DIGITAL HEALTH

Assessing the quality of breast cancer-related videos on TikTok: A cross-sectional study

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Abstract

Purpose: Breast cancer, the most common cancer in women globally, highlights the need for patient education. Despite many breast cancer discussions on TikTok, their scientific evaluation is lacking. Our study seeks to assess the content quality and accuracy of popular TikTok videos on breast cancer, to improve the dissemination of health knowledge.

Methods: On August 22, 2023, we collected the top 100 trending videos from TikTok's Chinese version using "breast cancer/ breast nodule" as keywords. We noted their length, TikTok duration, likes, comments, favorites, reposts, uploader types, and topics. Four assessment tools were used: Goobie's six questions, the Patient Educational Material Assessment Tool (PEMAT), the Video Information and Quality Index (VIQI), and the Global Quality Score (GQS). These instruments evaluate videos based on content, informational integrity, and overall quality.

Results: Among the 100 videos, content quality was low with Goobie's questions mostly scoring 0, except for management at 1.0 (QR 1.0). PEMAT scores were moderate: 54.1 (QR 1.6) for sum, 47.0 (QR 18.8) for PEMAT-A, and 52.3 (QR 11.7) for PEMAT-U. Regarding the quality of information, the VIQI (sum) median was 14.1 (QR 0.2). Additionally, the median GQS score was 3.5 (QR 0.1). Medical professionals' videos focused on breast cancer stages, while patient videos centered on personal experiences. Patient videos had lower content and overall quality compared to those by medical professionals (PEMAT, GQS: $P < 0.001$, $P = 0.004$) but received more comments, indicating higher engagement (all $P < 0.05$).

Conclusion: TikTok's breast cancer content shows educational potential, but while informational quality is moderate, content quality needs improvement. Videos by medical professionals are of higher quality. We recommend increased involvement of healthcare professionals on TikTok to enhance content quality. Non-medical users should share verified information, and TikTok should strengthen its content vetting. Users must scrutinize the credibility of health information on social platforms.

Introduction

Given the prominence of breast cancer as the most prevalent cancer among women globally and its considerable health implications,[1] understanding the potential of online platforms to enhance patient education is imperative.[2] The rise of the internet and social media has underscored the importance of online healthcare education.[3] Platforms like TikTok, launched by Chinese developers in 2017 and achieving over two billion downloads,[4] have become powerful mediums for disseminating health-related

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content,[5] including popular breast cancer awareness videos.[6,7] This aligns with the increasing digital health literacy among Chinese users[8] and the growing demand for digital health resources. Digital education on platforms like TikTok has shown benefits in improving emotional cognition and social life quality for patients.[9] TikTok has a strong influence in China and even around the world. Its outstanding feature is that it has a powerful content creation tool, which attracts a large number of ordinary users who have the desire to express themselves to participate in the creation, which is more conducive to us retrieving the information we want.

However, the use of social media for medical information distribution faces significant challenges. The lack of professional oversight and the potential for misinformation are major concerns. Previous research has found errors and misleading information on various social media platforms.[10–14] This is compounded by the Echo Chamber Effect, where users may engage with and reinforce their preexisting beliefs, potentially exacerbating misinformation impacts.[15,16] Additionally, the credibility of online health materials can be difficult for users, especially those with lower health literacy, to assess.[17]

Based on the above concerns, we aim to address the following two questions: First, how is the quality of breast cancer-related videos on TikTok? Second, what is the relationship between different uploaders and the content they upload? So, we employed four validated scoring instruments to evaluate the content, informational value, and overall quality of breast cancer-related information on TikTok. These tools include Goobie et al.'s six questions,[10,18] the Patient Education Material Assessment Tool (PEMAT),[19,20] the Video Information and Quality Index (VIQI),[18,21] and the Global Quality Score (GQS).[22–24] These instruments provide comprehensive assessments, evaluating content quality, information flow, accuracy, and overall utility to patients. This approach helps in identifying the effectiveness of TikTok videos in delivering accurate and useful health education, aiming to mitigate the challenges posed by the platform's open content environment.

Methods

Search strategy and information extraction

1. On August 22, 2023, we conducted a search on TikTok (Chinese mainland version) using the keywords "breast cancer/breast nodule". We included all videos relevant to breast cancer posted in Chinese and excluded irrelevant videos, duplicates, commercial promotions, and videos without audio or substantive content. We selected the top 100 videos from the "comprehensive ranking" for analysis (the workflow is shown in Figure 1). TikTok offers three sorting options: comprehensive ranking, latest releases, and most likes. We chose the comprehensive ranking as it is the default option, which most users typically follow. This selection was based on two observations: most relevant videos appeared within the top 100 search results, and beyond this, relevance noticeably declined (Figure 2 shows the correlation curve of the top 300 videos with the search target). Additionally, ordinary users prefer viewing initial search results due to their tendency towards minimal effort when using search engines.[25]

2. We systematically collected and recorded essential details of each video, including its URL, topic, publication date, uploader type and verification status, duration on TikTok, thumbs-up, comments, reposts, and favorites count, in an Excel spreadsheet (Microsoft Corporation).

Quality assessment

Two experienced breast surgery doctors (QY and LJ) assessed the video links presented in a tabular format. Before rating, they reviewed the scoring criteria for each scale. Independently, they viewed the videos to assign ratings and classify them according to source and content. In cases of discordant scores, a comprehensive discussion with an additional observer (PB) was conducted to achieve consensus. Video quality was evaluated based on three aspects: content quality, information quality, and overall quality. Content quality focuses on the reliability and completeness of the video content. Information quality pertained to how smoothly and accurately the information was conveyed. Overall quality synthesized these aspects to evaluate the video's usefulness to the audience.

To assess content quality, we utilized six questions from Goobie et al. and the PEMAT. To evaluate information quality, we employed the VIQI scale. The GQS tool was used to assess the overall quality of the videos. The details of each scale are depicted in the supplementary material. Below are detailed descriptions of each tool's scoring methods and characteristics:

1. Six questions from Goobie et al:[10,18] The scale evaluates the degree to which the video addresses six fundamental aspects: disease definition, signs/symptoms, risk factors, evaluation, management, and outcomes. Ratings were assigned based on content comprehensiveness: 0 points (no content), 0.5 points (limited content), 1 point (incomplete content), 1.5 points (substantial content), and 2 points (comprehensive content).

