Received: 31 August 2024 | Accepted: 14 December 2024

DOI: 10.1002/uro2.111

PERSPECTIVE

Ethical perspective on telemedicine usage in sexual medicine: A friend or a foe?

Mana Almuhaideb[1,2] | **Dhiresh Bandaru**[3] | **Elia Abou Chawareb**[4] | **Faysal A. Yafi**[4] | **Muhammed A. M. Hammad**[4]

[1]Division of Urology, Department of Surgery, McGill University, Quebec, Montreal, Canada

[2]Division of Urology, Department of Surgery, King Saud University, Riyadh, Saudi Arabia

[3]School of Medicine, University of California, California, Riverside, USA

[4]Irvine Department of Urology, University of California, Irvine, California, USA

Abstract

Telemedicine has rapidly integrated into healthcare, overcoming initial barriers such as regulatory restrictions and technological limitations. Its role in sexual medicine, especially urology, has been accelerated by technological advances and the COVID-19 pandemic. However, as telehealth continues to expand, key ethical challenges emerge, including concerns over privacy, healthcare equity, and informed consent. These challenges are particularly important in sexual medicine, where sensitive patient data and intimate conditions are involved. We aimed to examine the ethical implications of telemedicine in sexual medicine, focusing on data security, consent processes, and healthcare disparities. We further emphasize the importance of maintaining high ethical standards while integrating telemedicine as a complement to traditional care, ensuring that patient outcomes are not compromised.

KEYWORDS

ethical consideration, female urology, male infertility, male sexual dysfunction, telemedicine

1 | INTRODUCTION

In April 1924, the magazine *Radio News* featured a creative cover illustrating a "radio doctor" who could interact with a patient through both audio and a live image, anticipating the concept of telemedicine. This was during an era when radio was just starting to become widespread in American households, and experimental television broadcasts did not commence until 1927[1]. In 1948, radiologic images were transmitted by telephone between West Chester and Philadelphia, Pennsylvania covering a distance of 24 miles, marking the first use of telemedicine[2]. In the 1960s, upon the introduction of space exploration, the National Aeronautics and Space Administration began to study how to treat acute medical conditions remotely using telecommunication advances[3,4]. With the rapid evolution of technology, telemedicine has become present in the various forms we deal with today.

The American Telemedicine Association (ATA) refers to telemedicine as the "use of medical information exchanged from one site to another via electronic communications to improve a patient's clinical health status"[5]. As we live during an era with exponentially increasing advancements by the day, ATA was founded in 1993 to establish an organizational entity responsible for monitoring the incorporation of technologies into medicine.

Before March 2020, telemedicine in the United States was gradually increasing in use but faced numerous logistical challenges. Patients and providers encountered inconsistent reimbursement, location restrictions, required technology interfaces, and stringent privacy regulations. Interstate licensing restrictions limited providers from treating traveling patients, and

various rules about prescriptions and types of visits added complexity. Despite these challenges, 76% of US hospital systems used some form of telemedicine by 2018, particularly in radiology, psychiatry, and cardiology. Factors such as electronic medical record capabilities and reimbursement policies influenced which hospitals offered telehealth, limiting patient access. Patients who accessed telemedicine before March 2020 generally had positive impressions, citing improved outcomes, ease of use, low cost, better communication, and eliminated travel time. However, data security was a concern. Most telemedicine appointments were video conferences due to reimbursement restrictions on telephone-only visits. Clinicians had mixed opinions on telemedicine, with many inexperienced in its use before the COVID-19 pandemic. About half of the surveyed clinicians, mainly in psychiatry, felt the personal connection was inferior to in-person visits, and one-third believed the overall visit quality was better in person. Family medicine providers cited inefficiency, quality of care concerns, liability issues, lack of training, equipment costs, and inadequate reimbursement as barriers to telehealth adoption[6].

