studies (13, 23, 30) in the literature examined based on ARI the readability of patient information texts about other dental treatments performed in Turkey and have very similar results to the current study. All studies (13, 23, 30) stated the texts evaluated were difficult to understand and rearranging them would be better for the patients and their relatives. Also, in a study [30] that examined texts related to dental trauma using different readability indexes, similar results were obtained to the current and the mentioned studies.

The use of sedation in dentistry has become more common. A

Table 2. Descriptive statistics of texts in terms of language according to ARI

Linguistic outcomes	n	min	max	mean±SD
Number of words	31	75	2310	597.9±452.8
Number of characters	31	582	17971	4712.2±3563.8
Number of difficult words	31	73	2259	590.9±445.2
Number of unique words	31	0	584	290.2±158
Number of unique words (%)	31	0	77	60.3±17.9
Number of short words (<5 characters)	31	19	409	100.9±80
Number of short words (<5 characters) (%)	31	12	25	16.9±3.3
Number of characters without spaces	31	507	15638	4131.5±3094.8
Number of sentences	31	3	209	52.3±41.9
Number of paragraphs	31	2	133	25.1±24.7
Mean word length	31	2.64	3.25	2.8±0.1
Mean sentence length	31	8.2	25	12.5±3.4
Readability index	31	22.7	69.3	52.9±9.4
Readability level (difficulty level)	31	9^{th}- 10^{th} grade	Postgraduate Degree	11^{th}- 12^{th} grade

min: minimum max: maximum SD: Standard Deviation

Table 3. Distribution of the texts by readability levels

Readability level	n	%
9th- 10th grade	6	19.4
11th- 12th grade	15	48.4
13th- 14th grade	8	25.8
Bachelor Graduate	1	3.2
Postgraduate	1	3.2

Table 4. Evaluation of the content of the texts

Contents of the texts	Answer	n	%
Definition of Sedation	Yes	31	100
Indications of Sedation	Yes	31	100
Contraindications of Sedation	Yes	9	29.1
	No	22	70.9
Benefit / Advantages	Yes	26	83.8
	No	5	16.2
Complication / Risks	Yes	5	16.2
	No	26	83.8
Difference from General Anesthesia	Yes	17	54.8
	No	14	45.2
Cost	Yes	9	29.1
	No	22	70.9

study reported that 100000-250000 pediatric dental sedations are performed each year in the USA[31]. Since the number of pediatric dental treatment approaches under sedation is increasing in Turkey, it is aimed to analyze the readability and content of patient information texts on the subject[32].

With the increasing number of studies on dental treatments under sedation around the world, the use of sedation is subject to severe critics in terms of possible complications[9]. There are reported cases that resulted in death or permanent neurological damage depending on the sedation administered for dental procedures[33,34]. In the current study, only 16,7% of the informative texts about such a procedure with severe complication probability mention the complications, which is quite insufficient. It is thought that this might be since the physicians who prepared the texts do not want to create prejudice or fear in patients about the procedure. It is believed that patients and their relatives should be completely informed about a medical intervention.

Sedation is a costly procedure[35]. Only 9 of the websites examined under the study included cost information. It is believed that in order not to damage the physician-patient relationship especially in private institutions, it is essential for the patient and relatives to know the fact that the cost of sedation may vary according to the dental treatments to be applied, before consulting with his/her physician. Thus, it is believed that informative texts should have sufficient information on the cost of dental treatment under sedation. On the other hand, the study has some limitations including the examination of a part of websites in Turkish and the dynamic nature of internet that is continuously updated and changed.

Conclusion

The results of the study suggested that the relevant patient information texts on Turkish websites need to be organized more understandably. For this purpose, convenient readability formulas may be used before publishing the text. It is seen that the examined texts sufficiently highlighted the positive aspects of sedation (indications, benefits/advantages), but not sufficiently mentioned other aspects, which might seem relatively frightening and detract the patient from sedation (contraindications, complications/risks, cost). This might be due to fact that the physicians who prepared the texts did not want to create fear or prejudice in patients and their relatives for sedation procedure. However, when preparing an information text on an interventional medical procedure, it is legally and ethically required to inform the reader about the procedure fully and clearly. Accordingly, it is suggested that the patient information texts on the internet about sedation in pediatric dentistry should be updated considering the readability principles, the procedure should be explained sufficiently including all aspects, and in the future, texts should be prepared according to these principles.

