

Exploring the Evolution of Perception Towards Online Medical Education Through Social Media Analysis

Seungman Kim, Ph.D¹, Hyunchang Moon, Ph.D^{2*}, Sohyun Lee, Ph.D³, Jaehoon Lee, Ph.D⁴

¹School of Nursing, Texas Tech University Health Sciences Center

²Medical College of Georgia, Augusta University

³Geydang College of General Education, Sangmyung University

⁴Department of Educational Psychology, Leadership, and Counseling, Texas Tech University

*Correspondence addressed: Hyunchang Moon, Medical College of Georgia, Augusta University, 1301 RA Dent Blvd., GB3353 Augusta, GA 30901; Phone: +1(706)721-0105; Email: hymoon@augusta.edu

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Abstract

Introduction: The advancement of technology has led to a shift in the perception of online medical education. Using tweets as the data source, this study investigates the evolving perception towards online medical education in the United States over the past six years, encompassing pre- and post-periods of the national emergency declaration for the COVID-19 pandemic.

Method: The latent Dirichlet allocation method was utilized to identify relevant topics from Twitter data. Subsequent sentiment and longitudinal cluster analyses were performed to determine the perspectives of Tweeter authors and identify groups of topics that share unique joint trajectories across the six years.

Results: The findings indicated that while formal medical education had to shift to an online format, prompted by the pandemic, this increased distinct needs and challenges for online medical education. Despite the challenges, positive efforts were also underway to support individuals, as evidenced by a rise in social safety and emotional support and an increase in objectivity toward online medical education.

Conclusion: This study provides valuable insights into the current state and perception of online medical education. By better understanding the challenges and requirements of online medical education, further efforts can be made to enhance its practicality, adaptability, and accessibility.

Keywords: Online Medical Education, Social Media, Tweeter, Machine Learning.

Background

Technology integration has had a profound effect on our society, with many positive impacts in various areas. Nevertheless, there still exists potential for future improvement as public needs and technology enhancement. The COVID-19 pandemic has compelled us to explore various educational modalities, especially within the domain of medical education, where there has been a substantial surge in demand over the past two decades. For instance, the restrictions on physical interaction due to the pandemic have necessitated the adoption of online education by many educational organizations. Although not everyone is comfortable with or experienced online learning, it can be an indispensable alternative for certain groups of learners and specific circumstances. However, it is crucial to remember that the effectiveness of online education is contingent upon its implementation, with potential benefits and drawbacks to consider. Online instruction is likely to persist in many educational organizations worldwide, and medical education cannot be an exception to the trend. The recent shift towards online medical education has prompted a reevaluation of perception towards online learning in the field. This highlights the need for ongoing improvement of the quality of medical education delivered online.

Impact of COVID-19 on Medical Education

The COVID-19 pandemic has had a significant impact on medical education globally, and Medical Education has been

undergoing transformation in recent years, with the adoption of online learning. Nonetheless, medical education remains one of the fields most resistant to adopting online learning. This resistance has been reported in numerous studies and discussions [1-2]. In response to the pandemic, many medical schools have shifted to online modalities, such as remote, hybrid, or distance learning, for delivering real-time clinical exposure [2-3]. However, this has raised concerns over providing practical experience and assessment, as hands-on learning is a crucial component of medical education. Due to the pandemic, clinical placements and traditional classroom and laboratory learning have been suspended, requiring students to continue their studies remotely [2-4]. Medical professionals have also been forced to forego training opportunities in light of increased demands related to the COVID-19 crisis, which is considered integral to their education, development, and progression [5-7]. While the pandemic has accelerated the shift, it is essential to consider other drivers and factors behind the adoption of online medical education.

Emergence of Social Media Platforms

The rise of social media platforms can be traced back to 1996, with their modern form consolidating in the early 2000s. With platforms such as LinkedIn, Facebook, Twitter, Instagram, YouTube, Reddit, and more, the number of users globally has increased from nearly one billion in 2010 to 2.62 billion in 2018 [8-9]. Social media platforms provide a space for users to share

knowledge and insights [10], thereby creating new opportunities to gain insights into perceptions [11]. Contrary to traditional mass media, social media platforms facilitate direct and unmediated communication and information exchange between members of society. Studies have highlighted that Twitter, a popular social network, has evolved into a valuable instrument for educational research [12-16]. However, limited research has explored people’s perceptions of online medical education through social media data and machine-learning approaches. This study aims to examine the changes in perceptions toward medical education using Twitter data and machine-learning approaches to better understand the evolving requirements and challenges associated with online medical education behind this shift, even beyond the pandemic.

