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Evaluation of youtube videos about hashimoto's thyroiditis in terms of quality and reliability

Gokcen Unal Kocabas[1], Pinar Alarslan[2]

[1]Ege University Faculty of Medicine, Department of Endocrine and Metabolic Diseases, Izmir, Turkey
[2]Baskent University Zubeyde Hanım Training and Research Hospital, Department of Endocrine And Metabolic Diseases, Izmir, Turkey

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Abstract

This study aimed to evaluate the quality and reliability of Turkish YouTube videos about Hashimoto's thyroiditis. This cross-sectional study was carried out using the first 66 videos, sorted according to the relevance, obtained following a video search performed on June 18, 2020, by typing 'Hashimoto thyroiditis' on YouTube. The quality and reliability of included YouTube videos were evaluated by two independent researchers using DISCERN, Global Quality Score [GQS] and JAMA criteria. The GQS2 scores of the patient (p=0.035), other healthcare personnel (p=0.019) and non-endocrinologist videos (p=0.028) were lower than those of endocrinologist videos (p=0.03). DISCERN2 scores of non-endocrinologist doctor (p=0.014), other healthcare personnel (p=0.022) and patient (p=0.008) videos were lower than those of endocrinologist videos (p<0.05). The number of views (p=0.002) and subscribers (p=0.007) of channels belonging to the institution or doctors were less than those of other groups. A positive correlation was found between video duration and number of likes (r=0.47), number of dislikes (r=0.28), JAMA1 (r=0.28), JAMA2 (r=0.29), DISCERN1 (r=0.27) and DISCERN2 (r=0.26). A positive correlation was found between the number of views and number of likes (r=0.82), dislikes (r=0.90) and subscribers (r=0.49). A positive correlation was found between JAMA1, JAMA2, GQS1, GQS2, DISCERN1 and DISCERN2 scores. The quality and reliability of endocrinologist videos for Hashimoto's thyroiditis were greater. The quality and reliability of Hashimoto's thyroiditis videos were not related to their popularity. YouTube videos published by doctors can serve as a quality and reliable learning interface about Hashimoto's thyroiditis.

Keywords: Endocrinology, thyroiditis, hashimoto disease, internet, social media

Introduction

Hashimoto's thyroiditis, also known as chronic autoimmune thyroiditis or chronic lymphocytic thyroiditis, is an autoimmune disease that destroys thyroid cells through cell- and antibody-mediated immune processes. Worldwide, the most common cause of hypothyroidism is insufficient dietary iodine intake, while in developed countries, it is Hashimoto's thyroiditis. The estimated incidence of Hashimoto's thyroiditis is 0.8 per 1000 per year in men and 3.5 per 1000 in women [1].

The patients with Hashimoto's thyroiditis are frequently followed by specialist physicians in the field of internal medicine or endocrinology, however people from various disciplines have started to make suggestions or comments on this issue on some platforms, even though they do not have expertise in the subject. The Internet and social media are perceived as promising platforms for informal learning, as they contain a large amount of information and are easily and highly accessible. However, for areas such as health that are conceptually rich and require specialist knowledge, this attraction can be deceptive and the quality of online health information is a concern [2]. In a systematic review of multiple studies, 70% of the studies have reported that the quality of online health information (accuracy, completeness, readability, design, descriptions and references provided) was an issue [3]. Misleading YouTube videos are much more popular than non-misleading ones [4, 5]. However, social media platforms can be a way to reach people who do not appreciate the scope of traditional mass media as much as others, but who are still positive towards science [6]. In addition, online knowledge sharing platforms provide opportunities for people to comment and discuss published content, providing a chance to engage in discussion associated with constructive processes and learning [7].

YouTube is an easy-to-use platform for hosting video content, and the content found here reaches a global audience [8]. YouTube has

***Corresponding Author:** Gokcen Unal Kocabas, Ege University Faculty of Medicine, Department of Endocrine and Metabolic Diseases, Izmir, Turkey
E-mail: gokcenunal3@yahoo.com

more than two billion monthly logged in users, and more than one billion hours of videos are watched every day [9]. Scientific or non-scientific suggestions on this platform, which is very widely used, reach more and more people.

