# Quality Assessment of TikTok as a Source of Information about Mitral Valve Regurgitation in China: A Cross-Sectional Study

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## *Abstract*

**Background:** In China, mitral regurgitation is the prevailing cardiovascular valve disease, however, Chinese patients are generally characterized by high incidence, low rate of health knowledge and a low surgical-treatment rate. TikTok hosts a vast amount of content related to diseases and health knowledge, enabling viewers to acquire relevant information. Nevertheless, there has no investigation or evaluation conducted on the quality of videos pertaining to mitral valve regurgitation.

**Objective:** Our study aimed to assess the quality of videos about mitral valve regurgitation in China on TikTok.

**Methods:** A cross-sectional study was conducted using the Chinese version of TikTok on September 9, 2023. The top 100 videos were included, the videos were evaluated using quantitative scoring tools such as the mDISCERN, JAMA, GQS, and the PEMAT-AV. Correlation and Poisson regression analyses were performed between video quality and characteristics.

**Results:** We obtained 88 valid video files, most videos (92.1%) were uploaded by certified physicians, mainly cardiac surgeons and cardiologists. News agencies/organizations and physicians had higher GQSs than individuals (news agencies/organizations vs. individuals P = 0.001, physicians vs. individuals P = 0.026). News agencies/organizations had higher PEMAT understandability scores than individuals (P = 0.013). Videos regarding disease knowledge had higher GQS, PEMAT understandability scores, and PEMAT actionability scores, compared with videos covering surgical cases (P < 0.0011, P = 0.0002, and P = 0.0002, respectively). PEMAT actionability scores were higher for outpatient cases than for surgical cases (P = 0.0002); videos regarding surgical techniques had lower PEMAT actionability scores than videos regarding disease knowledge (P = 0.041). The strongest correlations included thumbs up and comments (r = 0.92, P < 0.001), thumbs up and favorites (r = 0.89, P < 0.001), thumbs up and sharing (r = 0.87, P < 0.001), comments and favorites (r = 0.81, P < 0.001), comments and sharing (r = 0.87, P < 0.001), and favorites and sharing (r = 0.83, P < 0.001).The Poisson regression analysis showed the GQSs of cardiac surgeons and cardiologists were 1.304-fold and 1.243-fold higher than those of other healthcare professionals. The GQSs for disease knowledge and surgical technique were 1.314-fold higher than those for news/advertising, respectively.

**Conclusions:** Our study shows that most MR-related videos on TikTok were uploaded by certified physicians, ensuring their professional and scientific content; however, overall video-quality scores were suboptimal. Although most videos had educational significance to the audience, guidance was insufficient. TikTok should strengthen its review and recommendation mechanisms for professional medical content to improve its quality. Current evaluation tools are unable to assess the quality of short videos comprehensively; more effective tools are needed to evaluate fully the contents of short-video platforms such as TikTok. Clinical Trial: None

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# Original Manuscript

**Original Paper**

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# Quality Assessment of TikTok as a Source of Information about Mitral Valve Regurgitation in China: A Cross-Sectional Study

**Abstract**

**Background:** In China, mitral regurgitation is the prevailing cardiovascular valve disease, however, Chinese patients are generally characterized by a high incidence of the disorder, low rate of health knowledge, and a low surgical-treatment rate. TikTok hosts a vast amount of content related to diseases and health knowledge, enabling viewers to acquire relevant information. Nevertheless, there has no investigation or evaluation conducted on the quality of videos pertaining to mitral valve regurgitation.

**Objective:** Our study aimed to assess the quality of videos about mitral valve regurgitation in China on TikTok.

**Methods:** A cross-sectional study was conducted using the Chinese version of TikTok on September 9, 2023. The top 100 videos were included, the videos were evaluated using quantitative scoring tools such as the modified DISCERN (mDISCERN), the Journal of American Medical Association (JAMA) benchmark criteria, Global Quality Score (GQS), and the Patient Education Materials Assessment Tool for audio-visual content (PEMAT- A/V). Correlation and Stepwise regression analysis were performed between video quality and characteristics.

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**Conclusions:** Our study shows that most MR-related videos on TikTok were uploaded by certified physicians, ensuring their professional and scientific content; however, overall video-quality scores were suboptimal. Although most videos had educational significance to the audience, guidance was insufficient. The predictive equation for GQS developed from our analysis offers insights but should be cautiously applied outside the study context. It suggests that creators should prioritize enhancing video content and presentation to improve the quality of health information disseminated on social media.

**Keywords:** mitral valve regurgitation; videos quality; TikTok; Journal of American Medical Association; JAMA; Global Quality Score; GQS; PEMAT- A/V; Spearman correlation analysis; Poisson regression analysis.

## Introduction

Mitral regurgitation (MR) refers to incomplete closure of the mitral valve, which causes blood to flow from the left ventricle into the left atrium during systole. MR is one of the most common heart-valve diseases, affecting 2–3% of the population; its prevalence and severity gradually increase with age. The prevalence of moderate or severe MR among individuals older than 75 years is > 10% [1,2]. The prognosis of MR is related to left ventricular function, etiology, severity, and duration of disease.

Mitral valve regurgitation (MR) is the second-most prevalent heart-valve disease requiring surgical intervention in Europe[1]. In the United States, 2,000 surveys have shown that nearly 2 million patients have moderate to severe MR; this number is expected to increase to 4 million by 2030[2]. In China, the detection rate of moderate and severe MR is 2.2%[3]. A large cross-sectional survey of a Chinese hospital population implied that MR is the most common valvular heart disease in China[4,5]. The proportion of patients with secondary MR gradually increases with age. A sampling survey showed MR rates of 18.4% among 35-year-old respondents and 25.2% among 65-year-old respondents; moreover, secondary etiologies caused 51.7% of cases in 75-year-old respondents [5]. It is estimated that approximately 10 million MR patients currently need treatment in China [6]. Although MR is relatively common, Chinese patients are generally characterized by high incidence, low rate of health knowledge and a low surgical-treatment rate; fewer than 20% of patients have confirmed valvular disease before admission, and ~33% of patients undergo invasive treatment [4]. Studies have shown that early diagnosis and intervention improve the survival rate [2, 7-10]; therefore, medical health education is particularly important in guiding more people to understand early symptom detection, timely medical treatment, and early treatment access.

Video-sharing media platforms, such as YouTube and TikTok, have been integrated into all aspects of personal and professional life. Videos containing cartoons or documentary content are most popular, including videos regarding occupational health and disease knowledge [11]. Medical information is often viewed online, and many patients retrieve information online before and after seeking medical treatment [12]. TikTok, a short-video-sharing social-media tool with wide acceptance in recent years, contains abundant content in almost all areas; there are many healthcare-related videos. TikTok has up to 600 million active users in China, and thus may be an important consumer-access channel for health information [13]. TikTok has great potential for disseminating

public-health information, but the quality of disease-related videos available on TikTok is variable. Researchers have evaluated the quality of TikTok videos regarding cholelithiasis, coronavirus disease 2019 (COVID-19), diabetes, and chronic obstructive pulmonary disease [14-17].However, the quality of the MR-related videos available on TikTok has not been assessed. Therefore, we investigated MR-related videos on TikTok; we aimed to identify the upload source, content, and feature information of these videos using quantitative scoring tools, such as DISCERN, the Journal of the American Medical Association (JAMA) benchmark criteria, and the Global Quality Score (GQS). We also evaluated educational guidance to the audience using the Patient Education Materials Assessment Tool-Audio/Visual (PEMAT- A/V) method.

## Methods

### Ethical Considerations

No clinical data, human specimens, or laboratory animals were involved in this study. Although this study is mainly based on a secondary analysis of mitral valve videos on TikTok, we placed great emphasis on ethical issues. We stated that all research data had been anonymized or de-identified to ensure the privacy of the participants was fully protected. For any information that could potentially involve personal identification, we had taken strict confidentiality measures, and the data was restricted to use within the research team only.

### Retrieval strategy

On September 9, 2023, from 09:00 AM to 11:00 AM, we conducted a search on the Chinese version of TikTok using the term "□□□□□" (mitral regurgitation). To avoid any research bias, we logged out from all personal accounts and did not use any filters. The first 100 retrieved videos were included in the study. We restricted our analysis to the top 100 videos because several studies [18, 19] have confirmed that videos outside the top 100 do not significantly affect analysis outcomes. Videos featuring animals (n=2) and those consisting solely of images (n=12) were excluded. For all included videos, the following features were recorded and analyzed: title, URLs, uploader, uploader's identity, website authentication, video duration (s), upload days (days), number of likes, number of comments, number of favorites, number of shares, upload date, and upload days.

### Visual classification

We classified video uploaders as: doctors, individuals (e.g., non-medical professionals), news agency (e.g., online media, newspapers, television stations, and radio stations), and organizations (e.g., hospitals, health authorities, research groups, universities, or colleges). The physicians were classified as cardiac surgeons, cardiologists, or other healthcare professional. The videos have been

categorized based on their content into several distinct types: disease knowledge, outpatient medical records, surgical cases, surgical techniques, and news/advertising.

**Video content and quality assessment**

The video reliability was evaluated using the JAMA benchmark criteria and the modified (m) DISCERN, while the quality of information in the videos was assessed using GQS. The educational impact of the video materials on the general public was measured using the Patient Education Materials Assessment Tool for audio-visual content (PEMAT- A/V) score. The quality assessment was conducted for all the videos that met the eligibility criteria.

