

Assessing the Quality and Reliability of Pes Planus Videos on Youtube: Implications for Health Information and Patient Education

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ABSTRACT

Objective: To evaluate the educational quality, reliability, and popularity of YouTube videos on pes planus using standardized scoring systems and assess their value for patient education.

Materials and Methods: A YouTube search on March 01, 2024, using “Pes planus,” “flatfoot,” and “flatfeet” yielded 150 English-narrated videos; 103 met the inclusion criteria. Data on views, duration, likes, comments, and video power index (VPI) were recorded. Videos were assessed using the Journal of the American Medical Association Score (JAMAS) for reliability, the global quality score (GQS) for educational value, and the pes planus-specific score (PPSS) for content relevance. Statistical analyses included Kruskal–Wallis and Mann–Whitney U-tests.

Results: Mean scores were: JAMAS 2.07, GQS 2.67, PPSS 8.52. Physician-created videos scored significantly higher on JAMAS and GQS ($p < 0.05$), while physiotherapists’ videos had the highest VPI (362.8). Exercise videos had the highest VPI among content types, whereas disease lecture videos had the highest PPSS (21.8) but the lowest VPI (6.24). GQS strongly correlated with PPSS ($r = 0.708$), and VPI with video views ($r = 0.831$); no correlation was found between JAMAS and VPI.

Conclusion: Popular videos often lack educational value. While physician-created content is more reliable, it attracts less engagement. Enhancing digital content quality and visibility is essential for effective patient education.

Keywords: Pes planus, YouTube, Patient education, Health information quality, Digital health

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INTRODUCTION

Today, the Internet is the most accessible and fastest way to obtain information in nearly every aspect of daily life. A significant portion of internet searches is health-related.^[1,2] Many individuals conduct online research before visiting a health-care provider.^[1,3] YouTube has become the world’s largest media-sharing platform due to its ease of access and the wide-

spread use of mobile devices.^[3] Its vast variety of video content and users’ preference for watching rather than reading make the platform particularly appealing.^[4] However, YouTube does not review uploaded videos for content quality and accuracy. Many lack proper authorship or source attribution. In addition to questionable reliability, users are also exposed to commercial manipulation.^[5] “Pes planus” is a term that encompasses

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both flexible and pathological flatfoot conditions. It ranges from benign, untreatable flexible flatfoot to symptomatic, rigid forms that may require surgical intervention.^[6] The condition primarily affects the pediatric population. Parents – who are often active internet users – tend to seek information online rather than consult medical professionals.^[3,7] While the quality of online video content on various medical conditions has been studied, the reliability and educational value of YouTube videos on flatfoot remain underexplored.

In this study, we hypothesized that YouTube videos about flatfoot may lack sufficient educational value for patients and their families. Therefore, we aimed to evaluate the content quality and reliability of such videos.

MATERIALS AND METHODS

On March 01, 2024, a YouTube search (<https://www.youtube.com>) was conducted using the keywords “Pes planus, flatfoot and flatfeet.” Videos were sorted using the “relevance” filter, which is YouTube’s default setting. This method reflects typical user behavior, as most users rely on the top-listed results suggested by the algorithm. From the approximately 11,000, 140,000, and 240,000 results returned for each keyword, respectively, the first 50 videos per keyword were selected, based on the assumption that most users do not browse beyond the first two result pages. A total of 150 English-narrated videos were initially recorded. Forty-one duplicate videos were excluded. Duplicates were defined as videos with identical narration, visuals, or reuploads by the same or different users. In such cases, only the version with the highest number of views was included. Six additional videos were excluded because their comment sections were disabled. Since user interaction (likes, dislikes, comments) is essential for calculating engagement and the video power index (VPI), videos without comment functionality were excluded. For the remaining 103 videos, data on video duration, number of views, time since upload, view rate (total views/day), number of comments, likes, and dislikes, and their like ratios ($\text{like} \times 100 / (\text{Like} + \text{Dislike})$) were collected. VPI was calculated using the following formula: $\text{VPI} = (\text{Like Ratio} [\%] \times \text{View Rate} [\text{views/day}]) / 100$.

