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A rapid review of quality of health information on TikTok

REVIEW

Georgia Hill, Aaron Manuell, Annabelle Willemsen

University of Notre Dame Australia, Melbourne Campus, Werribee, VIC, Australia

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Corresponding Author:
Georgia Hill
University of Notre Dame Australia
Melbourne Campus
Weribee, VIC, Australia
georgia.hill1@my.nd.edu.au

SUMMARY
TikTok has become an immensely popular platform globally where users share information, ideas, and personal guidance on many topics, including health-related information. This rapid review identified several key findings: viewers should use caution when accessing health-related content on TikTok for health guidance; the content quality of videos produced by healthcare providers is significantly higher than those produced by general users; and 42 per cent of videos assessed contained questionable information. Due to the limitations of the DISCERN and PRMAT-AV tools for this content form, a new objective scoring system needs to be developed to assess quality in healthcare-related short-form videos.

Key Words
Misinformation; disinformation; content quality; TikTok

ABSTRACT

Background

TikTok, the video-sharing social media platform, has more than one billion active monthly users worldwide. Given its extensive reach and high rates of user participation, TikTok could become a medium for the dissemination of health-related information. Concerns exist, however, regarding the quality of user-generated content focused on health care.

Aims

The aim of this review is to examine the quality of content in health-related videos on TikTok.

Method

We used Medline, Scopus, and PubMed to search for articles evaluating content quality of health-related videos on TikTok. We included articles if they were published between 2020 and 2022, were in English, assessed a health-related topic, and used an objective, standardised scoring system. We extracted and analysed the mean DISCERN and PEMAT-AV scores for videos published by healthcare providers (HCPs) and general users, as well as the percentage of videos containing misinformation.

Conclusion

Our review suggests that users should exercise caution when using TikTok as a source of health-related information because the quality of some of the content presented on the platform may be questionable.

BACKGROUND

TikTok is a video-sharing social media platform, with more than one billion active monthly users worldwide.[1] Since its launch in 2018, TikTok has become the fifth most used social media platform globally, and is particularly popular amongst teenagers and young adults, which account for 27.4 per cent and 39.9 per cent of total monthly users, respectively.[2] TikTok's unique selling point is its user-based algorithm, which can provide videos to users based on content they have previously engaged with. As such, this personalised experience helps accelerate user interaction, while also delivering "viral" and "trending" content. Given its extensive reach and high rates of user participation compared to other traditional social media platforms (including Facebook, Instagram, and YouTube), TikTok has the potential to become a key medium for the dissemination of health information. For example, during July 2020, at the height of the pandemic, videos published with #Coronavirus were viewed approximately 93.1 billion times.[3,4]

Recent research highlighting the large volume of unmoderated, user-generated content published on social media raises concern about the reliability of health-related content on TikTok. For example, one study found that Twitter contained the highest prevalence of healthcare misinformation amongst any social media platform, with videos pertaining to vaccines, drugs, and smoking, and non-communicable diseases containing the poorest quality of information.[5] Twitter's policy against misinformation during the COVID-19 pandemic cumulated in 11,230 accounts suspended and 97,694 pieces of content containing misinformation being removed.[6] Furthermore, during the first year of the COVID-19 pandemic, Facebook's parent company Meta reportedly removed more than 20 million pieces of non-factual healthcare content from its site and marked more than 190 million posts as false if they contained inaccurate vaccine information.[7] Misinformation published on social media platforms represents a serious healthcare risk and may contribute to delays in seeking medical care, establishing a diagnosis, and/or commencing treatment.

As TikTok is a relatively new social media platform, there has been limited research investigating the quality of healthcare information published on the platform. To address this gap in literature, we present a rapid review of what studies have been published in this area, and outline strategies to ensure the information provided is accurate and of high quality.

