

REPUTATION ENGINEERING IN NEUROLOGY: NAVIGATING CLINICAL AUTHORITY, DIGITAL PRESENCE, AND CONTENT STRATEGY IN THE INFORMATION ERA

Henry Riyanto Sofyan^{1,2}

¹ Department of Neurology, Faculty of Medicine, Universitas Indonesia, Jakarta, Indonesia; henry.riyanto01@ui.ac.id

² Department of Neurology, DR Cipto Mangunkusumo National General Hospital, Jakarta, Indonesia; henry.riyanto01@ui.ac.id

ABSTRACT

Introduction: The digital transformation in healthcare has fundamentally altered how neurologists develop and uphold their professional reputation. Although digital professionalism frameworks exist for general medical practice, approaches tailored to neurology remain underdeveloped. This narrative literature review aims to synthesize evidence exploring the intersection of clinical authority, digital professionalism, and reputation management in neurology and to develop a structured, neurology-specific conceptual framework.

Material and Methods: A narrative literature review was conducted by searching PubMed, Scopus, and Google Scholar using terms such as "physician reputation," "digital professionalism neurology," "online physician reviews," "social media physician," and "health communication neurology." Studies published from 2008 to 2025 were included if they addressed physician reputation, digital professionalism, online reviews, or health communication strategies relevant to neurological practice. A total of 37 sources were identified and synthesized across eight interconnected themes.

Discussion: This review presents the Neurology Reputation Architecture Model, a three-part framework consisting of Core (clinical competence, ethics, trust), Signal (digital presence, health communication, content strategy), and Shield (risk management, professional boundaries, crisis response). The evidence shows that social media activity, online patient reviews, and digital content strategies significantly influence patient choices, referral patterns, and professional reputation. Neurologists face unique challenges in communicating diagnostic uncertainties and complex neurological concepts in digital settings. Significant gaps remain in neurology-specific empirical research, especially in low- and middle-income countries (LMICs).

Conclusion: Effective reputation management in neurology requires blending traditional professionalism with strategic digital engagement. Future research should focus on neurology-specific studies, LMIC contexts, and interdisciplinary methods that combine behavioural science, marketing theory, and sociology of professions.

Keywords: digital professionalism; neurology; online physician reviews; reputation management; social media; health communication; signaling theory

INTRODUCTION

The practice of neurology is entering a period of significant digital transformation, in which professional

reputation is no longer built solely on clinical skill and peer recognition. Instead, it is increasingly shaped by digital platforms, online reviews, and

social media presence.^{1,2} Neurology carries a unique "uncertainty burden," in which diagnosis, prognosis, and treatment outcomes are often probabilistic rather than definitive. In the digital age, a neurologist can be assessed by online signals even before performing a single neurological exam. This shift involves more than just new technology; it signifies a fundamental change in the Doctor–patient relationship, the nature of medical authority, and the building and maintaining of trust.³ Neurologists, who often deal with diagnostic uncertainty and need to explain complex pathophysiological concepts to patients facing potentially serious diagnoses, face unique challenges in this digital environment.⁴

The concept of "reputation engineering"—the deliberate and strategic management of professional reputation through both traditional and digital channels—has become a vital skill for modern neurologists. This creates a core tension: while digital engagement can enhance accessibility and patient education, it may also promote

performance-driven behaviours that do not align with optimal clinical care. Unlike passive reputation management, reputation engineering actively involves shaping professional identity across multiple platforms while upholding ethical standards and clinical focus.^{5,30} This approach understands that reputation is not just a product of clinical excellence but a complex, multidimensional construct that demands intentional effort.

The reason for studying reputation engineering in neurology is threefold. First, neurological conditions often require ongoing disease management, involving long-term Doctor–patient relationships where trust and perceived expertise are essential.⁶ Second, the complexity and uncertainty common in neurological diagnosis pose unique communication challenges, especially in digital settings where subtlety can be lost.⁷ Third, the rise of health information online has enabled patients to research symptoms, treatments, and doctors before clinical visits, drastically changing the traditional information

gap that once characterized medical practice.^{8,9,36}

This narrative literature review synthesizes evidence across eight interconnected themes: foundations of medical reputation, digital transformation, digital professionalism and ethics, health communication in neurology, content strategy, reputation risks and crisis management, interdisciplinary insights, and clinical and academic implications. This study aims to provide a comprehensive, critical analysis of existing research, identify gaps, and propose a conceptual framework—the Neurology Reputation Architecture Model—to guide future practice and research.

