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The most contemporary analysis on YouTube videos on premature ejaculation

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Abstract

Background: It is unknown if the quality of information of videos on premature ejaculation (PE) uploaded on YouTube has improved during the last years. The current study aimed to quantify the quality of information in videos on PE uploaded on YouTube. **Methods**: A systematic collection of YouTube videos was completed using five keywords combination. The search was carried out after logging out from any personal account and in "incognito status". The first 200 videos were recorded for each keyword's combination. **Results**: According to the selection criteria, 149 (14.9%) were suitable for the analyses. Of those, 42 (28%) YouTube videos were uploaded by medical institutions *vs.* 107 (72%) by non-medical channels. According to Patient Education Materials Assessment Tool for Audiovisual Materials (PEMAT-A/V), higher Understandability score (88% *vs.* 15%) as well as higher Actionability score (100% *vs.* 0%) were recorded in video uploaded by medical institutions relative to non-medical channels ($p < 0.001$). The median total DISCERN score (57 *vs.* 32) was higher for videos uploaded by medical institutions relative to non-medical channels ($p < 0.001$). According to Global Quality Score (GQS), the quality of the YouTube videos uploaded by the medical institutions was of moderate quality. The median Misinformation total score was 2 (interquartile range (IQR): 1−3) for videos uploaded by medical institutions *vs.* 0 (IQR: 0−1.2) by non-medical channels ($p < 0.001$). **Conclusions**: The videos uploaded on YouTube on PE by medical institutions have been increasing during the last years. Specifically, they had better quality, evaluated according to PEMAT, DISCERN and GQS tools, than their non-medical channels counterparts. However, the degree of misinformation was still high, representing a social concern. Further improvements by medical institutions are needed to reduce the degrees of misinformation lower as possible.

Keywords

Patient information; Social media; Andrology; Premature ejaculation; Sexual dysfunction

1. Introduction

YouTube is a social platform, and it is the most frequently visited after Google [1–3]. In the last few years, YouTube has been widely used for dissemination of health information by hospitals and health organizations [4–7]. No standardized criteria have been established both to upload new videos and to spread on the YouTube platform [1, 8]. As a result, the misinformation is always behind the corner [9]. This major concern should be deeply understood and fixed by healthcare workers, improving the overall quality of contents shared on the platform. During the last years several videos were uploaded on YouTube, which is considered an important source of information for various medical conditions, such as male infertility, erectile dysfunction (ED), as well as premature ejaculation (PE) [5, 10, 11]. The PE is a common male sexual dysfunction worldwide with a prevalence ranging from 19.8% to 55% [12–16]. Moreover, the disease negatively impacts the quality of life and the relationship with the partner [17–21]. Previous authors have already investigated the PE contents on YouTube platform [5, 22]. However, to the best of our knowledge, no previous authors assessed the differences of quality content uploaded on YouTube according to video author, namely medical institutions *vs.* non-medical channels, between 2021 and 2023. We addressed this knowledge gap. Specifically, we hypothesized that YouTube videos on PE

uploaded by medical institutions had higher quality than their non-medical channel counterparts.

2. Materials and methods

2.1 Search strategy and video selection criteria

On the 01 December 2023, a search on YouTube was systematically conducted using five keywords ("premature ejaculation", "cure premature ejaculation", "end premature ejaculation", "stop premature ejaculation" and "premature ejaculation treatment"), according to previous methodology [5, 22, 23]. Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) diagram depicted inclusion as well as exclusion criteria of videos uploaded on YouTube, as previously assessed [24–27]. The search was carried out in incognito status. Specifically, any personal account was logged out before starting the search and a proxy located in the United States via Virtual Private Network (VPN) software was set [1]. No filters were applied during the research. For each combination of keywords, the first 200 videos were retrieved in chronological order [4, 28–30]. The following exclusion criteria were applied: non-English videos (n = 224); off-topic (n = 86); unavailable (n = 7); duration of video ≥60 minutes (n = 3); duration of video <1 minute (n = 149). In case of duplicated videos (n = 383), only one was considered (Fig. 1).

2.2 Variables of interest

For all the videos, the following variables were retrieved: length (seconds), number of views, number of likes, number of comments, number of videos with disabled comments, subscribers, video authors (medical institutions (including healthcare workers, medical hospital or medical association) *vs.* non-medical channels (including private users, non-medical association or single individual)), year of upload. Finally, Video Power Index (VPI) defined as ((like ratio×view ratio)/100) was used to define video popularity [31].

