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Research Article

Are YouTube videos on how to use nasal corticosteroid sprays helpful?

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ABSTRACT

Background: People can create video content on any topic they want via the internet and social media applications. Our aim is to determine the quality, reliability, understandability and actionability levels of YouTube videos on nasal corticosteroid usage and to evaluate the nasal corticosteroid application steps.

Methods: The first 200 videos were evaluated and recorded on YouTube (http://www.youtube.com) with the search term "use of nasal corticosteroid spray" on March 23, 2024. Videos regarding nasal corticosteroid use were evaluated by relevant clinicians using the Global Quality Scale (GQS), modified DISCERN (mDISCERN) and the Patient Education Materials Assessment Tool for Audiovisual Materials (PEMAT-A/V) scales, respectively. And the nasal corticosteroid application steps were recorded one by one.

Results: The median duration of 113 (56.5%) videos included in the study was 146 (min-max: 39-3582) seconds. The median GQS score of the videos was 3 (min-max: 1-5) and the median mDISCERN score was 3 (min-max: 0-5). When we evaluated the PEMAT-A/V scores of the videos, 35 were found to be understandable and 69 were actionable. The Global Quality Scala scores were found to be significantly higher in videos that were considered understandable and actionable (p=0.012, p<0.001, respectively). Modified DISCERN scores were found to be significantly higher in videos that were considered understandable and actionable (p=0.007, p=0.005, respectively). The steps for applying nasal corticosteroid spray were not adequately stated in the videos.

Conclusion: Increasing the number of actionable and quality content prepared using everyday language, far from medical terms, in the light of scientific data on social media, especially on the YouTube platform, can help larger audiences access accurate information on medical issues.

Keywords: Allergy, nasal spray, glucocorticoids, social media, digital health

Introduction

Allergic rhinitis occurs when disruption of the epithelial barrier allows allergens to penetrate the mucosal epithelium of the nasal passages. Patients apply to the hospital with complaints of nasal congestion, runny nose, postnasal drip, sneezing, and itching in the eyes, nose, and throat. Nasal corticosteroids play a role in the treatment of allergic rhinitis. It is even used to treat persistent moderate-to-severe allergic rhinitis, either as a standalone intranasal

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corticosteroid or in combination with an intranasal antihistamine.[1] Intranasal corticosteroid sprays also form the mainstay of medical treatment of inflammatory nasal conditions, including chronic rhinosinusitis.[2] To maximize the effectiveness of all medications, they must be used with appropriate techniques and all recommended application steps must be followed.[3] Additionally, the technique used to administer steroid nasal spray affects patient compliance and may cause side effects.[2]

Increasing access to the internet and mobile phone connections allows more people to access public health information faster and more directly than ever before.[4] Therefore, the internet is an important source of health information for the public, and social media platforms are a popular way to share health information with the public.[5] YouTube, one of the most well-known social media platforms, has an average of over two billion daily views, a new video is uploaded on average every minute, and the average user spends at least 15 minutes on the site per day.[6] Additionally, YouTube can be accessed freely, videos can be uploaded by individuals, and all videos can be viewed publicly.[7] Social media can be a powerful tool for the public health sector in this digital age, but its drawbacks, such as misinformation, must be considered.[4]

Using nasal corticosteroids with appropriate techniques can increase compliance with the drug by increasing the effect of the drug and reducing its side effects. YouTube, which reaches large audiences, is also a powerful source of access to health information. Therefore, we aimed to assess the quality, reliability, understandability, and actionability of YouTube videos on nasal corticosteroid use. We also evaluated which steps of nasal corticosteroid use were mentioned in the videos.

Materials and Methods

Study design

The search term 'use of nasal corticosteroid spray' was searched on YouTube™ (http://www.youtube.com) on March 23, 2024. A new YouTube account was created before searching to clear the search history and prevent previous search results from influencing the current search. Results were sorted by relevance using the search term in an incognito tab, and the first 200 videos viewed were saved for later evaluation. One duplicate video, 19 non-English videos, 63 irrelevant videos, and 4 videos shorter than 30 seconds were excluded from the study. The screening process for the study is shown in Figure 1.

