Quality of Information in Osteoporosis Videos on TikTok: Cross-sectional Study

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Abstract

Background: TikTok has become a significant channel for the general public to access and adopt health information. However, the quality of health content about osteoporosis on TikTok remains underexplored.

Objective: This study aimed to investigate the information quality of osteoporosis videos on TikTok.

Methods: We analyzed the first 200 videos related to osteoporosis on TikTok, focusing on 128 videos that met our criteria. The quality of these videos was evaluated using quantitative scoring tools such as the DISCERN instrument and Structured Content Integrity Assessment. Additionally, the correlation between video quality and characteristics, including duration, likes, comments, and shares, was investigated.

Results: Of the videos analyzed, 93.0% were posted by doctors, with disease knowledge being the most prevalent content (56%). The average DISCERN score was 36.51 (SD 6.87). Content integrity scores were: definition 0.61 (SD 0.77), symptoms 0.34 (SD 0.71), evaluation 0.39 (SD 0.71), risk factors 0.55 (SD 0.65), management 0.82 (SD 0.56), and outcomes 1.17 (SD 0.75). The majority of videos were rated as poor (71.09%) or fair (22.66%) in quality. DISCERN scores were significantly correlated with video duration ($r=0.581$, $P<0.01$). Engagement metrics such as likes, comments, favorites, and shares were highly interrelated but did not correlate with video quality.

Conclusions: Although the videos about osteoporosis on TikTok are mainly provided by doctors and contain disease knowledge, their quality is low. We found a positive correlation between video duration and video quality. High-quality videos received low attention, while popular videos were of low quality. The medical information on TikTok is currently not rigorous enough to guide patients to make accurate judgments. Due to the low quality and reliability of the information, TikTok is not an appropriate source of knowledge to educate patients.

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Although the videos about osteoporosis on TikTok are mainly provided by doctors and contain disease knowledge, their quality is low. We found a positive correlation between video duration and video quality. High-quality videos received low attention, while popular videos were of low quality. The medical information on TikTok is currently not rigorous enough to guide patients to make accurate judgments. Due to the low quality and reliability of the information, TikTok is not an appropriate source of knowledge to educate patients.

Keywords

Osteoporosis; Bone Health; TikTok; Video Quality; Health Information; Patient Education

Introduction

Osteoporosis is a systemic skeletal disorder characterized by low bone mass and microarchitectural deterioration of bone tissue, leading to increased bone fragility and a higher risk of fractures, which often worsen with age [1]. In the context of global aging, the prevalence of this chronic disease is increasing and has become a significant public health issue. Studies show that the prevalence of osteoporosis in adults over the age of 50 in the United States is approximately 12.6% [2]. In China, the prevalence ranges from 0.89% to 17.23% among people aged 18 to 75 [3]. Osteoporosis can lead to falls, and there is a certain causal relationship between them [4]. A systematic analysis of the Global Burden of Disease Study 2021 indicated that falls are one of the leading causes of age-standardized mortality globally, with 9.9 deaths per 100,000 people [5]. Additionally, osteoporosis may increase the incidence of cardiovascular diseases, respiratory diseases, and cancer [6], thus affecting the quality of life of patients [7]. Therefore, actively preventing and treating osteoporosis is crucial for improving patient prognosis and reducing the burden on the healthcare system.

It is noteworthy that although the medical term osteoporosis is well known, there are still many issues regarding its prevention and treatment [8]. This may be due to the early stages of bone loss often being asymptomatic and easily overlooked, leading to many patients being diagnosed only after a fracture occurs [9]. Furthermore, many diagnosed patients do not receive comprehensive and standardized treatment [10]. Thus, it is essential for clinical healthcare professionals to help more people understand the definition, symptoms, risk factors, assessment methods, management, and prognosis of osteoporosis, guiding them to adopt scientific, standardized, and effective interventions as early as possible.

The internet offers substantial assistance in disseminating medical knowledge [11]. With the rapid development of internet technology over the past few decades, people tend to obtain information from electronic devices such as mobile phones or computers [12]. Videos have gradually become one of the main ways for people to acquire medical information [13]. TikTok, a popular short video platform, has garnered 1.1 billion users in over 160 countries/regions, with users spending an average of up to 95 minutes per day on the platform, indicating that TikTok has become an integral part of people's daily lives. Additionally, TikTok has extended the maximum video length from 1 minute to 3 minutes, and recently to 10 minutes [14], suggesting that more information can be conveyed within videos, providing more scope for creating medically relevant videos. TikTok is widely used by the Chinese population, with 400 million daily active users in mainland China [15]. Therefore, high-quality, scientific, professional, and rigorous medical videos can be visible to people on this platform.