First, the JAMA benchmark criteria [20] was utilized to assess video reliability, encompassing four distinct criteria: (1) providing authorship; (2) listing copyright information and references, as well as sources of content; (3) providing initial date and subsequent updates; and (4) disclosing conflicts of interest, funding, sponsorship, advertising support, and video ownership. Each criterion scoring 1 point. Higher scores detect more reliable.

Second, the mDISCERN score, derived from the DISCERN tool, was used to analyze video reliability and quality. It has been proven to be useful in assessing health-related video materials on other platforms, such as YouTube [21-24]. It consists of five questions: (1) Are the aims clear and achieved? (2) Are reliable sources of information used? (3) Is the information presented balanced and unbiased? (4) Are additional sources of information listed? (4) Are additional sources of information listed for patient reference? (5) Are areas of uncertainty mentioned? Each question was scored 1 for yes and 0 for no. High scores indicated that the video was reliable.

Third, we used GQS to assess the quality of information in the videos. The GQS is widely used for evaluating the quality of health information on online video platforms [15,17,25]. It comprises five criteria, 1 (poor quality, poor flow of the site, most information missing, not at all useful for patients), 2 (generally poor quality and poor flow, some information listed but many important topics missing, of very limited use to patients), 3 (moderate quality, suboptimal flow, some important information is adequately discussed but others poorly discussed, somewhat useful for patients), 4 (good quality and generally good flow, most of the relevant information is listed, but some topics not covered, useful for patients), and 5 (excellent quality and excellent flow, very useful for patients). Higher scores detect higher quality videos.

Finally, we used the PEMAT-A/V [26] to evaluate the educational effect of the video materials on the public. The PEMAT- A/V was specifically designed for audiovisual materials and consists of 17 questions; 13 evaluate understanding of the health information received by the patients and 4 evaluate the actionability of the recommendations in the videos. The questions are scored “agree = 1,

disagree = 0, N/A"; the overall scores and the scores for the understandability and actionability sections are calculated as "total points/total possible points × 100", with higher scores indicating better understandability and/or actionability.

All authors are senior physicians with a high degree of clinical knowledge, working in cardiology-related specialties. All videos were collected and downloaded by one person (CNN). Two of the authors (CNN and CYL) evaluated the videos using the mDISCERN tool, JAMA score, GQS, and PEMAT- A/V. Scores were determined by discussion. In cases of disagreement, an arbitrator (CXF) decided the final score. Subsequently, all authors approved each rating.

**Data Analysis**

Data are expressed as means ± standard deviations or medians (ranges). The Kruskal–Wallis test or Mann–Whitney U test was used to compare data between two groups; Dunnett's multiple comparison test was used for two-way intergroup comparisons.

Due to our dataset comprising categorical variables and non-normally distributed data, we employed the Spearman correlation coefficient for assessing inter-parameter correlations. The degree of correlation was categorized as follows: less than 0.25, indicating a poor relationship; 0.25–0.5, signifying a moderate relationship; 0.5–0.75, denoting a good relationship; and 0.75–1.00, representing an excellent relationship.

The Spearman correlation analysis revealed a significant association between video parameters and the GQS. To investigate the predictive capability of these video parameters for GQS, we employed stepwise regression analysis based on data type, characteristics, and other relevant factors. Initially, collinearity detection was performed to identify variables with Variance Inflation Factor (VIF) > 5 for removal. Subsequently, employing GQS as the dependent variable and Uploaders, physicians, titles, content, duration, and length as independent variables in a "stepwise" approach facilitated statistical analysis. $P$ 0.05 was considered statistically significant.

We used the intraclass correlation coefficient (ICC) and a two-way fixed-effects model to evaluate the scores between the reviewers (CNN and CYL). ICC values range from 0 to 1, where < 0.5 indicates poor consistency, 0.5–0.75 indicates medium consistency, 0.75–0.9 indicates good consistency, and > 0.9 indicates excellent consistency.

Statistical analysis was performed using IBM SPSS version 19.0 software (IBM Corp., Armonk, NY, USA); figures were produced using GraphPad Prism version 9.5.1 (GraphPad Software, La Jolla, CA, USA) and OriginPro 2021 software (Origin Laboratories, Northampton, MA, USA).

**Results**

**Video characteristics**

In the final analysis, our study yielded 88 eligible video files. The descriptive statistics of these videos are tabulated in Tables 1 and 2, revealing a cumulative total of 476,511 likes, 33,123 comments, 39,781 favorites, and 49,314 shares. The median video length was 255 seconds, with the minimum and maximum durations being 4 and 1197 seconds, showcasing the spectrum of video lengths. Additionally, the median number of days since the videos were uploaded was 61 days, ranging from a minimum of 4 days to a maximum of 491 days, indicating the temporal spread of the content dissemination.

Initially, we obtained 100 videos; most (n = 84) were uploaded by physicians who had been certified by TikTok, followed by those uploaded by individual users (n = 13). Two videos were from a news agency (online media) and one was from an organization (hospital public account) (Fig. 1A). After excluding videos that did not meet the inclusion criteria, 88 videos were obtained: 81 were uploaded by physicians, 4 were uploaded by individual users, and 2 were uploaded by news agencies (online media). One video was from an organization (hospital public account) (Fig. 1B). Among the physicians who uploaded videos, 39 were cardiac surgeons, 37 were cardiologists, 3 were sonographers, 1 was a radiologist, and 1 was an anorectal surgeon (Fig. 1). Among the 81 videos uploaded by physicians, 58 were uploaded by chief physicians, 14 were uploaded by associate chief physicians, 7 were uploaded by attending physicians, and 2 were uploaded by residents (Fig. 1C). The videos were categorized according to their contents (Fig. 1D). The most common topic was disease knowledge (n = 50), followed by outpatient cases (n = 19), surgical cases (n = 11), surgical techniques (n = 4), and news/advertising (n = 4).

**Table 1.** General characteristics of the videos.

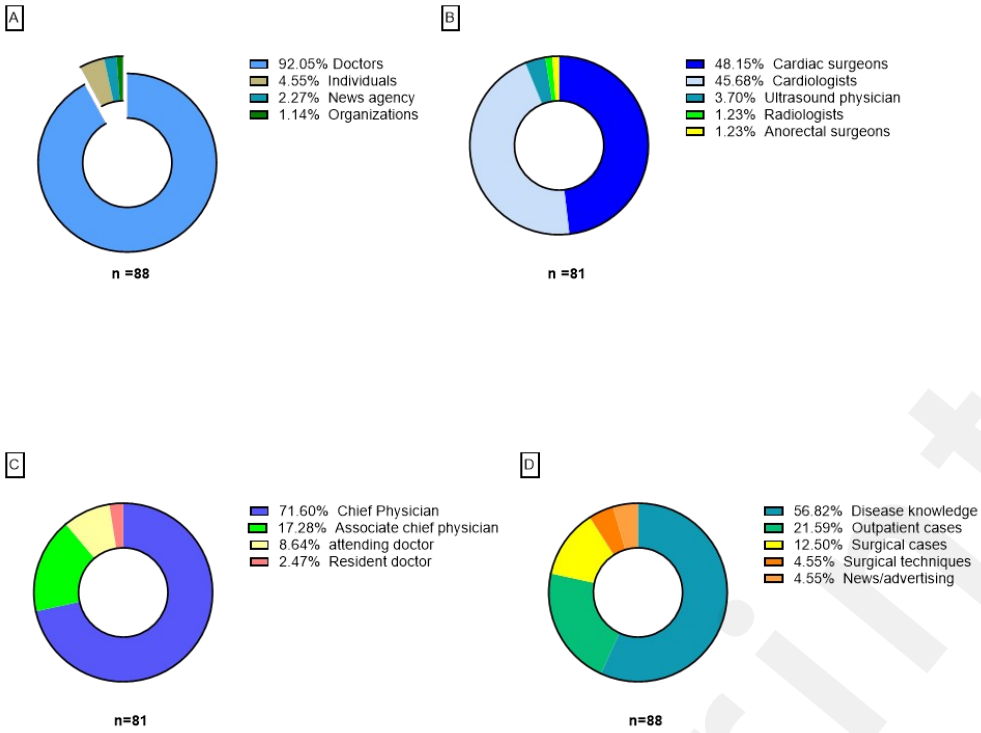
| Characteristic | Mean | SD | Median | min | max |
|---|---|---|---|---|---|
| Video length (second) | 336.71 | 273.99 | 255 | 4 | 1197 |
| Duration on TikTok (day) | 76.22 | 68.87 | 61 | 4 | 491 |
| Thumbs up | 5728.02 | 23785.95 | 433 | 23 | 206000 |
| Thumbs up/day | 20.07 | 107.09 | 2.22 | 0.05 | 853.88 |
| Comments | 396.20 | 1506.29 | 46 | 1 | 13000 |
| Comments/day | 1.91 | 6.69 | 0.23 | 0 | 53.89 |
| Favorites | 479.29 | 1382.07 | 98 | 0 | 9522 |
| Favorites/day | 4.11 | 15.03 | 0.31 | 0 | 107.51 |
| Sharing (count) | 581.64 | 1607.70 | 61 | 0 | 12000 |
| Sharing /day | 2.76 | 8.46 | 0.55 | 0 | 49.74 |
| *JAMA* score（0-4） | 1.99 | 0.11 | 2 | 1 | 2 |
| GQS score（0-5） | 2.75 | 0.79 | 3 | 1 | 5 |
| mDISCERN（0-5） | 3.06 | 0.23 | 3 | 3 | 4 |
| PEMAT understandability score (%) | 70.14 | 17.74 | 73.87 | 16.67 | 100 |
| PEMAT actionability score (%) | 54.55 | 45.26 | 66.67 | 0 | 100 |