The COVID-19 pandemic has wreaked havoc on healthcare systems and caused widespread school closures globally, presenting numerous challenges for educational organizations, educators, and learners. A new generation of medical students and professionals will need to continue their education and training during these challenging times [2-4]. Undoubtedly, the COVID-19 pandemic has hastened the shift towards education delivery via internet-based platforms [5-6]. While pandemics have historically posed difficulties, recognizing these challenges is the first step in transforming them into opportunities.

Purpose of the Study

The recent shift in medical education has presented an opportunity to assess people’s perceptions toward online learning and determine whether there has been a change in these perceptions. This examination helps to identify their needs, understand why some may not favor online education, and provide solutions to overcome these challenges. The purpose of this study was to examine the changes in perceptions towards online medical education in the U.S. over the past six years, using tweets as the data source. This study seeks to answer the following research questions: (a) What are the dominant themes in tweets related to online medical education over the past six years? and (b) What are the trends of changes in the characteristics (proportion, polarity, and subjectivity) of these dominant themes in online medical education?

Analytical Framework

The study adopted a quantitative research design to thoroughly analyze the change in perception towards online medical education in the United States using Twitter data. The data was

collected by extracting tweets containing predefined keywords, making them a suitable representation of the majority’s perception. The latent Dirichlet allocation method (LDA) was employed to identify the number of topics in the collected tweets and understand what they represent [17].

By LDA, each tweet was assigned to one of the identified topics, and using longitudinal cluster analysis (LCA), the evolution of these topics over time was analyzed to detect any differences in people’s interests. Sentiment analysis was also performed to determine the positive or negative and subjective or objective opinions expressed in the tweets. The extraction and quantification of affective states and subjective information were facilitated by sentiment analysis. Lastly, longitudinal cluster analysis was utilized to uncover groups with distinct trajectories of topics over a specific period.

Method

Data Collection and Preprocessing

The data collection for this study was guided by predefined keywords related to perception towards online medical education. The keywords were categorized into four primary groups: learning modality (9 keywords), medical (18 keywords), education (22 keywords), and region (3 keywords). Examples of these keywords include “online,” “remote,” “hybrid,” “virtual,” and “distance” for the learning modality category; “medical,” “clinical,” “clerkship,” and “medicine” for the medical category; and “education,” “teaching,” “learning,” “class,” and “course” for the education category. The keywords “United States,” “USA,” and “US” were used to specify the target region. Tweets were obtained using the predefined keywords through Twitter Premium API. A total of 7,488 tweets over six years were extracted: four years before the national emergency declaration for the COVID-19 pandemic (March 13th, 2016 through March, 12th 2020; Phases 1-4) and two years after the declaration (March 13th, 2020 through March 12th, 2022; Phases 5-6).

The extracted tweets underwent preprocessing to enhance the clarity of the results. This involved the exclusion of tweets (1,039, 13.88%) that were too short (i.e., < 60 characters) as they often lacked significance. Additionally, the use of the Natural Language ToolKit (NLTK) library [18] in Python 3.8 enabled the filtering of stop words such as pronouns, prepositions, and postpositions. As a result, 6,194 tweets were available for analysis.

Table 1: Numbers of tweets for each phase.

Phase	1	2	3	4	5*	6*	Total
Year	2016–17	2017–18	2018–19	2019–20	2020–21	2021–22	
Tweets	385	447	806	829	2,876	851	6,194
<i>Note.</i> Each year began March 13th and ended March 12th.							
*After the national emergency declaration							

Data Analysis

Data analysis proceeded in three stages. First, the LDA method, an unsupervised machine learning technique, was employed to identify topical patterns in the collected tweets. The “topicmodels” package [19] in R [20] and RStudio 1.3.1056 [21] was utilized to implement LDA. To determine the optimal

number of topics [22], the “ldatuning” package [23] in R was utilized, and three different metrics were used (see Fig. 1). These metrics suggested 20 topics as optimal, indicated by a maximized Griffith [11] value (approaching 1) and stabilized values for the Cao [24] and Arun [25] metrics.

