

# Evaluation of the Readability of Turkish Online Resources Related to Laryngeal Cancer

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## ABSTRACT

**Objective:** The aim of this study was to investigate the readability of patient education materials in Turkish about laryngeal cancer.

**Methods:** Patient education materials were determined by entering the term “gırtlak kanseri”, which is the Turkish equivalent of laryngeal cancer, into the Google search engine. The first 50 websites were determined. Duplicates, academic journals, videos, only graphics or tables were excluded. The websites are categorized as Hospitals, Doctors, and General information websites. These websites were evaluated with the Ateşman readability scale.

**Results:** After applying inclusion and exclusion criteria, 40 websites were analyzed. 19 PEM articles were included on Hospitals websites, 14 on Doctors websites, and 7 on General Information websites. The mean Ateşman readability score of the articles was  $58.5 \pm 7.06$ . Hospitals websites mean score was  $59.16 \pm 6.87$ . Doctors' websites average score was  $57.25 \pm 7.41$ . General information websites mean score was  $59.28 \pm 7.59$ . There was no significant difference in readability scores of Hospitals websites, Doctors websites and General Information websites ( $P=0.569$ ).

**Conclusion:** Patient education materials in Turkish about laryngeal cancer are above the desired reading level. Increasing the readability levels of websites to the desired level can help patients reach the right treatment and better compliance to the treatment process.

**Keywords:** laryngeal cancer, Ateşman readability index, patient education materials

## INTRODUCTION

Laryngeal cancer is the second most common malignancy of the upper respiratory system [1]. 54% of laryngeal cancers are detected at an early stage [2]. In the early stage, especially in cancer at the glottic level, 5-year survival reaches 90% [3].

The use of the Internet as a source of information on health-related issues is increasing. According to the data of 2022 in our country, the rate of internet usage is 85% [4]. Patients diagnosed with cancer, or their relatives are more likely to refer to the internet for information about their disease. The internet has an important place in patients' decisions about their health. Considering the survival rates of laryngeal cancer - which reaches up to 90% -especially in the early stage and the morbidity in the treatment process, the importance of patient education materials (PEM) about laryngeal cancer on the internet is understood.

Patient information texts on the Internet; can be used to

accurately inform patients about the diagnosis, treatment, benefits and possible risks of treatment types, and post-treatment follow-up processes. At the same time, these texts can provide patient-physician communication and facilitate patient compliance with treatment [5]. However, it is important that the texts are understandable. Approximately 40% of the American population has insufficient health literacy [6]. This rate is 57.9% in our country [7]. The American Medical Association (AMA) and the National Institutes of Health (NIH) recommend that complex medical information should be written in an effective manner that maximizes comprehension and should be understood at or below six-year education level, due to the poor health literacy of the majority of the population [8,9].

Readability is a concept that objectively measures how difficult a written text is to be read for the reader by using various mathematical formulas. Formulas can be prepared in accordance

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with the grammatical structure of each language. Ateşman readability formula, developed in accordance with the syllable and word structure of Turkish texts, is designed to determine the readability levels of Turkish texts [10]. According to the Ateşman readability formula, the texts are divided into five levels: very easy, easy, medium difficulty, difficult and very difficult. It is recommended that the texts should be easy and very easy to read [10] (Table 1).

The aim of this study is to investigate the readability of online resources written in Turkish for patients who apply to the internet for information about laryngeal cancer.

**Table 1.** Ateşman Readability Formula

Scores	Levels
90-100	very easy
70-89	easy
50-69	medium difficulty
30-49	difficult
1-29	very difficult

**METHODS**

Patient Education Materials (PEM) on “Laryngeal cancer” were identified by searching on Google Search. The search term used was “gırtlak kanseri”, which is the Turkish equivalent of laryngeal cancer. Only “full sentence” and “Turkish language” are selected in the advanced search. The top 50 websites that come up as a result of the search are included. Only those containing graphics or tables, academic journals, videos, and repetitive websites were excluded. Since public data were used in our study, an ethics committee is not required.