**Table 2.** Detailed characteristics of videos based on uploaders and content.

| Characteristic | n | Length (second) | Duration (day) | Thumbs up | Comments | Favorites | Sharing (count) |
|---|---|---|---|---|---|---|---|
| **Uploaders** | | | | | | | |
| Doctors | 81 | 63□4,491□ | 256.28(4,1958) | 421□23,206000□ | 46□1,13000□ | 92□0,9522□ | 66□0,12000□ |
| Individuals | 4 | 25.5□8,74□ | 375.37□74,949□ | 323□140,1480□ | 38□24,57□ | 48□2,311□ | 7□0,221□ |
| News agency/ Organizations | 3 | 201□55,277□ | 650.5□490.2□724.6□ | 399□255,1451□ | 87□13,145□ | 77.5□0,155□ | 343□0,401□ |
| ***P***-value | | .049 | .175 | .928 | .945 | .464 | .222 |
| **Doctors** | | | | | | | |
| Cardiac surgeons | 39 | 63□5□491□ | 214□8□1197□ | 766□29,39000□ | 94□3□2733□ | 152□0,2149□ | 165□0,3206□ |
| Cardiologists | 37 | 61□4,210□ | 258□4,1958□ | 270□23,20600□ | 32□1□13000□ | 50□0□9522□ | 48□1,12000□ |
| Other health care professionals | 5 | 79.4±33.1 | 337.8±308.7 | 349.6±303.5 | 43.4±38.8 | 67.4±64.3 | 57□1,419□ |
| ***P***-value | | 0.703 | 0.815 | 0.096 | 0.166 | 0.224 | 0.364 |
| **Professional titles** | | | | | | | |
| Chief Physician | 58 | 63.5□4,491□ | 255.5□4,966□ | 545□36,39000□ | 65.5□3,2733□ | 118.5□0□6410□ | 86□1□7263□ |
| Associate chief physician | 14 | 56.86±49.6 | 314.9±245.5 | 103□23,1416□ | 15□1,237□ | 18□0,399□ | 8.5□0,892□ |
| Attending / registered physician | 9 | 113.67±55.0 | 705.33±671.4 | 300□46,206000□ | 54□5,13000□ | 20□0□9522□ | 282□1,12000□ |
| ***P***-value | | .028 | .413 | .04 | .011 | .008 | .008 |
| **Content** | | | | | | | |
| Disease knowledge | 50 | 66.5□15,210□ | 73.1±13.98 | 699.5□23,20600□ | 79.5□1,13 000□ | 164□0,9522□ | 204.5□0,12000□ |
| Outpatient cases | 19 | 66□4,491□ | 64.74±13.00 | 226□43□25000□ | 16□3,2695□ | 35□1,2149□ | 19□0,2007□ |
| Surgical cases | 11 | 26.73±19.43 | 46.36±15.60 | 169□29,9642□ | 22□3,769□ | 20□0,137□ | 12□1,275□ |
| Surgical techniques | 4 | 86.75±38.95 | 63.75±35.80 | 7740□54,39 000□ | 482□15,2733□ | 523□24,1730□ | 693□34,1783□ |
| News/advertising | 4 | 126±134.16 | 64.75±23.08 | 303.5□67,399□ | 50□12,202□ | 5□0,31□ | 8.5□0,343□ |
| ***P***-value | | .003 | <0.001 | .031 | .045 | <0.001 | <0.001 |

* Values are expressed as mean ± SD for continuous variables and median (min, max) for ordinal and discrete variables.

**Figure 1.** Percentage of videos on MR from different sources and with different contents in TikTok. (A). Distribution of the videos based on uploaders. (B). Distribution of the doctors. (C). Professional and technical titles of doctors. (D). Distribution of the videos based on content.




## Comparison of general data

Table 2 meticulously delineates the intergroup comparisons conducted based on the uploader category, physician type, academic title, and video content. Within the video uploader classification, only the video length exhibited a statistically significant difference, with videos from News agency/ Organizations being significantly longer than those in other groups (***P***=0.049). In the classification by physician's technical level, pairwise comparison analysis revealed statistical differences in video length (Chief Physician vs. Associate Chief Physician, ***P***=0.023), number of thumbs up (Chief Physician vs. Associate Chief Physician, ***P***=0.003), number of comments (Chief Physician vs. Associate Chief Physician, ***P***<0.05), number of favorites (Chief Physician vs. Associate Chief Physician, ***P***=0.006), and number of shares (Chief Physician vs. Associate Chief Physician, ***P***=0.009,; Attending / Registered Physician vs. Associate Chief Physician, ***P***=0.047); the number of upload days did not show a difference. When classified by video content, statistical analysis indicated differences in all parameters among groups (Table 2). Pairwise comparison results showed significant differences in the durations (Disease knowledge vs. Outpatient cases, ***P***=0.012), video length (Disease knowledge vs. Outpatient cases, ***P***=0.001; Outpatient cases vs. Surgical cases, ***P***=0.014), number of favorites (Disease knowledge vs. Surgical cases, ***P***=0.007), and number of shares (Disease knowledge vs. Outpatient cases, ***P***=0.006; Disease knowledge vs. Surgical cases, ***P***=0.007). Due to a small sample size, pairwise comparisons for the number of thumbs up and

comments could not be conducted. No significant statistical differences were observed in other classifications (Table 2).

**Video quality and reliability assessments**

We evaluated videos using quantitative scoring tools such as the mDISCERN, JAMA benchmark criteria, and GQS. Most videos (87/88) had a JAMA rating of 2, and one video had a JAMA rating of 1 (1/88). Thus, the JAMA criteria (range 0-4) were unable to classify and accurately assess video quality. Accordingly, the JAMA criteria were excluded from analyses of video quality and correlations.

The videos had a mean mDISCERN score of 3.06 (3, 4), and a mean GQS of 2.75 (1, 5), indicating that the TikTok videos exhibited fair quality and reliability. The PEMAT understandability score was 70.14 (16.67, 100), and the PEMAT actionability score was 54.54 (0, 100) (Tables 1 and 3), indicating that the TikTok videos were easily understood by the audience; however, the suggestions were not adequately implemented, which was mainly manifested as no suggestions or general suggestions only. The reviewers demonstrated good agreement concerning the mDISCERN scores (ICC, 0.830; 95% confidence interval [CI], 0.752–0.885), GQSs (ICC, 0.808; 95% CI, 0.716–0.872), PEMAT understandability scores (ICC, 0.966; 95% CI, 0.966; 95% CI, 0.946–0.978), and PEMAT actionability scores (ICC, 0.829; 95% CI, 0.748–0.885).

**Subgroup Analysis**

We classified videos according to the uploaders, physician type, title, and content; we then performed a statistical analysis of the characteristic parameters of each group of videos. Subgroup comparisons are shown in Table 4 and Figures 2–5. Subgroups of uploaders differed in terms of GQSs and PEMAT understandability scores; news agencies/organizations and doctors had higher GQSs than individuals (news agencies/organizations vs. individuals $P = 0.001$, doctors vs. individuals $P = 0.026$). News agencies/organizations had higher PEMAT understandability scores than individuals ($P = 0.013$). There were no significant differences between subgroups according to physician type or title. The results were analyzed according to video-content classification; they revealed differences in GQSs, PEMAT understandability scores, and PEMAT actionability scores. Videos regarding disease knowledge had higher GQSs, PEMAT understandability scores, and PEMAT actionability scores, compared with videos covering surgical cases ($P < 0.001$, $P < 0.001$, and $P < 0.001$, respectively). PEMAT actionability scores were higher for outpatient cases than for surgical cases ($P < 0.001$); videos regarding surgical techniques had lower PEMAT actionability scores than videos regarding disease knowledge ($P = 0.041$).

**Table 3.** The global quality scores, mDISCERN scores and PEMAT scores of the videos.

| Scale, score | N (88) | Rate |
|---|---|---|
| mDISCERN | | |
| 1 | 0 | |
| 2 | 0 | |
| 3 | 83 | 94.3% |
| 4 | 5 | 5.7% |
| 5 | 0 | |
| **Global Quality Score** | | |
| 1 | 2 | 2.3% |
| 2 | 31 | 35.2% |
| 3 | 46 | 52.3% |
| 4 | 5 | 5.7% |
| 5 | 4 | 4.5% |
| **PEMAT - Understandability Score** | | |
| [0—60] | 26 | 29.5% |
| [61—80] | 32 | 36.4% |
| [81—100] | 30 | 34.1% |
| **PEMAT - Actionability Score** | | |
| 0 | 30 | 34.1% |
| [33.33—66.67] | 15 | 17.0% |
| 100 | 43 | 48.9% |