2. Patient Education Material Assessment Tool (PEMAT):[19,20] This scale was designed to evaluate audiovisual materials. It consists of 17 questions: 13 assessing the understandability of health information
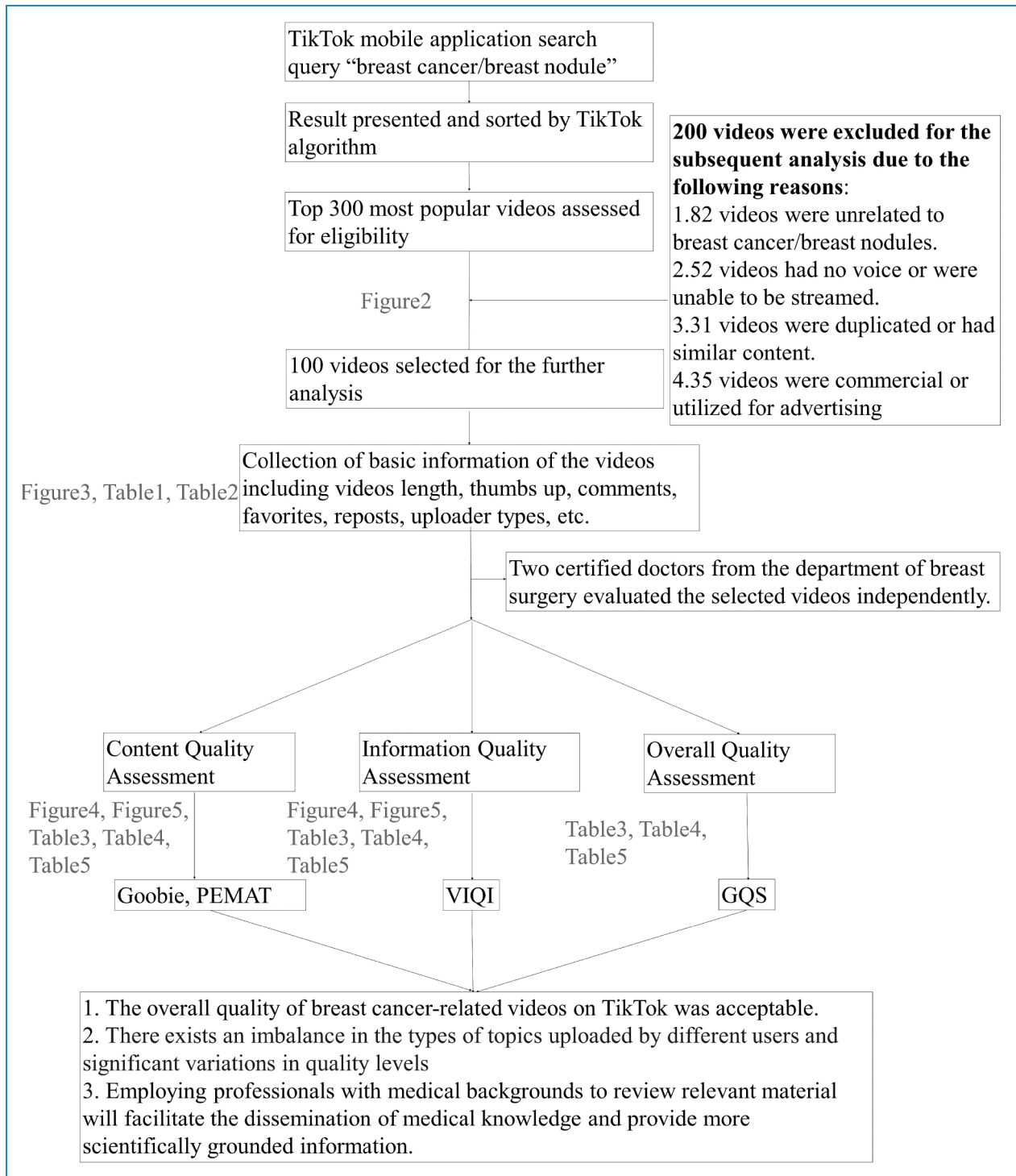
TikTok mobile application search query "breast cancer/breast nodule"

Result presented and sorted by TikTok algorithm

Top 300 most popular videos assessed for eligibility

200 videos were excluded for the subsequent analysis due to the following reasons:
1.82 videos were unrelated to breast cancer/breast nodules.
2.52 videos had no voice or were unable to be streamed.
3.31 videos were duplicated or had similar content.
4.35 videos were commercial or utilized for advertising

Figure2

100 videos selected for the further analysis

Figure3, Table1, Table2

Collection of basic information of the videos including videos length, thumbs up, comments, favorites, reposts, uploader types, etc.

Two certified doctors from the department of breast surgery evaluated the selected videos independently.

Content Quality Assessment

Information Quality Assessment

Overall Quality Assessment

Figure4, Figure5, Table3, Table4, Table5

Figure4, Figure5, Table3, Table4, Table5

Table3, Table4, Table5

Goobie, PEMAT

VIQI

GQS

1. The overall quality of breast cancer-related videos on TikTok was acceptable.
2. There exists an imbalance in the types of topics uploaded by different users and significant variations in quality levels
3. Employing professionals with medical backgrounds to review relevant material will facilitate the dissemination of medical knowledge and provide more scientifically grounded information.

Figure 1. The workflow of the study.

and 4 evaluating the actionability of video recommendations. Each question is scored as "Agree = 1" or "Disagree = 0," and the total score, understandability score, and actionability score are calculated as "Total Score/Total Possible Score × 100."