Unfortunately, the quality of many medical videos on the TikTok platform in China is not optimistic [13, 16]. The poor quality of these videos necessitates cautious consideration of the information they provide. However, most non-medical professionals are not well-equipped to assess the reliability of the video sources, the authenticity of the content, or the accuracy of the information. They may be misled by this information and make erroneous medical decisions [17]. Previous studies have reported on the quality of videos related to chronic diseases such as Takotsubo syndrome, diabetes, COPD, and liver cancer, showing significant variability in video quality, which indicates that the quality of videos on a single disease cannot represent the overall picture [16, 18-20]. Osteoporosis-related videos have not yet been evaluated, so it remains unclear whether they are truly beneficial to viewers. Based on this, the aim of this study is to evaluate the characteristics, content, and quality of osteoporosis-related videos on China's TikTok platform.

Methods

Ethical Considerations

This study did not involve clinical data, human specimens, or experimental animals. All information used in this study was obtained from publicly available TikTok videos, and all data did not involve personal privacy. Moreover, the study did not involve any interaction

with users; therefore, ethical review was not required.

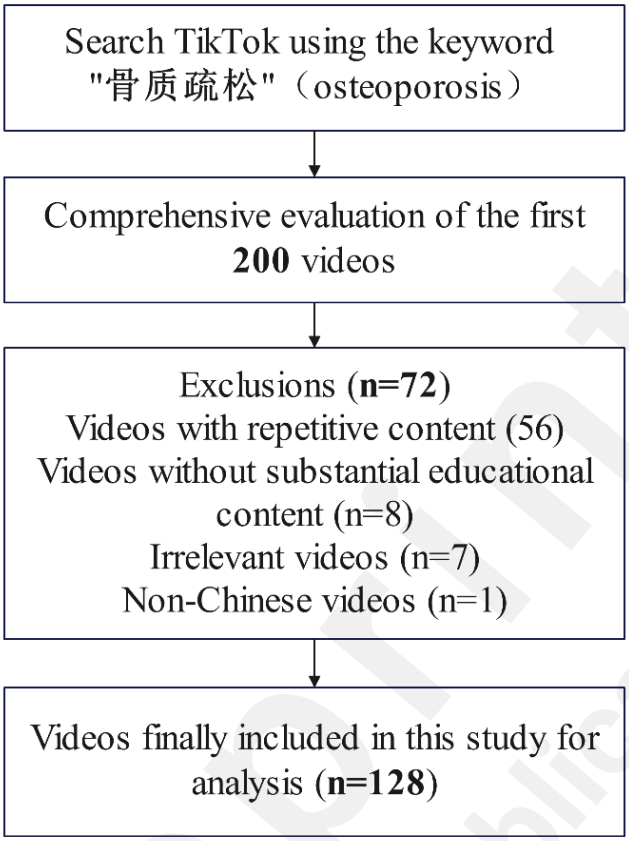
Data Collection

In this cross-sectional study, we searched the Chinese version of TikTok on May 10, 2024, using the Chinese term "□□□□" (osteoporosis). Videos were sorted by comprehensive ranking, with the publication time set to unlimited, which is the default setting on TikTok. We limited our evaluation to the first 200 videos because studies have shown that users typically browse between 100 to 300 videos [21-23]. Prior to the evaluation, we reviewed the search results and found that videos beyond the 200th position had significantly fewer likes and favorites. These videos also tended to have repetitive content and low originality. [19, 20]. The exclusion criteria for videos were: (1) videos unrelated to osteoporosis or lacking educational information; (2) duplicate videos; (3) non-Chinese videos; (4) non-original videos.

For the overall features of osteoporosis-related TikTok videos, the following were recorded and analyzed: days since upload, duration (seconds), year of publication, views (likes, comments, favorites, and shares), and the sentiment of the top three comments (positive, neutral, and negative). Positive comments express affection, appreciation, or support for the video content, typically containing praise, encouragement, and other positive words. Negative comments express dissatisfaction, criticism, or disapproval of the video content or publisher, possibly containing negative words or tones. Neutral comments do not show a clear emotional tendency towards the video content and simply state facts or express opinions.

For the characteristics of video sources and production, the following were recorded and analyzed: the publisher's profession (healthcare professionals, individual science communicators, news agency personnel, and research institutions); the affiliated organization of the author or unit (profit organizations and non-profit organizations); and video production elements (subtitles, presence of people, animations, and background music).

Figure 1



Flowchart of Screening Process

Quality Assessment

First, we adopted the coding schema proposed by Goobie [15] to rate the content integrity of the videos across six dimensions: definition of the disease, signs/symptoms, risk factors, evaluation, management, and outcomes. Two raters independently assessed each video, with each dimension scored on a scale of 0-2 points: 0 points (no content), 0.5 points (little content), 1 point (some content), 1.5 points (most content), and 2 points (extensive content). Multimedia Appendix 1.

The DISCERN tool is used to determine the quality of health information regarding treatment options and includes 16 questions divided into three sections, each scored on a 5-point scale [24]. Section 1 (item 1-8) assesses the reliability of the article, Section 2 (item 9-15) focuses on the quality of treatment information, and Section 3 (item 16) evaluates the overall quality. The overall DISCERN score ranges from 16 to 80, categorized as very poor (16-26), poor (27-38), fair (39-50), good (51-62), and excellent (63-80). Multimedia

Appendix 2.

