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Research article

Judicious use of the YouTube platform as a complementary source of reliable medical information for physiotherapy students — a paradigm shift in educational methodology during the COVID-19 pandemic.

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Abstract: Background. The COVID-19 pandemic has imposed a paradigm shift in the pedagogical methodology for a resilient medical educational university system.
The epidemiological context has imposed a large-scale closure of universities and disturbed traditional methods of teaching and learning (the direct face-to-face patient-student clinical interactions).
Social networks such as the YouTube platform seemed to be a complementary source for medical information, providing a modern, viable e-health strategy for physiotherapy students.
Only nine studies addressed rehabilitation in various pathologies, but none of them analyzed the quality of videos focusing on neuraxial rehabilitation.
Methods. During the 2021–2022 academic year, six undergraduate license theses focused on the frequently encountered pathology in the Neuromuscular Rehabilitation Clinic of TEHBA: rehabilitation after spinal cord injury, stroke, Parkinson`s disease, and disk hernia.
The studies started with the hypothesis that the materials posted on the YouTube platform might have variable-quality content depending on the provider who posted the film. The students were given guidance to search for and select the videos and instructions to use the DISCERN and global quality (GQS) scales and to classify the technical and scientific features of each item using descriptive analysis.
These qualitative Likert scales assess several video parameters, including the audio-visual flow, the content's medical knowledge value, and its applicability to physiotherapy students.
Given the use of public-domain videos available to the general public and posted in the mass media on the YouTube platform, the approval of the Ethical Council was not necessary.
Results. Each movie's scientific content was assessed according to its significance, relevance, and clarity.
Videos posted to the YouTube platform by healthcare professionals (including experienced physiotherapists), healthcare institutions, and academic health organizations achieved the highest DISCERN and GQS scores compared to other video sources.
Videos posted by vloggers (independent authors or patients) received the lowest reliability and quality scores.
Discussion. The article presents a timely and relevant study on integrating digital tools in medical education. Although many YouTube videos with kinesiotherapy and rehabilitation content have offered valuable information, students and younger residents should be aware that the social platform sometimes fails to provide high-quality content.
YouTube administrators, vloggers, and publishers should use validity scales (such as DISCERN and GQS) as standard guides for quality self-control and promote reliable, evidence-based medical information.

Conclusions. A judicious use of e-health education and social media platforms during the COVID-19 pandemic represented complementary sources of reliable medical information for physiotherapy students.

1. Introduction

The COVID-19 pandemic represented a challenge to the traditional pedagogical and educational models, highlighting the need for flexibility, adaptability, and equitable access to education.

The widespread closure of schools and universities has disrupted traditional teaching and learning methods and forced educational institutions to quickly adapt to distance learning (e-learning) and online education.

The teachers had to develop and deliver lessons through digital technology, video conferencing platforms, and other online learning management systems.

The pandemic has led to changes in education policies, with authorities having to reassess the management of academic calendars, grading systems, and assessment methods, develop strategies for online learning, and incorporate technology into education.

The transition to online learning has been challenging for educators and students as they have had to adapt to new technologies and teaching methodologies.

This situation has created disparities in educational opportunities through unequal access to technology and reliable internet connections, which has generated difficulties in attending classes or accessing educational resources.

The pandemic has exacerbated the educational inequities among students from marginalized or under-resourced communities or those with special educational needs who faced additional challenges, leading to the academic achievement gap.

Social and physical distancing and epidemiological isolation measures have disrupted rehabilitation, physiotherapy programs, and practical bedside teaching activities.

The limitation of direct interactions with patients due to access restrictions in hospitals has imposed a paradigm shift in the educational methodology for a resilient medical university education system.

Epidemiological safety measures have determined the reorientation of the classic methods for practical rehabilitation programs from the classical direct interactions to e-health and tele-neurorehabilitation.[1]

Telemedicine has transformed the virtual space into a new reality and partially compensated for the restrictions imposed by the pandemic, allowing the "remote delivery" of tailored or personalized physical therapy programs.