METHOD

Search strategy

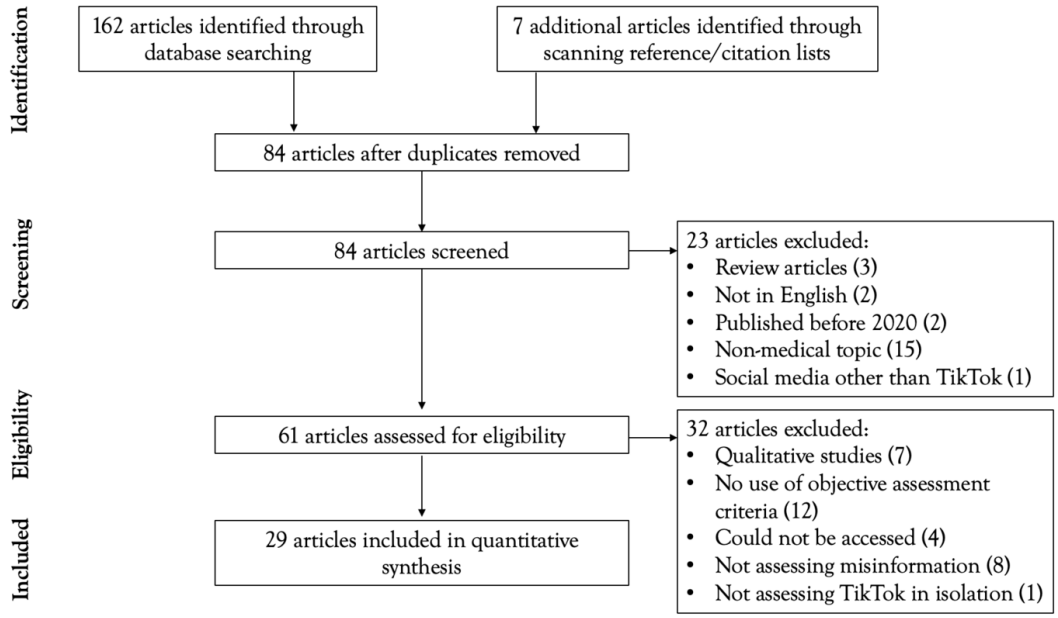
This review used a predetermined search strategy to retrieve articles from three databases. We consulted Medline, PubMed, and Scopus databases using the following terms:

TikTok AND ((Content AND "quality" OR "accuracy") OR "misinformation" OR "disinformation" OR "misleading" OR "inaccurate" OR "false" OR "miseducation" OR "patient information")

We conducted the search on December 24, 2022, and identified 162 articles. Prior to undertaking relevance assessment, we applied a filter to ensure only studies published in English between 2020 and 2022 were included. Through a manual search of the retrieved articles' bibliographies we identified seven additional papers for consideration. After removing duplicated

articles, the search retrieved 86 papers (Figure 1).

Figure 1: PRISMA diagram detailing the selection of reports included in the review



Selection criteria

We reviewed the titles and abstracts of the 86 unique articles for the following inclusion criteria:

1. Articles published in English between 2020 and 2022.
2. Article focuses primarily on TikTok or evaluates TikTok content separate from other social media applications.
3. Uses a standardised scoring system (either PEMAT-AV or DISCERN) to evaluate TikTok video content.
4. Video content evaluated in the article relates to medical or healthcare topics.

If inclusion was uncertain from the abstract alone, we read the full article and reached a consensus between three reviewers. Three articles could not be retrieved for review as they were published solely in specialist society journals that we did not have access to; they were subsequently excluded from analysis. We used the JBI Critical Appraisal Tool to assess the quality of the retrieved articles. The tool consists of eight standardised questions designed to evaluate the validity of the paper. We completed this tool separately, answering each question with "Yes", "No", "Unclear", or "Not Applicable". Then we used the answers to determine if articles were worthy of inclusion, exclusion, or required further discussion. We resolved any disagreements through further discussion. Following full text review, we determined 29 articles met the inclusion criteria and we included them in the analysis.

Data management and analysis

We searched the 29 included articles for relevant data on sample size, DISCERN and PEMAT-AV scores overall and by user type, and presence of misinformation. Where DISCERN scores

were measured on a different scale, we converted all scores to a score out of 5. Where overall DISCERN or PEMAT-AV scores were missing, we took an average from the data provided. We entered all data into an Excel spreadsheet, with figures, means, and standard deviations generated using GraphPad Prism. We performed statistical analysis using the Student's t-test.