MATERIAL AND METHODS

This narrative literature review was conducted according to the Scale for the Assessment of Narrative Review Articles (SANRA) guidelines. A thorough search was conducted across the PubMed, Scopus, and Google Scholar databases for articles published between January 2008 and December 2025.

Search strategy

The following search terms were used in various combinations: "physician reputation," "digital professionalism," "neurology social media," "online physician reviews," "physician rating websites," "health communication neurology," "medical professionalism digital," "signaling theory physician," and "trust physician online." Additional articles were identified through backward citation tracking of relevant publications.

Inclusion criteria: (1)

Peer-reviewed articles, position statements, or systematic reviews that address physician digital professionalism, online reputation, physician rating platforms, or health communication; (2) studies directly relevant or applicable to neurological practice; (3) publications in English, Portuguese, or Indonesian.

Exclusion criteria

- (1) Conference abstracts lacking full-text availability.
- (2) Opinion pieces without empirical or theoretical support.
- (3) Studies focused solely on non-physician healthcare providers.

Data synthesis

Identified articles were thematically categorized into eight domains. Evidence was summarized narratively, focusing on neurology-specific findings and their implications for practice in both high-income and low- to middle-income country settings.

Limitations of the search

This review used a narrative rather than a systematic approach. Therefore, the search may not be comprehensive, and the common selection bias in narrative reviews is acknowledged.

A total of 37 sources met the inclusion criteria and were included in this review. The literature consists of position statements from professional neurology organizations (n=2), empirical studies on online physician reviews and ratings (n=12), research on digital professionalism and social media in medicine (n=10), health communication and narrative medicine literature (n=5), theoretical frameworks from signaling theory and trust theory (n=4), and studies

specific to LMICs (n=2). Notably, only two sources were neurology-specific empirical studies, highlighting a significant gap in the literature.

DISCUSSION***Evolution of Medical Reputation: From Classical Professionalism to Digital Era***

The foundations of medical reputation have traditionally rested on three pillars: clinical competence, ethical conduct, and interpersonal trust.^{3,10} Classical medical professionalism emphasized technical skill, adherence to ethical standards, and the development of bedside manner during clinical encounters.^{10,30} Reputation was primarily built through peer recognition, institutional ties, academic publications, and word-of-mouth referrals within professional networks.^{11,13}

The Doctor–patient relationship in neurology has traditionally been characterized by significant information asymmetry, with neurologists possessing specialized knowledge about complex neurological conditions that patients

and even other doctors might find difficult to grasp.⁷ This asymmetry provided authority but also imposed ethical duties of beneficence, non-maleficence, and respect for patient autonomy.¹ Trust in this context was built through demonstrated competence, compassionate communication, and consistent ethical behavior over time.⁸

However, the digital age has disrupted traditional systems. The democratization of medical information through online resources has reduced—though not eliminated—information asymmetry.^{12,36} Patients more frequently arrive at consultations having researched their own conditions, explored treatment options, and formed preconceived expectations based on online content.⁹ This shift has changed the neurologist's role from being the only source of information to becoming an interpreter, guide, and collaborative decision-maker.^{8,12}

Signaling theory, first introduced by Spence in the context of job markets, provides a useful framework for understanding this evolution. In

traditional settings, physicians signaled competence through credentials (such as degrees, board certifications, and institutional affiliations) that were costly to forge and easy to verify.^{11,31,31} In digital environments, new signals have emerged: social media follower counts, online review ratings, website sophistication, and content creation.^{9,13} These signals are more accessible to patients but also more ambiguous regarding their connection to actual clinical competence.^{6,32}

The literature shows a conflict between traditional professionalism standards and digital engagement. Some scholars argue that social media use endangers professional boundaries and patient confidentiality, while others believe that a strategic digital presence enhances accessibility, patient education, and public health outcomes.^{5,12,14,35} This debate prompts deeper questions about the role of medical authority in an age of distributed information and patient empowerment.