The evaluation of video quality was conducted by two orthopedic clinical experts, both of whom have over 10 years of experience and possess professional knowledge and skills. During the screening and rating process, authors 1 and 2 simultaneously used the content integrity assessment tool and the DISCERN tool to assess the videos. Scores were determined through discussion. An arbitrator (rater 3) resolved any score discrepancies between raters 1 and 2 and provided the final score. Subsequently, all raters agreed on all the ratings.

Statistical Analyses

The main statistical methods included descriptive statistical analysis. The median (range) was used to describe data related to video characteristics, such as the number of likes, while the mean (standard deviation) was used to describe quality evaluation results. Frequency and percentage were used to describe count data. The Kruskal-Wallis test was employed to assess differences between groups, and Dunn's multiple comparison test was used for pairwise comparisons of quantitative variables that did not follow a normal distribution. Spearman's correlation analysis was used to evaluate relationships between quantitative variables, with $P<0.05$ considered statistically significant. All statistical analyses were performed using SPSS (version 25.0; SPSS Inc., Chicago, IL, USA). Graphical plotting was done using R (version 4.4.0, Puppy Cup).

Results

Features of osteoporosis Videos

The 128 videos collected through the TikTok search had a total of 761,088 likes, 22,508 comments, and 220,582 shares, Multimedia Appendix 3. The average video duration was 77 seconds (range: 8 to 834 seconds). Moreover, by the data collection date, the average number of days since upload was 254 days (range: 3 to 1435 days). The details of videos uploaded in different years and their view counts are shown in Table 1.

Table 1

Overall Characteristics of the Videos

Information	n□%□
Days Uploaded	254□3, 1435□
Duration□s□	77□8, 834□

□60s	43□33.6□
60-300s	81□63.3□
□300s	4□3.1□
Year of Publication	
2020	2□1.6□
2021	15□11.7□
2022	20□15.6□
2023	40□31.3□
2024	51□39.8□
Views	
Likes	1924□0, 164000□
Comments	77□1, 2650□
Favorites	609□0, 82000□
Shares	448.5□0, 36000□
Comment Sentiment	
Positive	210□49.1□
Neutral	254□51.7□
Negative	27□5.5□

Table 2 shows the descriptive statistics for TikTok videos from different sources and related to their production. According to video sources, 93.0% (119/128) of the videos were posted by doctors. The proportions of the other sources were individuals (3.1%, 4/128), news agencies (3.1%, 4/128), and research institutions (0.8%, 1/128). The vast majority of the videos came from non-profit organizations (98.4%, 126/128). In terms of video production, 95.3% (123/128) of the videos had subtitles, 96.1% (124/128) featured people, but only 21.7% (28/128) included animations to aid in content expression.

Table 2

Characteristics of Video Sources and Production

Video Source	n□%□	Likes	Comments	Favorites	Shares
Publisher's Profession					
Healthcare Professionals	119□93.0□	651878	20487	201040	201575
Individual Science Communicators	4□3.1□	105214	1952	7191	16293
News Agency Personnel	4□3.1□	2201	63	1093	553
Research Institutions	1□0.8□	1795	3	287	1831
Affiliated Organization of the Author or Unit					

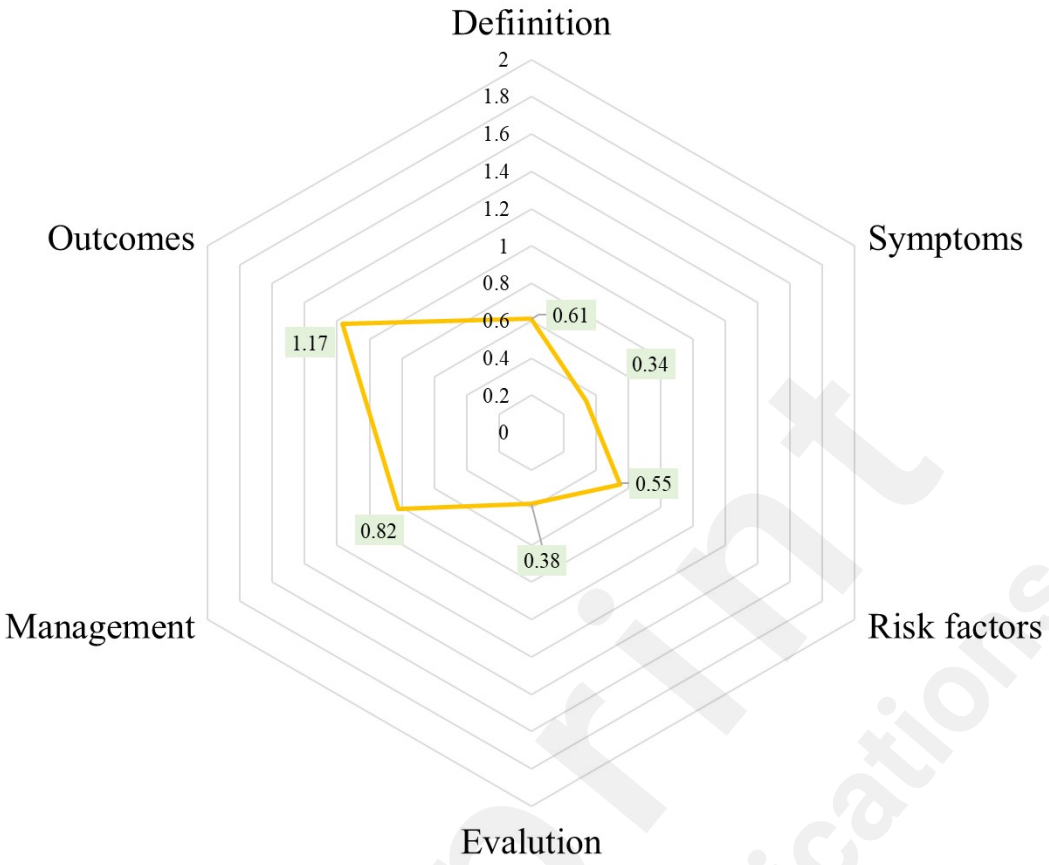
Profit Organizations	2□1.6□	3141	147	1925	779
Non-Profit Organizations	126□98.4□	757947	22361	307686	219803
Video Production					
Subtitles	123□95.3□	31427	1299	20603	12857
Presence of People	124□96.1□	708734	22189	308562	217569
Animations	28□21.7□	135157	50953	3592	28740
Background Music	81□62.8□	575119	230069	14857	159154