Social media networks seemed to be a potentially beneficial instrument for medical education, as a complementary source of information during the COVID-19 epidemic, and as a foundation for the development of a modern digital and medical education (e-health) strategy among physiotherapy students.

An advanced search on the American platform PubMed using the syntactic association ((YouTube) AND (rehabilitation)) AND (physical medicine) AND (education) found 18 articles regarding the analysis of videos with medical content posted on YouTube between 2018 and 2023.

Only nine studies addressed rehabilitation in various pathologies (knee instability, piriformis syndrome, ankylosing spondylitis, post-COVID pain, pediatric physical medicine and rehabilitation in the COVID-19 pandemic, umbilical hernia, psychomotor or other clinical skills [2-7, 15-17].

Methods.

In the 2021–2022 academic year, six undergraduate license theses for physical therapy students were conducted and supervised, focusing on the pathology frequently

encountered in the Neuromuscular Rehabilitation Clinic of TEHBA: rehabilitation after spinal cord injury, stroke, and disk hernia. The six studies analyzed the quality of the information posted on the YouTube social media platform.

The studies did not involve the recruitment of human participants; they analyzed the videos available to the general public and posted in the mass media on the YouTube platform, so the approval of the Ethical Council was not necessary.

The scientific findings and, consequently, the young graduates were promoted by presenting the previously stated papers as e-posters during the Young Researcher session at the 10th edition of the "Carol Davila" University of Medicine and Pharmacy Congress, 2022. [8-12]

To enable an organized examination of the information presented, to collect data, and to assess the quality and reliability of each video a protocol was established to allow for a structured analysis of the information contained.

The students were trained on the search methodology (focused on the indicated topic) by using lists of terms or keywords in English, Romanian, and other foreign languages, taking advantage of the translation and subtitling opportunity of the YouTube platform

The students were instructed on how to do the descriptive analysis required to categorize the scientific and technical features (audio-video) of each selected item using the DISCERN scale and the global quality scale (GQS), [Table I and Table II].

The reliability analysis and quality assessment of the videos were carried out using the free-of-charge DISCERN tool/scale [13] (http://www.discern.org.uk – table I and II) and the global quality scale (GQS), respectively (table III).

DISCERN is an educational tool, designed to inform the general public (consumers - patients, caregivers, and their advisors) on how to evaluate the quality of online posted medical information published in the mass media, to select and use correct knowledge concerning the therapeutic options and benefit from quality healthcare. The questions focus on the scientific content's value, relevance, clarity, and balance in the published materials (table I and II).

Table I The DISCERN Instrument Modified and adapted from [13] http://www.discern.org.uk/discern_instrument.php		**Rating the questions**				
		No		Partially		Yes
Section 1	Is the video clip /publication reliable?	1		3		5
	1. Are the aims clear?					
	2. Does it achieve its aims?					
	3. Is it relevant?					
	4. Is it clear what sources of information were used to compile the video/publication (other than the author or producer)?					
	5. Is it clear when the information used or reported in the video/publication was produced?					
	6. Is it balanced and unbiased?					
	7. Does it provide details of additional sources of support and information?					
	8. Does it refer to areas of uncertainty?					

Section 2	How good is the quality of information on treatment choices?					
	9. Does it describe how each treatment works?					
	10. Does it describe the benefits of each treatment?					
	11. Does it describe the risks of each treatment?					
	12. Does it describe what would happen if no treatment is used?					
	13. Does it describe how the treatment choices affect the overall quality of life?					
	14. Is it clear that there may be more than one possible treatment choice?					
	15. Does it provide support for shared decision-making?					
Section 3	**Overall rating** of the video/publication	**Low**		**Moderate**		**High**
	16. Based on the answers to all of the above questions, rate the overall quality of the video/publication as a source of information about treatment choices	*Serious or extensive shortcomings*		*Potentially important but not serious shortcomings*		*Minimal shortcomings*

Table II	**Modified DISCERN criteria** [7]
Item	**Description**
1	Are the aims clear and achieved?
2	Are reliable sources of information used? (i.e., publication cited; provided by certified specialists)
3	Is the presented information balanced and unbiased?
4	Are additional sources of information listed for patient/ student reference?
5	Are areas of uncertainty mentioned?