Content quality metrics

To assess the quality of published information, the Patient Education Materials Assessment Tool for Audio-visual Materials (PEMAT-AV) and the DISCERN Assessment Instrument may be used. PEMAT-AV consists of 17 items related to the understandability or actionability of video content.[8] Research into PEMAT-AV has revealed that the tool is a valuable contribution in the assessment of patient education material and has strong internal consistency and interrater reliability.[9] Similarly, the DISCERN tool is designed to evaluate the quality of online health information by using 16 metrics, each graded from 1 to 5 (1–2 points: low; 3 points: moderate; 4–5 points: high quality). Total scores out of 80 are then assigned, with the greater the score indicating higher quality information. Due to its simplicity and specificity for health-related information, DISCERN has become one of the most widely used tools since its initial publication in 1999.[10]

RESULTS

Of the 162 articles identified following our database search, we identified an additional seven articles via hand searching. We included a total of 29 cross-sectional studies in the rapid review (Table 1). Each of the articles analysed between 14 to 480 videos, with a cumulative total of 4,078 videos reviewed in our article. Of the articles included, each focused on a different health-related topic, however, there were three predominant themes of the videos reviewed: three articles focused on a form of cancer (including gastric, genitourinary, and prostate); three focused on orthodontics; and eight focused to an aspect of physical appearance (acne, aesthetic surgery, alopecia, breast reconstruction, dermatology, eczema, and two articles on gender affirmation surgery).

Table 1: Included articles

	Study	Authors	Health Topic	n=Count
DISCERN				
1	Acne and social media: A cross-sectional study of content quality on TikTok.[19]	Zheng DX, Ning AY, Levoska MA, Xiang L, Wong C, Scott JF	Acne	100 videos
2	Analyzing the Quality of Aesthetic Surgery Procedure Videos on TikTok.[20]	Om A, Ijeoma B, Kebede S, Losken A.	Aesthetic Surgical Procedure	200 videos
3	Alopecia areata and pattern hair loss (androgenetic alopecia) on social media – Current public interest trends and cross-sectional analysis of YouTube and TikTok contents[21]	Gupta AK, Polla Ravi S, Wang T	Alopecia	24 videos

4	TikTok and YouTube as sources of information on anal fissure: A comparative analysis.[3]	Chen Z, Pan S, Zuo S.	Anal Fissures	62 videos
5	TikTok: An Opportunity for Antibiotic Education?[22]	Evans E, Gory L, O'Kane A	Antibiotics	300 videos
6	A Cross-Sectional Analysis of Breast Reconstruction with Fat Grafting Content on TikTok.[23]	Gupta R, John J, Gupta M, Haq M, Peshel E, Boudiab E, Shaheen K, Chaiyasate K.	Breast Reconstruction	131 videos
7	Short-Video Apps as a Health Information Source for Chronic Obstructive Pulmonary Disease: Information Quality Assessment of TikTok Videos[24]	Song S, Xue X, Zhao YC, Li J, Zhu Q, Zhao M.	COPD	199 videos
8	Assessing the quality of COVID-19 vaccine videos on video-sharing platforms.[25]	Tan RY; Pua AE; Wong LL; Yap KY	COVID	14 videos
9	Slugging: TikTok as a source of a viral "harmless" beauty trend.[26]	Pagani K, Lukac D, Martinez R, Jablon K, McGee JS.	Dermatology	50 videos
10	TikTok as a Health Information Source: Assessment of the Quality of Information in Diabetes-Related Videos[27]	Kong W, Song S, Zhao YC, Zhu Q, Sha L.	Diabetes	199 videos
11	Current Public Trends in the Discussion of Dry Eyes: A Cross-Sectional Analysis of Popular Content on TikTok.[28]	Naseer S, Hasan S, Bhuiyan J, Prasad A.	Dry Eyes	101 videos
12	Biologics to breast milk: A cross-sectional study of popular eczema treatment content on TikTok.[29]	Khan S, Yee D, Khan S, Mehta M, Zagona-Prizio C, Maynard N, Reddy R, Armstrong AW.	Eczema	120 videos
13	Quality and accuracy of gastric cancer related videos in social media videos platforms[30]	Hu RH, Zhang HB, Yuan B, Zhang KH, Xu JY, Cui XM, Du T, Song C, Zhang S, Jiang XH.	Gastric Cancers	240 videos
14	Evaluating the Quality and Reliability of Gender-affirming Surgery Videos on YouTube and TikTok[31]	Song S, Park KM, Phong K, Kim EA.	Gender affirmation surgery	55 videos
15	TikTok as an Information Hodgepodge: Evaluation of the Quality and Reliability of Genitourinary Cancers[32]	Xue X, Yang X, Xu W, Liu G, Xie Y, Ji Z.	Genitourinary Cancers	61 videos
16	Keratosis pilaris on TikTok: A cross-sectional analysis of trending content[33]	Mansour M, Abushukur Y, Potts G	Keratosis Pilaris	100 videos
17	#Neurosurgery: A Cross-Sectional Analysis of	McBriar, J.D., Mishra, A., Shah, H.A.,	Neurosurgery	84 videos