This formula has been adapted from previous studies evaluating YouTube video popularity metrics in health-related research. The like ratio was calculated as: $\text{Likes} \times 100 / (\text{likes} + \text{dislikes})$. Since YouTube disabled the public dislike count in 2021, the number of dislikes was estimated using the “Return YouTube Dislike” browser extension, which has been validated and used in earlier publications. This tool estimates the number of dislikes using crowd-sourced user interactions and historical data, and has been validated and used in previous studies.

Video popularity was evaluated using the benchmark criteria of the Journal of the American Medical Association (JAMA) (Table 1) and overall content quality was assessed using the glob-

Table 1. The benchmark criteria of the Journal of the American Medical Association

Benchmark criteria	Description
Authorship	Authors and contributors, their affiliations, and relevant credentials should be provided.
Attribution	References and sources for all content should be listed clearly, and all relevant copyright information noted.
Disclosure	Website ‘ownership’ should be prominently and fully disclosed, as should any sponsorship, advertising, underwriting, commercial funding arrangements or support, or potential conflicts of interest.
Currency	Dates that content was posted and updated should be indicated.

al quality score (GQS) (Table 2) which is commonly applied to health-related websites. The educational value of each video was assessed using a five-point scale adapted from Singh et al.^[8] (Table 2). Videos were rated using by JAMA Score (JAMAS) for reliability and GQS for educational and informational content.^[8-11] All videos were evaluated by a single reviewer with a background in orthopedic surgery. Therefore, inter-rater reliability metrics, such as Cohen’s kappa were not applicable in this study.

In this study, video content was more comprehensively evaluated using the Pes Planus-Specific Score (PPSS), which assessed disease-specific features, including diagnosis, classification, treatment options, and complications related to pes planus, flatfoot, and flatfeet. This scoring system was originally

Table 2. Global quality score for educational value

Score	Quality Description	Interpretation
1	Poor quality	Very unlikely to be of any use to patients.
2	Poor quality, but some information present	Of very limited use to patients.
3	Suboptimal flow, some information covered, but important topics missing	Somewhat useful to patients.
4	Good quality and flow, most important topics covered	Useful to patients.
5	Excellent quality and flow	Highly useful to patients.

developed by Mathur et al.^[7] to evaluate the quality of online information about scoliosis. It was later adapted by Staunton et al.^[5] for scoliosis videos, and by Erdem et al.^[3] for kyphotic deformity content. Based on expert consensus and relevant literature, the scale was revised to suit flatfoot-related video content. In the PPSS, each correctly presented term or concept in the video (either spoken or written) earns 1 point, with a checklist ranging from 0 to 36 items.

The final revised version of PPSS used in this study contains 32 subcategories focusing on various aspects of the disease and its treatment, each assigned 1 point, for a maximum possible score of 32 points. These categories include: Foot and arch deformities (medial, lateral, and transverse arches), ankle and subtalar joint involvement, gait abnormalities, pain, diagnostic tools, such as radiographic measurements (Meary’s angle, talonavicular coverage angle, calcaneal pitch), conditions, including ligamentous laxity, tarsal coalition, Achilles tendon contracture, and congenital vertical talus, clinical tests (e.g., Jack toe rise test, pedobarographic measurements), deformities, such as heel valgus and tibial/femoral rotational abnormalities, treatment options (e.g., orthoses, exercises, shoe inserts, taping, and surgeries, including arthroereisis, osteotomy, and arthrodesis), disease progression, implant failure, and psychosocial implications.

The videos were categorized into eight groups based on source and content.

By source, the categories were: (a) Physiotherapist, (b) Podiatrist, (c) Physician, (d) Animator, (e) Academic Staff, (f) Patient, (g) Coach, (h) Merchant (Fig. 1). Based on content, the videos were grouped into: (a) Disease Lecture, (b) Surgical Technique Animation, (c) Disease Information, (d) Medical History, (e) Foot Orthotic Advertising, (f) Surgical Technique, (g) Chiropractic Treatment, and (h) Exercise Training (Fig. 2).