Although it was designed to assess the quality of printed materials, the scale has proven to be effective in assessing the quality of information provided on the web (internet).

The DISCERN tool is beneficial for physical therapy students (after prior training) in the educational approach of the paradigm "training to learn correctly", applied under the advice of a qualified, experienced health professional. [14]

The GQS was used to assess the instructive aspects of online health resources. [7,15]

It is also a comprehensive five-point Likert scale (table III), used by physiotherapy students to evaluate medical information on websites and analyze several criteria of a video (the quality of the information, and the practical utility of the material).

Each selected video was observed and quantified independently by two "spectators": the teacher (the supervisor of the bachelor's thesis) and the student.

Videos that meet the inclusion criteria were evaluated for usefulness and classified as "useful" (quoted 4 and 5) or "confusing/ incorrect/ erroneous, or misleading" respectively (quoted 2 and 3).

Table III	**GQS (global quality scale)** [adapted and modified from 7, 15]
Item	**Description**
1	**Very low quality** and flow, most information missing; technique misleading. **Not at all useful** for patient/ student education
2	Generally **poor** quality, sparse flow, some information provided but many important topics missing; technique poor. **Very limited use** to patient/ student education
3	**Accurate** videos. Moderate quality and suboptimal flow, some important information was provided adequately but others were poorly discussed; technique adequate. **Somewhat useful** for patients/ students
4	**Good** quality and generally good flow, majority of information provided but some topics not covered; technique almost adequate. **Useful** for patients/ students
5	**Excellent** quality and flow, full information provided; technique adequate. **Highly useful** for patients

The videos considered "useful" contained the mention of the source (the author of the video), the date of uploading to the YouTube platform, the clarity of the therapeutic goals and their achievement, the description of how the therapeutic program could influence the general quality of life, the description of the methods and procedures of the physical kinetic therapy applied, and the benefits and risks of them. [15]

Those evaluated as "confusing/ misleading" contained at least one scientifically unproven information, constituting a possible source of misinformation for the student.

The ANOVA test revealed statistically significant correlation between the analytical performance of the two assessment methods (DISCERN and GQS).

The average final DISCERN scores were significantly correlated with the average number of likes and dislikes for the analyzed videos.

Discussion

The paper focused on the qualitative content analysis of videos posted on the YouTube platform, which was used as a complementary source of information during the pandemic era as a premise for a modern digital and medical education strategy among physiotherapy students.

With the improvement of the Internet flow and the quality of the materials posted on the YouTube platform, the need for a careful analysis of information with medical content has increased to avoid scamming and informational pollution. Videos posted to the YouTube platform by healthcare professionals (including experienced physiotherapists), healthcare institutions, and academic professional health organizations achieved the highest DISCERN and GQS scores compared to other video sources. Videos posted by independent vloggers received the lowest reliability and quality scores.

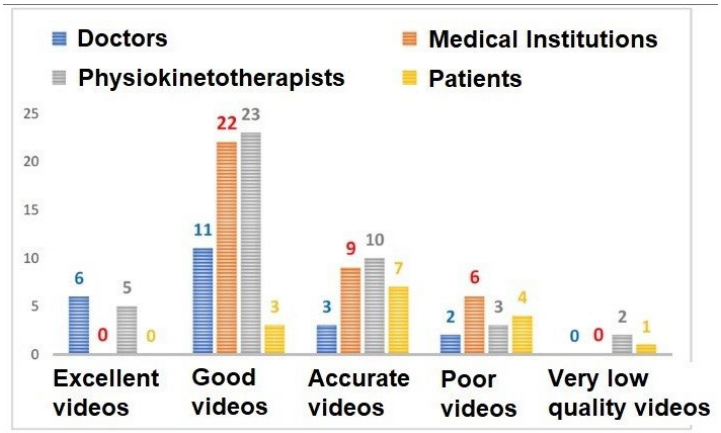

Fig.1 Distribution of videos by category according to quality and sources, a critical evaluation of movies about disk hernia rehabilitation techniques. The correlation between the scientific and didactic levels of the content posted on the YouTube platform and the authors of the information: doctors, physiotherapists, specialized (academic) institutions, independent vloggers (or patients)