Author Contributions

Author Contributions: T.N.Ş.: Study design, literature review, data collection and processing, preparation of the manuscript. E.E.Ö.: Literature review, data collection and processing, preparation of the manuscript.

Conflict of Interest

The authors deny any conflicts of interest related to this study.

Authors' ORCID(s)

T.N.Ş. 0000-0002-7617-9719
E.E.Ö. 0000-0003-1920-4655

References

1. Leelataweedwud P, Vann Jr WF. Adverse events and outcomes of conscious sedation for pediatric patients: study of an oral sedation regimen. JADA. 2001;132(11):1531–1539. doi:10.14219/jada.archive.2001.0086.
2. Bodur H, Berrin I, Oztas N, Odabas ME, CINAR C, Ulusu T. Kaygili cocukların dis tedavileri sirasinda uygulanan azot protoksit/oksijen sedasyonunun etkinliğinin degerlendirilmesi. GU Diş Hek Fak Derg. 2011;28(1):29–33.
3. Bolgul B, Serindere G. Pedodontide Sedasyon. Dent & Med J - R. 2019;1(1):28–36.
4. Charles J Coté SW. American Academy of pediatrıc dentistry. Clinical guideline on the elective use of conscious sedation, deep sedation, and general anesthesia in pediatric dental patients. Pediatr Dent.2003; 25: 73-78. Pediatr Dent. 2019.
5. American Dental Association. Guidelines for the use of sedation and general anesthesia by dentists. Adopted by the ADA House of Delegates. 2016.
6. Coté CJ, Wilson S, Pediatrics AAo, Dentistry AAoP. Guidelines for monitoring and management of pediatric patients before, during, and after sedation for diagnostic and therapeutic procedures. Pediatrics. 2019;143(6). doi:10.1542/peds.2019-1000.
7. Ozler CO, Keceli TI, TEKCICEK MU. Cocuk Dis Hekimligi ve Genel Anestezi. Ank Med J. 2019;19(3):658–664. doi:10.17098/amj.624720.
8. Gulay K, Atabek D, Alkan M, Alacam A. Cocuk Hasta Grubunda Dis Tedavileri Sirasinda Uygulanan Sedasyon Islemlerinin Retrospektif İncelenmesi. GMJ. 2019;30:184–187.
9. Berrin I. Dis Hekimliginde Sedasyon. ADO Klinik Bilimler Dergisi. 2021;10(3):150–158.
10. Ozturk G, Gumus H. Cocuklarda Genel Anestezi Altında Uygulanan Dis Tedavileri ile İlgili YouTube Videolarının İçerik Analizi. Selcuk Dental Journal. 2021;8(1):140–147. doi:10.15311/selcukdentj.856093.
11. Akbulut AS. Internet Ortamindaki Seffaf Plak Tedavisi ile Ilgili Bilgilerin Okunabilirlik Analizi. NEU Dent J. 2022;4(1):7–11. doi:10.51122/neudentj.2022.2.
12. Jayaratne YS, Anderson NK, Zwahlen RA. Readability of websites containing information on dental implants. Clin Oral Implants Res. 2014;25(12):1319–1324. doi:10.1111/clr.12285.