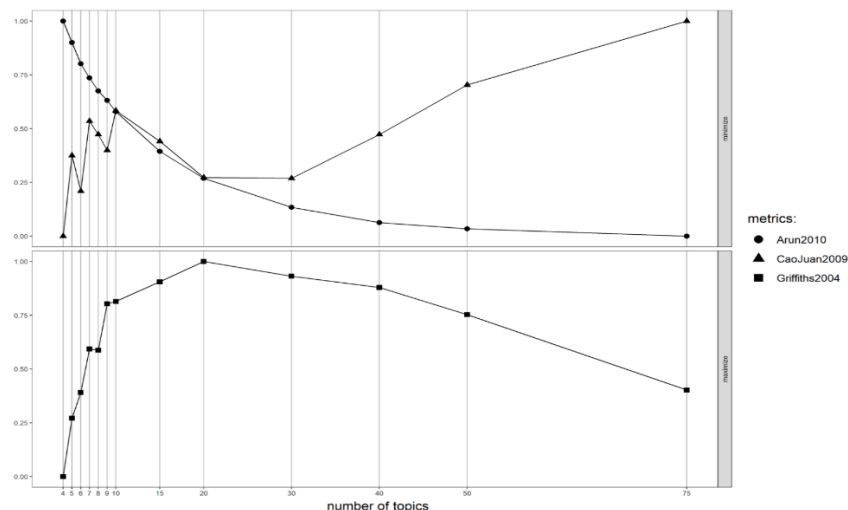


Figure 1: Metric values used to determine optimal number of topics.

Second, sentiment analysis was performed to determine the authors’ perspectives using the “TextBlob” library [26] in Python. The subjectivity of the tweets was assessed, with a value closer to 1 indicating a more subjective point of view and a value closer to 0 denoting a more objective stance. The subjectivity values were further categorized into strongly objective (subjectivity ≤ 0.3), moderately objective ($0.3 < \text{subjectivity} \leq 0.5$), neutral ($0.5 < \text{subjectivity} \leq 0.6$), moderately subjective ($0.6 < \text{subjectivity} \leq 0.7$), and strongly subjective ($0.7 < \text{subjectivity} \leq 1$). The polarity of each tweet was also estimated, ranging from -1 to 1, and was classified into strongly negative (polarity ≤ -0.6), moderately negative ($-0.6 < \text{polarity} \leq -0.2$), neutral ($-0.2 < \text{polarity} \leq 0.2$), moderately positive ($0.2 < \text{polarity} \leq 0.6$), and strongly positive ($0.6 < \text{polarity}$).

Lastly, LCA, an unsupervised machine learning technique, was employed to identify groups of topics that share unique joint trajectories across the six years. The method allows for

comparing trends among trajectories without human intervention, making it a practical and interpretable solution for large datasets. The analysis grouped topics based on changes in three factors: the proportion of the topics, the average polarity, and the average subjectivity across the six phases [27-28].

Results

The application of LDA on the tweets data resulted in the identification of 20 topics. However, one of these topics was deemed non-interpretable and was thus excluded from further analysis. The five key terms for each of the interpretable 19 topics are presented in Table 2. Additionally, Table 3 displays the labels assigned to each topic, which were determined based on their essential terms. The labels cover various themes, including online medical education, health and wellness, and challenges related to remote/hybrid learning. The examples of actual tweets categorized under each respective topic are shown in the Appendix.

Table 2: Important terms for 19 topics.

Topic 1	Topic 2	Topic 3	Topic 4	Topic 5	Topic 6	Topic 7
online class take anatomy classes	online class done due pay	clinical study practice medicine patients	program college learn graduate career	training therapy new offering certification	online course every health exercise	medical help care need services
Topic 8	Topic 9	Topic 10	Topic 11	Topic 12	Topic 13	Topic 14
virtual join register residency medicine	school online med high stress	medical virtual lab technology future	online get home nurse school	health mental learning kids remote	students learning remote teaching teachers	virtual great education thank excited
Topic 15	Topic 16	Topic 17	Topic 18	Topic 19		
distance people safe social need	feel bad don't even can't	right better well want best	healthcare education support independent schools	day year first week flexible		

Table 3: Labels for each topic.