During the COVID-19 era, telemedicine was further evaluated as it was heavily relied on. In March 2020, Congress made substantial modifications to the Medicare restrictions in relation to telemedicine (e.g., any physician can bill, no preexisting physician–patient relationship is required, can be conducted from home)[6]. Studies on chronic diseases like fibromyalgia portrayed that despite patients having their treatment halted due to the COVID-19 pandemic, a total of 89.9% joined the telerehabilitation program and showed some significantly positive outcomes[4]. Oncology is another area drastically affected by the COVID-19 pandemic. Ben-Arye et al. implemented an online Integrative Oncology treatment program during the COVID-19 pandemic. The breast cancer patients who were treated via online modalities had lower rates of metastatic disease ($p = 0.01$), and in general, patients were found to more likely choose online treatment (100%)[7]. In a clinical trial reporting home-based virtual prehabilitation program for patients who are undergoing neoadjuvant therapy, it was foreshadowed that a well-structured virtual prehabilitation program for cancer patients can equip them well for future surgery[8].

In urology, while several resources assess telemedicine broadly, few specifically address its application in sexual medicine. Koukourikis et al. stated that telemedicine has been adopted across various medical specialties and is particularly prevalent in urology for three main reasons. First, diagnosing urological conditions often relies heavily on imaging data, and variations in practitioner experience have minimal impact on the outcomes of physical examinations. This reduces the need for in-person evaluations, accommodating remote consultations. Second, the relatively fixed anatomical locations of urinary system organs make remote procedures more feasible compared to surgeries on more variable organs. Third, and most importantly, urology has been at the forefront of telerobotic surgery advancements[9].

Interest in telemedicine research within urology has grown, with 1357 studies published over the past two decades, led by the United States[10]. The COVID-19 pandemic further underscored the role of telehealth in sexual medicine, as telemedicine consultations in male sexual health formed a significant part of outpatient care during that time[11].

Khera et al. reported that telemedicine is a viable approach for diagnosing and managing major sexual health conditions[12]. This technology offers new opportunities to expand treatment access, improve preventive care, and raise awareness and education about sexual health issues[12]. Telemedicine holds promise for advancing men's sexual health, yet reliance on remote consultations without physical exams limits comprehensive assessments, especially for underlying medical issues. Ethical concerns arise around the risk of missed diagnoses, patient safety, and ensuring equitable access to both remote and in-person care, highlighting the need for innovative solutions that integrate telemedicine as a supplement to traditional practices for optimal patient outcomes[12,13].

Although Hammad et al. have reported in a recent meta-analysis that telemedicine has positive patient perception after the COVID-19 pandemic, more for videoconferencing than telephone visits for sexual medicine patients[14], telemedicine in this realm should be further scrutinized to assess ethical considerations in all aspects of patient care (Table 1).

2 | METHODOLOGY

This article was conducted to explore the ethical considerations of telemedicine in sexual medicine, particularly focusing on privacy, informed consent, and healthcare equity. We searched several electronic databases, including PubMed, Scopus, and Google Scholar, to identify studies that were relevant to our research question. Studies were included if they were published in peer-reviewed journals, specifically addressed telemedicine in sexual health or urology, and discussed ethical issues such as patient privacy, consent processes, data security, and equity in healthcare access. We excluded studies that did not focus on sexual medicine or urology, or that lacked substantial discussion of ethical implications in the context of telemedicine. We also considered the diverse range of study designs, including qualitative, quantitative, and mixed-methods research, which may introduce biases in how ethical issues were presented.

TABLE 1 Summary of findings

Ethical domain challenge	Key findings	References
Confidentiality and data security	Ensuring secure transmission and storage of sensitive patient information; robust protections against breaches.	[15–18]
Informed consent	Patients must be fully informed about telemedicine procedures, risks, and data usage before consenting.	[17–20]
Legal and jurisdictional issues	Cross-border consultations raise jurisdictional challenges; clear regulatory frameworks are needed.	[15,17–20]
Doctor–patient relationship	Virtual consultations can impact the quality of care and rapport; guidelines needed to maintain relationship integrity.	[17,20]
Ethical guidelines and regulatory frameworks	Development of comprehensive ethical guidelines is essential for standardizing telemedicine practices.	[17,18,20]
Efficiency and finance	AMA codes of medical ethics. Autonomy is inevitably compromised when telemedicine is utilized, exacerbating potential disparities and the care provided. The ACA encourages value-based care which can increase risk toward hospitals and independent physician groups.	[21–23]

Abbreviations: ACA, Affordable Care Act; AMA, American Medical Association.