Video Quality Assessments

The content integrity scores were as follows: definition 0.61 (SD 0.77), symptoms 0.34 (SD 0.71), evaluation 0.39 (SD 0.71), risk factors 0.55 (SD 0.65), management 0.82 (SD 0.56), and outcomes 1.17 (SD 0.75). The average DISCERN score of all 128 videos was 36.51 (SD 6.87).

The radar chart presents the content integrity scores of osteoporosis-related TikTok videos across six dimensions, with each dimension scored on a scale from 0 to 2 points (Figure 2). Except for the outcomes dimension, which scored above 1 (1.17), all other dimensions scored below 1. Overall, the chart indicates that while some dimensions (such as outcomes and management) are relatively well-covered, others (such as symptoms and evaluation) receive less attention.

Figure 2



Content Integrity Radar Chart

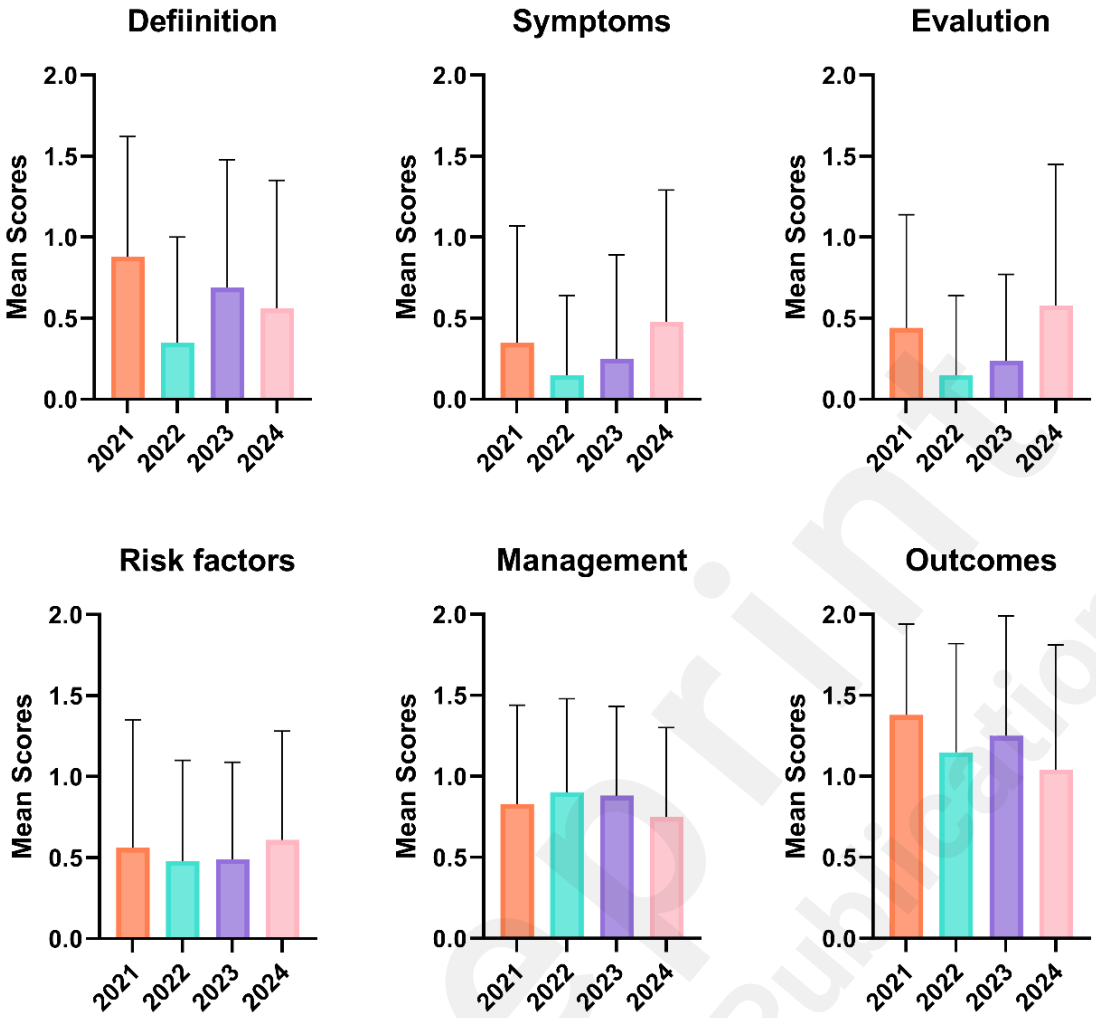
Table 3 shows that the vast majority of videos lack content in the key dimensions of "symptoms" and "evaluation," with 78.3% and 72.9% of the videos scoring 0 points, respectively. In contrast, the dimensions of "definition" and "outcomes" have relatively higher proportions of complete content, but a significant proportion of videos still lack content in these areas. The results of the Kruskal-Wallis test indicate that there are no statistically significant differences in content integrity dimensions across different years, with *P*>0.05 (Figure 3).