3. Video Information and Quality Index (VIQI):[18,21] This index assesses the information quality of a video using four components: VIQI 1 (Information Flow), VIQI 2 (Information Accuracy), VIQI 3 (Quality: based on the inclusion of images, animations, interviews, captions, and
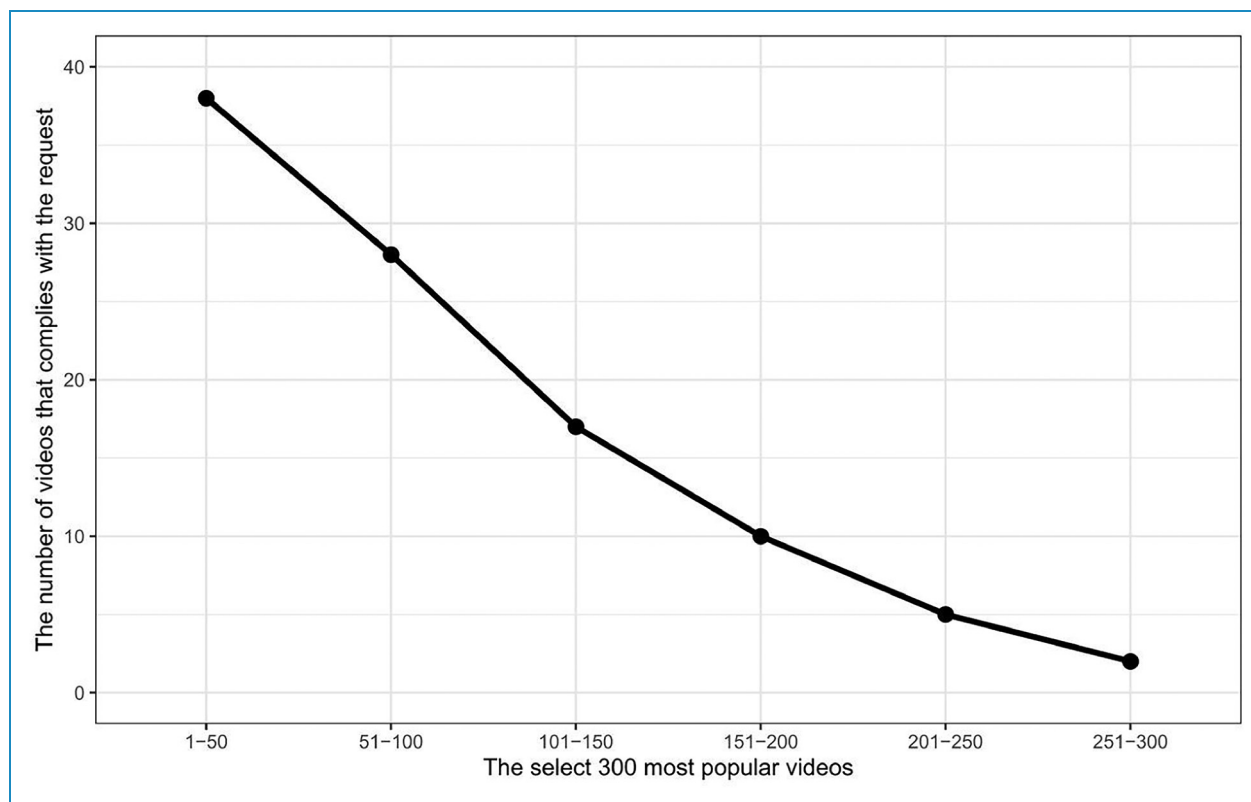
Figure 2. The number of videos that comply with our criteria in the top 300 most popular videos.

summaries), and VIQI 4 (Precision: consistency between the video title and content). Each component is rated on a Likert scale ranging from 1 to 5.

4. Global Quality Scale (GQS):[22–24] Designed to assess the quality of information on websites and rate videos based on their reliability and content. Scores range from 1 to 5, indicating poor to excellent video quality, with higher scores representing more reliable and comprehensive videos.

Statistical analysis

For statistical analysis, we used the Kolmogorov–Smirnov test for normality when the sample size was greater than 50 and the Shapiro–Wilk test when the sample size was less than 50.[26,27] Mean ± standard deviation and min-max were employed for normally distributed continuous variables, while median ± quartile range (QR) was used for non-normally distributed variables. The Kruskal–Wallis test was used to compare multiple non-normally distributed groups, and the Bonferroni post-hoc test assessed differences between two non-normally distributed groups. The interclass correlation coefficient (ICC) was used to assess the consistency of scoring by the two raters.[28,29] The inter-rater agreement represents how consistent two breast surgeons (QY and LY) are in scoring each evaluation criterion

for each video. We opted for the one-way random effects, absolute agreement, multiple raters/measurements model, with the calculation formula being (MSR = mean square for rows; MSW = mean square for residual sources of variance). Statistical significance was defined at a P-value < 0.05.

Results

Video characteristics

1. Uploader types: The TikTok platform authenticates users' professional credentials and affiliations, allowing us to categorize video uploaders into five groups (Figure 3A): breast cancer (BC) patients (20%), modern medicine (MM) professionals (60%), traditional Chinese medicine (TCM) practitioners (14%), news media workers (3%), and science bloggers (3%). Table 1 shows the proportion of content shared by different uploaders. MM professionals covered all topics but mainly focused on breast cancer stages, with "Risk factors/Prevention" being the most shared topic (28.3%). BC patients mostly shared survivorship and illness experiences. TCM practitioners primarily disseminated information on risk factors/prevention.
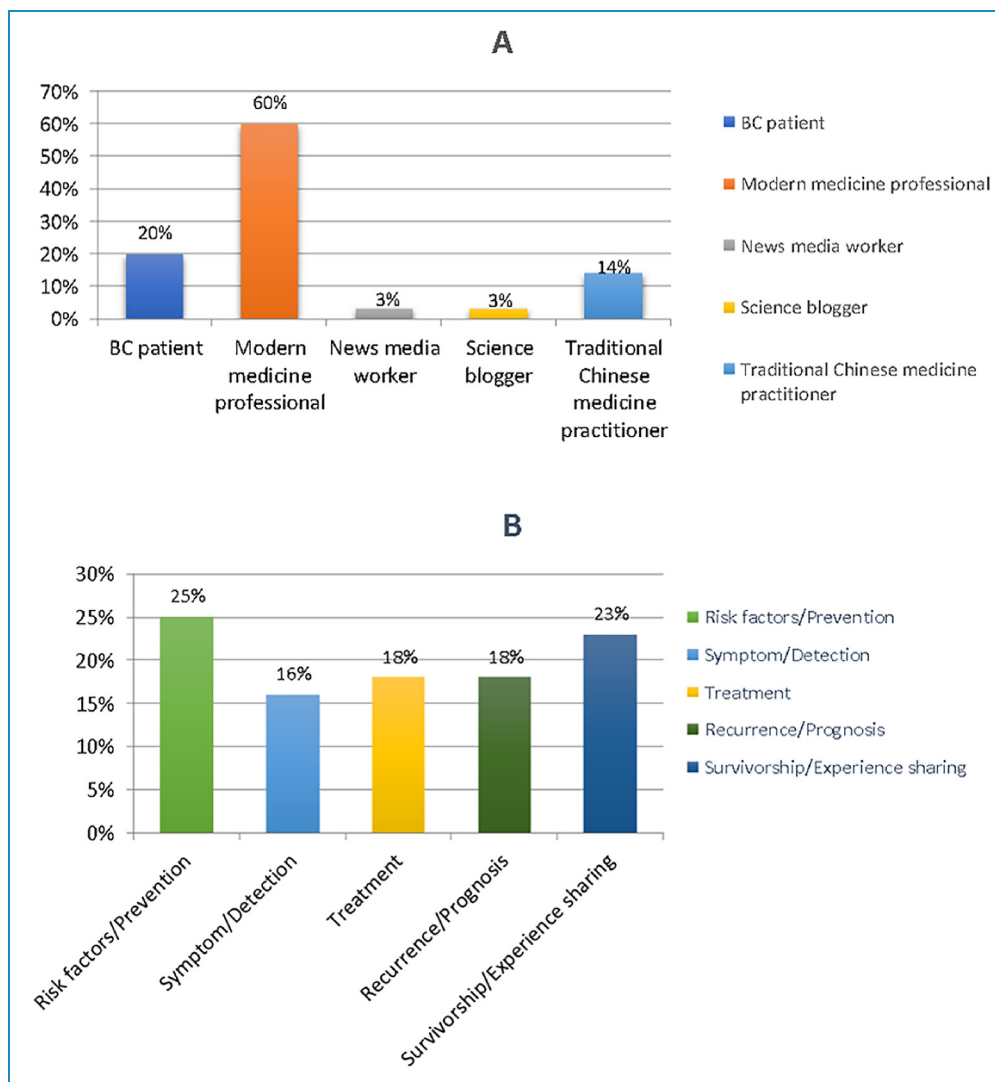
Figure 3. Distribution of breast cancer-related video topics and uploaders on TikTok. (A) Distribution of the videos based on uploaders. (B) Distribution of the videos based on topics.