This study aimed to evaluate the quality and reliability of Turkish YouTube videos about Hashimoto's thyroiditis.

Materials and Methods

This cross-sectional study was conducted by YouTube research for Hashimoto's thyroiditis in Turkish at 12.12.2020. Ethics committee approval is not necessary for this type of study.

Since it was not possible to evaluate all videos published in Turkish, which were found as a result of the search performed by typing 'Hashimoto's thyroiditis' into the search engine, the first 66 videos ranked according to their relevance were included in the analysis. Videos reproduced after the first sample was published were not included in the analysis. Each of the videos consisting of several parts was evaluated as a separate videos. As regards the recency of the video, the time from uploading to data collection, number of subscribers, number of views and number of likes or dislikes of the channel at the date of data collection were recorded. Content producers were classified according to their respective expertise categories.

The quality and reliability of YouTube videos included in the analysis were evaluated by two independent researchers using DISCERN, Global Quality Score (GQS) and JAMA criteria. The researchers were both experienced in the field of Endocrinology .

The scores given by the experts to the scales were named 1 and 2 (such as GQS1 and GQS2). Videos were rated for reliability using the DISCERN scale developed by Oxford University. Each question was answered and evaluated as 'yes' (1 point) or 'no' (0 points). Higher scores represent better quality, reliability and sophistication [10]. The overall quality of the videos was subjectively rated using a 5-point Likert-type GQS, which evaluates the quality of information, ease of use and usefulness of the video for a user. As the score obtained from the scale increases, the quality of the video also increases [11]. JAMA, another measurement tool used to evaluate the quality of videos, consists of four questions of 1 point each. Higher scores obtained from the scale indicate an increase in the quality of information [12].

Statistical analyses

Research data were evaluated using IBM SPSS v26 (SPSS Inc., Chicago, IL, USA). As a result of the Kolmogorov–Smirnov normality test applied for continuous variables, only DISCERN2 was normally distributed ($p>0.05$), and all other variables were not normally distributed ($p<0.05$). Accordingly, nonparametric tests were used in all analyses to be applied to all variables, except DISCERN2. Analysis of variance and least significant difference post hoc analyses were used for the DISCERN2 variable, and Kruskal–Wallis and Dunn–Bonferroni post hoc tests were used for all non-normally distributed variables. Spearman correlation analysis was used to examine the relationships between variables. Statistical significance level was accepted as $p<0.05$.

Results

Among the video group included in the analysis, the groups that uploaded the most videos were non-endocrinologist doctors (51.5%) and endocrinologist users (34.9%). Overall, 86.4% of all videos were published by doctors. In the channels where the videos were broadcasted, the highest rate belonged to doctors (48.5%). The frequency of videos broadcasted from a doctor or institution channel was 62.1%. Majority of YouTube content reviewed was about general information with 53.0% [Table 1].

Table 1. Descriptive features of YouTube videos

Variables	n [%]
Video uploader	
Endocrinologist	23[34.9%]
Non-endocrinologist physician	34[51.5%]
Health personnel other than physician	5[7.6%]
Patient	2[3.0%]
Other	2[3.0%]
Channel	
Physician	32[48.5%]
Institutional	9[13.6%]
Entertainment	10[15.2%]
Other	13[19.7%]
Unknown	2[3.0%]
Content	
General information	35[53.0%]
Treatment	12[18.2%]
Experience	6[9.1%]
Pathogenesis	13[19.7%]
Total	**66[100.0%]**

GQS2 scores of video groups uploaded by patients (p=0.035), non-physician health personnel (p=0.019) and non-endocrinologist physicians (p=0.028) were significantly lower than the scores of the video group uploaded by endocrinologists (p=0.03). DISCERN2 scores of non-endocrinologist physician (p=0.014), non-physician health personnel (p=0.022), patient (p=0.008) videos and other (p=0.021) videos were significantly lower than those of endocrinologist videos (p=0.01) [Table 2].

The distribution of the number of views of YouTube videos by channel type was significantly different from each other (p=0.002). The number of watched videos of institutional channels was lower than that of entertainment channels (p=0.001) and other channels (p=0.004). The number of views of videos of physicians' channels was significantly lower than that of videos of entertainment channels (p=0.009) and other channels (p=0.04). The number of likes according to the type of channel on which the videos were broadcasted was significantly different (p=0.013). The number of likes of institutional channels was significantly lower than that of videos of physician (p=0.029), entertainment (p=0.001) and other (p=0.022) channels.