2.3 Video quality assessment tools

The quality of videos was assessed by two investigators (a junior urology resident (AL) and a senior urology resident (GP)). In case of discrepancy, a third investigator (an Associate Professor (RLR)) solved the disagreement. Reviewers independently conducted the evaluation of contents and were also blinded to each other's evaluations. The video quality assessment was performed according to the following tools: the Patient Education Materials Assessment Tool for audio-visual content (PEMAT-A/V), the DISCERN scores, Global Quality Scores and the Misinformation scores [32–34].

First, the PEMAT-A/V (Patient Education Materials Assessment Tool for audio-visual content): This tool evaluates the Understandability and Actionability of patient education materials. It consists of 17 questions. Of those, 14 questions evaluated the Understandability of the contents (questions 1−13) and three the Actionability (questions 14−17). The total score is presented as a percentage obtained by summing all points and dividing by the number of items judged as agree or disagree. A

scores greater than 70% is considered a threshold for defining good video quality for PEMAT [32].

Second, the DISCERN tool is a validated questionnaire for consumer health information designed to assess the quality of information of treatment choices for a medical problem. It consists of three sections (16 questions) with five possible answers (from 1 = strongly disagree, to 5 = strongly agree). The first 9 questions (Section 1) address the reliability of the publication, the following 6 questions (Section 2) focuses on specific information of treatment choices, and last question (number 16, Section 3) represents the overall quality rating. Higher scores indicate higher quality content [33].

Third, the Global Quality Scores is a validated tool assessing the quality, feasibility, and clinical utility of each video. Ratings range from 1 ("poor quality, poor flow of the site, most information missing, not at all useful for patients") to 5 ("excellent quality and excellent flow, very useful for patients"), with higher scores indicating higher quality videos [35].

Finally, the Misinformation tool was also used. It was adopted to estimate how far the video content was from the current evidence-based knowledge, reported in international guidelines. It consists of a 5-point Likert scale [34, 36], with scores ranging from 0 (extreme misinformation) to 4 (no misinformation). In this study, information on PE were assessed according to the Premature Ejaculation Diagnostic Tool (PEDT) [37].

2.4 Statistical analyses

Descriptive statistics were presented as medians and interquartile ranges (IQR) for continuously coded variables or counts and percentages for categorically coded variables. Wilcoxon rank sum and Chi-square tests examined the statistical significance in proportions and medians' differences. The estimated annual percentage changes (EAPC) tested temporal trends of videos uploaded on YouTube on PE between the 2021 and 2023. Pearson's test was used to assess a potential correlation between the variables. The overall videos eligible for the analyses were stratified according to video author (medical institutions *vs.* non-medical channels), and the PEMAT, DISCERN, GQS tools as well as Misinformation scale were used to assess video quality content. In all statistical analyses, the R software (www.rproject.org) environment for statistical computing and graphics (R version 4.0.0) was used. All tests were two-sided with a level of significance set at $p < 0.05$. Cohen kappa statistics were used to measure the reliability of the investigator's evaluations of the videos [38, 39].