**Table 4.** Quality assessment of videos based on uploaders and content.

| **Characteristic** | n | mDISCERN, | GQS | PEMAT understandability score (%) | PEMAT actionability score (%) |
|---|---|---|---|---|---|
| **Uploaders** | | | | | |
| Doctors | 81 | 3[3,4] | 3[1,5] | 75[25,100] | 66.67[0,100] |
| Individuals | 4 | 3[3,3] | 2[1,2] | 45.83[16.67,66.67] | 0[0,33.33] |
| News agency /Organizations | 3 | 3[3,4] | 5[3,5] | 83.33[83.33,91.67] | 100[0,100] |
| ***P***-value | | .103 | .002 | .014 | .118 |
| **Doctors** | | | | | |
| Cardiac surgeons | 39 | 3[3,4] | 3[1,5] | 75[25,100] | 100[0,100] |
| Cardiologists | 37 | 3[3,4] | 3[2,3] | 66.67[41.67,100] | 66.67[0,100] |
| Other health care professionals | 5 | 3[3,4] | 3[2,3] | 75[58.33,91.67] | 100[0,100] |
| ***P***-value | | .249 | .115 | .435 | .775 |
| **Professional titles** | | | | | |
| Chief Physician | 58 | 3[3,4] | 3[1,5] | 75[41.67] | 83.34[0,100] |
| Associate chief physician | 14 | 3[3,3] | 2.5[2,4] | 70.84[25,91.67] | 16.67[0,100] |
| Attending/ Resident doctor | 9 | 3[3,3] | 3[2,3] | 66.67[58.33,91.67] | 100[0,100] |
| ***P***-value | | .439 | .525 | .686 | .097 |
| **Content** | | | | | |
| Disease knowledge | [50] | 3[3,4] | 3[2,5] | 76.09±13.98 | 100[0,100] |
| Outpatient cases | [19] | 3[2,4] | 3[1,5] | 67.82±13.04 | 70.18±39.90 |

| | | | | | |
|---|---|---|---|---|---|
| Surgical cases | 11 | 3[3,3] | 2[1,2] | 49.24±15.57 | 0[0[33.33] |
| Surgical techniques | 4 | 3[3,3] | 2[2,2] | 66.67±36 | 0[0,0] |
| News/advertising | 4 | 3[2,4] | 3.5[2,5] | 67.63±23.72 | 0[0,100] |
| ***P***-value | | .984 | <0.001 | < 0.001 | <0.001 |

* Values are expressed as mean ± SD for continuous variables and median (min, max) for ordinal and discrete variables.

**Figure 2.** Quality assessment of videos based on uploaders.

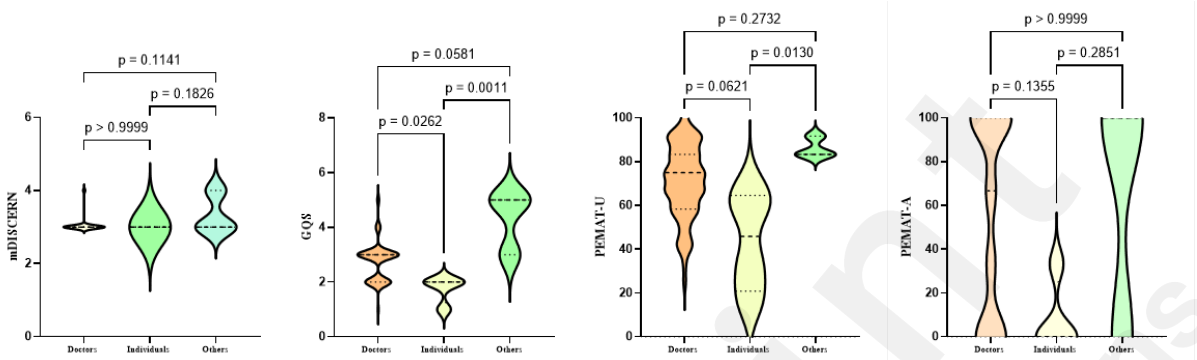



**Figure 3.** Quality assessment of videos based on doctors.

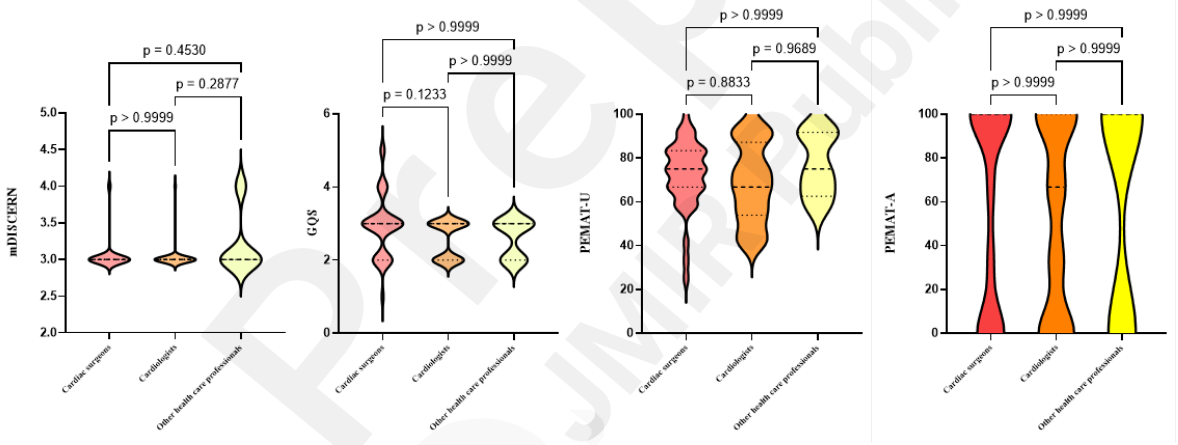



**Figure 4.** Quality assessment of videos based on professional titles.

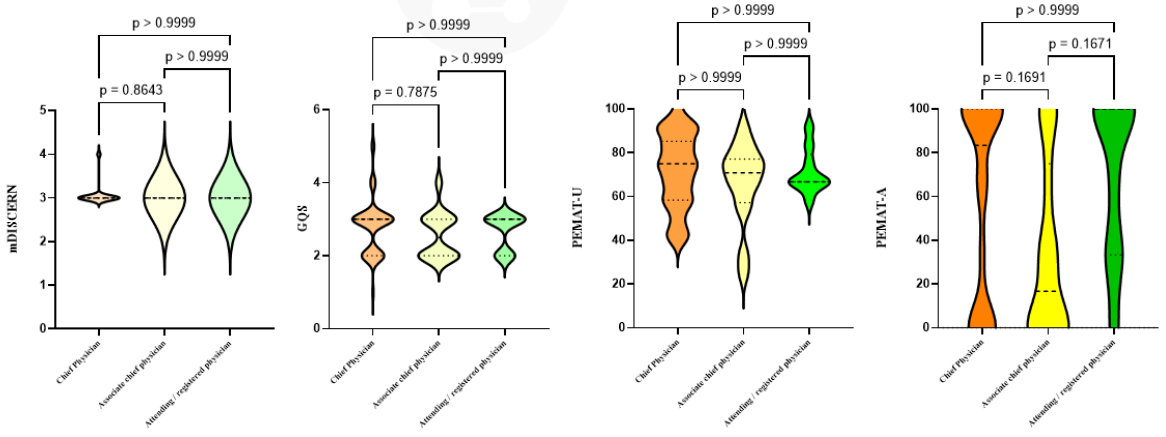
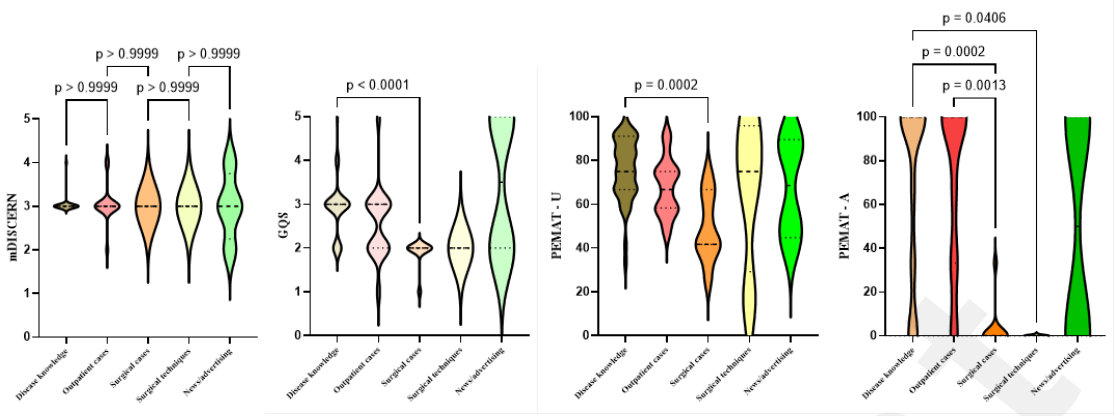


**Figure 5.** Quality assessment of videos based on Content.




## Correlation and Stepwise regression analysis

In order to explore the correlation among various video parameters, we conducted a correlation analysis. Since the data includes categorical variables and data not normally distributed, we utilized Spearman's correlation analysis (Figure 6). As illustrated in the figure, there is a strong correlation between video length, duration on TikTok, thumbs up, comments, favorites, and shares: thumbs up and comments (r=0.92, *P*<.001), thumbs up and favorites (r=0.89, ***P***<.001), thumbs up and shares (r=0.87, ***P***<.001), comments and favorites (r=0.81, ***P***<.001), comments and shares (r=0.87, ***P***<.001), and favorites and shares (r=0.83, ***P***<.001). However, the correlation between these video parameters and the evaluation tool is relatively weak (0.5 > r > 0.3): video length and GQS (r=0.48, ***P***<.001), thumbs up and GQS (r=0.30, ***P***<.001), and shares and GQS (r=0.37, ***P***<.001). Furthermore, we found negative correlations between some video parameters: uploaders and physicians (r=-0.51, ***P***<.01), uploaders and titles (r=-0.55, ***P***<.01), physicians and content (r=-0.24, ***P***<.05), content and comments (r=-0.23, ***P***<.05), content and favorites (r=-0.28, ***P***<.05), content and shares (r=-0.37, ***P***<.01), content and GQS (r=-0.41, ***P***<.01), content and PEMAT-U (r=-0.26, ***P***<.05), and content and PEMAT-A (r=-0.34, ***P***<.01).