	Neurosurgical Content on TikTok[12]	(...), Langer, D.J., D'Amico, R.S.		
18	Orthodontic clear aligners and TikTok videos: A content, reliability and quality analysis[34]	Meade MJ, Meade EA, Dreyer CW	Orthodontic aligners	117 videos
19	Analysis of the information contained within TikTok videos regarding orthodontic retention[35]	Meade MJ, Dreyer CW.	Orthodontic retention	209 videos
20	Is the information about orthodontics on Youtube and TikTok reliable for the oral health of the public? A cross sectional comparative study[36]	Kılınç DD	Orthodontics	480 videos
21	Reliability, Quality, and Educational Suitability of TikTok Videos as a Source of Information about Scoliosis Exercises: A Cross-Sectional Study[37]	Jang C, Kim M, Kang SW, Cho H	Scoliosis	171 videos
22	Quality and Audience Engagement of Takotsubo Syndrome–Related Videos on TikTok: Content Analysis.[38]	Liang J, Wang L, Song S, Dong M, Xu Y, Zuo X, Zhang J, Adrian Sherif A, Ehsan J, Ma J, Li P	Takotsubo Syndrome	80 videos
23	The Assessment of TikTok as a Source of Quality Health Information on Varicoceles[39]	Siegal A, Ferrer F, Baldisserotto E, Malhotra N	Varicoceles	36 videos
24	Quality and Popularity Trends of Weight Loss Procedure Videos on TikTok[17]	Lahooti A, Hassan A, Critelli B, Westerveld D, Newberry C, Kumar S, Sharaiha RZ	Weight Loss Procedures	150 videos
PEMAT-AV				
25	TikTok and Attention-Deficit/Hyperactivity Disorder: A Cross-Sectional Study of Social Media Content Quality[40]	Yeung A, Ng E, Abi-Jaoude E	ADHD	100 videos
Multiple Scoring Systems – DISCERN and PEMAT-AV				
26	Cross-sectional and comparative analysis of videos on erectile dysfunction treatment on YouTube and TikTok[41]	Babar M, Loloi J, Patel RD, Singh S, Azhar U, Maria P, Small A, Watts K.	Erectile Dysfunction	50 videos
27	"#TransTok: An Analysis of Surgical Gender Affirmation Content on TikTok"[42]	Wang F, Cheng T, Rothchild E, Chemakin K, Ricci J	Gender Affirmation Surgery	429 videos
28	Assessing the Quality of Hearing Aids- Related Videos on TikTok[43]	Chen K, Zhou L, Zhao R, Tang Y.	Hearing Aids	155 videos
29	TikTok and prostate cancer: misinformation and quality of	Xu AJ, Taylor J, Gao T, Mihalcea R, Perez-Rosas V, Loeb S.	Prostate Cancer	61 videos

	information using validated questionnaires[44]			