Table 3

Video Content Integrity

Content	Definition □n□%□	Symptoms □n□%□	Risk factors □ n □ %□	Evaluation□ n□%□	Management □n□%□	Outcomes □n□%□
Extensive content □ 2 points□	24□18.6□	17□13.2□	12□9.3□	18□14.0□	7□5.4□	48□37.2□
Most content□1.5 points□	1□0.8□	2□1.6□	4□3.1□	0□0□	18□14.0□	0□0□
Some content□1 points□	22□17.1□	5□3.9□	31□24.0□	11□8.5□	51□39.5□	53□41.1□
Little content□0.5 points□	13□10.1□	3□2.3□	18□14.0□	5□3.9□	26□20.2□	1□0.8□
No content□0 point□	68□52.7□	101□78.3□	63□48.8□	94□72.9□	26□20.2□	26□20.2□

Figure 3



Comparison of Scores for Different Dimensions of Video Content Integrity Across Different Years

The majority of the videos (71.2%) had DISCERN scores between 27 and 38, indicating a "poor" level (Table 4). This suggests significant deficiencies in the quality of treatment-related information in osteoporosis educational videos on TikTok. Only six videos achieved a "good" level. Table 5 shows that there are no statistically significant differences in DISCERN scores among different publishers (P>0.05). We used a heatmap to illustrate the DISCERN scores for various items by different publishers (Figure 4), showing that videos published by doctors are superior to those published by individuals under the DISCERN standards. Due to the very small number of videos from research institutions and news media, their scores are slightly better than those from doctors and individuals. However, we see many dark areas in the figure, indicating low content quality in the corresponding items.

Table 4

Grading of DISCERN Score Results

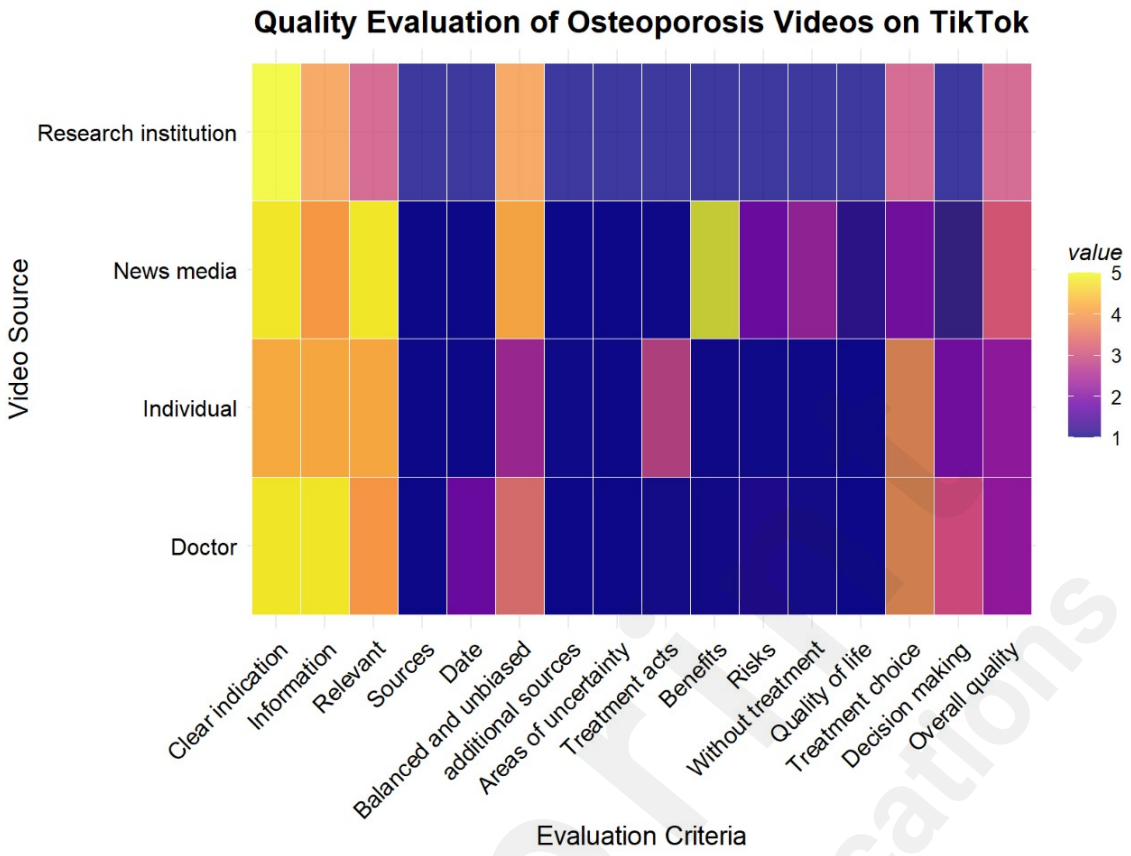
Grade	N（%）
16-26 (very poor)	2（1.56）
27-38 (poor)	91（71.09）
39-50 (fair)	29（22.66）
51-62 (good)	5（3.91）
63-80 (excellent)	1（0.78）