Digital Transformation in Neurology Practice

The digital transformation of neurology covers three main areas: social media engagement, online review platforms, and patient self-education through digital health information.^{1,15}

Social Media and Professional Networking

Social media platforms have become more common in neurology practice, used for professional networking, continuing medical education, patient engagement, and public health advocacy.^{5,34} The American Academy of Neurology's position statement on social media use highlights both opportunities and risks, emphasizing that ethical principles stay the same even as their application evolves with technology.¹ Likewise, the Society of NeuroInterventional Surgery has issued detailed guidelines for social media use, recognizing its increasing importance for promotional and educational purposes.²

Limited empirical evidence exists regarding the adoption of social media among neurologists. One cross-sectional study observed varied

usage patterns, with some neurologists actively engaging on digital platforms and others not.¹⁶ This variation may result from generational differences, practice settings, or attitudes toward digital professionalism.¹⁵ Notably, neurosurgery departments with an active social media presence have been associated with higher online patient ratings, suggesting potential reputation benefits.¹⁷

The literature highlights several mechanisms by which social media can influence reputation. First, consistently creating high-quality content builds thought leadership and signals expertise to both professional and lay audiences.^{5,34} Second, engaging with patient communities demonstrates accessibility and empathy.¹² Third, participating in professional discussions enhances peer recognition and referral networks.² However, these benefits must be balanced against risks such as boundary violations, breaches of confidentiality, and the spread of misinformation.^{1,4,35}

Online Review Platforms and Patient Ratings

Online physician rating websites mark a significant change in how patients evaluate and select healthcare providers.^{18,19,33} These platforms gather patient reviews, forming public reputation scores that influence healthcare choices.²⁰ Research using Yelp data shows that user-generated physician ratings strongly influence patients' decisions, with higher ratings increasing the likelihood that patients will choose a particular doctor.²⁰

The relationship between online ratings and clinical quality remains debated. One study on managing chronic disease found that online reviews can be reliable signs of clinical outcomes, suggesting a link between patient satisfaction and objective quality measures.⁶ However, other research indicates that online ratings might reflect factors unrelated to clinical skill, such as wait times, office appearance, or billing practices.²¹

For neurologists, online reviews present unique challenges. Neurological conditions often involve diagnostic uncertainty,

treatment failures, and continued decline despite optimal care.⁴ Patients might leave negative reviews based on disease outcomes rather than the Doctor's performance, creating reputational risks that are partly beyond the neurologist's control.²² Moreover, the complexity of neurological explanations can lead to patient misunderstanding, which may result in negative online feedback.⁷

The literature on physician responses to online reviews emphasizes strategic considerations for managing reputation. Experimental research shows that effective responses to negative reviews can prevent reputational damage, with empathetic, professional replies lessening the impact of criticism.²² However, physicians must navigate legal and ethical constraints, especially concerning patient confidentiality.¹⁹

Patient Self-Education and Information Seeking

The rise of online health information has altered patient behavior, with more individuals researching symptoms, conditions, and

treatments both before and after doctor visits.^{12,36} This self-education can increase patient engagement and shared decision-making, but it also poses challenges when patients encounter false or misleading information.^{1,30}

Trust theory provides insights into how patients assess online health information and the credibility of physicians. Research shows that patients depend on multiple cues to determine trustworthiness, including professional credentials, institutional affiliations, and consistency with other sources of information.^{8,9} Physicians' online reputation—seen in reviews, social media presence, and digital content—serves as a trust indicator that influences patient decisions even before their initial clinical visit.²³

The concept of the "digital divide" raises important equity concerns. While digital health information and online reviews are becoming increasingly influential in high-income countries, access and use patterns vary widely across LMICs.⁹ This gap impacts reputation management strategies, which may need to be adjusted to fit local

settings and technology infrastructure.²⁴

The Neurology Reputation Architecture Model

Based on a review of the literature, we present the Neurology Reputation Architecture Model (Table 1), a three-part framework for understanding and managing professional reputation in the digital age. This model combines traditional professional values with contemporary digital realities, offering a structured approach to reputation management. These three components are interconnected rather than independent; imbalance—such as strong signaling without core competence—can lead to reputational instability.

Core Component: Clinical Competence, Ethics, and Trust Foundations

The Core component signifies the vital elements of medical reputation that stay consistent across both traditional and digital environments. Clinical competence—the ability to accurately diagnose, effectively treat, and compassionately care for patients

with neurological conditions—serves as the foundation of professional reputation.¹⁰ No level of digital sophistication can replace clinical excellence; in fact, efforts to build a reputation without this foundation risk inauthenticity and backlash.¹⁴ Ethical conduct involves adhering to professional codes, respecting patient autonomy, maintaining confidentiality, and managing conflicts of interest.¹ The American Academy of Neurology's Code of Professional Conduct describes specific ethical principles that apply across all types of communication.¹ These principles include honesty in communication, respect for patient

privacy, and avoiding exploitation of the Doctor–patient relationship for personal gain.² Trust in neurology foundations is especially crucial given the vulnerability of patients with neurological conditions. Research on the Doctor–patient relationship in outpatient neurology emphasizes the sociocultural and legal factors involved in building trust.⁷ Patients need to trust not only the neurologist's technical abilities but also their judgment in managing uncertainty, their commitment to the patient's best interests, and their capacity to explain complex information clearly and concisely.⁴