Topic#	Label
1	Online anatomy class
2	Online class payment
3	Online clinical medicine study and practice
4	Medical education degree and career development
5	Medical therapy training
6	Online physical health and wellness courses
7	Medical care in need
8	Join, registration, and learn medicine in a live session
9	Online medical learning stress
10	Virtual lab experience
11	Online nursing education and licensure
12	Mental health problem
13	Remote/hybrid learning and teaching
14	Appreciation for virtual education
15	Social distancing and social needs
16	Various negative feelings
17	Various positive feelings
18	Healthcare education support and benefits for equitable public services
19	Timing and duration flexibility

LCA was conducted to simultaneously examine each topic's trajectories of proportion, polarity, and subjectivity over the six years (Phases 1-6). The slopes of the topics' trajectories were also considered in the analysis. The algorithm identified four distinct trajectories, represented by Clusters A, B, C, and D (as

shown in Fig. 2). Cluster A (represented in red) included nine topics (47.4%), Cluster B (represented in blue) comprised four topics (21.1%), and Clusters C (represented in green) and D (represented in yellow) consisted of three topics each (15.8%). The topics grouped in each cluster are detailed in Table 4.

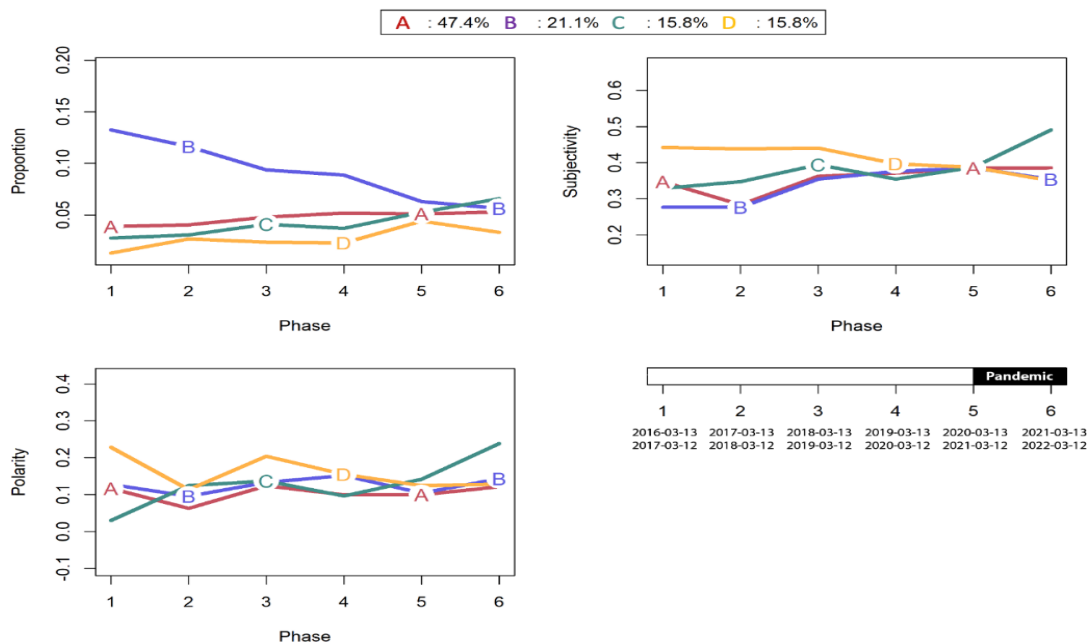


Figure 2: Identified clusters representing unique trajectories of 19 topics.

Regarding proportion (upper-left line chart in Fig. 2), Cluster A showed a stable pattern that slightly increased over the six years, with a difference of .01 between Phases 1 and 6. Cluster B displayed an obvious decreasing trend of $-.08$ over the six years. Cluster C showed a steadily increasing trend except between Phases 3 and 4, with a .04 increase. Cluster D demonstrated an overall increasing pattern before the national emergency declaration (.03), but the proportion decreased after the declaration ($-.01$).

The subjectivity of the tweets (upper-right line chart in Fig. 2) in Cluster C increased after the national emergency declaration

(.10), and the tweets were written with a more subjective viewpoint. Cluster D displayed a decreasing trend of $-.09$, meaning the tweets were written in a slightly more objective view over time. Cluster B showed an increase before the pandemic (.11), but dropped after ($-.03$), becoming more objective in viewpoint. Cluster A reported stable subjectivity (.04) except in phase 2 ($-.06$). Despite the varying patterns of subjectivity among the clusters, the mean ($M = .36, SD = .07$) of subjectivity was less than .5, indicating that the tweets analyzed were written with an objective point of view.

The overall polarity (lower-left line chart in Fig. 2) was reported within neutral to moderate positive ($M = .12$). All four clusters reported increasing trends of polarity after the pandemic, with

Cluster A = .02, Cluster B = .04, Cluster C = .10, and Cluster D = .00.