Table 1. The percentage of each topic shared by different uploaders.

	BC patient (N=20) N(%)	MM professional (N=60) N(%)	News media worker (N=3) N(%)	TCM practitioner (N=14) N(%)	Science blogger (N=3) N(%)
Risk factors/Prevention (N=25)	3 (15.0%)	17 (28.3%)	0 (0.0%)	5 (35.7%)	0 (0.0%)
Symptoms/Detection (N=16)	1 (5.0%)	12 (20.0%)	1 (33.3%)	1 (7.1%)	1 (33.3%)
Treatment (N=18)	3 (15.0%)	12 (20.0%)	0 (0.0%)	3 (21.4%)	0 (0.0%)
Recurrence/Prognosis (N=18)	2 (10.0%)	14 (23.3%)	0 (0.0%)	2 (14.3%)	0 (0.0%)
Survivorship/Experience sharing (N=23)	11 (55.0%)	5 (8.3%)	2 (66.7%)	3 (21.4%)	2 (66.7%)

2. Video topics: Content creators addressed five main domains (Figure 3B): risk factors/prevention (25%), symptoms/detection (16%), treatment (18%), recurrence/prognosis (18%), and survivorship/experience sharing (23%). Videos were classified by their primary emphasis if multiple themes were present.
2.1. Risk factors/prevention: predominantly shared by MM practitioners (n = 18, 72%), followed by TCM practitioners (n = 4, 16%) and patients (n = 3, 12%).
2.2. Symptoms/detection: mainly contributed by MM practitioners (n = 12, 75%), with smaller contributions from TCM practitioners, patients, science bloggers, and news media workers (each n = 1, 6.25%).
2.3. Treatment: led by MM practitioners (n = 12, 66.7%), followed by TCM practitioners and patients (each n = 3, 16.7%).
2.4. Recurrence/prognosis was primarily shared by MM practitioners (n = 14, 77.8%), with contributions from TCM practitioners and patients (each n = 2, 11.1%).
2.5. Survivorship/experience sharing: involves various professionals, including patients (n = 11, 47.8%), MM practitioners (n = 5, 21.7%), TCM practitioners (n = 3, 13%), science bloggers (n = 2, 8.7%), and news media workers (n = 2, 8.7%).
3. Video features: Table 2 presents the fundamental characteristics of all the videos collected. We found that the length of videos varies from 11 s to 1777 s with a median length of 109 s. To mitigate potential confounding effects from publication time on other metrics, we further standardized the values for thumbs-ups, comments, favorites, and reposts by dividing them by the respective number of days since publication.

Video quality

Table 3 presents the quality assessment scores of the 100 TikTok videos related to breast cancer.

1. Content quality: the Goobie scale's six questions examine the breadth and depth of disease information covered. Except for Goobie 5 (management) with a median score of 1.0(QR 1.0), all other indicators had a median score of 0. The PEMAT scale assessed video content for actionability and understandability, with median scores of 54.1 (QR 1.6) for the sum, 47.0 (QR 18.8) for actionability (PEMAT-A), and 52.3 (QR 11.7) for understandability (PEMAT-U).

Table 3. Quality assessment of videos about breast cancer on TikTok.

	Median (QR)	Min−Max
Content quality assessment		
GOOBIE1(definition)	0.0 (0.0)	0−2.0
GOOBIE2(symptoms)	0.0 (1.0)	0−2.0
GOOBIE3(risk factors)	0.0 (0.5)	0−2.0
GOOBIE4(evaluation)	0.0 (1.0)	0−2.0
GOOBIE5(management)	1.0 (1.0)	0−2.0
GOOBIE6(outcomes)	0.0 (1.0)	0−2.0
PEMAT (sum)[a]	54.1 (1.6)	23.5−82.4
PEMAT-A	47.0 (18.8)	0−75.0
PEMAT-U	52.3 (11.7)	28.6−85.7
Information quality assessment		
VIQI1[b]	3.1 (0.0)	2.0−4.0
VIQI2	3.9 (0.8)	2.0−5.0
VIQI3	2.9 (0.8)	2.0−4.0
VIQI4	4.0 (0.8)	3.0−5.0
VIQI (sum)	14.1 (0.2)	11.0−18.0
Overall quality assessment		
GQS[c]	3.5 (0.1)	2.0−5.0

[a]Patient Educational Material Evaluation Tool.
[b]Video Information and Quality Index.
[c]Global Quality Score.

Table 2. Characteristics of videos about breast cancer on TikTok.

Characteristics	Median (QR)	Min−Max
Video length (second)	109 (77.1)	11−1777
Duration on TikTok (days)	425 (568)	1−1360
Thumbs-up	3834 (17,494)	15−40,700
Thumbs-up/day	39 (122)	0−7679
Comments	440 (1514)	0−61,000
Comments/day	3 (11)	0−504
Favorites	348 (1689)	0−81,000
Favorites/day	3 (30)	0−903
Reposts	473 (2646)	0−106,000
Reposts/day	4 (25)	0−2751

2. Information quality: the VIQI scale's median score was 14.1 (QR 0.2), with the highest performance in video title and content consistency (VIQI4) at a median score of 4.0 (QR 0.8) and information accuracy (VIQI2) at 3.9 (QR 0.8).
3. Overall video quality: the median GQS was 3.5 (QR 0.1).

Association between video features and characteristics with uploaders

Table 4 shows the associations between different types of uploaders, video characteristics, and video quality. Figure 4 highlights statistically significant disparities, including:

1. Video length: news media posted the shortest videos (median 56 s, QR 30 s), while science bloggers posted the longest (median 216 s, QR 116 s).
2. Duration on TikTok: TCM practitioners had the shortest median duration (31 days, QR 491), whereas news media workers had the longest (788 days, QR 433).
3. Engagement metrics: Science bloggers had significantly more likes, comments, favorites, and reposts.
4. Content quality: BC patients, MM practitioners, news media workers, and TCM practitioners scored highest on Goobie 5 (management), while science bloggers scored highest on Goobie 4 (evaluation).