The stepwise regression analysis yielded three models, each progressively including additional predictors (Table 5 and 6). The final model (Model 3) included 'Length', 'Content', and 'Physicians' as predictors and demonstrated the strongest predictive power with an $R^2$ of .501, indicating that 50.1% of the variance in GQS can be explained by these variables. The adjusted $R^2$ value was .482, and the model showed statistical significance with an F Change of 8.663 (***P***= .004). The Durbin-Watson statistic for Model 3 was 1.960, suggesting no significant autocorrelation in the residuals. The collinearity diagnostics showed no multicollinearity concerns, with tolerance values above 0.9 and

variance inflation factors (VIFs) below 2.0 for all predictors in Model 3. The predictive equation for GQS, based on the model 3, is as follows:

GQS=3.230−0.294×Content−0.274×Physicians+0.005×Length

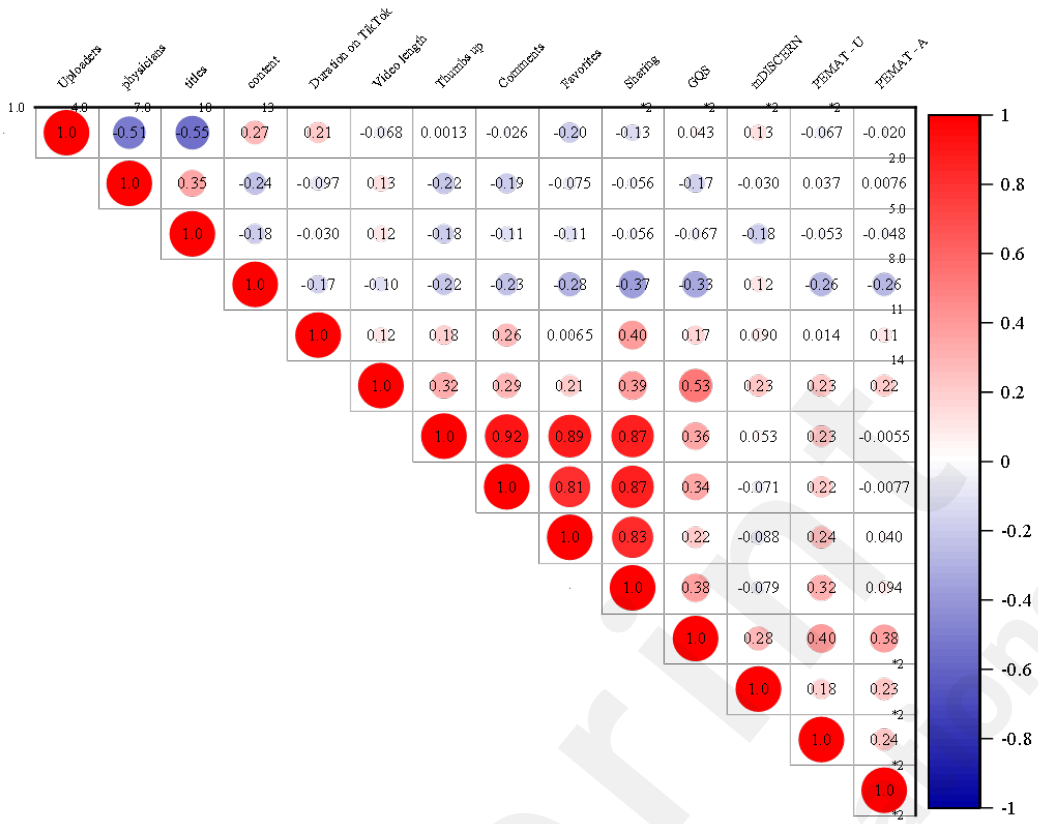
**Table 5.** Stepwise Regression Analysis Summary

| | | | | | | | | ANOVA | |
|---|---|---|---|---|---|---|---|---|---|
| Model | Predictors Included | $R^2$ | Adjusted $R^2$ | Std. Error of the Estimate | F Change | P | Durbin-Watson | F | P |
| 1 | Constant, Length | 0.285 | 0.276 | 0.59888 | 31.563 | <.001 | | 31.563 | <.001 |
| 2 | Constant, Length, Content | 0.445 | 0.431 | 0.53112 | 22.444 | <.001 | | 31.287 | <.001 |
| 3 | Constant, Length, Content, Physicians | 0.501 | 0.482 | 0.50681 | 8.663 | 0.004 | 1.96 | 25.795 | <.001 |

**Table 6.** Stepwise Regression Coefficients, Statistical Significance, and Collinearity Assessment

| | | Unstandardized Coefficients | | Standardized Coefficients | | | 95.0% CI for B | | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|---|---|---|
| Model | Predictors | B | Std. Error | Beta | t | ***P*** | Lower Bound | Upper Bound | Tolerance | VIF |
| 1 | (Constant) | 2.241 | .103 | | 21.849 | <.001 | 2.036 | 2.445 | | |
| | length | .006 | .001 | .534 | 5.618 | <.001 | .004 | .008 | 1.000 | 1.000 |
| 2 | (Constant) | 2.779 | .146 | | 19.087 | <.001 | 2.489 | 3.069 | | |
| | length | .005 | .001 | .464 | 5.412 | <.001 | .003 | .007 | .970 | 1.031 |
| | content | -.286 | .060 | -.406 | -4.738 | <.001 | -.407 | -.166 | .970 | 1.031 |
| 3 | (Constant) | 3.230 | .207 | | 15.618 | <.001 | 2.818 | 3.642 | | |
| | length | .005 | .001 | .457 | 5.586 | <.001 | .003 | .006 | .969 | 1.032 |
| | content | -.294 | .058 | -.416 | -5.089 | <.001 | -.409 | -.179 | .968 | 1.033 |
| | physicians | -.274 | .093 | -.237 | -2.943 | .004 | -.459 | -.089 | .998 | 1.002 |

**Figure 6.** Spearman correlation analysis between video variables and the global quality scores, mDISCERN scores and PEMAT scores




## Discussion

### Principal Findings

This cross-sectional study demonstrated that the majority of MR-related videos on TikTok were uploaded by certified physicians, predominantly cardiac surgeons or cardiologists. Notably, all physician identities were verified by TikTok to ensure professionalism and scientific accuracy. The quality of the video content was evaluated using the mDISCERN tool, yielding satisfactory scores, whereas the GQS scores did not meet the expected standards. The evaluation of the educational impact of the videos revealed that a significant majority achieved PEMAT understandability scores above the threshold, indicating a high level of comprehension and acceptance among viewers. However, there was considerable variation in the PEMAT actionability scores, with approximately half of the videos falling below satisfactory levels, suggesting limited practical applicability in many instances. Our analyses yield several noteworthy observations.

### Mitral Regurgitation Video Characteristics and Audience Interaction Analysis

Our study findings indicate that the 88 videos garnered a total of 476,511 thumbs up, 33,123 comments, 39,781 favorites, and 49,314 shares, demonstrating a strong viewer interest in mitral

regurgitation videos and a high level of interactivity, which differs from previous studies [27-28]. The majority of the videos were uploaded by cardiologists certified by TikTok, with the majority being cardiac surgeons and cardiologists, as well as some from the ultrasound department, indicating that medical professionals are willing to share their expertise on the TikTok platform. In addition to doctors, there were also videos uploaded by news media, non-profit medical official accounts, and individuals. The content of the videos covered a range of topics including disease knowledge, outpatient cases, surgical cases, surgical techniques, and personal experiences, reflecting a diversity that meets the needs of different audiences for medical information and positively impacts public health awareness.

Furthermore, our results suggest that video length is a significant distinguishing factor, which is consistent with previous results [12]. When analyzed by different classification criteria, it showed statistical differences among groups (Table 2). Videos uploaded by Chief Physicians and those focused on disease knowledge were notably longer and received a higher number of thumbs up, comments, favorites, and shares. A detailed examination of these videos revealed that this discrepancy may be attributed to the public's higher trust in physicians with higher technical ranks and their desire to understand disease knowledge, seeking assistance through consultation. However, we also observed a video by an attending physician that achieved exceptionally high engagement, with 206,000 thumbs up, 13,000 comments, and 12,000 shares. Upon thorough evaluation, we found that the physician used colloquial language to explain disease knowledge in an accessible and sincere manner, which may provide insights for content creators on how to produce higher-quality videos.

**Video Ratings and Quality Evaluation**

Our study employed various assessment tools to evaluate the quality of the videos. Initially, we utilized the modified DISCERN validation tool to gauge the reliability of the videos. The mDISCERN results indicated that the videos had moderate credibility, which was acceptable but not entirely satisfactory. Subgroup analysis did not reveal significant differences among the groups. Upon closer examination, we observed that video creators often neglected to provide sources of information, and there was no mandatory review mechanism by TikTok, resulting in the question regarding additional sources for patient reference ("Are additional sources of information listed for patient reference?") not being scored. This serves as a reminder to content creators that providing clear and reliable sources can enhance the credibility of the content.

Secondly, we assessed the overall quality of the video content using the GQS. The GQS scores averaged 2.75 (0-5), which is close to the threshold for moderate quality. This finding aligns with the results of Collà Ruvolo C et al. [28], but is notably lower than those of Morra S et al. [27] Subgroup

analysis indicated that videos from doctors and news agency /organizations had higher GQS scores than those from individuals (Figure 2B), and that content focused on disease knowledge scored higher than surgical cases (Figure 5B).