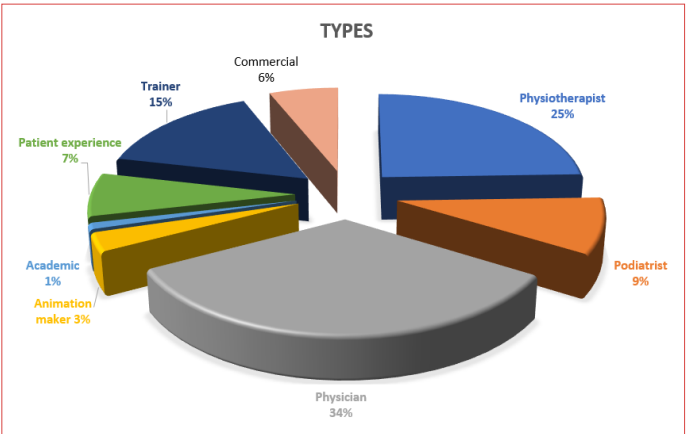


Figure 1. Distribution of video sources included in the study. Videos were categorized based on their creators: Physicians, physiotherapists, podiatrists, academic staff, patients, coaches, animators, and merchants.

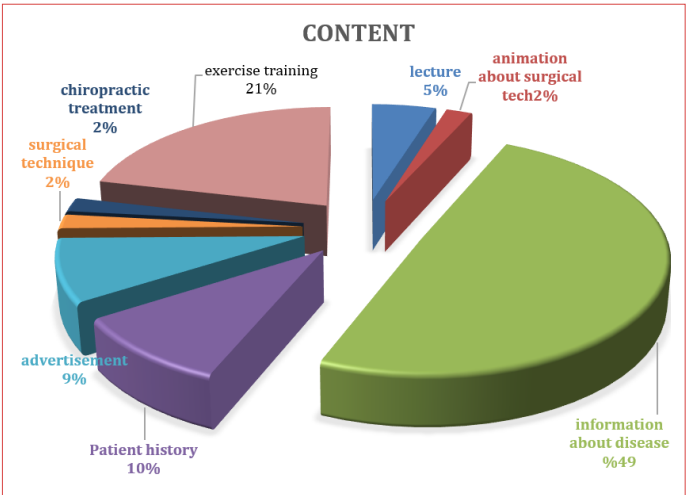


Figure 2. Categorization of video content types. Videos were classified into eight categories: Disease lecture, surgical technique, disease information, medical history, orthotic advertisement, chiropractic treatment, surgical animation, and exercise training.

Statistical Analysis

Statistical analyses were performed using IBM Statistical Package for the Social Sciences Statistics version 26. Since most variables were ordinal or categorical, and continuous variables did not follow a normal distribution, non-parametric tests were applied. The Kruskal–Wallis H test was used to compare more than two groups, and the Mann–Whitney U-test was applied for pairwise comparisons. To assess the magnitude of group differences, effect sizes were calculated: η^2 for Kruskal–Wallis and r for Mann–Whitney U. Spearman’s rho correlation was used to examine associations between variables. A $p<0.05$ was considered statistically significant in all analyses.

Ethical Statement

This study involved the analysis of publicly available online content (YouTube videos) and did not include any human participants or patient data. Therefore, ethical approval was not required in accordance with institutional and international guidelines.

RESULTS

A total of 103 videos that met the inclusion criteria were analyzed. The combined total duration of these videos was 46,116 s, with an average length of 448 ± 621 s per video. The videos had a cumulative view count of 8,011,030, averaging $77,777\pm176,594$ views per video. The mean time elapsed since upload was $1,239\pm809$ days. On average, videos received an average of 113 ± 321 comments, $966\pm2,538$ likes, and 39 ± 79 dislikes, with an average like ratio of 93 ± 13 . One video was ex-

cluded from the study due to having zero likes, which made the VPI calculation infeasible.