Across all health topics, the median DISCERN and PEMAT-AV scores were 2.02±0.23/5 and 56 ±16.488, respectively (95% CI; Figure 2). While 23 papers exclusively used the DISCERN score, two papers used PEMAT-AV, and four employed both metrics in their assessment. Greater variability was found amongst the papers using PEMAT-AV as a measure of assessment. Of the various medical issues covered, videos related to COVID-19 had the lowest mean PEMAT-AV score (27.5 per cent). Alternatively, videos related to erectile dysfunction were found to have the lowest overall DISCERN scores (0.98/5), while videos related to Chronic Obstructive Pulmonary Disease (COPD) had the highest overall DISCERN score (3.75/5). Only 3 of the 27 articles found TikTok videos on their chosen topic to have a median DISCERN score greater than 3, and therefore they were classified as moderate in quality. There was similarity amongst DISCERN scores for articles assessing content on the same health topic: papers assessing orthodontics (1.8, 1.8, 1.27), gender-affirming surgery (2.5, 2.14), and cancer (2, 2.08, 2.41) all returned comparative DISCERN scores.

Twenty papers commented on the quality of the content based upon the source(s) of publication. In 9 per cent of the papers, content quality was greater in videos produced by HCPs compared to videos published by general users. The one exception was McBriar et al. who investigated neurosurgery on TikTok, which had lower DISCERN scores for HCP user videos compared to general users, 1.61 vs 1.52, respectively.[12] Eighteen papers provided mean overall DISCERN scores for healthcare provider and general users (Figure 3). The mean DISCERN score for HCP user videos was 2.38±0.56 (n=18) and videos produced by general users was 1.82±0.45 (n=18). The mean DISCERN score for HCPs was significantly higher than general users (p=0.002). We present individual DISCERN and PEMAT scores for the included articles (Table 2).

Of the 29 articles, six analysed the percentage of questionable health-related information presented on TikTok. The overall average percentage of videos containing such information was 42 per cent (Figure 4). Song et al. found the most accurate videos, whose analysis pertained to videos discussing COPD (10 per cent of videos were unreliable). On the other hand, potentially the most unreliable videos were in Babar et al., which focused on gender-affirming surgery (95.7 per cent of videos containing questionable information).

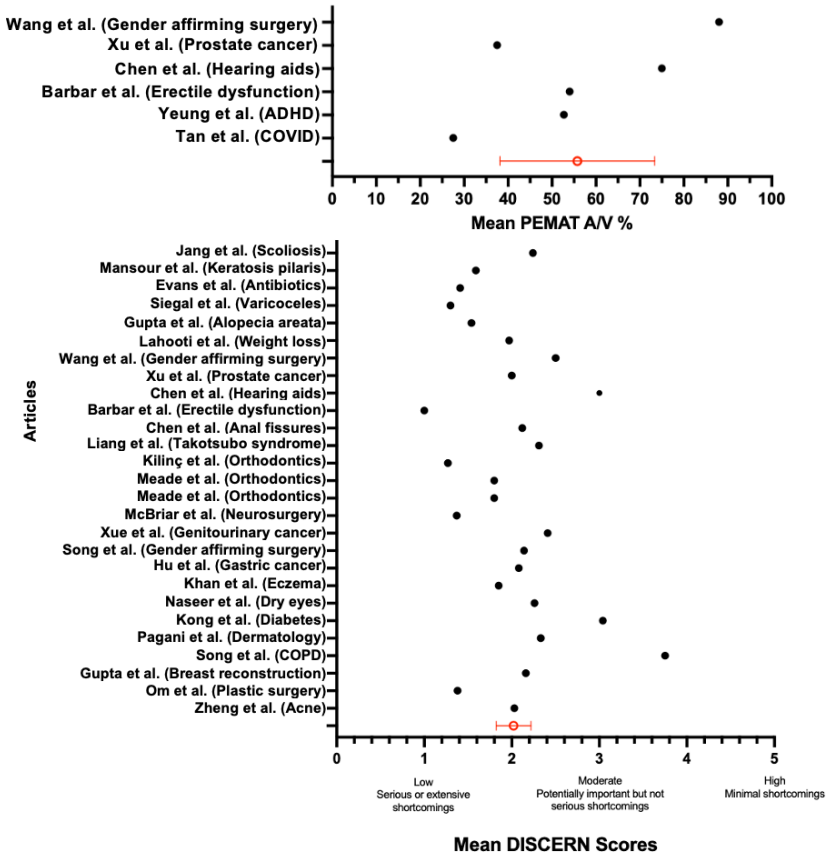
Table 2: Summary of topic, misinformation, mean DISCERN and PEMAT-AV scores overall and by user in the reported literature