Lastly, we employed a third tool, PEMAT- A/V, to evaluate the educational significance of the videos. According to the PEMAT- A/V tool, the understandability score was 70.14%, and the actionability score was 54.54%. Shoemaker et al. [26] defined video content as understandable or actionable enough if the PEMAT score exceeds 70%. Our results suggest content that is understandable but lacks actionability, which is consistent with the findings of Kanner J et al. [29] regarding TikTok and YouTube videos on Overactive Bladder. Subgroup analysis showed that media/organizations scored higher than individuals (Figure 2C), and that the PEMAT- A/V understandability scores for disease knowledge were higher than those for surgical cases, with both disease knowledge and outpatient cases scoring higher than surgical cases.

Integrating these assessment outcomes, we found that videos originating from doctors or news agency /organizations with a medical background, focusing on disease knowledge, tend to be of higher quality compared to other videos. Therefore, patients interested in this topic are advised to prioritize watching these videos for their informative and reliable content.

**Correlation and Stepwise Regression Analysis Between Video Quality and Video Characteristics**

We endeavored to conduct an in-depth analysis of mitral regurgitation video content on TikTok. Utilizing Spearman's correlation analysis, we assessed the correlation between video characteristics and quality assessment metrics, and further employed stepwise regression analysis to determine the predictive capacity of video parameters on quality scoring—a novel approach not previously undertaken in similar studies. Our correlation and stepwise regression analyses have yielded a holistic perspective on the determinants of video quality within the realm of mitral regurgitation content on TikTok. However, the interpretation of our results, particularly regarding the observed negative correlations, should be approached with an understanding of the statistical methods employed.

The pronounced positive correlations identified among video length, duration, and engagement metrics—encompassing thumbs up, comments, favorites, and shares—demonstrate a potent interrelation among these variables. This finding corroborates existing literature, which posits that content garnering greater audience engagement is more likely to achieve widespread dissemination, a concept explored by Weng et al. [30] in the context of social media network effects. The less robust correlation between video characteristics and GQS scores suggests that viewer engagement, while

significant, does not automatically correspond to the intrinsic quality of the content. This aligns with the work of Berger and Milkman [31], who identified emotional appeal and content novelty as drivers of engagement, irrespective of the content's educational or informational merit. The negative correlations observed between certain video parameters, such as the uploader's professional role and content type, may be a byproduct of our statistical methodology rather than indicative of a genuine inverse relationship.

The stepwise regression analysis has brought to light 'Length', 'Content', and 'Physicians' as significant predictors of GQS scores, with the final model exhibiting substantial predictive strength. The predictive equation derived from this model implies that longer videos and those involving physicians are linked to higher GQS scores, whereas certain content types may correlate with lower scores. Nonetheless, the negative coefficients associated with 'Content' and 'Physicians' in the model warrant judicious interpretation and should not be hastily attributed to a direct causal effect.

**Practical Significance**

Mild mitral regurgitation often goes unnoticed, with many cases identified through ultrasound scans. In the digital age, people increasingly turn to video platforms to seek health information and exchange experiences. The Chinese government recognizes the importance of these platforms in health education, encouraging medical professionals to actively engage in disseminating health science knowledge [32]. This initiative is particularly relevant on TikTok, a leading short-video platform in China teeming with disease-related content. Our study reveals that cardiologists' contributions to TikTok provide professional and scientifically sound MR-related content, offering valuable guidance to patients and potentially minimizing unnecessary medical consultations. However, challenges remain, including the imperfections in TikTok's recommendation algorithms and constraints on video length, which may limit the depth of information conveyed. To foster a reliable source of high-quality medical content, it is imperative for TikTok to enhance its certification processes for content creators and implement robust content review mechanisms. These measures will help ensure that viewers receive accurate, comprehensive health information that meets their needs and supports informed decision-making.

**Strengths and limitations**

Our study delivers robust insights into the dissemination of health information on TikTok, marked by the validation of content by certified medical professionals, ensuring the reliability of the health messages conveyed. The comprehensive measurement of audience engagement through metrics such as likes, comments, favorites, and shares offer a multi-dimensional understanding of video impact. The innovative application of stepwise regression analysis to predict video quality from specific

characteristics introduces a novel analytical approach in digital health communication. The methodological rigor, evident in the use of Spearman's correlation and regression models, bolsters the study's findings, and the emphasis on practical implications equips content creators and viewers with useful guidance.

Despite these strengths, the study faces limitations. One such limitation is the potential bias in statistical methodology, which may influence the interpretation of negative correlations. The content analyzed may not fully represent the entire spectrum of mitral regurgitation topics, which could limit the applicability of the findings. Additionally, the study does not consider the effects of TikTok's recommendation algorithms, which could significantly impact video visibility and engagement levels. The diverse demographics of TikTok users and their varying interactions with health content are not fully accounted for, potentially affecting the study's conclusions. As a correlational study, it does not infer causality, and the findings may not be generalizable to other platforms or contexts. Moreover, the study's scope is confined to a specific research timeframe, which may not capture the dynamic nature of content evolution and user engagement on social media platforms over time. This temporal limitation could affect the long-term applicability and stability of the findings.

**Conclusion**

Currently, most MR-related videos on TikTok were uploaded by certified physicians, ensuring their professional and scientific content; accordingly, they were highly reliable. However, overall video-quality scores were suboptimal. Although most videos had educational significance to the audience, guidance was insufficient; video-production quality requires improvement. Notably, video prevalence was weakly correlated with quality. The predictive equation for GQS developed from our analysis offers insights but should be cautiously applied outside the study context. It suggests that creators should prioritize enhancing video content and presentation to improve the quality of health information disseminated on social media. TikTok should strengthen its review mechanisms to elevate the quality of medical content, benefiting both users and the integrity of health communication online.

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CNN conceived and designed the study. CNN, and CYL were responsible for reviewing and scoring the videos. LYT AND CXF collected and analyzed the data. CNN wrote the original draft. FSQ and SQ reviewed and edited the manuscript. All the authors contributed to manuscript writing and editing and approved the final draft for submission.

**Disclosure of AI Tool Use**

During the period of our manuscript creation, we did not use ChatGPT as we did not have access to it

in our country. However, we utilized Youdao AI, which is a language translation software, to enhance the overall readability and clarity of the manuscript. Following its use, we conducted a comprehensive review and editing of all content, taking full responsibility for the published material.

## Data availability statement

The data for this study, derived from the TikTok platform, have been anonymized to protect privacy, with URLs and titles retained for research integrity. Due to privacy concerns, these data are not publicly accessible. However, we are committed to sharing the data upon request for legitimate research purposes, in accordance with privacy protection principles and data sharing policies. Interested researchers should contact the corresponding author for access.

## Conflicts of Interest

None.

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## Abbreviations

GQS: global quality score

MR: mitral regurgitation

mDISCERN: modified DISCERN

JAMA: The Journal of American Medical Association

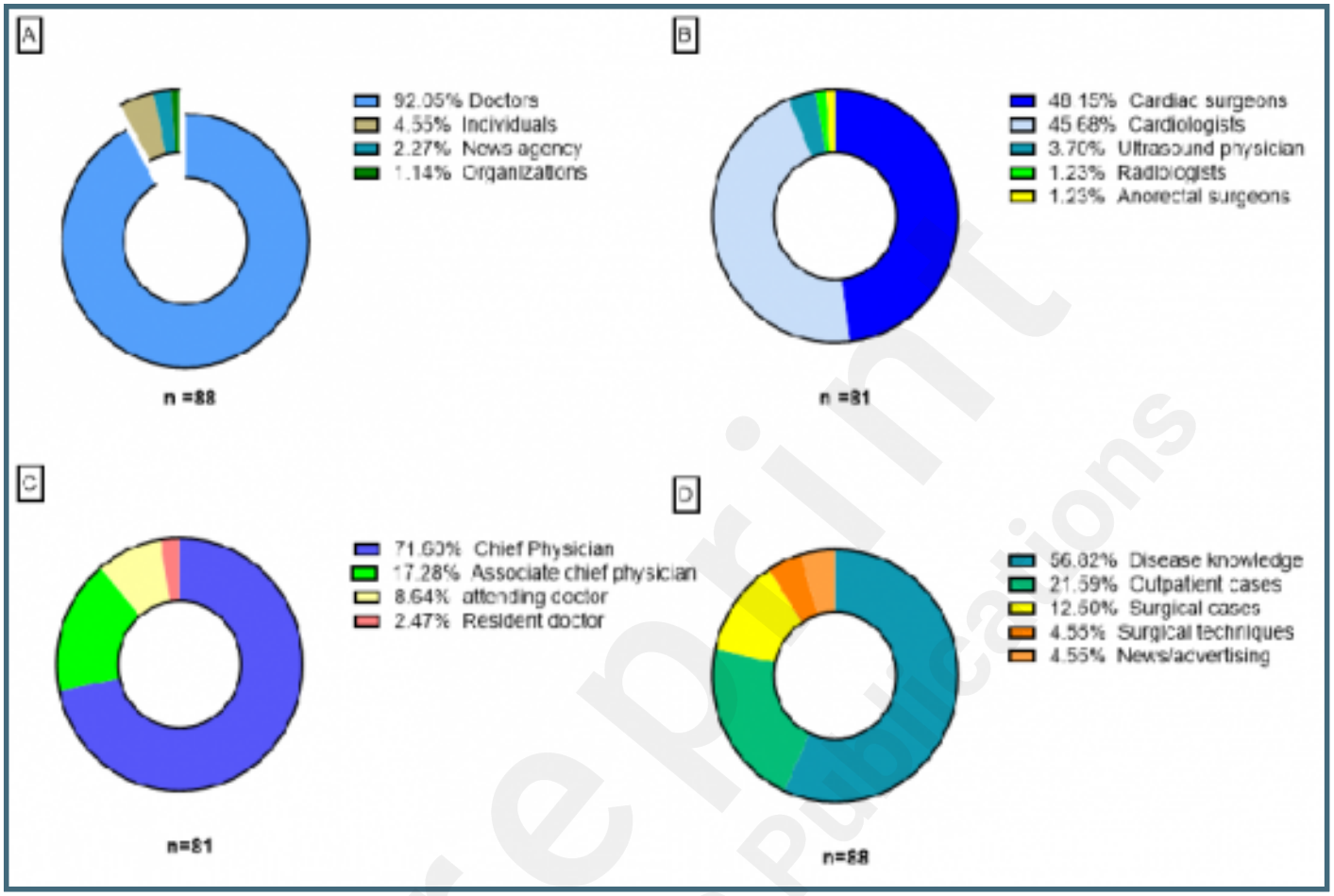
GQS: the Global Quality Score

PEMAT- A/V: The Patient Education Materials Assessment Tool for audiovisual materials.