Table 4: Identified clusters and assigned topics by proportion, polarity, and subjectivity.

Cluster A (Topic#)	Cluster B (Topic#)
<ul style="list-style-type: none"> • Medical therapy training (5) • Online physical health and wellness courses (6) • Medical care in need (7) • Online medical learning stress (9) • Virtual lab experience (10) • Mental health problem (12) • Appreciation for virtual education (14) • Various negative feelings (16) • Healthcare education support and benefits for equitable public services (18) 	<ul style="list-style-type: none"> • Online anatomy class (1) • Online class payment (2) • Online clinical medicine study and practice (3) • Medical education degree and career development (4)
Cluster C (Topic#)	Cluster D (Topic#)
<ul style="list-style-type: none"> • Join, registration, and learn medicine in a live session (8) • Online nursing education and licensure (11) • Social distancing and social needs (15) 	<ul style="list-style-type: none"> • Remote/hybrid learning and teaching (13) • Various positive feelings (17) • Timing and duration flexibility (19)

To assess the impact of the national emergency declaration on the proportion, polarity, and subjectivity of the topics, a paired-samples *t*-test was conducted (see Table 5). The results revealed significant changes in proportion for Clusters B and D: Cluster B experienced a decrease after the pandemic ($t = 5.43, p < .001$; pre-pandemic $M = .11$, post-pandemic $M = .06$), while Cluster D demonstrated an increase ($t = -3.05, p = .021$; pre-pandemic $M = .02$, post-pandemic $M = .04$). No significant changes were found in Clusters A and C ($p > .05$).

Regarding subjectivity, a significant change was observed overall ($t = -2.65, p = .010$), with tweets exhibiting a more subjective tone after the pandemic (pre-pandemic $M = .35$, post-pandemic $M = .39$). At the cluster level, significant changes were found for Clusters A, B, and D ($t = -2.91, p = .005$ for Cluster A; $t = -2.85, p = .010$ for Cluster B; $t = 2.12, p = .050$ for Cluster D). Clusters A and B showed an increase in subjectivity after the pandemic (Cluster A: pre-pandemic $M = .34$, post-pandemic $M = .39$; Cluster B: pre-pandemic $M = .32$, post-pandemic $M = .37$), while Cluster D demonstrated a decrease (pre-pandemic $M = .43$, post-pandemic $M = .37$). After the pandemic, the polarity was not significantly changed compared to before the pandemic at both the overall and cluster levels (all $p > .05$).

Table 5: Comparison of proportion, subjectivity, and polarity between before and after the pandemic.

Cluster	Pandemic	n^*	Proportion					Subjectivity					Polarity						
			M^{**}	SD	t	p	d	M	SD	t	p	d	M	SD	t	p	d		
Overall			-	-	-	-	-			-2.65	.010	0.49					-0.77	.443	0.15
	Pre	76	-	-	-	-	-	0.35	0.07					0.12	0.07				
	Post	38	-	-	-	-	-	0.39	0.06					0.13	0.07				
A																			
	Pre	36	0.04	0.02				0.34	0.07					0.10	0.07				
	Post	18	0.05	0.03				0.39	0.04					0.11	0.06				
B																			
	Pre	16	0.11	0.03				0.32	0.06	-2.85	.010	0.94		0.13	0.04				
	Post	8	0.06	0.01				0.37	0.02					0.12	0.05				
C																			
	Pre	12	0.03	0.01				0.36	0.08					0.10	0.07				
	Post	6	0.06	0.03				0.44	0.12					0.19	0.12				
D																			
	Pre	12	0.02	0.01				0.43	0.07					0.18	0.08				
	Post	6	0.04	0.01				0.37	0.05					0.17	0.04				

Note. Overall proportion comparison was not conducted because the proportion of summated all topics is conceptually always 1.0. * n was calculated by multiplication of the number of topics and the number of phases (before the pandemic:4, after the pandemic:2).

Discussion

The present study analyzed the evolution of public perception towards online medical education over the last six years, including the COVID-19 pandemic period, using Twitter data and machine learning techniques.