Article	Health Topic	User Type	DISCERN	PEMAT-AV	Misinformation
Zheng et al.	Acne	General users HCPs Overall	1.99 2.41 2.03		
Om et al.	Plastic surgery	Overall	1.38		
Gupta et al.	Breast reconstruction	General users HCPs Overall	1.99 2.48 2.16		
Song et al.	COPD	Overall	3.75		4.30%
Tan et al.	COVID-19	Overall		27.50%	

Pagani et al.	Dermatology	General users HCPs Overall	2 3 2.33		
Kong et al.	Diabetes	General users HCPs Overall	2.58 3.26 3.04		
Naseer et al.	Dry eyes	General users HCPs Overall	2.05 2.55 2.26		
Khan et al.	Eczema	General users HCPs Overall	1.65 2.40 1.84		
Hu et al.	Gastric cancer	General users HCPs Overall	2.01 2.11 2.08		
Song et al.	Gender affirming surgery	Overall	2.14		
Xue et al.	Genitourinary cancer	General users HCPs Overall	2 2.21 2.41		36.07%
McBriar et al.	Neurosurgery	General users HCPs Overall	1.61 1.53 1.37		
Meade et al.	Orthodontics	General users HCPs Overall	1.17 2.69 1.8		
Meade et al.	Orthodontics	Overall	1.8		
Kılınç	Orthodontics	Overall	1.27		
Lahooti et al.	Weight loss	General users HCPs Overall	1.81 2.59 1.97		
Gupta et al.	Alopecia areata	General users HCPs Overall	1.4 1.68 1.54		
Siegal et al.	Varicoceles	General users HCPs Overall	1.07 1.48 1.28		23%
Evans et al.	Antibiotics	General users HCPs Overall	1.17 1.65 1.41		
Mansour et al.	Keratosis Pilaris	General users HCPs Overall	1.41 1.87 1.59		
Jang et al.	Scoliosis	General users HCPs Overall	2.38 2.4 2.24		
Liang et al.	Takotsubo Syndrome	General users HCPs Overall	1.93 2.54 2.31		
Yeung et al.	ADHD	General users HCPs		53.40% 61.50%	

		Overall		54.30%	52%
Chen et al.	Anal fissures	Overall	2.12		
Babar et al.	Erectile dysfunction	Overall	0.98	54%	90%
Chen et al.	Hearing aids	General users HCPs Overall	2.5 3.17 3	50% 81.82% 75%	
Xu et al.	Prostate cancer	General users HCPs Overall	2 2.21 2	 37.50%	 47%
Wang et al.	Gender affirming surgery	General users HCPs Overall	2 3 2.5	84% 90% 88%	

Figure 2: Mean DISCERN and PEMAT-A/V scores by paper



Note: Low DISCERN represents serious or extensive shortcomings, moderate DISCERN represents potentially important but no serious shortcomings, and high DISCERN score represents minimal shortcomings in the assessed videos.