Pairwise comparisons revealed

1. Content quality: MM videos scored higher than patient videos in PEMAT and PEMAT-U ($P < 0.001$ and $P = 0.02$, respectively).
2. Information quality: Patient videos had significant differences with MM practitioners in VIQI3, VIQI4, and VIQIsum ($P = 0.05$, $P = 0.006$, and $P < 0.001$, respectively).
3. Overall quality: BC patients' median scores were significantly lower than MM practitioners ($P = 0.004$).

Association between video features and characteristics with video topics

Table 5 compares the differences in features and quality across various video themes, while Figure 5 graphically illustrates items with significant differences.

1. Interaction metrics: "Symptoms/Detection" videos received the most thumbs-ups, reposts, comments, and favorites.
2. Content quality (Goobie/PEMAT): Scores were largely similar across "Goobie1" through "Goobie6", with a slight statistical difference in "Goobie4" ($P = 0.046$). Except for Goobie5 (evaluation), which had a median score of 1.0, most other topics had a median score of 0. PEMAT evaluation: "Symptoms/Detection" videos achieved the highest overall scores, with a total score of 64 (IQR 11.77), understandability score of 50 (IQR 25), and actionability score of 57.1 (IQR 12.0).
3. Information quality (VIQI): "Risk Factors/Prevention" videos scored highest in "VIQIsum" with a total of 14.2 (QR 1.2), significantly higher than "Survivorship/ Experience Sharing" ($P = 0.01$).
4. Overall quality (GQS): "Symptoms/Detection" videos scored highest at 3.8 (± 0.8). Median scores for "Survivorship/Experience Sharing" were significantly lower than those for "Risk Factors/Prevention" and "Symptoms/Detection" ($P < 0.001$ and $P = 0.03$, respectively).

Notably, "Survivorship/Experience Sharing" videos consistently received the lowest scores across multiple quality assessment indicators.

Discussion

General discussion

Breast cancer, with its increasing incidence rate but abundant treatment options, and relatively good prognosis, has gradually gained attention from researchers and patients. This study explored breast cancer-related content on TikTok, a popular social media platform in China. By analyzing the top 100 most popular videos, we gained insights into the state of educational content about breast cancer on TikTok, along with differences in uploader types and discussion topics.

Findings concerning general characteristics of videos

In our analysis, the median video duration was 109 s (IQR 77.1), aligning with research that indicates videos under one minute attract larger audiences.[5] These videos received a median of 3834 likes (IQR 17,494), 440 comments (IQR 1514), and 348 favorites (IQR 1689), showing TikTok's potential for spreading breast cancer awareness and enhancing health literacy.[30,31] However, the significantly lower number of comments compared to likes suggests that TikTok's health communication is mainly one-directional,[5] indicating a need for more interactive dialogue.[32] To maximize TikTok's benefits, analyzing audience characteristics such as age, gender, and location can help create targeted videos,[5,33] fostering active health-related discussions.

Table 4. Detailed characteristics of videos based on uploaders.

	BC patient (N = 20) Mean (SD)/ Median (QR)	MM professional (N = 60) Mean (SD)/Median (QR)	News media worker (N = 3) Mean (SD)/Median	TCM practitioner (N = 14) Mean (SD)/Median (QR)	Science blogger (N = 3) Mean (SD)/ Median	P-value
Common characteristics of videos						
Video length (second)	148 (84)[a]	60 (47)	56 (30)	74(50)	216 (116)	0.006
Duration on TikTok (day)	436 (234)[b]	422(573)	788 (433)	31 (491)	63	0.1
thumbs-up	17,500 (75,655)	2166 (10,368)	39,791 (40,518)	1146 (7949)	206,000 (130,543)	<0.001
thumbs-up/day	61 (209)	26 (88)	59 (58)	62 (145)	2871 (2949)	0.02
Comments	1422 (4892)[c]	201 (767)	2001 (1445)	100 (843)	16,217 (5828)[d]	<0.001
Comments/day	7 (12)	2 (6)	4 (3)	4.5 (15)	241 (163)	0.09
Favorites	1052 (2202)	142 (886)[e]	1916 (1763)	102 (1125)	29,625 (44,497)	0.002
Favorites/day	4 (11)	2 (5)	4 (3)	8 (23)	52	0.10
Reposts	1050 (2649)	202 (2102)	12,650 (10,243)	210 (1769)	47,243 (52,312)	<0.001
Reposts/day	4 (12)	2.5 (5)	28 (27)	4.5 (20)	91[f]	0.04
Content quality assessment						
GOOBIE1	0 (0)	0 (0)	0	0 (0.3)	0	0.6
GOOBIE2	0 (1)	0 (1)	0	0 (0.5)	0.8 (0.8)	0.6
GOOBIE3	0 (0.8)	0 (1)	0	0 (0.3)	0.5 (0.9)	0.3
GOOBIE4	0.5 (1.5)	0 (1)	0.3 (0.6)	0 (0.5)	1.2 (0.3)	0.1
GOOBIE5	1 (1.0)	1 (1)	0.8 (0.8)	1 (1.3)	1	0.6
GOOBIE6	0 (1)	0 (0.8)	0	0 (1.0)	0	0.8
PEMAT (sum)	46.2 (6.5)[g]	59 (15)	54.9	54.2 (13.0)	53	0.003
PEMAT-A	33.8 (21.3)	50 (16.8)	50 (0)	50 (13)	50	0.001
PEMAT-U	46.4 (7.0)[h]	57 (14)	52.4 (8.9)	50.5 (13.6)	50	0.09
Information quality assessment						
VIQI1	3 (0)	3.1 (0)	3	3 (1)	3	0.6
VIQI2	4 (0)	3.9 (0)	3 (0.8)	4 (1)	4 (0.7)	0.03
VIQI3	3 (1)[i]	2.7 (1)	3	3 (1)	3	0.08
VIQI4	4 (1)[j]	4.3 (1)	4	4 (1)	4	0.03
VIQI (sum)	14 (2)[k]	14 (2)	13	14.1 (2)	14.7 (1.5)	0.03

Table 4. Continued.