3. Results

3.1 Videographic characteristics

Of all 1000 videos, 149 (14.9%) resulted suitable for the analyses (Table 1). According to the author entity, 42 (28%) YouTube videos were uploaded by medical institutions *vs.* 107 (72%) by non-medical channels. The videos uploaded by medical institutions had higher numbers of views (4402 *vs.* 151), numbers of likes (49 *vs.* 8), and higher VPI (2181 *vs.* 10) then their non-medical channel counterparts (all $p < 0.001$).
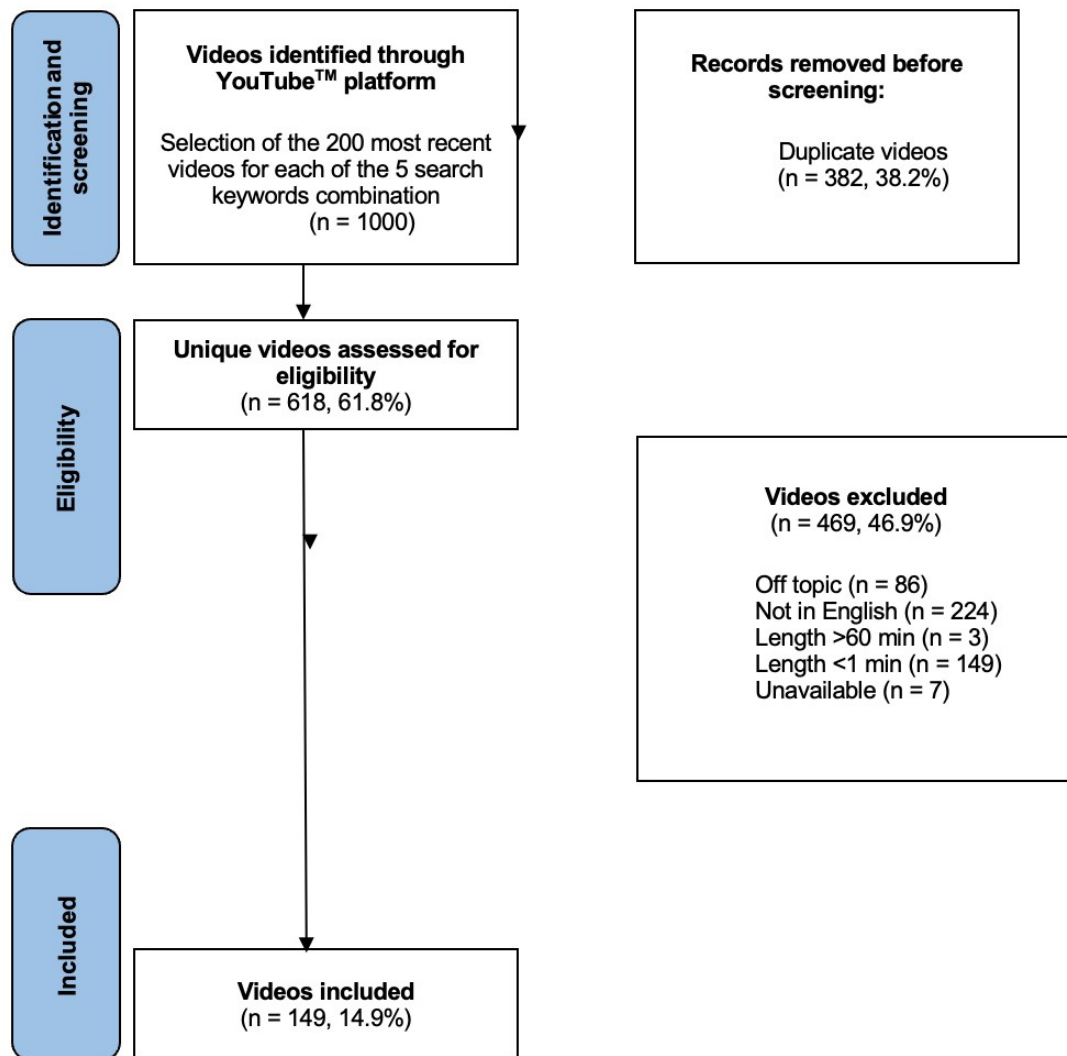
F I G U R E 1. PRISMA diagram depicting inclusion and exclusion criteria of YouTube videos on premature ejaculation between 2021 and 2023.

T A B L E 1. Videographic characteristics of 149 YouTube videos on premature ejaculation selected on 01 December 2023, stratified according to video authors (medical institution *vs.* non-medical channel).

	Overall, N = 149[1]	Medical Institution, N = 42 (28%)[1]	Non-medical channel, N = 107 (72%)[1]	*p*-value[2]
Views	365 (73, 6551)	4402 (141, 82,000)	151 (52, 2050)	<0.001
Like	11 (0, 105)	49 (5, 246)	8 (0, 48)	<0.001
VPI	37 (0, 12,362)	2181 (8, 288,864)	10 (0, 875)	<0.001
Comments	2 (0, 16)	8 (1, 38)	1 (0, 9)	0.001
Length	295 (188, 494)	254 (142, 410)	307 (207, 518)	0.100
Subscribers	3170 (359, 34,100)	6065 (1433, 60,500)	2500 (208, 25,700)	0.020

[1]*Median (IQR).* [2]*Wilcoxon rank sum test. Abbreviations: IQR: interquartile range; VPI: video power index.*

3.2 Estimated annual percentage changes

The EAPC for YouTube videos uploaded by medical institutions between 2021 and 2023 was +31.2% (95% confidence interval (CI): from +11.5 to +58.0, *p* = 0.1). Conversely, the EAPC for YouTube videos uploaded by non-medical channels was −8.7% (95% CI: from −11.6 to −5.8%, *p* = 0.1), between 2021 and 2023 (Fig. 2).