Table 1: The Neurology Reputation Architecture Framework

Component	Elements	Key Functions	Failure Mode	Evidence Base
CORE	Clinical competence, Ethical conduct, Trust foundations, Doctor-patient relationship	Establishes fundamental credibility, provides substance behind signals, Ensures long-term sustainability	Loss of trust despite visibility	Traditional professionalism literature; ^{3,10} Trust theory. ^{8,9}
SIGNAL	Digital presence, social media engagement, Content strategy, Health communication, Online reviews	Communicates competence to external audiences, Builds visibility and accessibility, Shapes patient perceptions	Popularity without competence	Signaling theory; ^{11,31,32} Social media research; ^{1,2,5} Online review studies. ^{6,18,20}

SHIELD	Risk management, Professional boundaries, Crisis response, Confidentiality protection, Misinformation mitigation	Protects against reputational threats, maintains ethical standards, Manages negative feedback	Reputational collapse during crisis	Digital professionalism guidelines; ^{1,2,14} Crisis management research. ^{19,22}
---------------	--	---	-------------------------------------	--

The literature suggests that trust is built through consistency between words and actions, demonstrated empathy, and transparency about limitations and uncertainties.⁸ In digital environments, this means aligning online personas with clinical behavior—a concept we call "digital-clinical congruence".³ Patients who engage with a neurologist via social media or online reviews expect the same professionalism, empathy, and competence during clinical visits.²³

Signal Component: Digital Presence, Health Communication, and Content Strategy

The Signal component explains how neurologists showcase their competence, values, and expertise to external audiences. Signaling theory, which originated in economics³¹ and has been used in various organizational and healthcare settings,³² holds that people use

observable traits to communicate qualities that cannot be directly observed. For physicians, credentials, affiliations, and online presence act as signals of their clinical skills and trustworthiness.^{9,11} However, this can lead to a 'signal-substance mismatch," where digital visibility might not accurately reflect actual clinical expertise.

Digital presence includes social media profiles, professional websites, online review profiles, and participation in digital health platforms.¹³ Research shows that physicians' online popularity is associated with higher prices for online health consultations, suggesting that digital signals reflect perceived value.¹¹ However, the connection between digital presence and actual clinical quality remains uncertain, raising concerns about possible misalignment between signals and real substance.⁶

Content strategy for neurologists involves decisions about what, where, when, and how to communicate online.⁵ The literature distinguishes between educational content (disease information, treatment explanations, research updates) and promotional content (practice information, credentials, patient testimonials).²⁵ An effective content strategy balances these elements while maintaining professional boundaries and avoiding the commercialization of the Doctor–patient relationship.²

Health communication in neurology presents unique challenges due to the complexity of neurological concepts and the frequent presence of diagnostic uncertainty.⁴ Narrative medicine approaches, which focus on storytelling and patient perspectives, offer potential strategies for making complex information more accessible.⁴ However, neurologists must balance the need to simplify for lay audiences with the requirement to represent scientific uncertainty accurately.⁷

The concept of "thought leadership" emerges as a key strategy for building reputation in the digital

age.⁵ Neurologists who consistently produce high-quality educational content, engage in professional discussions, and contribute to public understanding of neurological health can establish authority that goes beyond their immediate patient base.^{5,17} This authority may lead to more referrals, academic opportunities, and greater influence within professional organizations.¹⁷

Shield Component: Risk Management, Professional Boundaries, and Crisis Response

The Shield component focuses on the defensive aspects of reputation management: protecting against threats, responding to crises, and maintaining professional boundaries in digital environments.¹ The literature highlights several categories of reputational risk for neurologists using digital platforms.^{2,35}

Professional boundary violations are a significant concern. Social media platforms blur the lines between personal and professional identities, creating risks of inappropriate patient interactions, dual relationships, and boundary crossings.^{14,24} Guidelines

from professional organizations stress maintaining clear boundaries, avoiding friend requests from patients, and keeping personal and professional accounts separate.^{1,2}