	BC patient (N=20) Mean (SD)/ Median (QR)	MM professional (N=60) Mean (SD)/Median (QR)	News media worker (N=3) Mean (SD)/Median	TCM practitioner (N=14) Mean (SD)/Median (QR)	Science blogger (N=3) Mean (SD)/ Median	P-value
Overall quality assessment						
GQS	3.0 (1)[l]	3.7 (1)	3	3.7 (0.9)	4	0.004

[a]Compared with modern medicine practitioner, $P=0.04$.
[b]Compared with traditional Chinese medicine practitioner and modern medicine practitioner, $P=0.02$ and 0.001, respectively.
[c]Compared with traditional Chinese medicine practitioner, modern medicine practitioner, $P=0.009$ and <0.001, respectively.
[d]Compared with modern medicine practitioner, $P=0.04$.
[e]Compared with breast cancer patients, $P=0.03-$.
[f]Compared with traditional Chinese medicine practitioner, $P=0.04$.
[g]Compared with modern medicine practitioner, $P<0.001$.
[h]Compared with modern medicine practitioner, $P=0.02$.
[i]Compared with modern medicine practitioner, $P=0.05$.
[j]Compared with modern medicine practitioner, $P=0.006$.
[k]Compared with modern medicine practitioner, $P<0.001$.
[l]Compared with modern medicine practitioner, $P=0.004$.
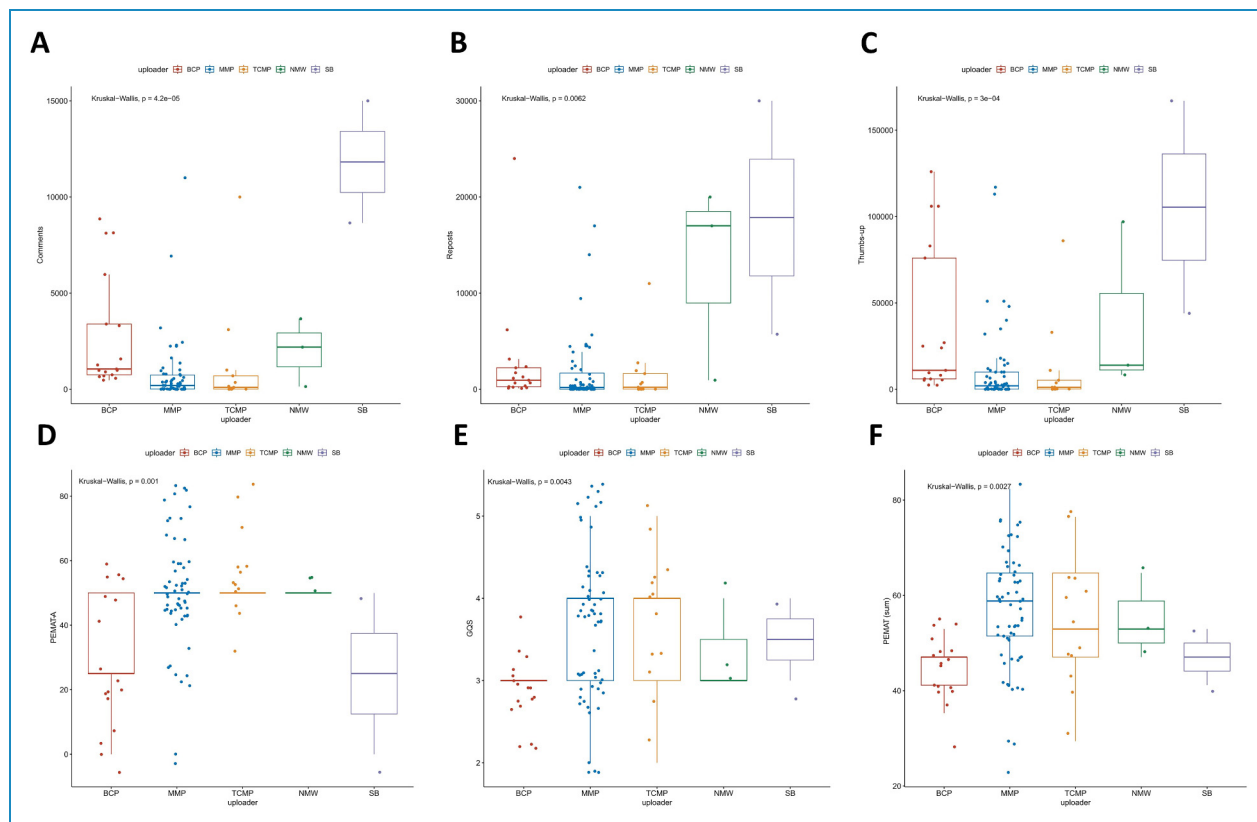
Figure 4. The analysis of comments, reposts, thumbs-up, PEMAT-A, GQS and PEMAT-sum was based on different TikTok video uploaders, which were statistically different. When the distribution of the data is concentrated, the box plot is a straight line. (A) The number of comments. (B) The number of reposts. (C) The number of thumbs-up. (D) The score of PEMAT-A. (E) The score of GQS. (F) The score of PEMAT-sum. BCP: Breast Cancer Patient; MMP: Modern Medicine Professional; NMW: News Media Worker; SB: Science Blogger; TCMP: Traditional Chinese Medicine Practitioner.

Table 5. Detailed characteristics of videos based on types.

	Risk factors/ Prevention (*N* = 25) Mean(SD)/ Median (QR)	Symptom/ Detection (*N* = 16) Mean(SD)/ Median (QR)	Treatment (*N* = 18) Mean(SD)/ Median (QR)	Recurrence/ Prognosis (*N* = 18) Mean(SD)/ Median (QR)	Survivorship/ Experience sharing (*N* = 23) Mean(SD)/Median (QR)	*P-value*
Common characteristics of videos						
Video length (second)	66 (58)	83 (44)	78 (50)	70 (64)	70 (162)	0.9
Duration on TikTok (day)	326 (634)	464 (604)	168 (483)a	190 (501)	190 (385)	0.03
thumbs-up	2470 (20,780)	5470 (50,658)	1045 (7255)	2813 (9520)	2813 (102,243)b	0.01
thumbs-up/day	41 (10)	32 (116)	68 (118)	27 (82)	17 (223.6)	0.7
Comments	201 (1452)	388 (2881)	123 (805)	334 (755)	334 (7645)c	0.007
Comments/day	3 (10)	3 (4)	5 (15)	2 (7)	2.24 (16.8)	0.6
Favorites	256 (2109)	878 (3396)	161 (466)	348 (775)	348 (2168)	0.2
Favorites/day	5 (22)	4 (7)	7.5 (30)	2 (8)	2.5 (12.7)	0.5
Reposts	384 (4459.5)	1289 (4778)	135 (580)	369 (1371)	369 (2920)	0.049
Reposts/day	5 (16)	3.5 (9)	2 (7)	3 (4)	2.78 (42)	0.3
Content quality assessment						
GOOBIE1 (definition)	0 (0.5)	0 (0)	0 (0)	0 (1)	0 (0)	0.2
GOOBIE 2 (symptoms)	0 (1)	0 (1)	0 (0)	0 (1)	0 (1)	0.3
GOOBIE 3 (risk factors)	0 (0)	0 (0)	0 (1)	0 (1)	0 (1)	0.2
GOOBIE 4 (evaluation)	0 (1.5)	1 (1.5)	0 (0.125)	0 (1)	0 (1.5)	0.046
GOOBIE 5 (management)	1 (1)	1 (0.88)	1 (0.75)	1 (1)	1 (1)	0.3
GOOBIE 6 (outcomes)	0 (1)	0 (0.38)	0 (0.5)	0 (1)	0 (0.5)	0.6
PEMAT (sum)	59 (11.8)	64 (11.77)	51.6 (14.0)	55.2 (9.3)	44.8 (9.0)d	<0.001
PEMAT-A	50 (0)f	50 (25)	50 (25)	50 (13)	50 (25)e	0.001
PEMAT-U	57 (14.28)	57.1 (12.0)	51.2 (15.0)	50 (16)	50 (14)g	<0.001
Information quality assessment						
VIQI1	3 (0)	3 (0)	3 (0)	3 (0)	3 (0)	0.6
VIQI2	4 (0)h	4 (0)	4 (1)	4 (0)	3 (1)	0.02
VIQI3	3 (1)	3 (0)	3 (1)	2 (1)	3 (1)	0.2