The distribution of videos in terms of the number of dislikes was significantly different between the groups (p=0.002). The number of dislikes of videos of institutional channels were significantly lower than that of videos of entertainment (p=0.003) and other (p=0.009) channels. The number of dislikes of physician channels was lower than that of entertainment channels (p=0.004) and other channels (p=0.013).

Table 2. Distribution of parameters measured by type of video uploader [Mean±SD, Median [Min-Max]]

	Endocrinologist	Non-endocrinologist physician	Health personnel other than physician	Patient	Others	Total	p
Duration on YouTube [day]**	317.4±473.9, 111[24-1642]	409.1±403.0, 240[39-1743]	460.5±260.0, 458[206-720]	804.5±260.9, 804.5[620-989]	535.5±560.7, 535.5[139-932]	395.8±422.5, 182[24-1743]	0.07
Views**	317.4±473.9, 111[24-1642]	26115.1±54277.7, 6832.5[21-291000]	15624±18637.8, 13000[120-46000]	18000±2828.4, 18000[16000-20000]	136880±181189.0, 136880[8760-265000]	22485.6±50584.9, 6840.5[21-291000]	0.40
Like**	317.4±473.9, 111[24-1642]	272.5±392.8, 49.5[0-1500]	231.6±232.4, 225[1-543]	279.5±68.6, 279.5[231-328]	3527.5±4910.9, 3527.5[55-7000]	290±893.4, 46.5[0-7000]	0.08
Dislike**	3.3±5.5, 1[0-26]	15.5±29.8, 2[0-149]	8.2±10.0, 3[1-25]	26.5±12.02, 26.5[18-35]	86±113.1, 86[6-166]	13.2±29.6, 2[0-166]	0.08
Subscriber**	27355.7±37240.5, 13700[45-107000]	76434.9±157451.4, 14400[221-767000]	62851±49524.2, 82000[55-113000]	31246±43916.99, 31246[192-62300]	16980±17847.4, 16980[4360-29600]	54803.7±116789.3, 13700[45-767000]	0.47
JAMA1**	0.5±0.7, 0[0-2]	0.5±0.7, 0[0-2]	0±0, 0[0-0]	0±0, 0[0-0]	0±0, 0[0-0]	0.4±0.6, 0 [0-2]	0.29
JAMA2**	0.5±0.7, 0[0-2]	0.4±0.8, 0[0-3]	0±0, 0[0-0]	0±0, 0[0-0]	0±0, 0[0-0]	0.4±0.7, 0 [0-3]	0.34
GQS1**	3.1±0.9, 3[1-4]	2.6±1.2, 2[0-5]	1.8±0.8, 2[1-3]	2±1.4, 2[1-3]	2±1.4, 2[1-3]	2.7±1.1, 3[0-5]	0.05
GQS2**	3.3±1.1, 4[1-5]	2.6±1.2, 3[0-5]	2.0±0.7, 2[1-3]	1.5±0.7, 1.5[1-2]	2.5±2.1, 2.5[1-4]	2.8±1.2, 3[0-5]	0.03*
DISCERN1**	37.3±13.9, 36[16-68]	36.4±16.6, 31[16-75]	27.8±16.12, 23[17-56]	26±7.1, 26[21-31]	23.5±6.4, 23.5[19-28]	35.3±15.4, 31[16-75]	0.23
DISCERN2***	41.7±11.2, 42[23-67]	34.6±10.5, 31[16-53]	29.6±6.8, 26[24-40]	20.5±0.7, 20.5[20-21]	23.5±9.2, 23.5[17-30]	35.9±11.4, 35.5[16-67]	0.01*

* Statistically significant at the 0.05 level, ** Kruskal Wallis Test, *** ANOVA

Table 3. Distribution of measured parameters by channel type [Mean±SD, Median [Min-Max]]