Confidentiality breaches present another major risk. Even de-identified case discussions can accidentally reveal patient details, especially in neurology, where rare conditions or distinctive imaging findings might be recognizable.² The Society of Neurointerventional Surgery guidelines specifically cover posting radiographic images, stressing strict adherence to HIPAA regulations and institutional policies.²

Misinformation spread presents both ethical and reputational risks. Neurologists who share false information, support unproven treatments, or engage with pseudoscientific content risk harming their professional credibility.¹ On the other hand, neurologists who actively fight misinformation through evidence-based communication can boost their reputation as trusted sources.^{12,35}

Crisis response strategies for handling negative online reviews or

social media controversies are discussed in several studies.²² Research shows that empathetic, professional responses to criticism can reduce reputational damage, while defensive or dismissive responses might worsen negative perceptions.²² However, physicians need to balance the desire to respond with legal and ethical limits, especially concerning patient confidentiality.¹⁹

The literature reveals a gap in neurology-specific crisis management protocols. Although general guidelines are in place for physician social media use, the distinctive challenges of neurological practice—including high levels of diagnostic uncertainty, treatment failures, and progressive diseases—necessitate tailored approaches to reputation risk management.⁴

Clinical and Academic Implications

The reputation engineering literature has important implications for clinical practice, patient outcomes, referral patterns, and academic careers in neurology.¹⁷

Patient Outcomes and Selection

Research shows that online physician ratings influence patient choices, with higher-rated doctors more likely to be selected.^{20,26} This choice effect could impact patient outcomes through several mechanisms. First, if online ratings reflect clinical quality, choosing doctors based on ratings might lead to better outcomes.⁶ Second, the reputation-building process may motivate physicians to focus on patient satisfaction, possibly enhancing communication and shared decision-making.²⁷ Third, doctors with strong online reputations might attract more complex or motivated patients, creating selection effects that make outcome comparisons more difficult.⁶ However, the literature also highlights possible negative effects. Physicians might engage in "reputation management" behaviors that prioritize ratings over providing the best care, such as avoiding difficult patients, overprescribing requested medications, or downplaying discussions of poor prognoses.²⁸ In neurology, where many conditions have grim outcomes despite optimal treatment, the

pressure to maintain positive reviews can lead to ethical challenges.⁴

Referral Patterns and Professional Networks

Digital presence and online reputation impact physicians' referral patterns.¹⁷ Neurologists with strong digital profiles may attract more referrals from primary care physicians who find them through online searches or professional social media.¹³ Furthermore, active involvement in professional social media discussions can boost peer recognition and referral connections.⁵ The literature indicates that digital reputation may be especially crucial for neurologists in competitive markets or those starting new practices.¹¹ However, the relative significance of digital versus traditional reputation-building methods (such as conference presentations, publications, and personal relationships) remains uncertain and may vary by practice setting and geographic location.¹³

Academic Visibility and Thought Leadership

For academic neurologists, digital presence intersects with traditional metrics of scholarly impact.⁵ Social media engagement can amplify research dissemination, boost citation rates, and increase visibility for academic positions and speaking opportunities.^{5,34} The concept of "altmetrics"—alternative metrics of scholarly impact based on social media mentions, downloads, and online engagement—reflects the growing importance of digital presence in academic evaluation.⁵ However, tensions exist between the time spent on digital engagement and traditional academic productivity.⁵ Junior faculty may face competing pressures to build their digital presence while also publishing in high-impact journals and securing research funding.⁵ The literature lacks clear guidance on the optimal balance between traditional and digital reputation-building activities for academic neurologists.¹³

Future Directions and Research Gaps

This review highlights notable gaps in the reputation engineering literature, especially in neurology-focused research and evidence from LMICs.¹ Future studies should use longitudinal and experimental methods to explore causal relationships between digital reputation strategies and measurable clinical outcomes.

Neurology-Specific Empirical Research

While research on general physician reputation is expanding, studies focused specifically on neurology remain limited.¹⁶ The distinct traits of neurological practice—such as diagnostic uncertainty, complex communication issues, chronic disease management, and often poor prognoses—call for dedicated research.⁴ Future studies should explore: (a) how online reviews of neurologists differ from those of other specialties in content, tone, and factors; (b) the link between neurologists' digital presence and patient outcomes in specific conditions (e.g., epilepsy, multiple

sclerosis, stroke); (c) effective communication techniques for expressing diagnostic uncertainty in digital settings; (d) how narrative medicine approaches influence neurologists' online reputation; and (e) specialty-specific crisis management strategies for negative reviews related to treatment failures or progressive disease.