A systematic review of the YouTube platform has signaled since 2015 a relatively high possibility of misleading information, promoting unscientific therapies and drugs, and contradicting academic standards. As in our recent license studies, Madathil et al. [23] emphasized that the videos published by authoritative sources (government organizations and professional associations) contained high-quality information and trustworthy data.

Interventions to educate and enable consumers (students, young doctors, and the general public) to critically analyze and assimilate the information posted on the YouTube platform are essential for healthcare educational decisions.

In this particular epidemiological context, the judicious use of e-health education and social media platforms as reliable complementary sources of medical information and possible tools for the medical education of students specializing in physiotherapy represented an alternative in the frame of epidemiological isolation measures.

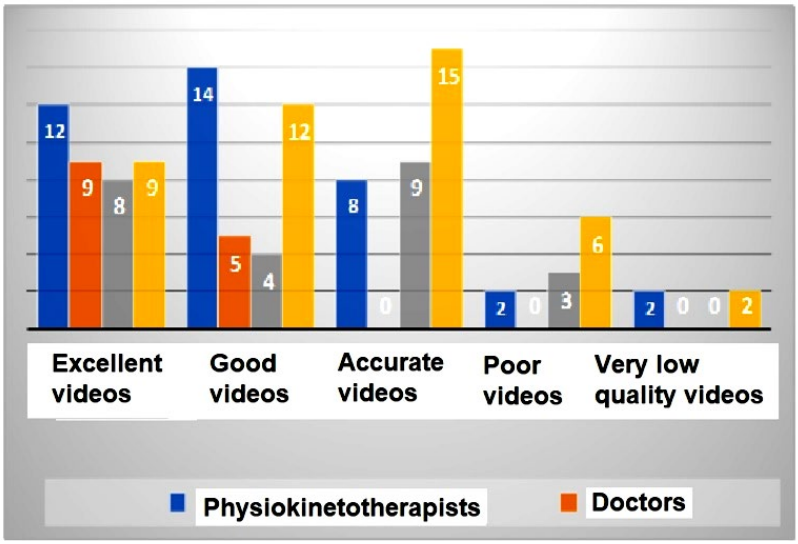

Fig.2 Category distribution of videos based on sources and quality. A qualitative analysis of films regarding the physical kinetic rehabilitation techniques and methods of tetraplegic patients after spinal cord injury.

In the current context of a possible recurrence of infections with pandemic impact, the authors estimate some predictions on possible innovative educational directions for the future of medical education in the physiotherapy specialization.

- An increased use of technology, virtual reality, simulation, and other technology-based methods is likely to trend upward in the field of medical education. [16-20].
- Although artificial intelligence (AI) and chatbots are still in their infancy, they might be a possible adjunct to the medical education of the students and young doctors, with some limitations that can compromise the quality of the study: inaccurate content, a "hallucinatory" tendency from ChatGTP, consisting of the generation of "confabulatory" data, as well as attempts to summarize non-existent articles in an inexact fashion.

AI chatbots remain at the level of imperfect search engines and cannot take responsibility for the data generated. The human mind and intelligence must carefully analyze all data obtained from artificial intelligence. [21,22]

Conclusions

Consumers and beneficiaries are entitled to benefit from a higher level of published content and not "informational pollution". While the majority of kinesiotherapy and rehabilitation videos might offer useful information, students and younger residents should be aware that YouTube does not always offer high-quality content. [23,25]

Future medical professionals must thus acquire the skills necessary to "separate the wheat from the chaff" and assist their patients in using the proper medical gymnastics practices. YouTube administrators, vloggers, and publishers should use validity scales (such as DISCERN and GQS) as standard guides for quality self-control to ensure the accuracy of videos shared and to promote the dissemination of reliable, evidence-based medical information [23-25].