	Physician	Instutional	Entertainment	Others	p
Duration on YouTube [day]**	318.3±289.8, 163.5[24-911]	401.1±534.8, 146[39-1642]	537.5±594.3, 286[62-1743]	486.1±485.5, 270[57-1451]	0.675
Views**	11244.9±17165.3, 3006[64-73000]	3806.1±6744.34 556[21-21000]	64535.1±88159.7, 39000[239-291000]	33892.77±70402.79, 9470[2658-265000]	0.002*
Like**	156±269.5, 46.5[0-1100]	27.6±38.1, 5[0-105]	460±475.8, 295.5[4-1500]	709.9±1907.7, 36[5-7000]	0.013*
Dislike**	7.22±15.72, 1[0-80]	1.3±1.9, 1[0-5]	31.7±44.4, 19.5[0-149]	23.5±44.6, 5[0-166]	0.002*
Subscriber**	16062.7±28603.7, 13700[45-155000]	33528.2±46778.8, 8050[55-107000]	202877±243710.4, 88750[1910-767000]	47274.8±43525.5, 29600[192-122000]	0.007*
JAMA1**	0.5±0.7, 0[0-2]	0.6±0.7, 0[0-2]	0.2±0.4, 0[0-1]	0.4±0.6, 0 [0-2]	0.635
JAMA2**	0.4 ± 0.8, 0[0-3]	0.4±0.7, 0[0-2]	0.2±0.4, 0[0-1]	0.5±0.8, 0 [0-2]	0.879
GQS1**	2.7±1.0, 3[0-5]	2.4±1.1, 2[1-4]	2±1.0, 2[1-4]	3.1±1.2, 3[1-5]	0.124
GQS2**	2.8±1.1, 3[0-4]	2.78±1.39, 3[1-5]	2±1.15, 1.5[1-4]	3.23±1.3, 3[1-5]	0.138
DISCERN1**	36.1±14.1, 33[16-75]	34.8±15.3, 33[16-68]	28±16.1, 19.5 [17-65]	41.1±17.6, 37[19-69]	0.122
DISCERN2***	38.2±10.4, 39.5[16-53]	37±12.0, 33[24-63]	33.1±15.4, 30[16-67]	32.6±10.5, 31[17-50]	0.409

* Statistically significant at the 0.05 level, ** Kruskal Wallis Test, *** ANOVA

Table 4. Distribution of parameters measured by content type [Mean±SD, Median [Min-Max]]

	General information	Treatment	Experience	Pathogenesis	p
Duration on YouTube [day]**	426.5±485.0, 165[24-1743]	422.7±394.7, 210[80-1129]	421±344.8, 349.5[61-989]	278.8±295.7, 120[60-848]	0.588
Views**	25795.7±64882.9, 3756[21-291000]	33754.2±36712.2, 22000[1000-126000]	16384±18545.5, 12073.5[595-51000]	5988.1±9022.5, 3000[97-34000]	0.038*
Like**	369.5±1203.4, 32[0-7000]	302.9±342.3, 152.5[17-1000]	256±267.5, 197[18-749]	79.6±124.0, 46[1-483]	0.062
Dislike**	15.0± 37.1, 1[0-166]	18.7±24.6, 7[2-80]	12.5±13.7, 10[0-35]	79.6±124.0, 46[1-483]	0.013*
Subscriber**	54027.7±96932.9, 10435[45-355000]	45587.3±43124.4, 20450[224-113000]	168673.5±296639.2, 61250[192-767000]	79.6±124.0, 46[1-483]	0.535
JAMA1**	0.5±0.6, 0 [0-2]	0.4±0.7, 0 [0-2]	0.3±0.8, 0[0-2]	0.3±0.6, 0[0-2]	0.716
JAMA2**	0.4±0.6, 0 [0-2]	0.6±1.1, 0[0-3]	0.3±0.8, 0[0-2]	0.2±0.4, 0[0-1]	0.897
GQS1**	2.5±1.3, 2 [0-5]	2.8±0.8, 3[1-4]	2.7±1.2, 2.5[1-4]	2.7±0.8, 3[2-4]	0.736
GQS2**	2.7±1.3, 3[0-5]	2.8±1.0, 3[1-5]	2.5±1.4, 2.5[1-4]	2.9±1.0, 3[1-4]	0.920
DISCERN1**	34.1±17.3, 28 [16-75]	39.8±14.7, 39[18-67]	39.3±18.2, 34[21-72]	32.7±7.4, 33[23-51]	0.357
DISCERN2***	36.5±11.9, 36[16-67]	41.2±12.4, 47[19-53]	29.7±11.3, 25.5[20-49]	32.4±6.9, 30[24-44]	0.128