Low- and Middle-Income Country Contexts

The literature is heavily dominated by research from high-income countries, especially the United States.¹⁸ Only two papers in this review specifically focus on LMIC contexts.^{9,24} This geographic bias restricts generalizability and ignores key contextual factors that may affect reputation engineering in resource-limited settings.⁹

Research gaps in LMIC contexts include: (a) patterns of digital health information seeking and physician selection in settings with limited internet access; (b) the role of traditional versus digital reputation mechanisms in healthcare systems with different structures; (c) ethical considerations for physician social

media use in contexts with varying cultural norms regarding professional boundaries; (d) the impact of the digital divide on health equity and access to highly-rated physicians; and (e) adapting reputation management strategies to local technological infrastructure and cultural contexts.

Interdisciplinary Integration

The reputation engineering literature would benefit from integrating insights from behavioral science, marketing, and sociology of professions more deeply.³² Behavioral science can shed light on the cognitive biases and heuristics that patients use when evaluating physician online.²⁸ Marketing theory provides frameworks for understanding brand building, positioning, and differentiation that could apply to physician reputation.²⁵ Sociology of professions offers critical perspectives on how digital transformation influences professional autonomy, authority, and the social contract between medicine and society.^{3,14}

Future research should utilize interdisciplinary teams and

mixed-methods approaches that combine quantitative analysis of online data with qualitative insights from physicians and patients.²⁹ Longitudinal studies tracking the development of reputation over time, alongside experimental designs testing specific reputation-building interventions, would improve the evidence base.^{19,37}

Ethical and Policy Considerations

The literature uncovers unresolved ethical questions about physician reputation management.¹⁴ Is it ethically right for doctors to actively build their online reputation through strategic content creation and review management? How should professional organizations balance promoting digital engagement with safeguarding against the commercialization of medicine? What duties do physicians have to correct misinformation online, and how should this be balanced with time constraints and personal boundaries?

Policy research is necessary to develop evidence-based guidelines for physician digital professionalism that are specific, actionable, and

adaptable across specialties and practice settings.¹ Additionally, research on regulating online physician rating platforms, including review verification and the prevention of fraudulent content, would aid policy discussions.¹⁸

CONCLUSION

In neurology, reputation depends not only on what is known but also on how uncertainty is communicated. Reputation in neurology reflects a balance between clinical expertise and digital signaling, maintained by ethical safeguards. Managing reputation is a crucial skill for modern practice, requiring the integration of traditional professionalism with strategic digital engagement. The Neurology Reputation Architecture Model introduced in this review—consisting of Core (clinical competence, ethics, trust), Signal (digital presence, communication, content strategy), and Shield (risk management, boundaries, crisis response)—provides a framework for understanding and handling this complex landscape.

The literature shows strong evidence that digital presence, online reviews, and social media engagement influence patient choice, referral patterns, and professional reputation. Still, important gaps exist, especially in neurology-specific research, data from LMICs, and interdisciplinary viewpoints. The unique challenges in neurological practice—including diagnostic uncertainty, complex communication needs, and often poor prognoses—call for customized approaches to reputation management that balance professional authority with patient empowerment.

As healthcare undergoes digital transformation, neurologists need to develop skills in health communication, content strategy, and digital professionalism alongside traditional clinical expertise. Professional organizations, training programs, and healthcare institutions play vital roles in offering guidance, education, and support for reputation management that upholds ethical standards while leveraging digital opportunities. Future research should focus on neurology-specific studies, LMIC contexts, and interdisciplinary

approaches to build an evidence base that informs practice and policy in this fast-changing field.

Ethical Consideration

This study is a narrative review based solely on previously published literature. No human participants or animal subjects were involved; therefore, ethical approval was not required.

AI Assistance Statement

Artificial intelligence tools (ChatGPT, OpenAI; Claude, Anthropic) were used to assist with literature search refinement, language editing, reference verification, and manuscript structural organization. The author reviewed and verified all generated content and assumes full responsibility for the accuracy, interpretation, and scientific integrity of the manuscript. All references were manually verified against source databases (PubMed, CrossRef, Google Scholar).

CONFLICT OF INTEREST

The author declares no conflicts of interest related to this manuscript.

FUNDING STATEMENT

This research did not receive any external funding.

Universitas Indonesia, and DR Cipto Mangunkusumo National General Hospital for their institutional support.