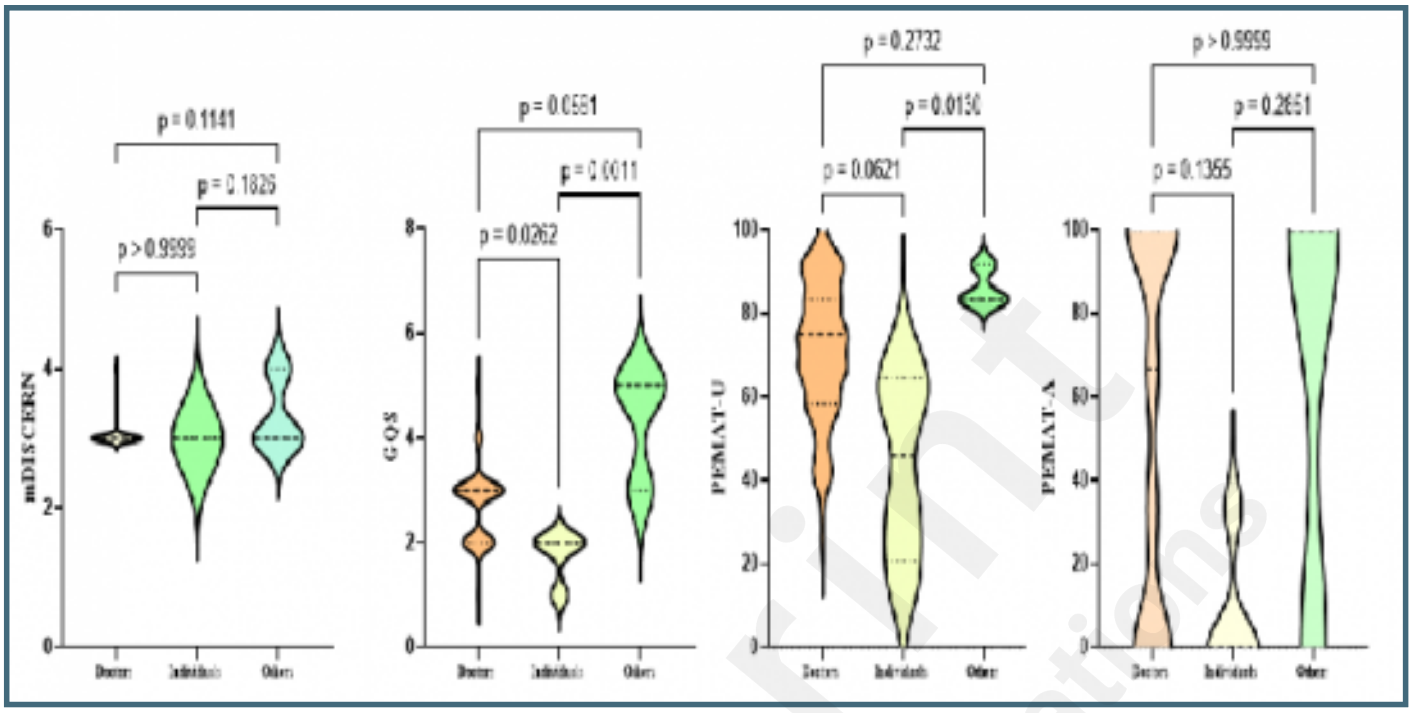
# Supplementary Files

# Figures

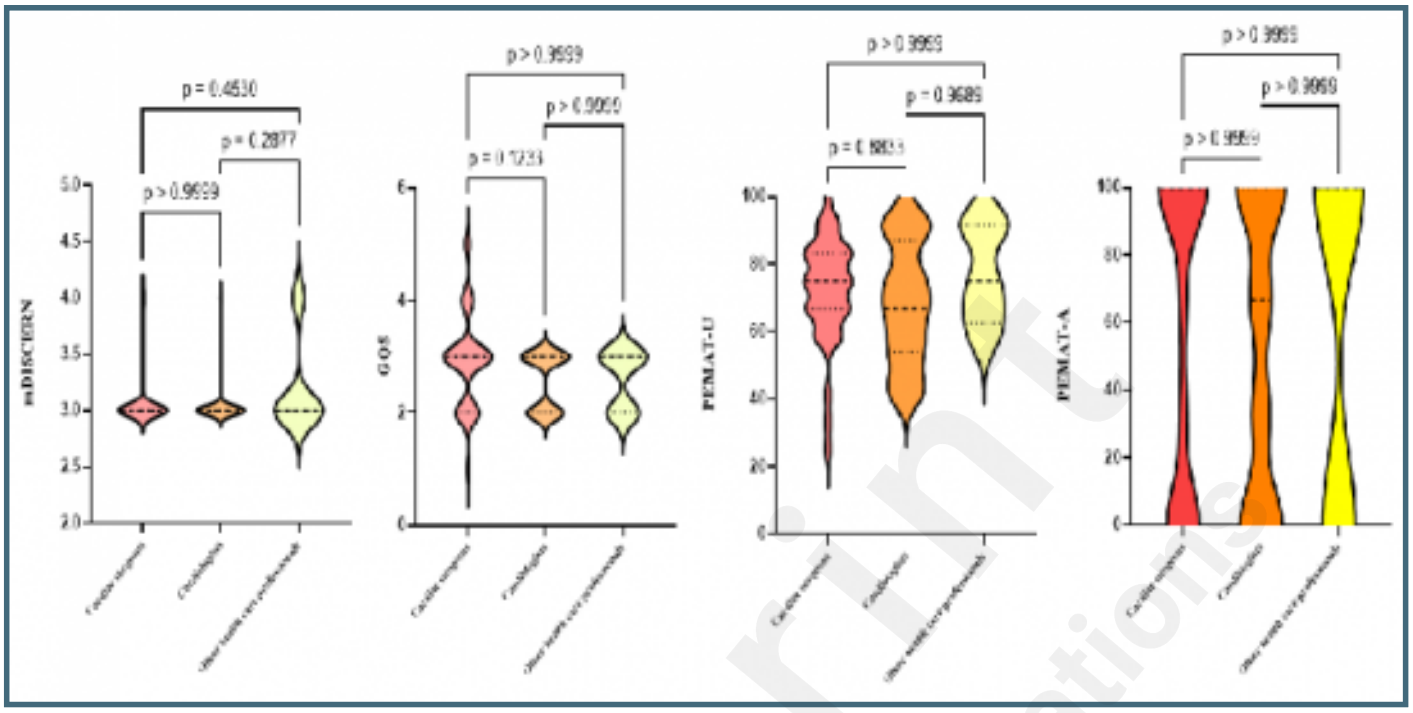
Percentage of videos on MR from different sources and with different contents in TikTok. A. Video distribution based on uploaders. B. Physician distribution. C. Physicians' professional and technical titles. D. Video distribution based on content.