The remaining 113 videos were evaluated by an allergy immunologist (M.E.) and a public health specialist (Y.S.) in terms of the target audience of videos (public education, academic education), video source (physician, non-physician health worker, independent user, organization, drug company, hospital/university, news agency), number of likes, video duration, number of comments, and video content (how to use a nasal

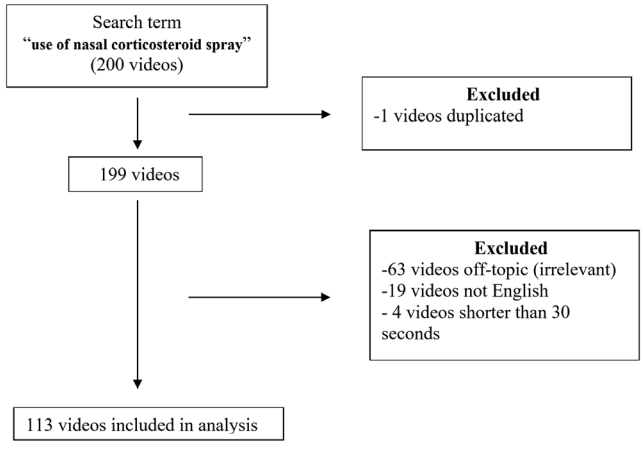

Figure 1. Flowchart of the video selection process.

steroid spray, what does nasal steroid spray do). The videos that prompted disagreement among the researchers underwent reassessment by another allergy immunologist (G.T.V.S), and the final decision was reached based on their evaluation.

The number of daily views of the videos was calculated based on the time elapsed from the day the video was uploaded, and the number of likes and comments per 1000 views was calculated. Videos were evaluated with the Global Quality Scale (GQS)[8], modified DISCERN (mDISCERN)[9], and the Patient Education Materials Assessment Tool for Audiovisual Materials (PEMAT-A/V).[10]

Recommended steps for administering corticosteroid nasal spray are: (1) shaking before use, (2) spraying into the air before first use, (3) gently blowing nose, (4) leaning forward with the nasal spray aiming nearly vertical, (5) using the hand opposite the nostril being treated, aim the nozzle slightly up and outward (lateral and cephalad) toward the tear duct or medial canthus, (6) spray without sniffing or while sniffing very gently, (7) cleaning the spray head.[11,12]

Scoring system

The authors reviewed the video evaluation guidelines and then the videos were rated. The GQS, a five-point scale, was used to assess the overall quality of the content. This score was graded using 5 criteria:

1 (Poor): Inadequate, lacking important content, confusing or misleading.

2 (Generally Poor): Some relevant information is present but significantly flawed.

3 (Moderate): Adequate quality with some useful content, although limited in scope or clarity.

4 (Good): Informative and mostly accurate, with good clarity and structure.

5 (Excellent): Highly informative, comprehensive, and clearly presented.[8] Those that were 'poor' and 'generally poor' were categorized as low quality, while those that were 'good' and 'excellent' were classified as high quality. The moderate group was called 'intermadiate.'

The mDISCERN scale consists of five questions, each of which targets an important aspect of content reliability. One point is given for each positive response, resulting in a total score between 0 and 5, with higher scores indicating greater reliability. The five questions assess:

1. Are the objectives of the content clearly stated and achieved?
2. Are reliable sources of information cited?
3. Is the information presented in a balanced and unbiased manner?
4. Are additional sources of information provided for further reading?
5. Are areas of ambiguity or controversy discussed?[9]

The version of PEMAT-A/V that evaluates audiovisual materials was used and this version has two main categories: understandability and actionability.

1.Understandability Score

This measures how easy it is for a person to understand the content. The 13 items here focus on clarity of language, structure, and use of visual and audio aids. Each item is scored on an Agree or Disagree scale to calculate a score.

2. Actionability Score

This measures how well the content enables the viewer to take specific, actionable steps. Four items are assessed, with each item being scored as Agree or Disagree to calculate a final score.[10] According to the PEMAT-A/V score, videos are classified as understandable or actionable if the mean scores on each scale exceed 70%.[10]

Ethical considerations

The study analyzed publicly available content on YouTube, an open-access platform, and did not involve any interaction with human or animal subjects. Additionally, no personally identifiable or sensitive information was collected or processed during the evaluation of the videos. As with previous studies in the literature that evaluated online medical content on platforms such as YouTube without requiring ethical approval[13,14] our study did not require ethical approval.

Statistical analysis

The data were analyzed using the SPSS (Statistical Package for the Social Sciences) 20.0 software package, with $p<0.05$ was considered statistically significant. In descriptive statistics, categorical variables are expressed as frequency and percentage. The conformity of the data to normal distribution was assessed with the Kolmogorov-Smirnov test. Metric variables that did not show normal distribution were given as median (minimum-maximum). Chi-Square test was used to compare independent groups in terms of categorical variables. Mann-Whitney U test was used to compare metric variables that do not show normal distribution.