Through the examination of 19 selected topics from both sentiment and longitudinal cluster analyses, the discourse on online medical education uncovered three main themes. Firstly, medical education institutions faced significant challenges in transitioning to online teaching due to a lack of preparedness and resources, including new planning and support, accessibility, addressing mental health concerns, and registration issues (Topics# 2, 8, 9, 12, 16). The transition from traditional face-to-face teaching to the online modality of learning resulted in barriers for students [29-31], one of which was a significant 30% increase in failing grades [32]. The abrupt shift to virtual learning has been a source of stress for many students, and there was widespread concern regarding the impact on their mental health, particularly due to reduced social interaction and extended periods spent indoors in a digital learning environment. Secondly, the COVID-19 pandemic expedited the transformation of medical education, leading to a need for a long-term shift in teaching methods (Topics# 6, 7, 10, 13) [4, 33]. Ironically, the pandemic provided the opportunity for colleges and universities to enhance their educational approaches. This included incorporating technology-based training tools, strengthening leadership, fostering a safe learning environment, and integrating elements such as clinical study, group activities, and virtual laboratories into the curricula [34-36]. Thirdly, despite the challenges faced in recent years, online medical education also offers new opportunities and possibilities, including benefits for professional development, virtual experiential learning, and the potential integration of in-person and online education in the future (Topics # 1, 3-5). The future of medical education will likely embody a blend of both online and traditional methods [37].

The results of the sentiment and longitudinal cluster analyses revealed clusters and their associated topics based on proportion, polarity, and subjectivity. The trajectory analysis conducted over the past six years provides insights into the challenges and opportunities of online medical education. The proportion of the identified clusters indicates that the discussion of medical education has become more nuanced, encompassing complex topics. Furthermore, compared to previous periods, the topics of discussion were more evenly balanced. The shift to remote medical education due to social distancing has led to an increase in conversations about mental health crises, as well as the need for support to mitigate these effects. It is essential to address equity issues in terms of access and the quality of online medical education [6]. Additionally, it is important to acknowledge that the transition to online education has caused delays in training medical professionals [5].

The analysis of tweet polarity over the specified period (2016-2022; Phases 1-6) reveals a predominance of positive statements, particularly about the growing demand for online medical education. A notable correlation between positive emotions and the rising need for online medical education was observed. In contrast, Cluster D exhibited a minor decline in positive statements, indicating a shift towards a more neutral perspective on online medical education. As the pandemic wanes, the focus on remote learning environments has

diminished, likely causing a gradual decrease in the overall positivity of tweets over time.

It is important to note that statements regarding online medical education on social media tend to be subjective, reflecting personal opinions, feelings, or judgments rather than objective facts. All clusters identified were subjective in their expression, as social media platforms are primarily used for personal expression. A significant difference between Cluster B and D was observed in the past, but this gap has been gradually closing recently. In particular, the need for online medical education has been expressed with greater subjectivity in Cluster C. This subjectivity can be attributed to the fact that the statements reflect personal experiences with online medical education rather than experiences shared by others.

Online education continues to be a significant mode of learning, though its prevalence has decreased from the peak levels seen during the pandemic. This study aims to expand our understanding of online medical education and the potential barriers that learners face. These barriers may include limited clinical experience, inadequate internet connectivity and computer facilities, insufficient technological proficiency with new tools, financial or technical difficulties, mental health challenges, and a lack of accessible resources and real-time support. By exploring the needs of learners in online medical education, this study seeks to identify next steps to address these barriers. Potential solutions encompass diverse delivery formats such as online, hybrid/blended, or hyflex models alongside interactive activities replicating clinical experiences. Additionally, considered are active online instruction, social and collaborative learning practices, faculty training and technical support for educational tools, accessible and downloadable materials, online resources for medical board and fellowship examinations, mental health support, as well as career counseling services.

Limitations

The results of this study, which was conducted using Twitter data, reflect individuals' unbiased opinions and thoughts. However, it is important to acknowledge that the data was obtained using specific search keywords, which might contain irrelevant or inappropriate content. Also, the analyses and results presented in this study should have addressed specific aspects within each profession that may or may not be amenable to online learning. Furthermore, as the data was collected from a single platform, there is a possibility of bias due to platform-specific characteristics such as restrictions on language, word limits, or deletion rules.