The materials were divided into three categories: (1) Hospitals (2) Doctors (3) General Information websites. Hospitals were defined institutionally as the websites of private, public and foundation hospitals. Physicians were defined as websites belonging to the physicians’ own names. General information websites, on the other hand, were defined as newspapers and general information websites in the field of health, excluding the first two groups.

Each meaningful text on laryngeal cancer was copied into a separate Microsoft Word (version 2010; Microsoft, Redmond, WA) document. Non-educational text such as web page navigations,

copyright notices, disclaimers, author information, feedback polls, links, website URLs, references, figures, tables, footnotes, addresses, and phone numbers have been removed to avoid affecting readability scores.

The readability levels of the texts were calculated using the Ateşman readability formula (198.825-40.175x (total syllables/total words)-2.610x (total words/total sentences)) [10]. Mean, standard deviation, median, minimum, maximum value, frequency, and percentage were used for descriptive statistics. The distribution of variables was checked with the Kolmogorov-Smirnov test. Kruskal-Wallis was used to compare quantitative data. SPSS 28.0 program was used for statistical analysis.

**RESULTS**

After applying the inclusion and exclusion criteria, 40 websites were reviewed. 19 PEM on Hospitals websites met the inclusion criteria. A total of 14 PEM were included on the Doctors websites. 7 PEM from General Information websites were included. Mean Ateşman readability scores of the materials were 58.5±7.06. While the lowest score was 45.4, the highest score was calculated as 73 (Table 2).

Hospitals websites mean score was 59.16±6.87, while the lowest score was 47, the highest score was 72.4. Doctors’ websites average score was 57.25±7.41, lowest score was 45.7, highest score was 73. On the General information websites, the mean score was 59.28±7.59, the lowest score was 45.4, and the highest score was 69.4 (Table 3). There was no significant difference in readability scores of Hospitals websites, Doctors websites and General Information websites (p=0.569) (Table 4).

There were no very easy-level materials. There were two materials on the easy level. There were no very difficult materials. There were five materials on the difficult level. The remaining 33 materials were at medium difficulty level.

**DISCUSSION**

The aim of this study was to determine the readability of Turkish language online resources about laryngeal cancer. The materials were examined in three different groups as Hospitals, Doctors and General Information websites. Almost all of the related websites were above the readability level.

The use of the Internet to obtain health-related information has been increasing in recent years [11]. With the increase in Internet use in Turkey, they use search engines more frequently for health-related information [4]. An increasing number of doctors and health professionals create and share health-related content on the internet, and patients can access these resources with the help of search engines. The results of these searches affect patients’ compliance to treatment. It is known that information obtained from accessible and safe sources positively affects the treatment process [12] and will play an increasingly important role in health care, especially for diabetes and other chronic diseases. Diabetes patients with limited health literacy have worse health outcomes, and limited health literacy may be a barrier to effectively utilizing internet-based health access

**Main Points:**

- There were no very easy-level materials.
- There were only two materials on the easy level.
- There were no very difficult materials.
- 33 (82.5%) materials were at medium readability level.
- There was no difference between the materials prepared by hospitals and doctors and general information websites.
- Hospitals and health professionals have a duty to provide patients with easy-to-understand educational materials.

**Table 2.** Ateşman readability scores of all the resources

	N	Minimum	Maximum	Mean	Std. Deviation
VAR00001	40	45.40	73.00	58.5175	7.06493
Valid N (listwise)	40				

**Table 3.** Readability scores of Hospitals, Doctors and General Information websites

		N	Minimum	Maximum	Mean	Std. Deviation
Hospitals	VAR00001	19	47.00	72.40	59.1684	6.87645
	Valid N (listwise)	19				
Doctors	VAR00001	14	45.70	73.00	57.2500	7.41659
	Valid N (listwise)	14				
General Information	VAR00001	7	45.40	69.40	59.2857	7.59088
	Valid N (listwise)	7				