Results

The duration of the videos included in the study varies between 39 and 3582 seconds, and the median duration is 146.0 seconds. The time elapsed after the videos were uploaded varies between 25 and 5991 days, with the median time being 1778 days. The number of likes the videos receive from the audience varies between 0 and 20000, and the median duration is 32.5 likes. While there were 22 videos (19.5%) that were closed to comments by the uploader, the number of comments on the videos that could be commented on ranged from 0 to 1432, and the median number of comments was 2.0. While the videos we reviewed had a number of views between 2 and 2146567, the median number of views was found to be 5420. While 72.6% (n=82) of the videos are about how to use nasal steroids, 27.4% (n=31) are videos about what nasal steroids are used for. While 97% (n=110) of the videos were videos for the public, 3% (n=3) were videos prepared for academic education purposes. Information including video sources and the countries where the videos were uploaded are included in Table 1.

Table 1. Source and country of publication of the videos

Variable name	n (%)
Video Source	
Physician	40 (35.4)
Non-physician Health Worker	11 (9.7)
Organization/Administration	22 (19.5)
Independent User	21 (18.6)
Drug Company	7 (6.2)
Hospital/University	11 (9.7)
News Agency	1 (0.9)
Country of publication	
USA	62 (54.9)
Australia	13 (11.5)
United Kingdom	9 (8.0)
Canada	7 (6.2)
India	7 (6.2)
Ireland	6 (5.3)
Malaysia	2 (1.8)
Philippine	2 (1.8)
Other	5 (4.5)

When the GQS scores of the videos were examined, it was determined that the GQS scores varied between 1 and 5 points and the median score was 3.0, 3 videos were poor, 20 videos were generally poor, 35 videos were moderate, 47 videos were good and 8 videos were excellent. When we grouped the GQS scores into three groups, it was determined that 23 videos were low quality, 35 videos were intermediate and 55 videos (48.7%) were high quality. The scores of the videos according to the mDISCERN scale vary between 0 and 5 points, and the median score is 3.0.

When we evaluated the PEMAT-A/V scores of the videos, 35 videos were found to be understandable and 69 videos were found to be actionable. While the average understandability score of the videos evaluated as understandable was found to be 82.0 (70.0-92.0), the average score of the non-understandable videos 55.0 (27-67.0). While the minimum, maximum and median values of actionability scores of actionable videos were determined as 100 points, the actionability scores of non-actionable videos ranged between 0 and 67 and the median value was determined as 0.0 (Table 2).

The duration of understandable videos was found to be significantly longer than non-understandable videos (p=0.001), and although the duration of actionable videos was found to be longer than non-actionable videos, the difference was not significant (p=0.906). While the understandable rates of videos uploaded by health professionals were found to be significantly lower at 19.6% than those of other video uploaders (40.3%) (p=0.014), no significant relationship with actionability was detected. No significant relationship was found between the videos explaining 'what nasal steroids are for' and 'how to use nasal corticosteroids' and being understandable, and the non-actionable rate was found to be significantly higher in videos about 'what nasal steroids are for' (p<0.001). While there was no significant relationship between the number of views of the videos and their understandability, the number of views of actionable videos was found to be significantly higher (p=0.002). While there is no significant relationship between the number of daily views and understandable status of the videos since the date they were uploaded, it was found to be significantly higher in actionable videos (p<0.001). No significant relationship was found between the number of likes per 1000 views and whether the videos were understandable or actionable. Modified DISCERN scores of the videos were found to be significantly higher in understandable videos than in non-understandable videos (p=0.007). When mDISCERN scores and actionable situations were compared, the median (min-max) values of actionable videos were found to be significantly higher with 3.0 (2.0-5.0) points (p=0.005). GQS scores were found to be significantly higher in understandable videos with a median (min-max) score of 4.0 (3.0-5.0) (p=0.012). GQS scores of actionable videos were found to be significantly higher than non-actionable videos, with a median (min-max) score of 4.0 (2.0-5.0) (p<0.001) (Table 3, Table 4).

All steps on how to use nasal corticosteroid were explained in 4 videos. Step-by-step evaluation of nasal corticosteroid usage is shown in Table 5.

Table 2. The characteristics scores of understandable vs. non understandable and actionable vs. non- actionable

Scores		Overall n (%)	Median (Min-Max)	p
Understandability	Understandable	35 (31.0)	82.0 (70.0-92.0)	p<0.001
	Non- Understandable	78 (69.0)	55.0 (27.0-67.0)	
	All	113	60.0 (27-92.0)	
Actionability	Actionable	69 (61.1)	100.0 (100.0-100.0)	p<0.001
	Non- Actionable	44 (38.9)	0.0 (0.0-67.0)	
	All	113	100.0 (0.0-100.0)	

Min: minimum, max: maximum.