* Statistically significant at the 0.05 level, ** Kruskal Wallis Test, *** ANOVA

Table 5. Spearman Correlation Analysis results of measured parameters

	r [p]		r [p]
Views-Duration on YouTube	0.17[p=0.187]	GQS2-Duration on YouTube	0.16[p=0.199]
Like-Duration on YouTube	0.47[p<0.001]*	GQS2-Views	0.05[p=0.672]
Like-Views	0.82[p<0.001]*	GQS2-Like	0.11[p=0.400]
Dislike-Duration on YouTube	0.28[p=0.023]*	GQS2-Dislike	0.05[p=0.690]
Dislike-Views	0.90[p<0.001]*	GQS2-Subscriber	-0.03[p=0.797]
Dislike-Like	0.81[p<0.001]*	GQS2-JAMA1	0.45[p<0.001]*
Subscriber-Duration on YouTube	0.06[p=0.665]	GQS2-JAMA2	0.51[p<0.001]*
Subscriber -Views	0.49[p<0.001]*	GQS2-GQS1	0.86[p<0.001]*
Subscriber-Like	0.46[p<0.001]*	DISCERN1-Duration on YouTube	0.27[p=0.030]*
Subscriber-Dislike	0.43[p<0.001]*	DISCERN1-Views	0.04[p=0.775]
JAMA1-Duration on YouTube	0.28[p=0.024]*	DISCERN1-Like	0.11[p=0.402]
JAMA1-Views	-0.19[p=0.125]	DISCERN1-Dislike	0.04[p=0.736]
JAMA1-Like	-0.08[p=0.537]	DISCERN1-Subscriber	-0.04[p=0.756]
JAMA1-Dislike	-0.21[p=0.097]	DISCERN1-JAMA1	0.50[p<0.001]*
JAMA1-Subscriber	-0.23[p=0.065]	DISCERN1-JAMA2	0.56[p<0.001]*
JAMA2-Duration on YouTube	0.29[p=0.019]*	DISCERN1-GQS1	0.81[p<0.001]*
JAMA2-Views	-0.16[p=0.203]	DISCERN1-GQS2	0.71[p<0.001]*
JAMA2-Like	-0.07[p=0.555]	DISCERN2-Duration on YouTube	0.26[p=0.034]*
JAMA2-Dislike	-0.13[p=0.298]	DISCERN2-Views	0.07[p=0.601]
JAMA2-Subscriber	-0.18[p=0.156]	DISCERN2-Like	0.07[p=0.567]
JAMA2-JAMA1	0.82[p<0.001]*	DISCERN2-Dislike	0.03[p=0.810]
GQS1-Duration on YouTube	0.20[p=0.119]	DISCERN2-Subscriber	-0.13[p=0.312]
GQS1-Views	0.17[p=0.179]	DISCERN2-JAMA1	0.46[p<0.001]*
GQS1-Like	0.21[p=0.091]	DISCERN2-JAMA2	0.45[p<0.001]*
GQS1-Dislike	0.14[p=0.265]	DISCERN2-GQS1	0.60[p<0.001]*
GQS1-Subscriber	0.03[p=0.805]	DISCERN2-GQS2	0.55[p<0.001]*
GQS1-JAMA1	0.43[p<0.001]*	DISCERN2-DISCERN1	0.62[p<0.001]*
GQS1-JAMA2	0.49[p<0.001]*		

* Statistically significant at the 0.05 level

The number of subscribers of the channels of videos published according to the channel type was significantly different from each other (p=0.007). The number of subscribers of entertainment channels was significantly higher than those of physician (p=0.002) and institutional (p=0.018) channels [Table 3].

The distribution of the number of views of the videos according to the type of content was significantly different (p=0.038). The number of views for pathogenesis-related videos (p=0.011) and general-content videos (p=0.010) was lower than for treatment-related videos. The number of dislikes of treatment-related videos were higher than that of pathogenesis-related videos (p=0.002) and general-content videos (p=0.011) [Table 4].