(continued)

Table 5. Continued.

	Risk factors/ Prevention (N = 25) Mean(SD)/ Median (QR)	Symptom/ Detection (N = 16) Mean(SD)/ Median (QR)	Treatment (N = 18) Mean(SD)/ Median (QR)	Recurrence/ Prognosis (N = 18) Mean(SD)/ Median (QR)	Survivorship/ Experience sharing (N = 23) Mean(SD)/Median (QR)	P-value
VIQI4	4 (1)	4 (1)	4 (1)	4 (1)	4 (0)i	0.047
VIQI(sum)	14.2 (1.2)	14.1 (1.5)	14.0 (1.9)	13.7 (1.9)	12.9 (1.1)j	0.03
Overall quality assessment						
GQS	4 (1)	4 (1)	3 (1)	3.5 (1)	3 (0)k	0.002

[a]Compared with treatment, P = 0.03.
[b]Compared with Treatment and Recurrence/prognosis, P = 0.03 and 0.02, respectively.
[c]Compared with Risk factors/Prevention and Treatment, P = 0.009 and 0.03, respectively.
[d]Compared with Risk factors/Prevention, Symptoms/Detection and Recurrence/prognosis, P = 0.02, 0.02 and P < 0.001, respectively.
[e]Compared with Risk factors/Prevention and Symptoms/Detection, P = 0.03 and 0.004, respectively.
[f]Compared with Treatment, P = 0.04.
[g]Compared with Risk factors/Prevention, Symptoms/Detection,and Recurrence/Prognosis, P < 0.001 and P = 0.002, respectively.
[h]Compared with Survivorship/Experience sharing, P = 0.02.
[i]Compared with Risk factors/Prevention and Treatment, P = 0.02 and 0.02, respectively.
[j]Compared with Risk factors/Prevention, P = 0.01.
[k]Compared with Risk factors/Prevention and Symptoms/Detection, P < 0.001 and P = 0.03, respectively.

Findings concerning video quality

The majority of videos reviewed had some scientific value but often presented fragmented and limited information with considerable repetition. The scientific value varied depending on the uploader's background. Videos by medical professionals and science bloggers typically relied on evidence-based medicine, while those by patients and news media were more anecdotal and potentially subjective. Some videos had exaggerated titles, which could be misleading.

We assessed the videos using four evaluation tools. Content quality, as measured by the Goobie scale, was generally low, highlighting the difficulty of providing comprehensive explanations in short video formats.[21] The PEMAT scale showed low overall scores, with actionability (PEMAT-A) significantly lower than understandability (PEMAT-U), indicating a focus on theoretical knowledge rather than practical guidance. Previous studies have shown that users prefer easily understandable information and engaging videos.[5] To make videos more appealing and understandable, uploaders often use animations and subtitles. The VIQI scale suggested decent information quality, while the median GQS score of 3.5 (±0.1) indicated moderate overall quality of the videos.

Findings concerning video topics and uploaders

Our analysis revealed a wide range of breast cancer-related videos, broadly categorized into five themes. Risk factors/prevention were the most shared topics, signaling their growing importance in disease management. Survivorship/experience sharing was also prominent, providing emotional support and stress relief to patients.[34] These topics generated the highest number of comments, indicating strong user engagement. The remaining topics covered treatment, recurrence/prognosis, and symptoms/screening, addressing various stages of breast cancer progression.

In terms of uploader types, modern medicine (MM) professionals, particularly breast or oncology specialists, were the primary uploaders (60%), focusing mainly on risk factors/prevention, recurrence/prognosis, symptoms/detection, and treatment. Content related to survivorship/experience sharing was less frequent (8.3%). Only one uploader was an official hospital account, indicating a lack of engagement from official healthcare organizations in China on social media.[5]