The mean scores for the evaluated parameters were: JAMAS: 2.07 ± 0.62 , GQS: 2.67 ± 0.96 , and PPSS: 8.52 ± 7.22 . Videos produced by physicians had significantly higher JAMAS and GQS scores compared to those created by physiotherapists, patients, and coaches ($p < 0.05$). Physician videos also achieved significantly higher PPSS scores than those from patients, coaches, and merchants ($p < 0.05$). However, videos created by physiotherapists had the highest VPI values ($362.8 \pm 1,141.83$), significantly surpassing those from physicians and merchants ($p < 0.05$). Conversely, videos by physicians and podiatrists had significantly lower VPI scores compared to those from coaches ($p < 0.05$).

Content-based analysis revealed no significant differences among video types regarding JAMAS scores ($p > 0.05$). However, there were significant differences in GQS, PPSS, and VPI scores across content categories ($p < 0.05$). Videos categorized as disease information had significantly lower GQS and PPSS scores compared to disease lecture videos ($p < 0.05$) yet scored higher than those labeled exercise training, advertise-

ments, and medical history ($p < 0.05$). Exercise training videos showed significantly higher VPI scores than all other content categories, including disease information, animations, disease lectures, surgical techniques, advertisements, and medical history, except for chiropractic treatment ($p < 0.05$) (Table 3). In addition to p-values, effect sizes were reported, with values, such as $\eta^2 = 0.12$ (moderate) for GQS by content, and $r = 0.45$ (moderate) for PPSS by video source.

Correlation analyses revealed a moderate, positive, and statistically significant correlation between JAMAS and GQS scores ($r = 0.445$, $p < 0.01$) as well as between JAMAS and PPSS scores ($r = 0.412$, $p < 0.01$). These findings indicate that higher reliability scores (JAMAS) were associated with better educational quality (GQS) and more comprehensive content (PPSS). No significant correlations were observed between JAMAS and VPI, or between JAMAS and the number of views ($p > 0.05$). A strong, positive, and significant correlation was identified between GQS and PPSS ($r = 0.708$, $p < 0.01$), suggesting alignment between educational quality and topic-specific depth. A weak but significant correlation was also found between GQS and number of views ($r = 0.195$, $p < 0.05$), while no significant relationship was detected between GQS and VPI ($p > 0.05$).

Table 3. Mean and Median JAMAS, GQS, PPSS and VPI values of the videos based on source and content