Table 5

Source	Healthcare Professionals （119）	Individual Science Communicators （4）	News Agency Personnel （4）	Research Institutions （1）	*H*	*P*
Publication reliability	20.0（13.0,38.0）	22.0（18.0,24.0）	21.5（19.0,22.0）	20.0（20.0,20.0）	1.681	0.641
Quality of information on treatment choices	13.0（7.0,30.0）	13.0（7.0,23.0）	13（10.0,15.0）	9.0（9.0,9.0）	1.617	0.655
Overall rating	2.0（1.0,5.0）	3.0（2.0,3.0）	3.0（2.0,4.0）	3.0（3.0,3.0）	4.413	0.220
Total score	36.0（25.0,73.0）	35（33.0,50.0）	37.5（32.0,40.0）	32.0（32.0,32.0）	1.188	0.756

DISCERN Scores for Different Publishers, Content, and Video Characteristics

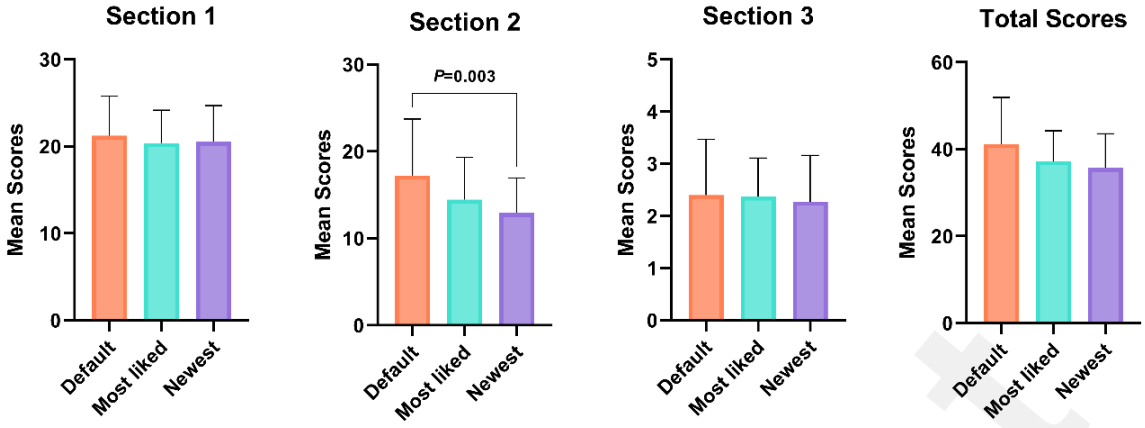
Figure 4



Scores of Different Publishers on Each DISCERN Item

We analyzed the top 30 videos based on the standards of "default sorting," "most likes," and "latest release." Users are most likely to engage with top-ranked videos. This approach is commonly supported by sorting algorithms and user interaction metrics, which prioritize the visibility and engagement of higher-ranked content. This method ensures that our analysis focuses on the most viewed and interacted-with videos, providing a representative sample of osteoporosis-related content on TikTok [25]. We found that Section 2 of DISCERN, Quality of information on treatment choices, showed statistically significant differences between "default sorting" and "latest release" (P<0.01, Figure 5). Additionally, when sorting by video duration, in Section 1 (Publication reliability), videos longer than 300 seconds scored significantly higher than those 60-300 seconds and less than 60 seconds (P<0.001). In Section 2 (Quality of information on treatment choices), videos longer than 300 seconds scored significantly higher than those 60-300 seconds and less than 60 seconds (P<0.001). In Section 3 (Overall rating), videos longer than 300 seconds scored significantly higher than those 60-300 seconds and less than 60 seconds (P<0.01). In the total score, videos longer than 300 seconds scored significantly higher than those 60-300 seconds and less than 60 seconds (P<0.001, Figure 6).