Breast cancer patients were the second largest group of uploaders (20%), primarily sharing their medical experiences and recovery stories (55%). Despite scoring lower on content quality (PEMAT) and overall quality (GQS), their videos received more likes, comments, and shares compared to those by MM professionals and TCM practitioners. TCM practitioners comprised the third largest group of uploaders (14%), with their content scoring well in quality assessments. News media workers and science bloggers made up the smallest proportion of uploaders (3% each), but science bloggers, with their large fan base, received significantly higher engagement metrics, highlighting the potential influence of social media influencers in health education.[35]
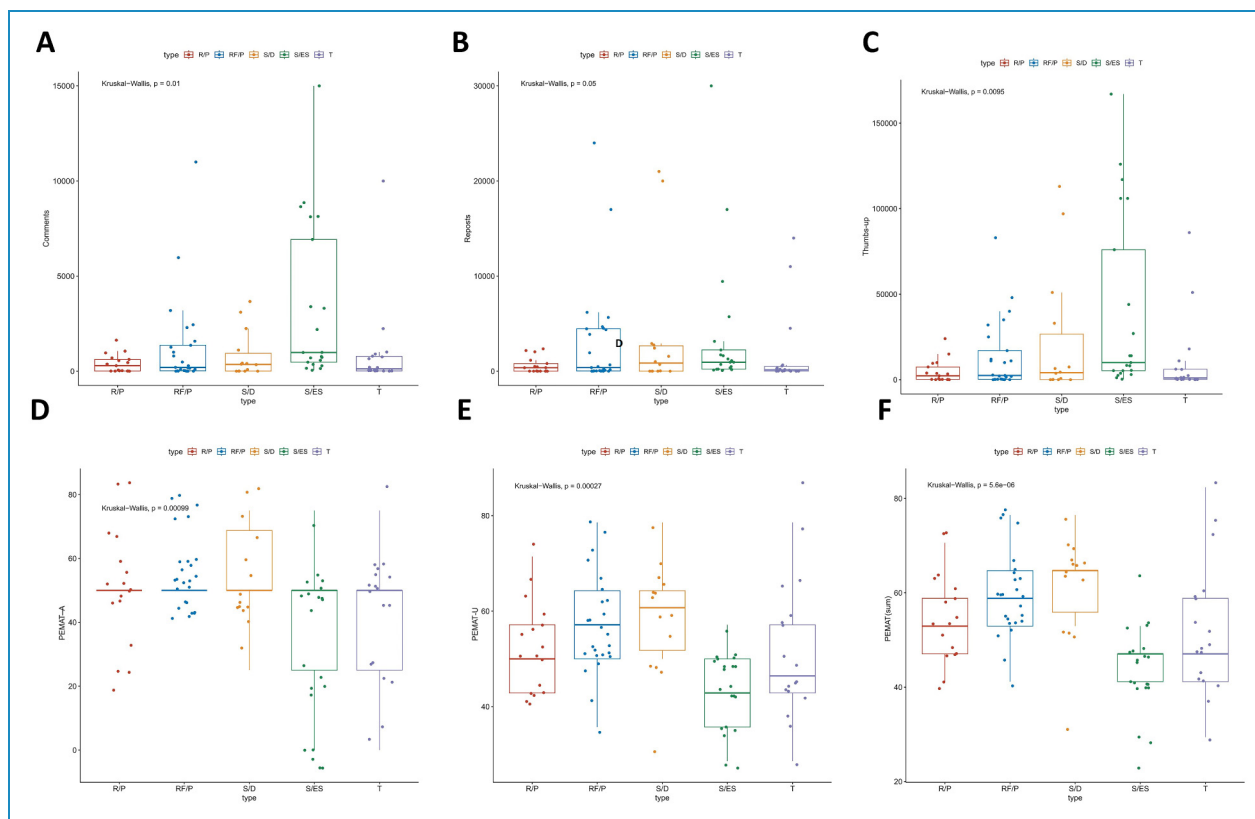
Figure 5. The analysis of comments, reposts, thumbs-up, PEMAT-A, PEMAT-U, and PEMAT-sum, which were statistically different. When the distribution of the data is concentrated, the box plot is a straight line. (A) The number of comments. (B) The number of reposts. (C) The number of thumbs up. (D) The score of PEMAT-A. (E) The score of PEMAT-U. (F) The score of PEMAT-sum. R/P: Recurrence/Prognosis; RF/P: Risk Factors /Prevention; S/D: Symptom/Detection; S/ES: Survivorship/Experience Sharing; T: Treatment.

We recommend that more medical professionals and non-profit healthcare institutions engage on TikTok, incorporate trending topics, and collaborate with influential organizations and individuals to amplify their promotional impact.[36] Maintaining attention primarily relies on video quality, which will ensure the extensive dissemination of their messages and influence health-related behaviors.

Comparison with other relevant studies

Furthermore, we reviewed studies on the quality of breast cancer videos across various languages and social media platforms. A study published in 2024 assessing information related to breast cancer surgery on TikTok confirmed that information about breast cancer surgery is widely shared on the platform, with the most common type of content creators being patients (77.3%).[37] Audience engagement was high. However, educational content was rare (6.5%), indicating a relative lack of objective and educational content provided by physician creators. A cross-sectional content analysis[6] of 100 videos on TikTok about breast cancer from the USA revealed that videos shared by breast cancer patients or their loved ones made up the

predominant proportion (81%). This is similar to our findings, where the proportion of videos shared by breast cancer patients was second only to those by modern medicine practitioners. Patients and their supporters often share their experiences on public platforms, seeking support and comfort from the community. They also convey breast cancer risk factors through personal stories in a relatable manner, which tends to be more persuasive and elicit greater public empathy. Consequently, despite the average quality of patient-shared videos being subpar in our study, they received more comments and thumbs-up.

In 2020, Chinese researchers analyzed the quality of 170 breast cancer-related videos on the Xigua video platform and found that a significant 62.4% of the videos contained misleading information.[38] The following year, a study of 101 YouTube videos concerning metastatic breast cancer in young women indicated that while the videos were rated satisfactory in terms of understandability and moderate in actionability, they scored low on reliability and overall quality, with some exhibiting commercial bias. This suggests that the full potential of online resources for patient support remains untapped.[39] In 2023, another study assessed the top 100 videos about breast cancer on

both TikTok and Bilibili, concluding that although the quality and reliability of videos on Bilibili were superior to those on TikTok ($P = 0.002$ and $P = 0.001$, respectively), both platforms' offerings were generally of poor overall quality. However, videos uploaded by physicians covering disease knowledge, prevention, and treatment were found to be of higher quality.[7]

Limitations

Our study has several limitations. First, our cross-sectional design, which captures a "snapshot" of data, may not reflect the dynamic nature of TikTok content. Second, selecting only a few tags and the top 100 most popular videos could introduce bias and overlook less popular videos with different qualities. Third, our search was limited to the Chinese version of TikTok, without considering content on other language platforms or other popular social media platforms in China. Fourth, owing to limitations in the TikTok system settings, we were unable to access important indicators such as the "number of views" for each video, which could provide insights into their level of dissemination. Additionally, the absence of a "dislike/disagree" function in TikTok prevented us from directly observing conflicting opinions among users. Finally, while user comments can indicate trust levels towards video content, it's important to remember that credibility is based on perceptions, not necessarily objective quality.[40]

Conclusion

In conclusion, our study highlights a substantial discourse on breast cancer on TikTok. However, the spread of information is not always based on scientific evidence, and individuals may struggle to assess its accuracy. High volumes of discussion don't necessarily lead to well-informed health decisions; this requires quality control and scientifically valid information. The information quality of popular breast cancer-related videos on TikTok is generally acceptable, yet the content quality is subpar, and there is a presence of misleading information. Furthermore, we noted an imbalance in the topics uploaded by different users and significant quality variations. Verified healthcare professionals play a crucial role in sharing scientific information, but the platform should regulate content from other users and ideally have medical professionals review it. As experts, we must understand patients' concerns and lead social media discussions, providing accurate and valuable information. This will empower people to take proactive steps in early cancer detection and treatment, ultimately supporting a normal lifestyle.

Further research is needed to evaluate the real impact of social media on early breast cancer detection and postoperative care. We urge healthcare professionals and institutions to understand the benefits and limitations of social media platforms like TikTok, and actively use them to share medical knowledge and provide more scientifically grounded information, thereby reshaping public perception and promoting healthier behaviors.

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