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Evaluation of Readability of Turkish Websites About Smoking Cessation

Sigara Bırakma Hakkında Hazırlanan Türkçe İnternet Sitelerinin Okunabilirliğinin Değerlendirilmesi

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Abstract

Objective: This study aimed to examine the readability levels and contents of Turkish websites on smoking cessation.
Method: A search was performed in August 2019 by typing the word "smoking cessation" in Google search engine (https://www.google.com). Commercial websites, advertisement websites, chat websites, forum websites, magazine websites, websites containing only images or videos, and websites with less than 10 sentences were excluded from the study. The readability levels of Turkish websites on smoking cessation were determined according to the Ateşman and Bezirci-Yılmaz readability formulas.
Results: A total of 62 websites (23 (37.1%) in the first group and 39 (62.9%) in the second group) were included in the study. The median Ateşman and Bezirci-Yılmaz readability values were respectively 48.47 and 13.08. The median number of sentences was 34.00. The median number of words was 439.00.
Conclusion: This study found that the readability level of Turkish websites on smoking cessation was "difficult" according to the Ateşman readability formula and at "undergraduate level" according to the Bezirci-Yılmaz readability formula. These results are fairly higher than the education level of Turkish people.

Keywords: Readability, smoking cessation, internet

Öz

Amaç: Bu çalışmada sigara bırakma hakkında hazırlanmış Türkçe internet sitelerinin okunabilirliğinin ve içeriklerinin incelenmesi amaçlanmıştır.
Yöntem: Ağustos 2019 tarihinde Google (https://www.google.com.tr) arama motoruna "sigara bırakma" kelimeleri yazılarak arama yapılmıştır. Bu sitelerden ticari blog siteleri, reklam içeren siteler, sadece resim ya da video içeren siteler, sohbet siteleri, forum siteleri, magazin içerikli siteler, cümle sayısı 10 dan daha az olan siteler dışlanmıştır. Sigara bırakma hakkında Türkçe internet sitelerinin okunabilirlik düzeyleri, Ateşman ve Bezirci-Yılmaz okunabilirlik formüllerine göre belirlenmiştir.
Bulgular: Çalışmaya 23(%37,1) "ü birinci grup, 39(%62,9)"u ikinci grup olmak üzere toplam 62 site alınmıştır. Çalışmaya alınan internet sitelerinin Ateşman okunabilirlik medyan değeri 48,47, Bezirci-Yılmaz okunabilirlik medyan değeri 13,08, cümle sayısı medyan değeri 34,00, kelime sayısı medyan değeri 439,00 olarak bulundu.
Sonuç: Sigara bırakma içerikli Türkçe internet sitelerindeki metinlerin, Ateşman" a göre okunabilirlik aralığı "zor", Bezirci-Yılmaz" a göre ise "lisans" düzeyindedir. Bu sonuçlar, halkımızın eğitim seviyesinin çok üstündedir.

Anahtar kelimeler: Okunabilirlik, sigara bırakma, internet

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Introduction

Cigarette and its smoke contains more than 4000 toxic substances that are considered as Group 1 carcinogenic substances (1). Cigarette has the potential to be addictive because of the high nicotine levels it has. Cigarette affects not only the smoker, but also those who are exposed to smoke. Cigarette is one of the most preventable causes of death worldwide, and was held responsible for nearly six million deaths. It is projected that this number will rise to 7.5 million worldwide by 2020 (2). Cigarette can be associated with approximately 40 chronic diseases that do not result in direct death, and is also associated with nearly 20 fatal diseases (3). The three main causes of smoking-related mortality are cardiovascular diseases, lung cancer, and Chronic Obstructive Pulmonary Disease (4).

With the cessation of smoking, there are decreases in the development of diseases caused by smoking and in the risk of death. In a cohort study conducted with 50.000 participants in Norway, the cessation of smoking reduced the risk of mortality between the ages of 40 and 70 in both men and women (5). The sooner smoking is quit, the lower the risk of death. According to a meta-analysis study conducted on smoking and old age on the elderly, quitting smoking even after the age of 80 was found to reduce mortality (6).

The Turkish Statistical Institute (TUIK) reported that internet access rate was 69.5% in 2015 in our country, and 87.9% in 2019 (7). This rate continues to increase with each passing day. According to 2016 TUIK data, the number of people using the Internet to search for health-related information was 65.9% (8). With the advances in technology, people use the Internet more often to learn about health problems.

Readability is defined as the easy or difficult understandability of a text by the reader, and can be objectively measured using various mathematical formulas (9). The basic criteria used in evaluating the difficulty or ease of understanding texts are; sentence length, syllable count of words, concrete–abstract words, synonyms, antonyms, combined-simple words, prefixes-suffixes and compound words (10). The Fry Readability Graphic, Flesch-Kincaid Readability Formula, Gunning Fog Index, and Dale Cale Formula, which measure the readability of texts, are among the commonly used international scales (11). However, since the language of these scales is English, they are not used in Turkish texts. For this reason, readability formulas were developed by Ateşman (12) and Bezirci-Yılmaz (13) to measure the readability of Turkish texts.