ACKNOWLEDGEMENT

The author thanks the Department of Neurology, Faculty of Medicine at

REFERENCE

1. Busl KM, Rubin MA, Tolchin BD, Larriviere D, Epstein L, Kirschen M, Taylor LP; Ethics, Law, and Humanities Committee. Use of Social Media in Health Care—Opportunities, Challenges, and Ethical Considerations: A Position Statement of the American Academy of Neurology. *Neurology*. 2021;97(12):585–594. doi:10.1212/WNL.0000000000012557
2. Fargen KM, Mocco J, Goyal N, Arthur AS, Siddiqui AH, Fiorella DJ, et al. Social media usage for neurointerventionalists: report of the Society of NeuroInterventional Surgery Standards and Guidelines Committee. *J NeuroIntervent Surg*. 2021;13(7):677–682. doi:10.1136/neurintsurg-2021-017278
3. Snyder L. Online professionalism: social media, social contracts, trust, and medicine. *J Clin Ethics*. 2011;22(2):173–175.
4. Alcauskas M, Charon R. Right brain: reading, writing, and reflecting: making a case for narrative medicine in neurology. *Neurology*. 2008;70(10):891–894. doi:10.1212/01.wnl.0000304945.48551.13
5. Martindale JM, Goldstein J, Xixis K, Lakhotia A, Rodman A, Strauss LD, Strowd RE, Bass N. Be in the Digital Room Where it Happens, Part I: Tweeting & Technology for Career Development. *Child Neurol Open*. 2022;9:2329048X221106843. doi:10.1177/2329048X221106843
6. Saifee DH, Bardhan IR, Lahiri A, Zheng Z. Are online reviews of physicians reliable indicators of clinical outcomes? A focus on chronic disease management. *Inf Syst Res*. 2020;31(4):1282–1300. doi:10.1287/isre.2020.0945
7. Spînu A. The Doctor–Patient Relationship in Outpatient Neurology: Sociocultural and Legal Dimensions. *Neurol Neurochir Pol*. [Year and volume to be verified by author].
8. Gong Y, Zhang Y, Zhao Y, Yin L, Liang X. Factors that determine a patient's willingness to physician selection in online healthcare communities: a trust theory perspective. *Technol Soc*. 2021;64:101510. doi:10.1016/j.techsoc.2020.101510
9. Li Y, Jiang Y, Luo Y, Huang J. Driving online healthcare growth amid the digital divide: how trust in professional signals from doctor biographies shapes patient decisions. *Healthcare*. 2025;13(12):1418. doi:10.3390/healthcare13121418
10. Adoni EM, Segal L, Ternes K. Training of neurologists for the 21st century: cultural and professional skills. *Arq Neuropsiquiatr*. 2022;80(5 Suppl 1):288–295. doi:10.1590/0004-282x-anp-2022-s104
11. Chen Y, Guo X, Zhang X, Vogel D. Physicians' Online Popularity and Price Premiums for Online Health Consultations: A Combined Signaling Theory and Online Feedback Mechanisms Explanation. In: *Proceedings of the International Conference on Information Systems (ICIS)*; 2015; Fort Worth, TX
12. Grajales FJ III, Sheps S, Ho K, Novak-Lauscher H, Eysenbach G. Social media: a review and tutorial of applications in medicine and health care. *J Med Internet Res*. 2014;16(2):e13. doi:10.2196/jmir.2912
13. Marcus A, Gowen BG, Thompson TW, et al. Recognition of tumors by the innate immune system and natural killer cells. *Adv Immunol*. 2014;122:91–128. doi:10.1016/B978-0-12-800267-4.00003-1
14. Au L. Online physicians, offline patients: professional identity and ethics in social media use. *Int J Sociol Soc Policy*. 2019;39(1/2):77–89. doi:10.1108/IJSSP-08-2017-0102