A moderate positive correlation was found between video duration and like (r=0.47), while dislike (r=0.28), JAMA1 (r=0.28), JAMA2 (r=0.29), DISCERN1 (r=0.27) and DISCERN2 (r=0.26) scores had a low level of positive correlation. A very strong positive correlation was found between the number of views and likes (r=0.82) and dislikes (r=0.90), while a moderate positive correlation was found between the number of subscribers (r=0.49). A very strong positive correlation was noted between the number of views and likes (r=0.82) and dislikes (r=0.90), while a moderate positive correlation was found between the number of subscribers (r=0.49). A moderate positive correlation was observed between the number of dislikes and the number of subscribers (r=0.43) and a low positive correlation between the duration (r=0.28). A strong positive correlation was found between JAMA1 and JAMA2 (r=0.82), while a moderate positive correlation was found between GQS1 (r=0.43), GQS2 (r=0.45), DISCERN1 (r=0.50), and DISCERN2 (r=0.46). A moderate positive correlation was found between JAMA2 and GQS1 (r = 0.49), GQS2 (r=0.51), DISCERN1 (r=0.56) and DISCERN2 (r=0.45). A strong positive correlation was found between GQS1 and GQS2 (r=0.86) and DISCERN1 (r=0.81), while a moderate positive correlation was found between DISCERN2 (r=0.60). A strong positive correlation was found between GQS2 and DISCERN1 (r=0.71), while a moderate positive correlation was found between DISCERN2 (r=0.55). A moderate positive correlation was noted between DISCERN1 and DISCERN2 (r=0.62) [Table 5].

Discussion

Information available in the Internet has the potential to be inaccurate. Individuals accessing this information can easily be mistaken, as they often have no idea who uploaded the information, when it was last updated and how accurate it is. As the number of information seekers and providers continues to increase, it is important to assess the reliability of online health information [13]. In this study, the quality and reliability of videos posted on YouTube about Hashimoto's thyroiditis were evaluated.

In this study, 86.4% of Hashimoto's thyroiditis videos were published by physicians overall, while 34.9% of the videos were published by endocrinologists. In a previous study of YouTube videos about thyroid cancer, only 26.9% of the videos were published by a specialist [such as specialist physician, hospital, endocrinology and surgery associations] [14]. The rate of physician-published video in the present study is considerably higher than that reported in other studies [14-18].

While the information shared through the video helps reinforce the words and message, the quality of both the image and sound of the video is crucial to creating a strong mental impression and engaging the viewer [19]. A positive correlation is expected between the measurement tools, each of which evaluates the quality and reliability of YouTube videos. In the present study, a positive correlation was found between the reliability and quality scores (DISCERN, JAMA and GQS) of YouTube videos about Hashimoto's thyroiditis. In a previous study, Önder and Zengin analysed YouTube videos about gout and reported that DISCERN, JAMA and GQS scores showed a positive correlation among themselves [12]. Moreover, Starks et al. reported a positive correlation between DISCERN and GQS scores of YouTube videos [15]. Another study reported that YouTube videos were positively correlated with GQS, DISCERN and JAMA scores [20]. However, Aydin et al. reported a positive correlation between DISCERN and JAMA scores [14].

Videos published by health experts on YouTube contain more useful information and have higher reliability than other individuals [21]. In the present study, the quality and reliability [GQS and DISCERN] of the videos in which the video uploader was endocrinologist was significantly higher than the other groups. Our results support the results of other studies in the literature. In a previous study, Starks et al. evaluated YouTube videos on thyroid surgery techniques and reported that videos uploaded by academic professionals had higher quality and reliability scores [15]. Ferhatoğlu et al. examined YouTube videos about sleeve gastrectomy surgery and reported that the quality and reliability scores of the videos uploaded by physicians working in the university hospital were significantly higher [20]. Çitgez et al. analysed YouTube videos about transoral endoscopic thyroidectomy and revealed that the quality and reliability scores of the videos of physicians were significantly higher [22]. Individuals who wanted to learn about Hashimoto's thyroiditis and other health-related issues can distinguish more competent sources on the topic by analysing a wide platform such as YouTube, so that misleading information can be prevented from spreading.