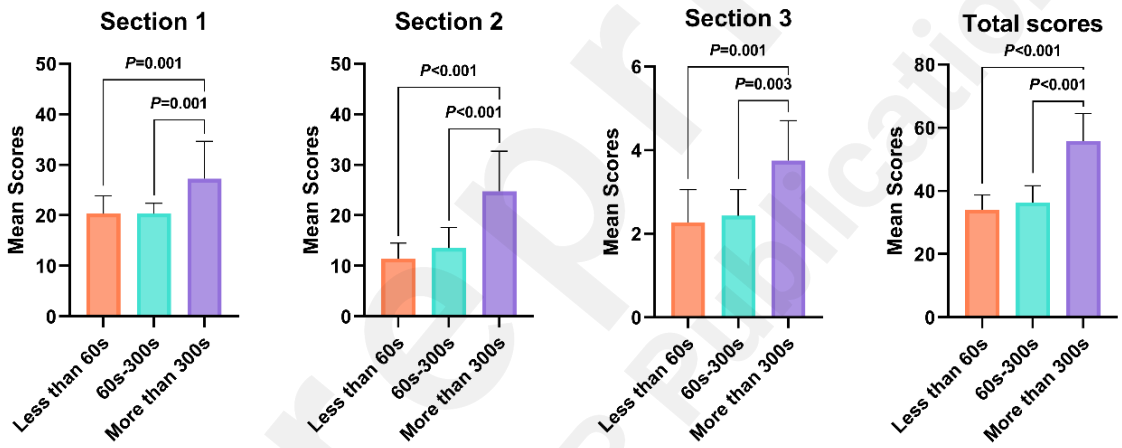
Figure 5



Default Sorting, Most Liked, Latest Published Top 30

Section 1, Publication reliability; Section 2, Quality of information on treatment choices; Section 3, Overall rating.

Figure 6



Comparison of Sorting Results by Different Video Lengths: Reliability, Treatment Choices, Overall Rating, Total Score

Section 1, Publication reliability; Section 2, Quality of information on treatment choices; Section 3, Overall rating.

Correlation Analysis

DISCERN scores were significantly positively correlated with video duration (r=0.581, P<0.01). Likes were significantly correlated with comments (r=0.901, P<0.01), favorites (r=0.901, P<0.01), and shares (r=0.898, P<0.01). Comments were also significantly correlated with favorites (r=0.855, P<0.01) and shares (r=0.899, P<0.01), and favorites were significantly correlated with shares (r=0.879, P<0.01). There were no significant correlations between the number of days since upload and other variables. Overall, likes, comments, favorites, and shares were highly correlated, while DISCERN scores were mainly correlated with video duration (Table 6).

Table 6

Relationship Between Video Variables *r*(*P*)

Variables	DISECRN	Likes	Comments	Favorites	Shares	Days Uploaded	Duration
DISECRN	1						
Likes	0.096(0.281)	1					
Comments	0.035(0.692)	0.901(<0.001)	1				
Favorites	0.074(0.403)	0.901(<0.001)	0.855(<0.001)	1			
Shares	0.072(0.420)	0.898(<0.001)	0.899(<0.001)	0.879(<0.001)	1		
Days Uploaded	0.099(0.266)	0.137(0.123)	0.160(0.071)	0.060(0.500)	0.158(0.075)	1	
Duration	0.581(<0.001)	0.029(0.749)	0.024(0.790)	0.022(0.805)	0.004(0.961)	-0.001(0.995)	1

Discussion

Main Findings

This cross-sectional study analyzed the characteristics and quality of osteoporosis-related videos on TikTok. Our primary finding is that the majority of these videos (93.0%) are produced by doctors, ensuring a professional source. However, despite this high level of professional involvement, the overall quality of these videos, as evaluated by the DISCERN and content integrity tools, was relatively low. This suggests a significant gap between the professional background of content creators and the quality of the information they provide.

Video Quality Assessment

The average DISCERN score for the videos was 36.51, indicating that most videos fall into the "poor" category. Only a few videos reached the "good" level, highlighting a significant inadequacy in treatment-related information. The content integrity evaluation results showed that the "outcomes" dimension had the highest score, but other critical areas such as "symptoms" and "evaluation" were significantly underrepresented. This lack of comprehensive coverage across all necessary dimensions points to a substantial deficiency in the educational value of these videos.

Correlation Between Video Quality and Characteristics

There is a positive correlation between video duration and quality, with longer videos generally providing more detailed information. This finding is consistent with previous research, indicating that longer formats allow for more detailed medical information presentation [26]. However, despite the higher quality of longer videos, this does not necessarily correlate with higher popularity. The number of likes, comments, and shares, which reflect video popularity [27], were negatively correlated with DISCERN scores. This

suggests that TikTok users are more likely to interact with lower-quality videos, possibly due to the platform's entertainment-oriented nature [28].