Figure 3: Mean DISCERN score by user type

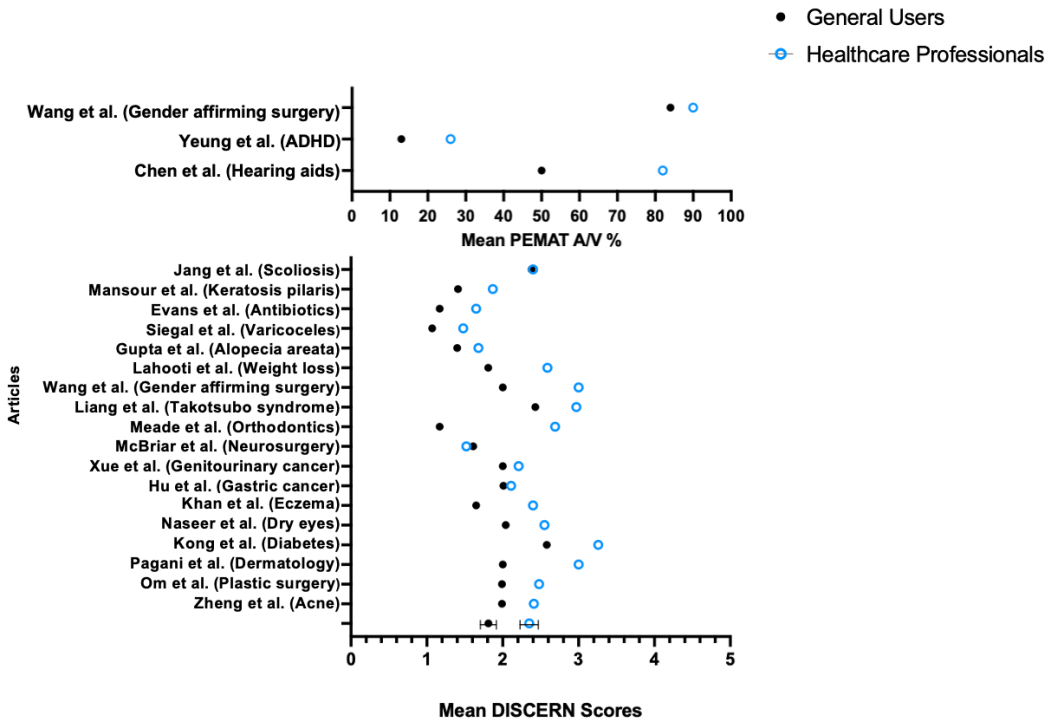
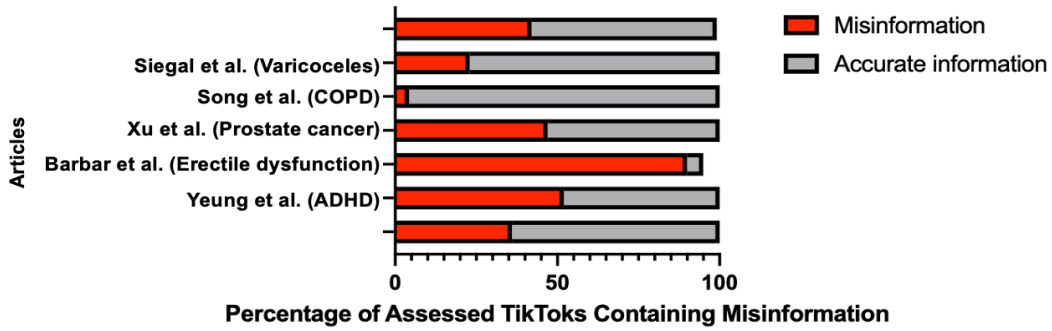


Figure 4: Percentage of TikTok videos containing questionable information



DISCUSSION

The wide variety of medical topics outlined in this rapid review illustrates that TikTok is a commonly used platform for the discussion of health-related issues. In the articles included and analysed in this review, the overall quality of health content on TikTok seemed questionable: many studies reported DISCERN scores of less than 3. DISCERN has previously been shown to accurately distinguish high- and low-quality content, with scores of less than 3 representing shortcomings in many crucial areas, such as reliability, purpose, bias, and relevance.[11] The most common shortcomings identified in the analysis of TikTok content were the lack of information regarding resources, and a limited or selective discussion of materials.

The studies included in the review revealed that TikTok videos produced by HCPs are of significantly higher quality than those produced by general users (p=0.0003). The McBriar et al. study, which assessed neurosurgery-related videos, was the exception. McBriar et al. demonstrated a slightly higher mean DISCERN score for videos produced by general users when compared to for HCP content generators (1.61 vs 1.53 respectively).[12] McBriar et al. included medical students, a substantial proportion of TikTok users, within the general users category (n=17), with doctors plus all allied health in the HCP category (n=63).[12] The addition of medical students into the general user category would have helped equilibrate the mean DISCERN scores between the two groups.