Potential biases included limitations in the geographic scope of the included studies, as many were focused on Western countries, which may not fully represent global perspectives on telemedicine ethics. Additionally, the studies varied in their focus on patient versus provider experiences, which could affect how ethical concerns were framed. Finally, the surge in telemedicine adoption during the COVID-19 pandemic may have influenced the nature of the studies included, as these were often shaped by the immediate need for remote healthcare services during the crisis.

3 | TELEMEDICINE IN UROLOGY: OVERVIEW

Hsiao et al. reviewed almost 2.5 million patient encounters between June 2020 and June 2021, showing that urology was among the least specialties in the proportion of telemedicine visits[24]. This was reported to be due to the lack of technological literacy, concerns for reimbursement, and resistance to changes in common practice. Despite the relatively low proportion of telemedicine utilization among urologists, the COVID-19 pandemic increased the utilization significantly[24–26]. In a cross-sectional study by Dubin et al.[27] for 620 urologists from 58 different countries and 6 continents, predilection to use telemedicine increased from 43.7% ($n = 139$) to 80.8% ($n = 257$) after trying it for the first time during the COVID-19 pandemic[22]. 80.9% ($n = 244$) of urologists surveyed were interested in continuing to use it in their practice. About half of participating urologists ($n = 116$, 52.9%) were interested in making use of telemedicine in the inpatient hospital setting. The majority of sampled urologists who had previous exposure to inpatient telemedicine usage were interested in continuing its utilization ($n = 308$, 74%), and about half ($n = 29$, 53%) of the urologists who had not used it before were interested in doing so. Telemedicine visits by urologists were mostly via Zoom, Doxy.me, Epic, WhatsApp, and Skype. Telemedicine was mostly done either in the office ($n = 169$, 59.7%) or at home ($n = 108$, 38.2%). No significant differences existed between the platforms in any category[22]. In another study at Michigan Medicine Department of Urology, 250 video visits of patients were compared to 250 in-person clinic visits with the same providers. The completion of visits rate was similar between video and clinic visits (58% vs. 61%, respectively, $p = 0.24$). The average cycle time for video visits was significantly shorter compared to clinic visits (24 min vs. 80 min, respectively, $p < 0.01$). Telemedicine proved to reduce the time urology patients spend on follow-up care without negatively affecting reimbursement rates while reducing average billing levels[28].

Within urology, telemedicine usage in male sexual medicine has been reported. In a study reviewing telemedicine utilization in sexual medicine at a single institution, video visits increased from 0% in April 2019 to 66% in April 2020[11]. Before the COVID-19 pandemic, popular direct-to-consumer websites for the treatment of erectile dysfunction noted 1,668% increase in usage between 2017 and 2019[21]. Saffati et al. sent out a satisfaction survey for patients who had telemedicine appointments over the span of 2 years. With over 600 patients completing the survey, over 60% of the younger patients and around 45% of the older patients preferred telemedicine visits over in person[22].

In a meta-analysis by Hammad et al., all andrology patients who went through telemedicine consults were included, showing that almost 70% of the patients had a positive response. Moreover, it was shown that 85% of

patients preferred video-conference visits as opposed to 39% who preferred telephone consultation ($p = 0.24$)[14]. Although telemedicine implementation had a positive response in all the included studies, we must be cautious of any ethical pitfall in implementing a rather feasible alternative to in-person visits[14].