The paper reflected on the significant impact on the medical system and academic education during the COVID era. It is under the strategic plan for Romanian education's digitalization from 2021 to 2027 (SMART.Edu), which was presented by the Ministry of Education and Research (fig.3). Through this education digitization strategy, the leadership forums call for cooperation among all interested decision-makers, starting with the priorities "***Accessibility, Connectivity, Community, Digital Educational Ecosystem, Innovation, and Sustainability***".

Fig 3. SMART.Edu: The strategic plan for Romanian education's digitalization 2021 to 2027, adapted from [26]

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References

1. Anghelescu A. Telerehabilitation: A Practical Remote Alternative for Coaching and Monitoring Physical Kinetic Therapy in Patients with Mild and Moderate Disabling Parkinson's Disease during the COVID-19 Pandemic. Parkinson`s Disease, Hindawi, Vol. 2022, Article ID 4370712, doi: 10.1155/2022/4370712
2. Yoo M, Hong J, Jang CW. Suitability of YouTube Videos for Learning Knee Stability Tests: A Cross-sectional Review. Arch Phys Med Rehabil. 2020 Dec;101(12):2087-2092. doi: 10.1016/j.apmr.2020.05.024
3. Ertem U, Özçakır S, İrdesel FJ, Günay SM. YouTube as a source of information on piriformis syndrome exercises. Turk J Phys Med Rehabil. 2022 Jul 27;69(1):15-22. doi: 10.5606/tftrd.2022.10459
4. Kocyigit BF, Nacitarhan V, Koca TT, Berk E. YouTube as a source of patient information for ankylosing spondylitis exercises. Clin Rheumatol. 2019 Jun;38(6):1747-1751. doi: 10.1007/s10067-018-04413-0.
5. Ozduran E, Büyükçoban S., A content analysis of the reliability and quality of Youtube videos as a source of information on health-related post-COVID pain. PeerJ. 2022 Sep 28;10:e14089. doi: 10.7717/peerj.14089
6. Haque M, Khan S, Sandhu A, Armstrong K. Social media and the practice of pediatric physical medicine and rehabilitation in the COVID-19 pandemic: A new era in patient-care. J Pediatr Rehabil Med. 2022;15(3):413-416. doi: 10.3233/PRM-220050
7. Wang H, Yan C, Wu T, et al. YouTube online videos as a source for patient education of cervical spondylosis reliability and quality analysis. BMC Public Health. 2023;23(1):1831. Published 2023 Sep 20. doi:10.1186/s12889-023-16495-w
8. Ionescu LJ, Anghelescu A. Rehabilitation of Tetraplegia Post Spinal Cord Injury. Qualitative Analysis of Information Posted on YouTube as a Complementary Source of Medical Education for Physiotherapy Students, in the Context of the Covid Pandemic. MAEDICA Supplement 2022 Volume 17 (20), Supplement Congress of Carol Davila University of Medicine and Pharmacy, Bucharest
9. Micloiu AI, Anghelescu A. Rehabilitation of Patients with Lumbar Disc Herniation - Qualitative Analysis of Information Posted on YouTube, as a Complementary Source of Medical Education for Physiotherapy Students in the Context of the Covid Pandemic. MAEDICA Supplement 2022 Volume 17 (20), Supplement Congress of Carol Davila University of Medicine and Pharmacy, Bucharest
10. Ionescu LJ, Anghelescu A. Gait Rehabilitation and Falls Prevention of Patients with Post-stroke Hemiplegia in Sub-acute and Chronic Stages. Qualitative Analysis of Information Posted on YouTube, as a complementary source of medical education for physiotherapy students in the context of the Covid pandemic. MAEDICA Supplement 2022 Volume 17 (20), Supplement Congress of Carol Davila University of Medicine and Pharmacy, Bucharest
11. Tudorache DI, Anghelescu A, Rehabilitation of the Patients with Paraplegia after Spinal Cord Injury in the Subacute and Chronic Stages. Qualitative Analysis of Information Posted on YouTube, as a Complementary Source of Medical Education for the Physical Therapy Student, in the Context of the Covid Pandemic. MAEDICA Supplement 2022 Volume 17 (20), Supplement Congress of Carol Davila University of Medicine and Pharmacy, Bucharest
12. Zavoianu R, Anghelescu A. Gait Recovery and Falls Prevention in Patients with Parkinson`s Disease in the Stage of Mild and Moderate Disability. Qualitative Analysis of Information Posted on YouTube, as a Complementary Source of Medical Education for Physiotherapy Students in the Context of the Pandemic, MAEDICA Supplement 2022 Volume 17 (20), Supplement Congress of Carol Davila University of Medicine and Pharmacy, Bucharest
13. DISCERN instrument/scale http://www.discern.org.uk, accessed on the 1st November 2022
14. Charnock D, Shepperd S, Needham G, Gann R. DISCERN: an instrument for judging the quality of written consumer health information on treatment choices. J Epidemiol Community Health. 1999 Feb;53(2):105-11. doi: 10.1136/jech.53.2.105
15. Cakmak G. Evaluation of Scientific Quality of YouTube Video Content Related to Umbilical Hernia. Cureus. 2021;13(4):e14675. Published 2021 Apr 25. doi:10.7759/cureus.14675
16. Burton R. Nursing Students Perceptions of Using YouTube to Teach Psychomotor