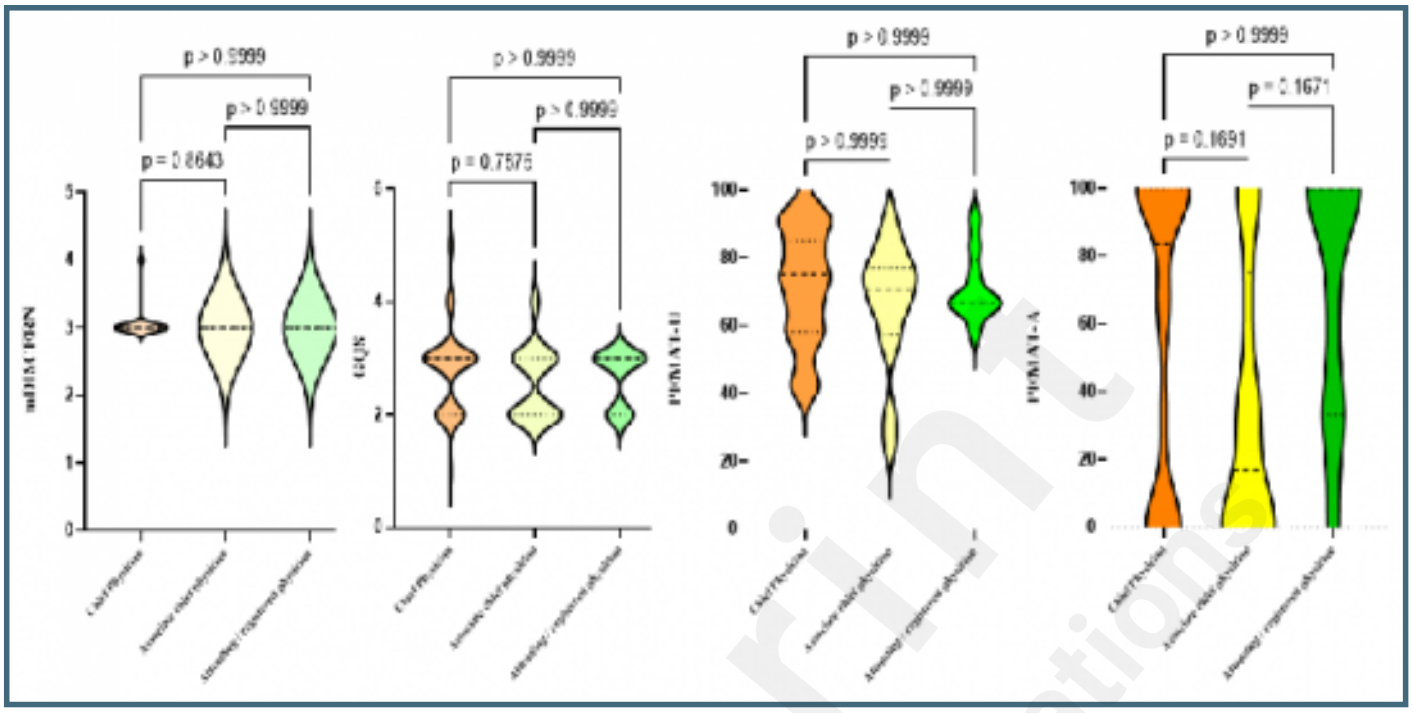
Quality assessment of videos based on uploaders.



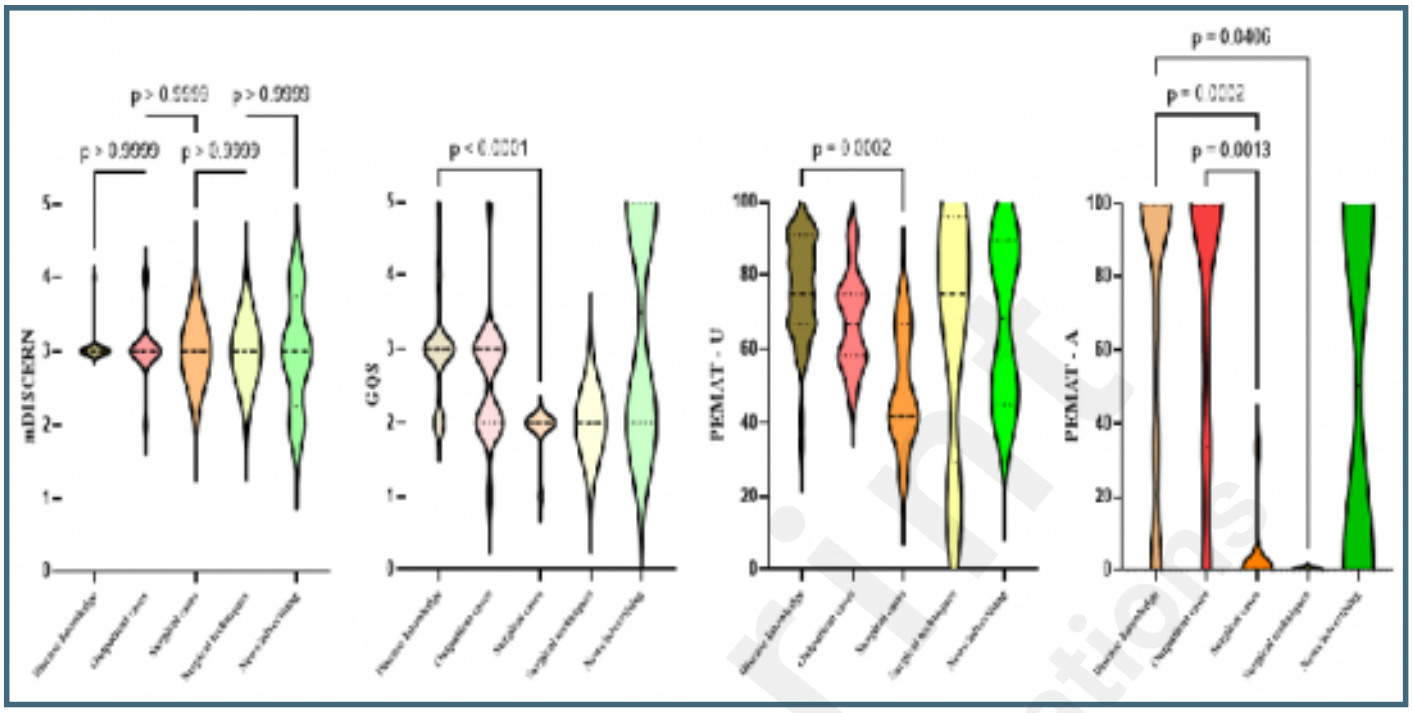
Quality assessment of videos based on doctors.



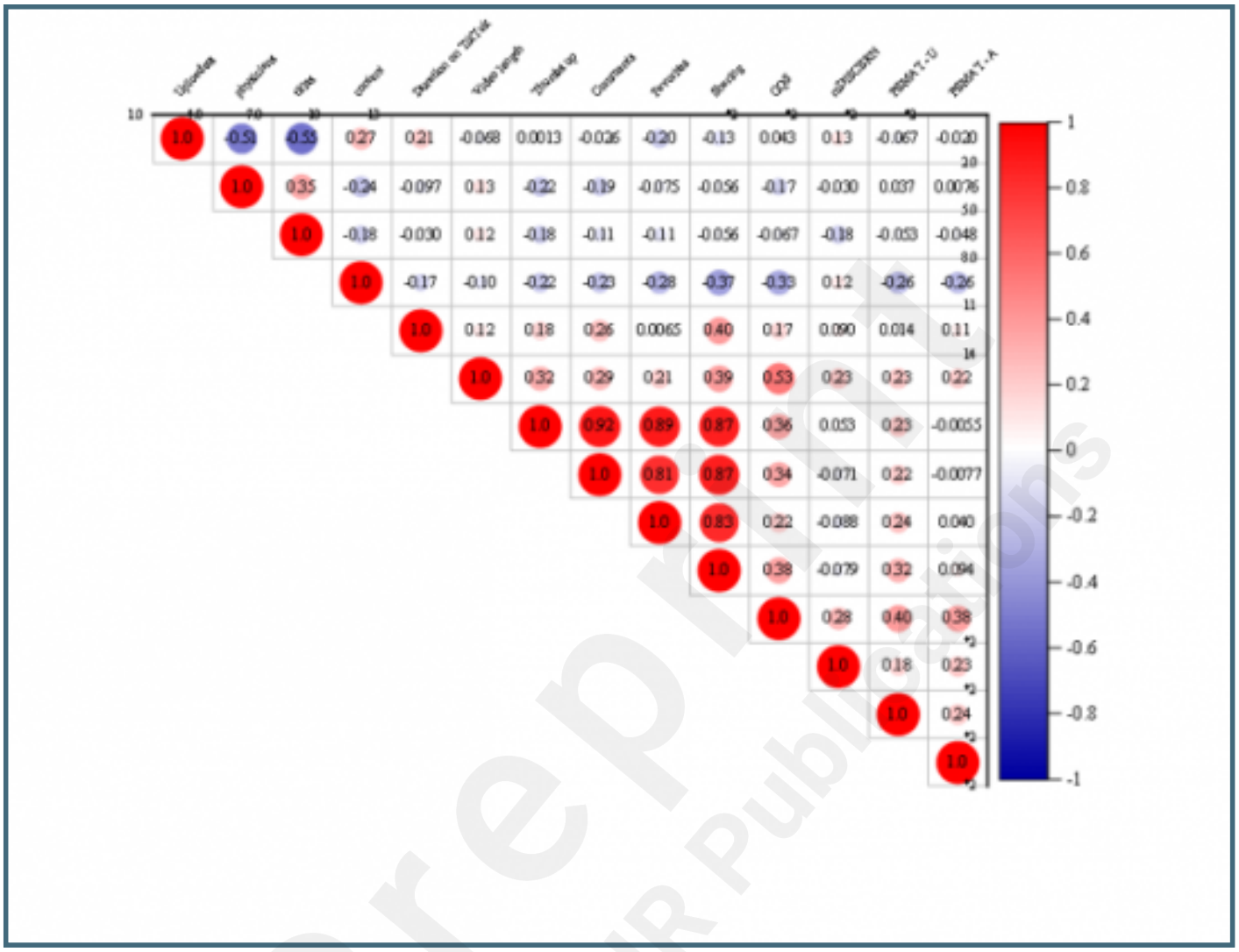
Quality assessment of videos based on professional titles.



Quality assessment of videos based on Content.



Spearman correlation analysis between video variables and the scores.



# Multimedia Appendixes

Untitled.
URL: http://asset.jmir.pub/assets/57be667d0bc52e3fd0cd2b20f3adf159.docx

Untitled.
URL: http://asset.jmir.pub/assets/1f2ef472d89cf74bd87dc87241b9c5e5.docx