Table 3. Factors associated with understandability

Video Characteristic	Overall n (%)	Understandable n (%)	Non-Understandable n (%)	p
Video Content				
What nasal steroids are for	31 (27.4)	11 (35.5)	20 (64.5)	0.524
How to use nasal steroids	82 (72.6)	24 (29.3)	58 (70.7)	
Video Source				
Health worker*	51 (45.1)	10 (19.6)	41 (80.4)	**0.014**
Others	62 (54.9)	25 (40.3)	37 (59.7)	
	Median (Min-Max)			p
Video Length (seconds)	146 (39- 3582)	210 (39 - 3582)	131 (40-560)	**0.001**
View	5420 (2-2146567)	5948 (44-1228331)	4749.5 (2-2146567)	0.747
View per Day	4.7 (0.0-2838.4)	10.5 (0.06-2838.4)	2.93 (0.0-623.88)	0.355
Like per 1000 view	6.3 (0.0 – 1000)	6.98 (0.0 – 68.1)	6.36 (0.0 – 1000)	0.756
Comment per 1000 view	0.33 (0.0-45.45)	0.25 (0.0-10.9)	0.4 (0.0-45.45)	0.674
Modified DISCERN	3.0 (0-5.0)	3.0 (2.0-5.0)	3.0 (0.0-5.0)	**0.007**
GQS	3.0 (1.0-5.0)	4.0 (3.0-5.0)	3.0 (1.0-5.0)	**0.012**

*Health worker: (Physician and non-physician), min: minimum, max: maximum, GQS: The Global Quality Scale.

Table 4. Factors associated with actionability

Video Characteristic	Overall n (%)	Actionable n (%)	Non-Actionable n (%)	p
Video Content				
What nasal steroids are for	31 (27.4)	0 (0.0)	31 (100.0)	**<0.001**
How to use nasal steroids	82 (72.6)	13 (15.9)	69 (84.1)	
Video Source				
Health worker*	51 (45.1)	28 (54.9)	23 (45.1)	0.153
Others	62 (54.9)	41 (66.1)	21 (33.9)	
	Median (Min-Max)			p
Video Length (seconds)	146 (39- 3582)	146.0 (39 - 571)	132.5 (40-3582)	0.906
View	5420 (2-2146567)	15992.0 (2-2146567)	2527.5 (22-580494)	**0.002**
View per Day	4.7 (0.0-2838.4)	11.03 (0.00-2838.43)	1.33 (0.06-509.65)	**<0.001**
Like per 1000 view	6.3 (0.0 – 1000)	5.7 (0.0- 1000)	7.11 (0.0-90.91)	0.136
Comment per 1000 view	0.33 (0.0-45.45)	0.36 (0.0-16.81)	0.27 (0.0-45.45)	0.637
Modified DISCERN	3.0 (0-5.0)	3.0 (2.0-5.0)	3.0 (0.0-5.0)	**0.005**
GQS	3.0 (1.0-5.0)	4.0 (2.0-5.0)	3.0 (1.0-4.0)	**<0.001**

*Health worker: (Physician and non-physician), min: minimum, max: maximum, GQS: The Global Quality Scale.

Table 5. Step-by-step evaluation of nasal corticosteroid usage

Nasal corticosteroid usage steps	Presented n (%)
Step-1: Shaking before use	39 (34.5)
Step-2: Spraying into the air before first use	46 (40.7)
Step-3: Blowing slowly through the nose	38 (33.6)
Step-4: Leaning forward so that the nasal spray is almost vertical	50 (44.2)
Step-5: Aim the nozzle slightly up and outward toward the tear duct or medial canthus	62 (54.9)
Step-6: Spray without sniffing or by sniffing very gently	54 (47.8)
Step-7: Cleaning the spray head	20 (17.7)

Discussion

We observed that the quality, reliability, actionability, and understandability levels of the 113 videos we watched by searching on YouTube with the term 'use of nasal corticosteroid spray' were low. We also found that the instructions for applying nasal corticosteroid spray in the videos were inadequate.