	PPSS	GQS	JAMAS	VPI
Video source				
Physiotherapist	5.47 ± 3.18 (5)	2.47 ± 0.79 (2)	1.91 ± 0.51 (2)	362.8 ± 1141.83 (101.94)
Podiatrist	10.4 ± 6.58 (9)	2.9 ± 0.99 (3)	2.1 ± 0.56 (2)	19.09 ± 22.1 (17.49)
Physician	12.73 ± 9.16 (10.5)	3.32 ± 0.91 (3)	2.41 ± 0.6 (2)	30.84 ± 60.4 (10.65)
Animator	10 ± 5.94 (10)	2.75 ± 0.95 (2.5)	2 ± 0.81 (2)	10.75 ± 11.05 (7.84)
Academic Staff	21	4	1	2.09
Patient	3.75 ± 2.49 (3)	1.87 ± 0.35 (2)	1.75 ± 0.7 (2)	24.5 ± 31.69 (16.43)
Coach	6.37 ± 4.42 (5.5)	2.25 ± 0.57 (2)	1.87 ± 0.61 (2)	135.42 ± 161.13 (71.67)
Merchants	3.14 ± 1.77 (3)	1.57 ± 0.53 (2)	2 ± 0 (2)	1.65 ± 2.02 (0.93)
Total	8.52 ± 7.22 (6)	2.67 ± 0.96 (2)	2.07 ± 0.62 (2)	116.55 ± 552.78 (18.65)
Video content				
Disease Lecture	21.8 ± 8.46 (21)	4 ± 0.7 (4)	2.2 ± 0.83 (2)	6.24 ± 7.82 (3.06)
Surgical technique animation	5.5 ± 3.53 (5.5)	2 ± 0 (2)	2.5 ± 0.7 (2.5)	13.65 ± 17.88 (13.65)
Disease Information	10.6 ± 7.57 (8)	3.07 ± 0.95 (3)	2.19 ± 0.63 (2)	153 ± 777.32 (16.11)
Medical History	4.7 ± 3.65 (3.5)	2 ± 0.47 (2)	1.8 ± 0.63 (2)	21.48 ± 28.97 (15)
Foot Orthotic Advertising	3.44 ± 1.66 (3)	1.66 ± 0.5 (2)	1.88 ± 0.33 (2)	31.9 ± 64.85 (1.54)
Surgical Technique	9.5 ± 2.12 (9.5)	3 ± 0 (3)	2.5 ± 0.7 (2.5)	25.33 ± 21.73 (25.33)
Chiropractic Treatment	5.5 ± 6.36 (5.5)	2 ± 1.41 (2)	2 ± 1.41 (2)	253.37 ± 354.82 (253.37)
Exercise Training	4.95 ± 2.86 (4.5)	2.27 ± 0.45 (2)	1.9 ± 0.52 (2)	138.16 ± 140.79 (106.46)
Total	8.52 ± 7.22 (6)	2.67 ± 0.96 (2)	2.07 ± 0.62 (2)	116.55 ± 552.78 (18.65)

JAMAS: Journal of the American Medical Association Score; GQS: Global quality score; PPSS: Pes planus-specific score; VPI: Video power index.

Regarding VPI and view counts, a strong, positive, and statistically significant correlation was found ($r=0.831$, $p<0.01$), indicating that videos with higher VPI scores also had greater popularity. However, no significant correlation was observed between PPSS and VPI, or between PPSS and view counts ($p>0.05$) (Tables 4 and 5).

DISCUSSION

The increasing number of patients diagnosed with flatfoot, combined with their families’ growing tendency to seek information online before consulting a physician, formed the ba-

sis of this study’s hypothesis.^[1,3,7] This study aimed to evaluate the accuracy, adequacy, and quality of information on flatfoot available on YouTube, and to assess this content from a clinical perspective.

Visual content plays a crucial role in online health searches, making YouTube a preferred platform due to its accessibility and ease of use.^[4] Patients tend to express satisfaction when they believe the information originates from credible sources.^[12,13] However, verifying the authorship and accuracy of online video content remains a challenge for patients and their families. Prior research has shown that patients often favor visually rich and engaging videos, even when such videos lack accuracy and reliability.^[3,7] This preference may mislead viewers and contribute to misinformation, potentially undermining the trust and communication between physicians and patients.

In this study, the average scores for the analyzed YouTube videos were as follows: JAMA Score (JAMAS) 2.07, GQS 2.67, and PPSS 8.52. These findings suggest that the overall quality of flatfoot-related information on YouTube is low, leaving patients with incomplete and unverified knowledge. This result is consistent with previous studies evaluating YouTube content on various medical topics, where the quality was often found to be unregulated and inconsistent.^[3,5,14-18] For clinicians, addressing misconceptions shaped by unreliable online content remains a challenge, emphasizing the importance of understanding how digital environments influence patient perceptions.

When grouped by content type, 49% of the videos were classified as providing general disease information. This category yielded average scores of JAMAS: 2.19, GQS: 3.07, and PPSS: 10.6, with the highest PPSS among all content types – except for disease lecture videos (PPSS=21.8), which were predominantly created by physicians. In contrast, exercise-focused videos, mostly produced by coaches (55%) and physiotherapists (41%), emphasized practical exercises rather than comprehensive disease education. Although these videos were not always consistent or evidence-based, their practical orientation made them highly appealing to patients.