Conclusion

In recent years, online medical education has emerged as a significantly more prevalent method of learning, primarily propelled by rapid advancements in digital technology and an escalating demand for healthcare education that is both accessible and flexible. While catalytic in expanding educational opportunities, this transition has not been without its challenges. Our study has illuminated that the rapid move towards virtual learning platforms in medical education might be obstacles for learners, ranging from technical issues to concerns about the quality and effectiveness of remote learning. However, there were also efforts to support the learners, as seen in the rise of positive statements and expressions of emotional support and social safety. Such efforts are heartening and

essential in mitigating the challenges posed by this new learning mode. Our study offered important insights into the current online medical education by examining both its strengths and weaknesses as perceived by the users on the Twitter social media platform. Importantly, these findings underscore the evolving nature of the educational sphere, highlighting its potential for ongoing research and innovation. As we delve deeper into understanding the specific challenges and needs inherent in online medical education, the way to enhance its practicality, adaptability, and accessibility becomes clearer. This understanding is essential for renovating online medical education to meet the diverse demands of students, ensuring it remains a feasible and effective alternative to traditional classroom education. By conducting further research and engaging in constructive dialogue, students, educators, and institutions can identify and implement practical solutions that address the current needs and overcome the obstacles prevalent in online medical education. Such collaborative efforts can significantly improve curriculum design, teaching methodologies, and the overall quality of online medical education. In turn, this will benefit current and future students and enhance medical education's capacity to adapt to ever-changing global healthcare systems. The future of medical education hinges on our collective ability to innovate and respond to these evolving challenges and opportunities.

List of abbreviations

NLTK: Natural Language ToolKit
LDA: Latent Dirichlet Allocation
LCA: Longitudinal Cluster Analysis
SD: Standard Deviation
COVID: Coronavirus Disease

Declarations

Ethics approval and consent to participate: Not applicable

Consent for publication: Not applicable

Availability of data and materials: The datasets used and analyzed during the current study are available from the corresponding author upon reasonable request.

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Authors' contributions: SK and HM conceptualized and designed the study. SK collected and analyzed the data. SK and HM wrote and interpreted the initial manuscript. JL and SL reviewed multiple versions of the manuscript. SK and HM finalized the manuscript. All authors read and approved the final manuscript.

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Appendix. Supplementary Information

Tweets Categorized by Topic

Topic 1 - Online anatomy class:

- Human Anatomy & Physiology lab space is looking good after a summer makeover! Check out these awesome MPAS students studying renal anatomy with the Anatomage virtual cadavers!
- Don't tell anyone but I'm actually really excited about this online Anatomy and Physiology class :)

Topic 2 - Online class payment:

- I feel like my friends hate me when I tell them I can't hangout but like I'm in nursing school, have two kids to take care of, two jobs to pay my bills, have to keep up on cleaning the house, AND have to help Savannah with online school
- went online to pay for my last class rn & saw that a scholarship I applied for was approved & its paying for EVERYTHING. I'm literally crying

Topic 3 - Online clinical medicine study and practice:

- Great news XXXXXXXXXXXX and XXXHealth - USF study makes operating rooms come to life in virtual reality to potentially improve medical training,
- I think there is growing evidence both in research and def this year on clinical practice that virtual therapy works. Given how it has made therapy so much more accessible (including for those living in remote areas) I imagine it's here to stay

Topic 4 - Medical Education degree and career development:

- I definitely wasted my bachelors and first masters. My only valuable degree is my MED that I got online but college was still fun
- I recalled in 2012 we met about RN to BSN program, responding to the institute of medicine calling to increase RNs with a BSN degree by 80% in 2020. We discussed how to make the online program flexible & high quality

Topic 5 - Medical therapy training:

- Just finished teaching Part 1 Remote EMDR Training with therapists from all over the country learning how EMDR therapy can help heal trauma. It was wonderful to see how supportive & caring they were throughout the process.
- Great Part 1 Remote EMDR Training weekend. Exciting to see therapists learning how to work with trauma using EMDR therapy. Thanks to XXX & XXX for helping me, and sharing your wisdom with the group this weekend

Topic 6 - Online physical health and wellness courses:

- Is anyone in need of an online professor who can teach Intro to Exercise Physiology, Intro to Kinesiology, Education courses, Curriculum courses, IDT courses, physical education teacher education courses and/or student success courses?
- Be proactive not reactive! Don't wait until something is wrong before you start to make your health a priority. Do it now! Exercise and healthy eating are our prevention and medicine.

Topic 7 - Medical care in need:

- Need Medical Care? Even though schools are closed, the XXXX School-Based Health Center is open for XXXX students! Get remote or in-person services at no cost to you. Just call XXX-XXX-XXX or email XXXX@XXXX.XXX for an appointment.
- There are absolutely NO systems in place for remote, specialized healthcare and education in the home. We need technology and human resources to come together to provide more support for those of us who need it.