13. DuBay WH. The principles of readability. Online Submission. 2004.
14. Bezirci B, Yilmaz AE. A software library for measurement of readability of texts and a new readability metric for Turkish. DEU FMD. 2010;12(3):49–62.
15. Ateşman E. Measuring readability in Turkish. AU Tomer Language Journal. 1997;58(2):171–74.
16. Çoban A. Okunabilirlik Kavramına Yonelik Bir Derleme Calismasi. Dil ve Edebiyat Egitimi Dergisi. 2014;(9). doi:10.12973/dee.11.227.
17. Flesch R. A new readability yardstick. J Appl Psychol. 1948;32(3):221.
18. Svider PF, Agarwal N, Choudhry OJ, Hajart AF, Baredes S, Liu JK, et al. Readability assessment of online patient education materials from academic otolaryngology–head and neck surgery departments. Am J Otolaryngol. 2013;34(1):31–35. doi:10.1016/j.amjoto.2012.08.001.
19. Topsakal KG, Aksoy M, Akbulut AS. Çocuklara Uygulanan Ortodontik Tedavilere Iliskin Youtube Videolarının Iceriklerinin Değgrlendirilmesi. NEU Dent J. 2021;3(3):108–114. doi:10.51122/neudentj.2021.25.
20. Kim K, Kwon N. Profile of e-patients: analysis of their cancer information-seeking from a national survey. J Health Commun. 2010;15(7):712–733. doi:10.1080/10810730.2010.514031.
21. Dilaver E, Kilinc DD. Evaluation of quality and reliability of websites about orthognathic surgery using Google Trends (TM) application. APOS Trends Orthod. 2020. doi:10.25259/APOS_125_2019.
22. Hane halkı bilisim teknolojileri (BT) kullanim arastirmasi [Web Page]. TUIK; 2019. Available from: https://tinyurl.com/6xfjek6x.
23. Norman CD, Skinner HA. eHealth literacy: essential skills for consumer health in a networked world. JMIR. 2006;8(2):e506. doi:10.2196/jmir.8.2.e9.
24. Browser Market Share Turkey June 2021 - June 2022 [Web Page];. Available from: https://gs.statcounter.com/browser-market-share/all/turkey/#month-ly-202101-202201.
25. Madden M, Fox S. Finding answers online in sickness and in health. vol. 2. Pew Internet & American Life Project Washington, DC; 2006.
26. Leira Y, Castelo-Baz P, Perez-Sayáns M, Blanco J, Lorenzo-Pouso AI. Available patient-centered Internet information on peri-implantitis. Can our patients understand it? Clin Oral Investig. 2019;23(4):1569–1574. doi:10.1007/s00784-018-2583-y.
27. McMorrow SM, Millett DT. Adult orthodontics: a quality assessment of Internet information. J Orthod. 2016;43(3):186–192. doi:10.1080/14653125.2016.1194599.
28. Degirmenci K. Dis Protezi Hakkında Bilgi Sunan Turkce Internet Sitelerinin Okunabilirlik Duzeylerinin Degerlendirilmesi: Nitel Arastirma. Turkiye Klinikleri J Dental Sci Cases. 2022;28(4). doi:10.5336/dentalsci.2022-89887.
29. Yesilyurt M, Karadeniz O, Gulel F, Caglar A, Uyar S. Mean and expected years of schooling for provinces in Turkey. PJESS. 2016;3(1):1–7.
30. Kılınç G, Atesci AA. Evaluation of Quality and Readability of Online Information on Treatments of Traumatic Dental Injuries. Selcuk Dental Journal. 2022;1(1).
31. Nelson TM, Xu Z. Pediatric dental sedation: challenges and opportunities. Clin Cosmet. 2015;7:97.
32. Akyıldız BM. Sedasyon veya Genel Anestezi Altında Yapılan Dental Tedavilerin Çocuk Hastaların Yaşam Kaliteleri Üzerine Etkisi. 2019:77–82.
33. Chicka MC, Dembo JB, Mathu-Muju KR, Nash DA, Bush HM. Adverse events during pediatric dental anesthesia and sedation: a review of closed malpractice insurance claims. Pediatr Dent. 2012;34(3):231–238.
34. Cote CJ, Notterman DA, Karl HW, Weinberg JA, McCloskey C. Adverse sedation events in pediatrics: a critical incident analysis of contributing factors. Pediatrics. 2000;105(4):805–814. doi:10.1542/peds.105.4.805.
35. Kocaman G. Periodontal cerrahi öncesi dental anksiyete duzeyi ve progresif gevseme egzersizlerinin vital bulgular uzerine etkisi. Cukurova Medical Journal. 2019;44:352–357. doi:10.17826/cumj.559480.