Although the correlation between GQS and number of views was statistically significant ($r=0.195$), the strength of the association was weak, suggesting limited clinical or educational relevance. This finding suggests that the video popularity of health-related YouTube videos may be more influenced by external engagement factors—such as compelling titles, attractive thumbnails, and professional production—than by content quality alone. Consequently, even videos with high educational value may fail to reach or engage patients effectively unless these extrinsic features are also strategically optimized.

Table 4. Result summary table	
Metric	Value
Total running time (seconds)	46.116
Average duration (seconds)	448±621
Total number of views	8.011.030
Average number of views	77.777±176.594
Average time since upload (days)	1.239±809
Average view rate (views/day)	121±561
Average number of comments	113±321
Average number of likes	966±2.538
Average number of dislikes	39±79
Average like rate	93±13
Average VPI	117±553
Mean JAMAS	2.07±0.62
Mean GQS	2.67±0.96
Mean PPSS	8.52±7.22
JAMAS: Journal of the American Medical Association Score; GQS: Global quality score; PPSS: Pes planus-specific score; VPI: Video power index.	

Table 5. Correlations table		
Correlation Pair	Correlation coefficient (r)	Significance
JAMA and GQS	0.445**	p<0.01
JAMA and PPSS	0.412**	p<0.01
GQS and PPSS	0.708**	p<0.01
GQS and Number of Views	0.195*	p<0.05
PPSS and VPI	N.S.	N.S.
PPSS and Number of Views	N.S.	N.S.
VPI and Number of Views	0.831**	p<0.01
JAMAS: Journal of the American Medical Association Score; GQS: Global quality score; PPSS: Pes planus-specific score; VPI: Video power index.		

Notably, exercise-related videos demonstrated the highest VPI scores (mean=138.16), making them the only category to surpass the overall group average. This may indicate a viewer preference for content offering practical, actionable guidance—particularly exercises that patients can integrate into their rehabilitation or treatment routines. In contrast, videos focusing on surgical procedures or general disease overviews garnered less engagement. This trend aligns with previous research emphasizing the appeal of self-applicable content in patient education.^[5]

Videos promoting insoles and specialized footwear – interventions that play a significant role in the management of flat feet—had the lowest GQS (1.66) and PPSS (3.44) among all content categories. Nevertheless, their VPI score (31.9) surpassed that of disease lecture videos, indicating that promotional content may attract more attention than purely educational material.

In terms of content sources, physicians produced 34% of the videos, representing the largest contributor group. These physician-generated videos received scoring highest in JAMAS (2.41), GQS (3.32), and PPSS (12.73) – ranking second only to academic content in the latter category. Despite their high reliability and educational value, these videos exhibited a relatively low VPI scores (30.84), suggesting limited audience engagement. In contrast, videos created by physiotherapists attained the highest VPI (362.8) despite having one of the lowest PPSS scores (5.47). Academic videos, while offering the most comprehensive and accurate information (PPSS=21) and achieving a perfect GQS score, recorded the lowest VPI (2.09), reflecting minimal viewer interest. These findings align with prior research indicating a persistent mismatch between content quality and popularity on platforms, such as YouTube.^[3,5,19] This discrepancy may be partly attributed to the platform's recommendation algorithm, which favors videos generating higher user engagement – such as likes, comments, and watch time – over those providing educational accuracy. Consequently, content produced by healthcare professionals, despite their high informational value, such videos may receive limited exposure, while less informative yet visually or emotionally engaging videos gain broader visibility.

Patient-generated videos had the second-lowest (PPSS: 3.75), ranking just above merchant-produced content (PPSS: 3.14). Despite their limited informational quality, these videos demonstrated relatively higher VPI values (24.5), indicating that patients tend to engage more with content produced by peers who share similar lived experiences. This suggests that emotional relatability may play a greater role in viewer engagement than informational accuracy alone.