Topic 8 - Join, registration, and learn medicine in a live session:

- Calling all #TwitteRx with Cardiology? interest! Wanna train with the Leaders and Best? Of course, you do! Join our PGY2 Cardiology Residency Program virtual info session: 11/29 6:30-7:30 pm EST
- Spending time this AM with my colleagues doing a virtual live training on Peer Support. This is a dedicated group & I'm excited to be a part of this network to support those in healthcare with their well-being!

Topic 9 - Online medical learning stress:

- my med school just sent out the? full transition to online learning until 2021? email and I am stressed run
- 2nd year of Medical school, what. Time goes by so fast. I also hate Online learning. It is making me stress even more.

Topic 10 - Virtual lab experience

- How I'm spending Hobo Day morning: pre-gaming it in the new @SDState virtual reality anatomy lab with physician friends. Incredible technology!
- Virtual learning is nothing new to me since starting my nurse practitioner program but a virtual cadaver lab class was AWESOME!

Topic 11 - Online nursing education and licensure:

- Thank god my nursing school offers online classes so while I'm in Chicago I'll be able to get that shit done
- start with online classes to get the basics done from a local school then see how that goes. Lot of nursing schools have flexible hours. LPN is a good starting point we hire new grads at 23.50 an hour in Florida.

Topic 12 - Mental health problem:

- Online learning can provide the flexibility that students with mental health issues, jobs, housing and other responsibilities may need in order to succeed in school. Many students adapted to a hybrid schedule, taking advantage of eliminated commute times and flexibility.
- Recommend this read and we'll written. Basically, fully remote instruction leads to 5-10% increases in school children mental health issue. This is a problem most rational people would agree needs addressing. These are the future contributors to society.

Topic 13 - Remote/hybrid learning and teaching:

- Remote education, employee work flexibility & remote healthcare could all be significant improvements in life balance, traffic congestion, and environmental impact post pandemic. Kudos to those embracing the opportunity for positive forward motion.
- My teaching colleagues plan to implement it next academic year in our hybrid psych course for medical students in Amoud University Somaliland. This year we've been doing preliminary

Topic 14 - Appreciation for virtual education:

- Had a great meeting today with @xxx School of Pharmacy. Working on a virtual global program/class between them and us, @xxx and @xxx Made me recall when we were there a year ago!
- An amazing set of lectures and I honestly learned a lot! Thanks, @xxx for the awesome virtual Advanced immunology course

Topic 15 - Social distancing and social needs:

- *A Note from SSPS Nursing Team* As we enter into Distance Learning today (6th-12th), it is important to continue to follow important health protocols even when school is remote. Remember the 3 W's: Wash Your Hands, Wear Your Mask, and Watch Your Distance.
- No, we're not, if we practice social distance, restrict groups, wear masks, wash hands & implement South Korea-style testing.

Topic 16 - Various negative feelings

- I'm really just complaining m but I HATE my class online, it's super awkward when nobody talks during a critique, everyone's mics fucking sucks and everyone is just stressed I honestly don't care that's there's only two weeks left I wish they just canceled the whole semester
- I've been sitting at my computer all day long and I'm defeated. I can't do it anymore. Doing school online has successfully killed my mental health in 24 hours! I can't do this and ready to give up

Topic 17 - Various positive feelings:

- Home sick the past few days but was able to still take an amazing online course for Mental Health First Aide the past few nights. Well worth it!
- The answer, we believe, lies in a hybrid model that transcends traditional medical instruction to adopt new technologies that will make healthcare and healthcare education more agile, innovative, and responsive.

Topic 18 - Healthcare education support and benefits for equitable public services:

- I believe a hybrid Medicare advantage healthcare program combined with Medicaid is the best system. Medicare is a very affordable public system. Advantage is a very affordable private insurance plan. Medicaid would cover the poor. They exist and would require moderate changes.
- Training for virtual health and its application in rural areas will be the real game changer in where 20% of the population is at risk of being underserved for healthcare

Topic 19 - Timing and duration flexibility:

- Me: Working 6-7 days a week and taking 2 online college classes. Wife: Working 3rd shift 3-4 days a week as a nurse? said and full-time nursing student. Add in a 1 1/2 year old to chase around.
- I had to add an online class because for the 1st week I only had 9 hours. I got so much free time run & I'm about to use it all 2k!