With increasing Internet use, information about diseases, drugs, medical treatment, surgeries and alternative treatment methods can easily be accessed. This can facilitate the increase in the awareness of patients, adapt to treatment, and strengthen the doctor-patient relation, but might also cause that individuals access misinformation and have unintended consequences. For this reason, it is important that websites are reliable and up-to-date in terms of accurate information, and are also readable and understandable. In this study, the purpose was to examine the readability levels of the websites prepared about smoking cessation according to Ateşman and Bezirci-Yılmaz readability formulas, and also to evaluate the contents of these websites.

Method

For this descriptive study, permission was obtained from Health Sciences University, Konya Education Research Hospital, Specialization at Medicine Board (dated 13.06.2019, decision number 48929119/774). Google (https://www.google.com.tr) search engine was employed with the keywords “smoking cessation” in August 2019. The websites on the first 10 pages were examined. A total of 300 websites on these pages were examined, and 62 websites that did not meet the exclusion criteria were included in the study. The commercial blog websites, websites that contained advertising, those containing only pictures or videos, chat websites, forum websites, websites with magazine contents, and websites with less than 10 sentences were excluded from the study. The readability levels of the Turkish websites

about smoking cessation were determined according to Ateşman and Bezirci-Yılmaz readability formulas. The websites that were included in the study were examined in two groups according to the institutions and organizations that prepared them. The first group consisted of hospital information websites, websites with the "gov.tr" extension, and websites of health associations; and the second group consisted of news websites and other websites.

Bezirci-Yılmaz Readability Formula

The Bezirci-Yılmaz Readability Formula was created based on sentence length and syllable counts in texts. It was developed in 2010 based on the statistical characteristics of the Turkish Language (13). According to this formula, the excessive number of words in sentences, increased number of syllables in words, and the length of a sentence affect the readability of a text. The length of the sentences of a text or the increase in the number of syllables in words decreases the readability of it. The Bezirci-Yılmaz readability formula is given below.

YOD √OKS ((H3 0.84) (H4 1.5) (H5 3.5) (H6 26.25))
YOD: New Readability Value
OKS: Average Word Count
H3: Average 3-Syllable Word Count
H4: Average 4-Syllable Word Count
H5: Average 5-Syllable Word Count
H6: Average 6-Syllable Word Count

The result obtained with this formula explains the class level of a text according to the education system in our country. The education system shows primary education for 1-8 classes, secondary education (high-school) for classes 9-12, undergraduate for classes 12-16, and academic education level for classes 16 and above.

Ateşman Readability Formula

It was developed by Ender Ateşman in 1997. It is the Turkish adaptation of the Flesh Ease of Reading formula based on the lengths of words and sentences. In the Ateşman formula, the readability level of a text is "very easy" if the total score is between 90-100, "easy" between 70-89, "medium" between 50-69, "difficult" between 30-49, and "very difficult" between 1-29 (12).

Readability level score = 198.825 – 40.175 x (total syllables/total words) – 2.610 x (total words / total sentences)

Statistical Analysis

The categorical statistics of the categorical data used in the study were shown by using frequency and percentage values, and the numerical data were shown by using median, and minimum-maximum values. Whether the study groups were distributed normally or not was tested by using the Shapiro Wilks and Kolmogorov Smirnov Tests. The Mann-Whitney U-Test was used in the study in numerical data comparisons between the independent groups, and the Chi-Square Test was employed in categorical data comparisons. All the statistical analyses were performed bilaterally, at 5% significance limit, and within 95% confidence interval in the study. The SPSS® 21.0 (IBM Inc., USA) Software was used for data analysis.

Results

A total of 62 websites were included in the study, with 23 (37.1%) in the first group, and 39 (62.9%) in the second group. The Ateşman Readability Median Value of the websites included in the study was 48.47 (Min=20.78 Max=76.99); Bezirci-Yılmaz readability median value was 13.08 (Min=0.00 Max=25.06), the number of sentence median value was 34.00 (Min=11.00 Max=328.00), the word count median value

was 439.00 (Min=154.00 Max=4940.00), the syllable count median value in a word was 2.91 (Min=2.59 Max=3.41), and the median value of four-syllable and above word count in a sentence was 3.82 (Min=1.46 Max=7.23).

No statistically significant differences were detected between Ateşman Readability values of the study groups (p=0.942), Bezirci-Yılmaz readability values (p=0.444), the average syllable count of words (p=0.710), and the average 4 and above-syllable word count in the sentence (p=0.919) (Table 1).

Table 1. Comparison of the readability level of the groups

Readability Values	1.Group n=23	2.Group n=39	p
Ateşman readability value	48,57 (28,37-76,99)	48,38 (20,78-67,76)	0,942
Bezirci-Yılmaz readability value	13,32 (0,00-18,26)	12,88 (0,00-25,06)	0,444
Mean number of syllables	2,93 (2,59-3,41)	2,91 (2,61-3,15)	0,710
Average number of syllable words of ≥4 in the sentence	4,1 (1,46-7,07)	4,05 (1,93-7,23)	0,919

*Mann-Whitney U test

When the readability ranges of the internet websites included in the study were examined, 4 (6.5%) were found to be “very difficult”, 29 (46.8%) were “difficult”, 28% (45.2) were “moderately difficult”, and 1 (1.6%) was “easy”. No statistically significant differences were detected between the readability ranges of the groups according to Ateşman (p=0.481) (Table 2).