Academic videos represented the smallest category, with only five entries in the dataset. Despite providing the highest-quality information, these videos exhibited the lowest VPI scores, reaffirming previous observations by Desai et al.^[4] that instructional or rigorously structured videos tend to attract fewer views compared to less formal content.^[4] Readability and visual appeal appear to play a substantial role influencing a video's reach; lower-quality videos are often perceived as more approachable or easily understandable by the general public.^[5,19] Consistent with our findings, videos with lower educational value tended to be easier to read and visually accessible, whereas those with higher content scores were often perceived as less engaging or “patient-friendly.”

Study Limitations

This study has several limitations that should be acknowledged. First, the analysis was restricted to the first 150 videos retrieved from YouTube using the keywords “pes planus,” “flatfoot,” and “flatfeet.” While this sampling strategy may appear limited, it reflects typical user behavior, as the majority of internet users rarely navigate beyond the first two pages of results.^[3,20]

Second, the evaluation was conducted from the perspective of a researcher, focusing on user experience rather than providing a comprehensive review of all available content related to flatfoot on YouTube. It is important to note that YouTube is a dynamic platform where content is continuously updated, and search results are influenced by various factors, such as geographic location, browsing history, and user preferences – all shaped by the platform's algorithm.

Finally, the sample size was inherently constrained to 150 videos. This limitation was necessary to ensure the feasibility of conducting an in-depth quality and reliability analysis, though it may not fully represent the breadth of flatfoot-related on the platform. Nevertheless, despite these limitations, the study provides meaningful insights into the overall quality, accessibility, and credibility of information on pes planus available through YouTube.

Although the PPSS used in this study was adapted from previously published scoring systems applied to other musculoskeletal conditions, it has not undergone formal validation specifically for pes planus–related content. As such, its accuracy and generalizability may be limited. Nevertheless, it offers a structured framework for evaluating disease-specific information in YouTube videos.

All video assessments in this study were performed by a single reviewer with a background in orthopedic surgery. While this ensured clinical expertise, it also introduces the potential

for subjective bias. Since no second reviewer was involved, inter-rater reliability (e.g., Cohen's kappa) could not be assessed. Future studies should consider using multiple independent reviewers to enhance objectivity and reproducibility.

Although several statistical comparisons were conducted in this study, adjustments for multiple testing (such as Bonferroni correction) were not applied. This decision was based on the exploratory nature of the analysis and the aim to avoid an increase in Type II errors. However, the lack of correction may increase the likelihood of Type I errors and should be considered when interpreting the results.

CONCLUSION

In the digital era, accessing health-related information has become increasingly convenient; however, verifying the accuracy and reliability of such content remains a significant challenge.^[21] The absence of rigorous validation mechanisms exacerbates the risk of misinformation, posing serious implications for both patients and healthcare providers. As individuals increasingly rely on platforms, such as YouTube for medical information, the potential for misinformation threatens informed decision-making and may undermine the patient-provider relationship.

This study reveals that the majority of YouTube videos about pes planus fall short of meeting essential standards for educational quality and reliability. While videos produced by physicians were generally more trustworthy, they frequently lacked comprehensive educational depth – underscoring the need for improvement, even among otherwise high-quality sources.” These findings highlight the pressing need for professional medical associations and reputable healthcare institutions to proactively engage in the creation of accurate, patient-oriented, evidence-based video content. By ensuring the availability of reliable and accessible information, these organizations can play a pivotal role in combating digital health misinformation and promoting public health literacy. To address this, collaborations between healthcare professionals and digital media experts may be instrumental in producing content that balances medical accuracy with viewer engagement. Such partnerships offer a promising strategy to bridge the existing gap between content quality and reach, ensuring that trustworthy health information is both visible and impactful for a broader audience.

DECLARATIONS

Ethics Committee Approval: This study involved the analysis of publicly available online content (YouTube videos) and did not include any human participants or patient data. Therefore, ethical approval was not required in accordance with institutional and international guidelines.

Informed Consent: Since the study exclusively analyzed publicly accessible content on YouTube, no informed consent was required. The videos used in this research were openly available to the general public, and no individuals were directly involved or identified in the study.

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