3.3 Video quality assessment

The video quality measures were tabulated (Table 2). The overall median PEMAT Understandability score was 88% (IQR: 35−100) for videos uploaded by medical institutions *vs.* 15% (IQR: 0−62) by non-medical channels (*p* < 0.001). The overall median PEMAT Actionability score was 100% (IQR: 6−100) for videos uploaded by medical institutions
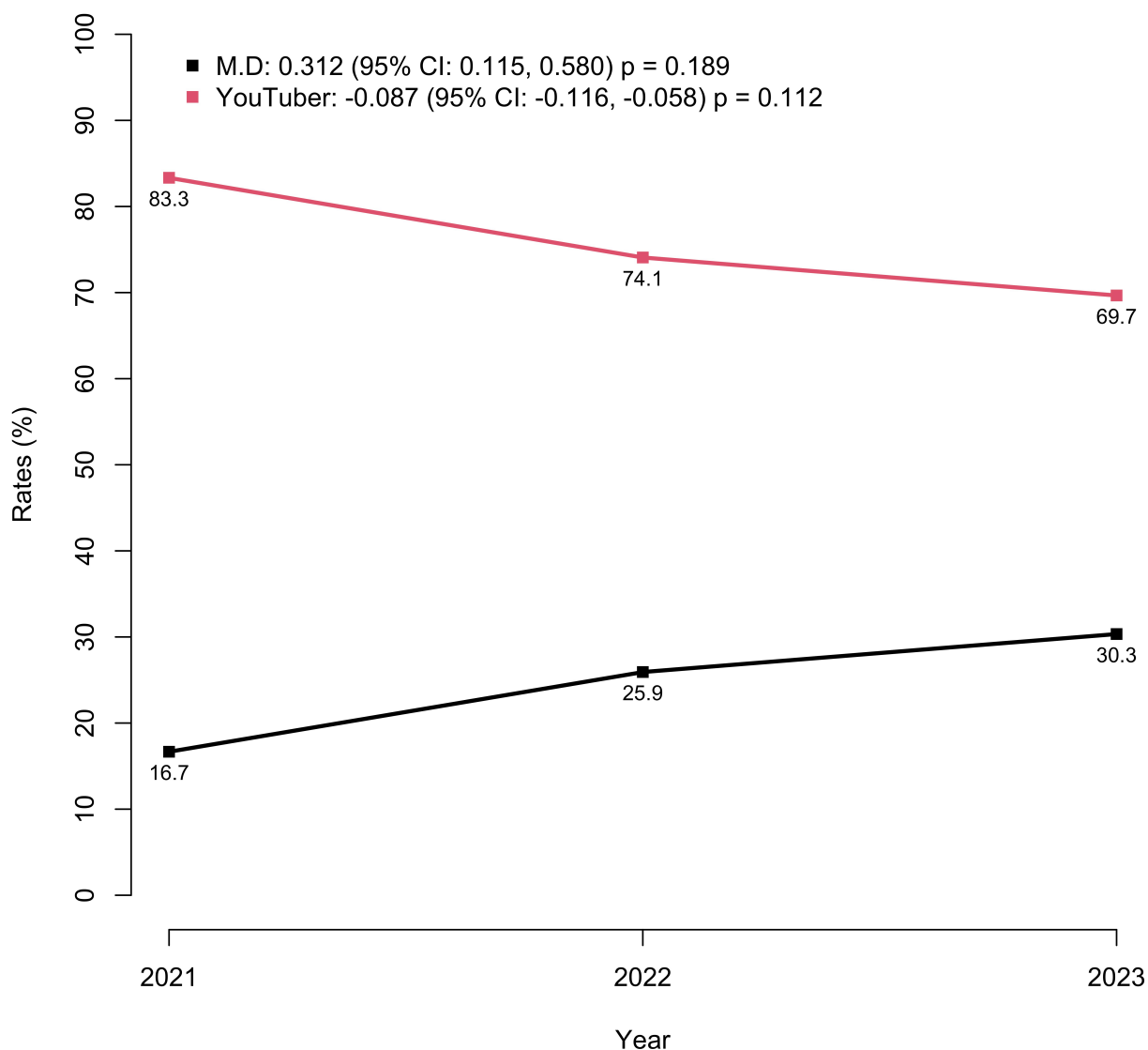
FIGURE 2. Estimated annual percentage change of 149 YouTube videos on premature ejaculation selected on 01 December 2023, stratified according to video authors (medical institutions *vs.* non-medical channels). M.D: Medical Doctors; CI: confidence interval.

vs. 0% (IQR: 0−100) by non-medical channels ($p < 0.001$). According to DISCERN tool, the total median DISCERN score was 57 (IQR: 43−70) for videos uploaded by medical institutions *vs.* 32 (IQR: 16−50) by non-medical channels ($p < 0.001$). According to GQS tool, the overall median score was 3 (IQR: 3−4) for videos uploaded by medical institutions *vs.* 2 (IQR: 1−2.5) by non-medical channels ($p < 0.001$). The median Misinformation total score was 2 (IQR: 1−3) for videos uploaded by medical institutions *vs.* 0 (IQR: 0−1.2) by non-medical channels ($p < 0.001$).