Table 2. Evaluation of the groups readability intervals according to Ateşman

Ateşman readability ranges	1.Group n=23	2.Group n=39	p
Very difficult + difficult	13(%56,5)	20(%51,3)	0,690
Medium difficulty + easy	10(%43,5)	19(%48,7)	

*Chi Square test

When the contents of the websites included in the study were examined, 38 (61.3%) included information on the damages of smoking, 39 (62.9%) information about smoking addiction, 6 (9.7%) information about the damages of electronic cigarettes, 46 (74.2%) information about smoking cessation treatment, 25 (40.3%) information pharmacological treatment, 27 (43.5) information hypnosis treatment, 7 (11.3%) information bioresonance treatment, 11 (17.7%) information about acupuncture treatment, and 6 (9.79%) included information about the side effects of pharmacological treatment.

Discussion

Smoking is among the preventable mortality reasons. Smoking cessation prevents the occurrence of all tobacco-induced diseases, and reduces the mortality risk (14). Clinicians have big tasks in terms of tobacco addiction, and multi-faceted approaches are required since it is a social problem. As the internet is the shortest and easiest way to access information in the technology age we are in, society firstly refers to Internet resources in terms of health. The accuracy and up-to-date status of this information is important as well as the readability and understandability. In the literature review we conducted about smoking cessation, no studies were detected on the readability of Turkish websites. Our study is the first one on this subject.

The average sentence length in Turkish language is 9-10 words in Ateşman Formula, and 10-11 words in Bezirci-Yılmaz Formula. The average word length is 2.6 syllables in both formulas (12, 13). In our study;

however, the length of the words on the websites that were included in the study on smoking cessation was determined to be above the specified values. When the literature using the same formulas as our study on readability was reviewed, it was seen that there were few studies. In the study conducted by Ebem et al., which evaluated the readability levels of a series of intravenous (IV) and intramuscular (IM) injection informed consent forms used at university, public, and private hospitals, it was found that the readability of these forms was very low, and that these forms should be revised in a way that could be read easily by the entire society (15).

Kara et al. examined the readability of Turkish websites on Autism Spectrum Disorder (11) and on specific learning disorders (16). Both studies reported that the websites examined were "difficult" according to Ateşman, and at "undergraduate" level according to Bezirci-Yılmaz. In the study conducted by Eker et al. on the readability level of health training materials used in Physical Therapy and Rehabilitation Clinics, it was determined that readers had to complete a training for at least 10-12 years to understand the brochures, and that the materials were difficult to understand (17).

In a study conducted by Kozanhan et al. on patient information texts prepared in the field of anesthesia on Turkish websites, -given the level of education of our country- it was determined that the readability rates were very low, and that the level of these websites were at academic literacy level (9). In our study, it was determined that the Turkish websites about smoking cessation are difficult to understand. In the study conducted by Solak evaluating the readability of Turkish websites on colon cancer, it was found that the readability level of the relevant texts was at "moderate" level according to the Ateşman formula, and at "undergraduate" level according to the readability formula of Bezirci-Yılmaz (18).

According to the Ateşman Readability Formula, the readability of websites about "smoking cessation" was "difficult", and at the "undergraduate" level according to the readability formula of Bezirci-Yılmaz in our study. The 2018 Humanitarian Development Report said that the average education duration for adults in our country was 8 years (19). When this is considered, the readability and understandability of the websites on "smoking cessation" was well above the average level of the society.

When the contents of the websites included in our study were examined, it was found that although the damages of smoking and electronic cigarettes were mentioned adequately, smoking addiction and cessation treatments were not mentioned at adequate levels. No statistically significant differences were detected between Ateşman readability values, Bezirci-Yılmaz readability values, average syllable counts of words, and the average four and above-syllable word count in the sentences of the study groups. This shows us that those who prepare these websites, whether they are healthcare professionals or other professional groups, do not pay adequate attention to the readability.

This study has several limitations. First, it may not be correct to generalize the research results to the country due to the small number of sites included in the study. In order to develop electronic health services effectively, medical sites should be organized in accordance with various quality criteria. The second limitation of the study is that most of the sites examined in the study are not certified sites that are not audited for quality.

As a conclusion, the readability of the texts on Turkish websites on "smoking cessation" were found to be "difficult" according to Ateşman, and at "undergraduate" level according to Bezirci-Yılmaz formula. When the level of education of our people is considered, these results are quite high. To enable patients and their relatives who want to learn about smoking cessation to understand what they read on websites, a simple language should be chosen where less-syllable words, sentences with fewer words, and medical terms are as little preferred as possible.

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