Factors Affecting Video Popularity

Our analysis showed that popularity metrics such as likes, comments, and shares were highly correlated (r=0.901 to 0.898, P<0.01). However, these metrics were not significantly correlated with video quality. This discrepancy indicates that TikTok's algorithm favors engagement metrics, potentially promoting lower-quality content. This finding is consistent with studies on video content on YouTube and other social media platforms, where visually appealing or sensational content often outperforms educational content in user interactions [29].

Implications for Health Education and Future Recommendations

Despite being primarily created by medical professionals, the low quality of osteoporosis-related videos on TikTok raises concerns about the platform's suitability for disseminating medical information. The negative correlation between video quality and popularity suggests that viewers may struggle to identify credible information, leading to misinformation and poor health decisions. Therefore, we propose recommendations in four areas, which also represent the motivations for our study. Through these efforts, we hope the public can access accurate and effective knowledge.

Enhancing Content Quality

To ensure comprehensive and detailed medical information, the duration of medical-related videos should be extended. This will allow content creators to cover various aspects of osteoporosis in greater depth, such as symptoms, risk factors, evaluation, management, and outcomes. TikTok should introduce a certification system for content creators who publish medical information. Certified medical professionals can obtain a certification badge, increasing the credibility of their content and helping users easily identify reliable sources [30]. Provide Content Guidelines: TikTok can develop and disseminate guidelines for creating high-quality medical content. These guidelines should emphasize the importance of evidence-based information and the need to cover medical topics clearly, accurately, and comprehensively. Encourage Peer Review: A peer review system for medical videos can be implemented, where other medical professionals review content

before publication [31]. This will help ensure the accuracy and reliability of the information provided.

Increasing User Engagement

Medical content creators should focus on making their videos visually appealing without compromising information quality [32]. Using animations, engaging visuals, and clear subtitles can make content more attractive and easier to understand. Including real-life patient stories and testimonials can make content more relatable and engaging [33]. This approach can help viewers connect with the information on a personal level, increasing their interest and retention. Incorporating interactive elements such as quizzes, polls, and Q&A sessions in the videos can actively engage viewers. This interactive approach can help reinforce learning and maintain viewer interest.

Platform-Level Interventions

TikTok should consider adjusting its recommendation algorithms to prioritize high-quality, professionally reviewed medical content. This change will ensure that users are more likely to encounter reliable and accurate information. Certified medical content should be prominently featured or prioritized on the platform. This can be achieved through special badges, prioritized search results, and dedicated sections for certified health information. TikTok can collaborate with medical organizations to conduct educational campaigns that promote the importance of seeking trustworthy medical information. These campaigns can guide users on how to identify reliable content and avoid misinformation.

Ongoing Monitoring and Research

There should be continuous monitoring and regular quality assessments of medical content on TikTok. This ongoing evaluation will help identify areas for improvement and ensure that information quality remains high [34]. Implementing a feedback mechanism that allows users to report misleading or low-quality medical content. This user-driven approach will help quickly identify and address issues, maintaining the platform's integrity. More studies should be conducted to explore the effectiveness of these interventions and understand the dynamic changes in medical content on social media platforms. Future research can investigate user behavior, the impact of visual and interactive elements, and the long-term effects of platform changes on content quality and user engagement.

Strengths and Limitations

This study is pioneering in its use of multiple tools to evaluate the quality and reliability of TikTok videos related to osteoporosis. We analyzed correlations between video duration, engagement metrics, and video quality, uncovering significant insights into the platform's content dynamics. However, the study has limitations. The evaluation tools were initially designed for textual content, limiting their effectiveness in assessing video content's production quality and audio-visual aspects. Furthermore, while we analyzed the number of comments, a deeper examination of comment sentiment could provide more nuanced insights into viewer engagement and feedback.

Conclusion

Although most osteoporosis-related videos on TikTok are produced by doctors and contain disease knowledge, their overall quality is low. High-quality videos receive less attention, while popular videos tend to be of lower quality. This indicates that TikTok's medical information is currently insufficiently rigorous to guide patients in making accurate health decisions. Due to the low quality and reliability of the information, TikTok is not an appropriate source for patient education. Addressing these issues through platform-level interventions and improved content standards is essential for enhancing the educational value of medical videos on TikTok.

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Abbreviations

OP	Osteoporosis
DISCERN	The DISCERN instrument questionnaire

Multimedia Appendix 1

Osteoporosis Summary Table

Multimedia Appendix 2

The DISCERN instrument questionnaire.

Multimedia Appendix 3

The URL of the video included in the evaluation.

Footnotes

Conflicts of Interest: None declared.

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Supplementary Files

Multimedia Appendixes

Osteoporosis Summary Table.
URL: http://asset.jmir.pub/assets/44711240d7f00228387a73ebf494e5a3.docx

The DISCERN instrument questionnaire.
URL: http://asset.jmir.pub/assets/5bb8642104e38e742b2712965eefc85c.docx

The URLs of the video included in the evaluation.
URL: http://asset.jmir.pub/assets/58b821a45f149c70b38d975af7cf7aa5.docx