Skills: A Comparative Pilot Study. SAGE Open Nurs. 2022 Jul 29;8: 23779608221117385. doi: 10.1177/23779608221117385

17. Coyne E, Rands H, Frommolt V, Kain V, Plugge M, Mitchell M. Investigation of blended learning

video resources to teach health students clinical skills: An integrative review. Nurse Educ Today. 2018, 63:101-107. doi: 10.1016/j.nedt.2018.01.021
18. The Mayo Clinic. (2021). Herniated disk. https://www.mayoclinic.org/diseases-conditions/herniated-disk/symptoms-causes/syc-20354095
19. Chipps J, Brysiewicz P, Mars M. A systematic review of the effectiveness of videoconference-based tele-education for medical and nursing education. Worldviews Evid Based Nurs. 2012 Apr;9(2):78-87. doi: 10.1111/j.1741-6787.2012.00241.x
20. Brame CJ. Effective Educational Videos: Principles and Guidelines for Maximizing Student Learning from Video Content. CBE Life Sci Educ. 2016 Winter;15(4):es6. doi: 10.1187/cbe.16-03-0125
21. Firan FC, Romila A, Onose G. Current Synthesis and Systematic Review of Main Effects of Calf Blood Deproteinized Medicine (Actovegin®) in Ischemic Stroke. Int J Mol Sci. 2020;21(9):3181. doi:10.3390/ijms21093181
22. Anghelescu A, Firan FC, Onose G, Munteanu C, Trandafir AI, Ciobanu I, Gheorghita S, Ciobanu V. PRISMA Systematic Literature Review, including with Meta-Analysis vs. Chatbot/GPT (AI) regarding Current Scientific Data on the Main Effects of the Calf Blood Deproteinized Hemoderivative Medicine (Actovegin) in Ischemic Stroke. Biomedicines 2023, 11, 1623. doi: 10.3390/biomedicines11061623
23. Madathil KC, Rivera-Rodriguez AJ, Greenstein JS, Gramopadhye AK. Healthcare information on YouTube: A systematic review. Health Informatics J. 2015 Sep;21(3):173-94. doi: 10.1177/1460458213512220
24. Shaikh AR, Alhoori H, Sun M. YouTube and science: models for research impact. Scientometrics. 2023;128(2):933-955. doi: 10.1007/s11192-022-04574-5
25. YouTube Community Guidelines & Policies - How YouTube Works (2021) https://www.youtube.com/about/policies/#community-guidelines, accessed on the 1st June 2023
26. SMART.Edu https://epale.ec.europa.eu/ro/content/strategia-pentru-digitalizarea-educatiei-din-romania-2021-2027-smart-edu accessed on the 1st June 2023