**Table 4.** Statistical analysis of readability scores

VAR00003	N	Mean Rank
Hospitals	19	21.58
Doctors	14	17.89
General Information	7	22.79
Total	40	
Test Statistics <sup>a,b</sup>		
Kruskal-Wallis H		1.126
df		2
Asymp. Sig.		<b>0.569</b>

a. Kruskal Wallis Test

b. Grouping Variable: VAR00003

services. We investigated use of an internet-based patient portal among a well characterized population of adults with diabetes. We estimated health literacy using three validated self-report items. We explored the independent association between health literacy and use of the internet-based patient portal, adjusted for age, gender, race/ethnicity, educational attainment, and income. Among 14,102 participants (28% non-Hispanic White, 14% Latino, 21% African-American, 9% Asian, 12% Filipino, and 17% multiracial or other ethnicity).

Laryngeal cancer is an important disease in terms of morbidity and mortality. It is quite understandable for patients to refer to the internet to get information about the process of the disease after being diagnosed. Online patient education materials can be useful to increase patient compliance with treatment. Although the content of the training materials contains correct information, it is important that it is understandable by the patient.

In the literature, there are different results according to the subject studied in the studies conducted with educational materials in Turkish language. In a study examining Turkish

language materials on vertigo, the materials were generally found to be easy to read [13]. Kozanhan and Tutar, on the other hand, found that online materials on anesthesiology required academic literacy and were well above the recommended levels [14]. Özduran et al. found that Turkish educational materials on low back pain were at medium readability level [15]. Cifci et al., in their study examining the Turkish language materials on 'Substance Addiction', concluded that the materials were at difficult readability level [16]. In another study examining Turkish materials on skin cancer, it was concluded that the materials were at medium readability level [17]. Similarly, in the study on colorectal cancer, the materials were found to be at medium readability level [18]. The materials in our study were at medium difficulty level and this seems to be compatible with the literature studies in Turkish.

As far as we know, there is no study on the readability levels of laryngeal cancer education materials in Turkish. In a study on English language materials on laryngeal cancer, the materials were found to be difficult to read [19] cochleostomy (C. This is well above the recommended level. In our study, although the

materials were not at the desired level, they were not at a very difficult level. This shows that the Turkish language materials on laryngeal cancer are more readable. However, the limited number of studies indicates that more studies are needed.

In our study, 40 different educational materials in Turkish about laryngeal cancer were examined. None of these were at a very easy readability level. There were only 2 (5%) materials with easy readability. However, there was also material that was very difficult to read. There were 5 (12.5%) materials at the difficult readability level. The remaining 33 (82.5%) materials were at medium readability level. These data show us that patient education materials in Turkish about laryngeal cancer are not at the level that they should be. However, the fact that there is no material at very difficult level, only 12.5% of the material is at difficult level, and 82.5% of the material is at medium level, showing that these materials can be moved to a level that patients can understand better with a little effort. This can be considered as an opportunity to increase patients' compliance with treatment and to facilitate patient-physician communication.

In our study, there was no difference between the materials prepared by hospitals and doctors and general information websites. Hospitals and health professionals have a duty to provide patients with easy-to-understand educational materials. The low level of health literacy in our country makes this even more important.

#### Limitations

This study has some limitations. First, using only the Google search engine may not reflect the experience of all users. Search engines used other than Google are not included in this study. Google was used because it is the most frequently used search engine. Second, the readability score does not evaluate the scientific accuracy of websites. Third, only written materials are evaluated while calculating the readability scores. Whereas an online resource with a graphic or video may be much more understandable.

#### CONCLUSION

Laryngeal cancer is a disease that can be treated and has a high survival rate at an early stage. It is vital for patients to be able to receive information about their disease and to be compliant with the treatment. Having the readability scores of the websites at the recommended level, especially very easy level will ensure that the patients are informed correctly and will increase their compliance with the treatment.

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