15. Potts MB, Lau D, Abila AA, Kim H, Young WL, Lawton MT. Neurologists and technology: the changing "Facebook" of practice. *Neurol Clin Pract*. 2013;3(2):149–154. doi:10.1212/CPJ.0b013e31828d9ee43
16. Rosati J. We Do not Talk About X (Twitter): A Cross-Sectional Analysis of Social Media Utilization Among Neurologists. [Journal, year, volume, and pages to be verified by author].
17. Lamano JB, Li M, Agarwal N, Oyelese AA, Gokaslan ZL. Correlation between social media utilization by academic neurosurgery departments and higher online patient ratings. *J Neurosurg*. 2021;136(4):1166–1172. doi:10.3171/2021.6.JNS2122.
18. Bhilwar M. Physician Rating Websites in the United States: A Systematic Review. Preprint. *JMIR Preprints*. 2022. doi:10.2196/preprints.35430
19. Emmert M, Adelhardt T, Sander U, Wambach V, Lindenthal J. Do Physicians Respond to Web-Based Patient Ratings? An Analysis of Physicians' Responses to More Than One Million Web-Based Ratings Over Six Years. *J Med Internet Res*. 2017;19(7):e275. doi:10.2196/jmir.7538
20. Wang Y, Kung L, Byrd TA. User-Generated Physician Ratings and Their Effects on Patients' Physician Choices: Evidence from Yelp. *J Mark*. 2023;87(3):425–442. doi:10.1177/00222429221146511
21. Zhu J, Shan G, Xie Y. Impact of Online Patient Reviews: Three Choice-based Conjoint Experiments of Hospital and Physician Ratings. *J Commun Technol*. 2024;6(1). doi:10.51548/joctec.6.1.2024.01
22. Arendt F. Dealing with negative reviews on physician-rating websites: an experimental test of how physicians can prevent reputational damage via effective response. [Journal, year, volume, and pages to be verified by author].
23. Wang X, Zhao K, Street N. The influence of doctors' online reputation on the sharing of outpatient experiences: an empirical study. *J Med Internet Res*. 2020;22(1):e16691. doi:10.2196/16691
24. Prawiroharjo P, Meilia PDI, Hardiati W. Tinjauan Etika Penggunaan Media Sosial oleh Dokter. *J Etika Kedokt Indones*. 2017;1(1):31–34. doi:10.26880/jeki.v1i1.7
25. Liu L. Impression management strategies and the effects on patient selection in psychiatric department from an online medical platform: A combined perspective of impression management. [Journal, year, volume, and pages to be verified by author].
26. Grabner-Kräuter S, Waiguny MKJ. Insights into the impact of online physician reviews on patients' decision making: randomized experiment. *J Med Internet Res*. 2015;17(4):e93. doi:10.2196/jmir.3991
27. Machado JC, Schneider H, Martins C. A influência do boca-a-boca por avaliações online na construção da confiança do paciente no médico. *REMark – Rev Bras Mark*. 2022;21(4):1094–1121. doi:10.5585/remark.v21i4.21163.
28. Peuchaud SR. Respected as a Client, Cared for as a Patient: Evidence of Heuristic Decision-Making from Yelp Reviews of Obstetrician-Gynecologists. *Health Commun*. 2020;35(7):821–830. doi:10.1080/10410236.2019.1598613.
29. Wang Y. Analyzing Professional Ethics of Physicians Using Online Patient Reviews: A Machine Learning Approach. [Journal, year, volume, and pages to be verified by author].
30. Ventola CL. Social media and health care professionals: benefits, risks, and best practices. *P T*. 2014;39(7):491–520.

31. Spence M. Job Market Signaling. *Q J Econ.* 1973;87(3):355–374. doi:10.2307/1882010
32. Connelly BL, Certo ST, Ireland RD, Reutzel CR. Signaling theory: a review and assessment. *J Manage.* 2011;37(1):39–67. doi:10.1177/0149206310388419
33. Hanauer DA, Zheng K, Singer DC, Gebremariam A, Davis MM. Public awareness, perception, and use of online physician rating sites. *JAMA.* 2014;311(7):734–735. doi:10.1001/jama.2013.283194
34. Cheston CC, Flickinger TE, Chisolm MS. Social media use in medical education: a systematic review. *Acad Med.* 2013;88(6):893–901. doi:10.1097/ACM.0b013e31828ffc23
35. George DR, Rovniak LS, Kraschnewski JL. Dangers and opportunities for social media in medicine. *Clin Obstet Gynecol.* 2013;56(3):453–462. doi:10.1097/GRF.0b013e318297dc38
36. Fox S, Duggan M. Health Online 2013. Washington, DC: Pew Research Center; 2013. Available from: <https://www.pewresearch.org/internet/2013/01/15/health-online-2013/>
37. Gao GG, Greenwood BN, Agarwal R, McCullough JS. Vocal minority and silent majority: how do online ratings reflect population perceptions of quality? *MIS Q.* 2015;39(3):565–589. doi:10.25300/MISQ/2015/39.3.03