3.4 Bivariate correlations

Pearson bivariate correlations measured that VPI is positively correlated with GQS ($r = 0.31$, $p < 0.001$), Understandability ($r = 0.18$, $p = 0.02$), Actionability ($r = 0.17$, $p = 0.05$), DISCERN total scores ($r = 0.26$, $p = 0.001$) and Misinformation total scores ($r = 0.27$, $p < 0.001$).

4. Discussion

The current study aimed to evaluate the differences of quality content uploaded on YouTube according to video author, namely medical institutions *vs.* non-medical channels, between 2021 and 2023. Our analyses identified several noteworthy observations.

First, from 2021 to 2023, we identified 149 videos uploaded on YouTube on PE. Compared to previous studies, our systematic search was conducted using five keywords and the "incog-

T A B L E 2. Video quality assessment of 149 YouTube videos on premature ejaculation selected on 01 December 2023, stratified according to video authors (medical institution *vs.* non-medical channel).

	Overall, N = 149[1]	Medical Institution, N = 42 (28%)[1]	Non-medical channel, N = 107 (72%)[1]	*p*-value[2]
PEMAT				
Understandability	33 (0, 83)	88 (35, 100)	15 (0, 62)	<0.001
Actionability	0 (0, 100)	100 (6, 100)	0 (0, 100)	<0.001
Discern N°16[3]	2.00 (1.00, 4.00)	4.00 (2.00, 5.00)	2.00 (1.00, 3.00)	<0.001
Total discern score	35 (16, 55)	57 (43, 70)	32 (16, 50)	<0.001
GQS	2.00 (1.00, 3.00)	3.00 (3.00, 4.00)	2.00 (1.00, 2.50)	<0.001
Total misinformation score[4]	1.00 (0.00, 1.80)	2.00 (1.00, 3.00)	0.00 (0.00, 1.20)	<0.001

[1]*Median (IQR).* [2]*Wilcoxon rank sum test.* [3]*Based on the answers to all the above questions, rate the overall quality of the publication as a source of information about treatment choices.* [4]*Based on Premature Ejaculation Diagnostic Tool. Abbreviations: PEMAT: Patient Education Materials Assessment Tool; GQS: global quality score; IQR: interquartile range.*

nito status". Indeed, Gul *et al.* [5] used only four keyword combinations resulting in 132 videos eligible for their analysis. Furthermore, Kaynak *et al.* [22] used only one keyword, resulting in 155 videos. According to our findings, the number of YouTube videos on PE uploaded by medical institutions was increased sharply (from +16.7% to +30.3%) compared to non-medical channels videos (from to 83.3% to 69.7%) between 2021 and 2023. Specifically, 42 (28%) YouTube videos were uploaded by medical institutions *vs.* 107 (72%) by non-medical channels. Similarly, Gul *et al.* [5] recorded that only a minor proportion of contents (21.5%) were uploaded by medical entities (defined as universities/professional organizations/nonprofit physician/physician groups). From our analysis it also emerged that videos uploaded by medical institutions have a greater number of views (402 *vs.* 151), likes (49 *vs.* 8) and comments (8 *vs.* 1) as well as a such greater engagement (2181 *vs.* 10) than their non-medical channels uploaded counterparts. It would be expected that the quality information of YouTube videos uploaded by medical institutions would be higher compared to non-medical channels. Indeed, according to Kaynak *et al.* [22] videos uploaded by health professionals were more reliable than those uploaded by private users. Thus, the quality of the information of YouTube contents necessary must be assessed to provide unbiased information to Internet users.

Second, we recorded higher Understandability scores (88 *vs.* 15%) as well as higher Actionability scores (100% *vs.* 15%) in video uploaded by medical institutions relative to non-medical channels. As a result, according to Shoemaker *et al.* [32] findings, the contents uploaded were highly understandable and actionable. No comparison can be made such similar reports do not exist. The current study, indeed, represented the most contemporary and the first analysis relying on standardized and validated PEMAT tool, evaluating the quality information of the video contents.