In the present study, 48.5% of the channels on which Hashimoto thyroiditis videos were broadcasted belonged to physicians and 62.1% belonged to physicians or institutions. Considering that 86.4% of the videos were published by a physician, it is seen that physicians do not use channels belonging to themselves or institutions to share videos. Considering that the videos created and uploaded by physicians are more reliable, it may be beneficial for physicians and institutions to share health education through channels belonging to them or their institutions to increase the accessibility of individuals seeking information to more reliable information.

In the present study, the number of views, likes and channel subscribers of the videos belonging to an institution or a physician among the YouTube videos related to Hashimoto's thyroiditis examined were significantly lower than those of entertainment channels. A previous study reported that the popularity scores of academic or physician-sourced YouTube videos were significantly lower than that of patient-sourced videos [20]. Çitgez et al. reported that the popularity scores of the YouTube videos of physicians were significantly lower than those of others [22]. The present study found that the quality and reliability level of videos about Hashimoto's thyroiditis and their popularity [number of views,

number of likes, etc.] were not related. Şahin et al. evaluated colorectal cancer YouTube videos and did not find a relationship between the popularity and comprehensiveness of the videos [4]. Another study reported the lack of significant relationship between popularity score and DISCERN and GQS scores [15]. Another study reported a negative correlation between the popularity scores of videos and their quality and reliability scores [22]. Moreover, Hornung et al. reported that more popular YouTube videos showed lower educational quality than less popular ones [23]. Considering that individuals who want to obtain information about Hashimoto's thyroiditis through YouTube videos will first reach more popular content, attempts to increase the popularity of more reliable physician videos will be beneficial for the dissemination of correct information.

The recency of a YouTube video can affect the quality and reliability of videos, as it may contain the latest information on the topic. Hornung et al. reported that the time elapsed after the YouTube video was published is a predictor of video quality [23]. Elangovan et al. reported that the duration of YouTube videos was similar between groups of videos containing misleading and useful information [21]. Starks et al. revealed the lack of a relationship between the duration of videos on YouTube and popularity, reliability and quality [15]. This study found that the quality and reliability of YouTube videos increase as the duration of the video lengthens. The finding that the quality and reliability of previous publications were higher indicates the presence of less-quality and up-to-date posts about Hashimoto's thyroiditis. In this regard, initiatives of health professionals may be beneficial.

Limitations

The study has some limitations. First, only YouTube videos published in Turkish were evaluated. A large number of videos in languages more widely used worldwide, especially in English, which is the most preferred language in scientific publications, were not included. Therefore, our results cannot be generalised for these videos. Second, different videos about Hashimoto's thyroiditis may have been published after the YouTube search. The results of these videos were not included in our cross-sectional study. By contrast, within the scope of this study, only videos published on YouTube were evaluated, and other videos shared by universities, hospitals and physicians on their own web pages and social media on this subject were not evaluated. Finally, the quality and reliability of results obtained are limited by the capacity of the measurement tools used. Despite all these limitations, this study is remarkable in that it is the first to evaluate YouTube videos about Hashimoto's thyroiditis and to share multifaceted results.

Conclusion

In conclusion, in this study, the majority of the videos were published by physicians, and endocrinologist videos had higher quality and reliability. Among YouTube videos about Hashimoto's thyroiditis, those belonging to an institution or a physician were less popular than those belonging to entertainment channels. The quality and reliability of the videos increased as the video duration lengthened. The quality and reliability of Hashimoto thyroiditis videos were not related to their popularity. If YouTube videos about Hashimoto's thyroiditis are properly integrated into health education, they can serve as a quality and reliable learning interface. Thus, it is very important to produce quality and reliable content that researchers, private institutions and government institutions will jointly produce. Therefore, it would be beneficial for physicians and academic institutions to create more channels through which they can transmit information about Hashimoto's thyroiditis and improve existing channels. However, there is a need for more comprehensive research to include YouTube videos on Hashimoto's thyroiditis in a wider geography and in more languages.

Conflict of interests
The authors declare that there is no conflict of interest in the study.

Financial Disclosure
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Ethical approval
This is a study of publicly available data,so ethical consent is not applicable.

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