Allergy practices increasingly utilize a variety of social networks to educate current and potential patients.[15] In the study, which included 86 videos, it was found that the usefulness of YouTube videos on allergic rhinitis varied and less than half of the videos provided useful information.[16] In another study where 130 videos related to details about asthma were evaluated, more than half of the videos were found to be useful, but a non-negligible portion of the videos were evaluated as misleading.[17] In a study conducted in Türkiye using GQS, PEMAT-A/V, and DISCERN tools, it was stated that YouTube was an effective platform for visual learning on the use of adrenaline auto-injector.[18] In the study in which YouTube videos on immunology were evaluated with GQS, it was concluded that YouTube can provide some useful information on immunology to medical students, but cannot replace textbooks and academic courses in terms of content.[19] Research indicates that videos on YouTube vary in their usefulness for medical information. The reason for this difference may be related to who the target audience is watching the video, who the video uploader is, and the extent of the medical issue.

When the videos were evaluated in terms of video duration, it was determined that understandable videos were significantly longer than non-understandable videos. This situation creates the idea that for the videos to be understandable, sufficient time should be allocated to explaining the subject. The number of video views and daily views since the date the videos were uploaded was significantly higher for actionable videos than for non-actionable videos. This situation makes us think that the demand for actionable videos is higher.

In the study conducted with the adrenaline auto-injector, it was observed that the understandability rates were higher in the health-related group, although it was not statistically significant.[18] In our study, we found that the understandable rates of the videos uploaded by healthcare professionals were significantly lower than those of other video uploaders. Different results in terms of understandability may be related to differences in categorization and content. In our study, the low understandability rate of the videos uploaded by healthcare professionals suggests that this is due to the healthcare professionals' use of medical terms in the videos.

In a study evaluating GQS, mDISCERN, PEMAT-A/V and epinephrine auto-injector, it was stated that there were serious problems in the quality, reliability, understandability and actionability of the videos.[20] In a study evaluating YouTube videos for adrenaline auto-injectors, it was concluded that videos recorded by medical professionals provide the highest quality and reliable information.[18] In the study where videos about inhaler use were examined, the average Journal of American Medical Association (JAMA) Benchmark criteria and GQS scores of the videos narrated by nurses and doctors were found to be significantly higher than the others.[21] The high quality and reliability of videos prepared by health professionals supports the idea that videos containing medical information should be uploaded with the contribution of health professionals. When healthcare professionals upload videos, explaining medical terms using everyday language contributes to increasing the understandability rate.

In the study where videos about inhaler use were evaluated, it was determined that some process

steps were skipped, and significantly more process steps were skipped in individually uploaded videos compared to professional organizations.[21] A study of 33 YouTube videos found that the most readily available instructional videos did not provide patients with accurate instructions for administering nasal sprays.[12] In another study where 26 videos were evaluated, 7.7% of the videos explained all the steps of correct nasal spray use.[22] Similarly, in our study, the nasal corticosteroid spray application steps were not adequately stated in the videos. All steps on how to use nasal corticosteroids were explained in only 4 videos. An incomplete explanation of the instructions for the use of drugs in the videos may cause patients to use the drugs incorrectly and even reduce the effectiveness of some drugs.

In one study, a statistically significant positive relationship was observed between the modified PEMAT score and both GQS and mDISCERN.[23] In our study, GQS and mDISCERN scores were found to be high in both understandable videos and actionable videos, and this was statistically significant. These findings suggest that users who produce quality and reliable video content produce more understandable and actionable videos.

Our study has some limitations, the first of which is that the study covers a short period considering the dynamic development of YouTube. The results may vary depending on the evaluation of videos on YouTube in different periods. The second limitation is that other social media platforms other than YouTube, which is widely used, were not evaluated. The third limitation is that although we created a new YouTube account by deleting the search history, we may have evaluated certain content due to country-specific internet providers. This may limit the universality of the study.

In conclusion, social media is becoming increasingly popular as a source of information on immunology and allergy diseases, and patients are turning to YouTube videos to learn about their diseases and how to use their medications. However, there are some problems with the quality, reliability, understandability, and actionability of YouTube videos. In addition, the steps of medication use is not explained well enough in the videos. We believe that creating videos, especially by healthcare professionals who are experts in their field, will increase the quality and reliability of the content. However, we think that to create understandable videos, everyday language should be used, away from medical terms. As healthcare professionals, we believe that we need to increase our role on social media, including the popular platform YouTube, to provide accurate information to a wide audience.

Ethical approval

YouTube is a free platform accessible to everyone. Since no humans or participants were included in our study, ethics committee approval was not required.

Author contribution

Study conception and design: ME, GTVS, YS; data collection: ME, GTVS, YS; analysis and interpretation of results: ME, GTVS, YS; draft manuscript preparation: ME, GTVS, YS; all authors reviewed the results and approved the final version of the article.

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Conflict of interest

The authors declare that there is no conflict of interest.

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