Despite HCP-produced videos being of higher quality, our findings suggest the overall quality of the health-related videos is poor to moderate for both user types. For instance, McBriar et al. noted that examples of concerns regarding HCP-produced videos include the use of medical jargon, and not demonstrating a range of treatment options. Ensuring health-related informational videos avoid medical jargon, display a full range to treatment options, and indicate clearly when to seek medical help are important areas where HCPs should be focusing their efforts when creating educational videos to post on TikTok. HCP producers need to be conscious of the commonplace use of TikTok for medical information. When producing videos, HCPs need to focus on providing, clear evidence-based information.

While social media platforms such as TikTok provide many benefits to patients, there appears to be no regulation stated in TikTok's community guidelines regarding the quality of the content uploaded.[13] Since uploaded items are not peer reviewed, videos may contain questionable information that might mislead users. We found that 42 per cent of videos included in our review contained questionable information. As today's youth continue to turn to social media platforms such as TikTok as a primary source of information, our review suggests that more needs to be done to ensure the quality of what is presented.

Another key issue surrounding the circulation of questionable information on social media platforms is the harmful effects of that have been brought to light from people acting on such unverified information. This issue is particularly prevalent around videos portraying methods to improve users' physical appearance. One such example is a high-profile cosmetic trend in which Melanotan, marketed as the "Barbie drug", was promoted for its use in sunless tanning and appetite suppression. It gained significant traction on TikTok and sparked major concerns because Melanotan is a prescription-only medication used in the management of erythropoietic protoporphyria, a rare, genetic disease.[14] When used inappropriately, Melanotan is associated with several potential side effects, including abdominal and chest pain, altered morphology of moles, and kidney failure.[14] As a result, Australia's Therapeutic Goods Administration has published several warnings against the use of this agent and reminded consumers of the convictions associated with its illegal sales.[14]

Throughout the COVID-19 pandemic, the dissemination of misinformation on social media platforms was topical. In response, TikTok partnered with members of *Politifact*, *Lead Stories*, and *Science Feedback* to develop a taskforce dedicated to identifying and removing misleading content.

In doing so, more than 250,000 videos containing information on COVID-19 were removed: 81 per cent of these videos were removed proactively, 80 per cent were removed within 24 hours, and more than 63 per cent were removed without views.[15] Furthermore, the taskforce also encouraged users to access a Frequently Asked Questions webpage published by the World Health Organization, and to report misleading content that violated their community guidelines.

Limitations

Our review has several limitations. First, both scoring systems used in the assessment of TikTok videos were not initially designed to assess short-form content. For example, DISCERN was originally intended to assess written health information, not audio-visual. While PEMAT-AV was designed to assess forms of audio-visual media, it is not a specific assessment tool for health- or medical-related content. Amongst studies who used the PEMAT-AV tool, there was greater variability of results. Unlike DISCERN, the PEMAT-AV score also evaluates actionability. Given the fact that TikTok videos are short form, PEMAT-AV may be an inappropriate metric. Therefore, as more forms of social media begin to transition towards the dissemination of short-form media content (ie, Instagram Reels, YouTube Shorts), it would be beneficial for researchers to design an assessment tool more specific to this form of content. We also acknowledge the absence of a meta-analysis within our review.

Future Research

Due to the relatively new nature of TikTok and research into this area, only a small sample of articles were eligible for inclusion within this review. However, in the period between consulting the database (December 24, 2022) and the publication of this article (October 2023), further research focusing on topics such as Monkeypox, intrauterine devices, and weight loss have been published.[16–18] Therefore, we contend it would be helpful for future researchers to repeat this review in future to monitor the trends for the quality of information offered.

CONCLUSION

Users should consider carefully the quality of health-related content on TikTok because it is questionable, it may be unverified, and it sometimes fails to meet patient needs outlined in the DISCERN and PEMAT-AV tools. As TikTok becomes the mainstay of social media communication, it is expected to play an increasingly important role in health care, which underscores the need to develop an accurate and specific scoring system to evaluate TikTok medical content. TikTok and other social media platforms should consider developing comprehensive policies regarding the creation and publication of content, like that about health care, which could have potentially negative or detrimental impacts on users.

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