Third, we recorded a median total DISCERN scores (57 *vs.* 32) higher for videos uploaded by medical institutions relative to non-medical channels ($p < 0.001$). According to DISCERN threshold the YouTube video uploaded by medical institutions harbored "good" quality *vs.* "poor" quality for non-medical channels. According to the above observations, videos

uploaded by medical institutions had slightly higher quality information, regarding scientific details, the reliability of sources used as well as treatment choices than those uploaded by non-medical channels.

Fourth, according to Global Quality Scores, the quality of the YouTube videos uploaded by the medical institutions had a moderate quality. They have a quality higher than non-medical channels videos. Consistently with Gul *et al.* [5], the higher GQS values were harbored by universities, professional organizations, and nonprofit physician/physician groups videos rather than non-medical channels.

Fifth, we finally performed a misinformation analysis based on PEDT questionnaire [37]. It emerged that videos uploaded by medical institutions were moderately misinformative (Median score = 2) while those uploaded by private users were extremely misinformative (Median score = 0, $p < 0.001$). Specifically, our findings revealed that YouTube videos uploaded by non-medical channels did not properly describe neither the control nor the psychological implication of ejaculation, compared to medical institutions videos. These aspects are even more worrying if we consider the engagement of the above contents. Indeed, we recorded that VPI and quality tools (such as PEMAT-A/V; DISCERN; GQS and Misinformation) had a mild positive correlation. It suggested that a higher amount of misinformation likely would be spread to Internet users [9]. Conversely, we recorded that the highest engagement level pertained YouTube videos uploaded by medical institutions, that had also better information quality that the YouTuber counterpart. Interestingly, the misinformation of YouTube contents related to sexual and reproductive health has been reported for English speakers as well for non-English speakers [40]. Specifically, Alzahrani *et al.* [40] highlighted the absence on YouTube of videos concerning sexual and reproductive health uploaded by medical institutions. Thus, the level of misinformation recorded in the current study is still considerable and future scientific society should improve the social media contents in order to contain the misleading information spread.

Taken together, although the number of YouTube videos on PE uploaded by medical institutions is on the rise, the quality is still moderate according to PEMAT-A/V scores,

DISCERN, Misinformation scores and GQS. YouTube users, that may be even represented by PE patients, could not get access to sufficiently good quality contents. In consequence, YouTube today cannot be recommended as a reliable source of medical information about this disease. Therefore, since the widespread of Internet as source of medical information, future research needs to focus on uploading higher quality videos to avoid misinformation issues. The authors should create videos using the international guidelines as sources and validated questionnaires to reduce the degrees of misinformation. Our study is not devoid of limitations. First, YouTube^{TM} search results rely on algorithms based on users' previous search activities and location. To reduce this bias, before searching, any personal accounts were logged out and a VPN proxy was used. Second, some reliable or non-reliable videos might be missed, due to our search terms. However, the combination of keywords that we adopted may cover the majority of relevant videos. Third, quality assessment was subjectively evaluated. However, to reduce this confounder, three investigators were involved to independently analyze video contents. Regardless of these limitations, the present study represents a contemporary snapshot of the "premature ejaculation" information on YouTube^{TM}-platform.

5. Conclusions

In conclusion, the videos uploaded on YouTube on PE by medical institutions were increasing during the last years. Specifically, they had better quality, evaluated according to PEMAT, DISCERN and GQS tools, than their non-medical channels counterparts. However, the degree of misinformation was still high, representing a social concern. Further improvements by medical institutions are needed to reduce the degrees of misinformation lower as possible. In conclusion, the videos uploaded on YouTube on PE by medical institutions have been increasing in recent years. Specifically, they had better quality, evaluated according to PEMAT, DISCERN, and GQS tools, than their non-medical channels counterparts. However, the degree of misinformation was still high, representing a social concern. Further improvements by medical institutions are needed to reduce the degrees of misinformation as low as possible. An awareness campaign is also needed for patients to discourage the use of YouTube as a source of information.

6. Highlights

- The majority of YouTube videos on premature ejaculation was uploaded by non-medical channels. However, the videos uploaded on YouTube on PE by medical institutions were increasing during the last years.

- Videos uploaded by medical institutions had better quality than their non-medical channel counterparts, according to PEMAT-A/V, DISCERN and Global quality Scores, but still held moderate level of misinformation.

- Future authors should create videos using the guidelines as sources and validated questionnaires in such a way as to reduce the degree of misinformation.

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