4 | EFFICIENCY AND FINANCE VERSUS QUALITY HEALTHCARE

Informed consent in tele-sexual medicine requires that patients are fully aware of the nature of telemedicine services, including potential risks and limitations compared to face-to-face interactions. Patients must be informed about how their data will be used and stored, and their explicit consent must be obtained before employing telemedicine procedures. This process is crucial to maintaining ethical standards and ensuring patient autonomy.

According to the code of medical ethics opinion 1.2.12, established by the American Medical Association, physicians who respond to individual health queries or provide personalized health advice electronically through a telehealth service in addition should:[29]

(a) Notify users of the limitations of the relationship and services provided.

(b) Advise site users on the arrangement for needed care when follow-up care is specified.

(c) Encourage users who have primary care physicians to inform their primary physicians about the online health consultation, even if in-person care is not nearly needed.

Despite reminding patients in each visit may seem a rather redundant process to healthcare providers, it is crucial to ensure that patients know the limitations of telehealth. On many occasions, the primary physician is not involved in the process at all. The principles of bioethics (autonomy, beneficence, justice, non-maleficence, and professional–patient relationship) have been reviewed in multiple studies in the context of utilizing telemedicine[23]. Autonomy, being the most prominent principle discussed in the literature, was deemed to be inevitably compromised to some extent when utilizing telemedicine and that compromise should be prevented in a multipronged approach.

Potential compromise of care quality for convenience and the risk of exacerbating existing healthcare disparities raise ethical and practical concerns in telemedicine. While it increases patient choice and convenience, it may miss critical diagnoses that require physical exams, especially for complex conditions. Patients generally appreciate telehealth's convenience, though many find in-person visits more thorough. Moreover, it can improve access for those with mobility issues but may also worsen disparities if face-to-face visits offer higher quality care. Vulnerable populations, such as the elderly and those in rural areas, might struggle with telehealth technology. As telehealth becomes routine, unintended consequences may include care models driven by reimbursement rather than quality and increased clinician burnout[30].

The Patient Protection and Affordable Care Act along with Medicare bundled payments are encouraging a modification towards value-based care, as the financial risk is taken away from commercial insurers and government payers to hospitals and independent physician groups[31]. Eventually, medical centers tend to focus on efficiency, time management, and reduction of costs. Consequently, this raises the concern of growth of an inherent bias towards more use of telemedicine in an inconsistent approach. Thus, it is necessary to evaluate the quality of healthcare provided to establish confident criteria for the use of telemedicine.

Eliminating the assumption that “one size fits all” and maintaining patient trust are crucial. It's important to recognize the limitations of the patient–physician relationship in telehealth visits. Urologists should be aware that telehealth might not be suitable for all types of communication, especially given the intimate nature of the specialty. For instance, while telehealth may work for assessing benign prostatic hyperplasia, it may be inappropriate for discussing more sensitive issues like terminal renal masses or prostate cancer metastasis. Additionally, telehealth may hinder accurate communication about fertility and sexual function, potentially leading to inadequate diagnosis and treatment[32]. In the context of sexual medicine, the nuances of patient-physician communication are even more critical. Discussions around sensitive topics such as sexual dysfunction, infertility, or intimate relationships require a level of trust and understanding that might be challenging to establish through telehealth. The virtual format can sometimes hinder the accurate expression of concerns, leading to potential misdiagnoses or suboptimal treatment plans. Therefore, it's crucial to carefully consider when telehealth is appropriate and ensure that it doesn't compromise the quality of care or the patient's comfort. Guidelines are needed to help healthcare providers maintain the integrity of the doctor–patient relationship in a virtual setting, ensuring that care remains patient-centered and compassionate.

Furthermore, patients' trust in the healthcare provider can significantly affect their outcomes and quality of life[33]. Patient's previous experiences, knowledge, lack of trust in Western medicine and technology, socioeconomic status, beliefs, and culture can influence the way they perceive telemedicine[32]. If telemedicine happens to compromise this trust even marginally, we may be creating a caveat for unexplained poor healthcare outcomes.

In sexual medicine, patients with conditions that require physical examination, or procedures are not amenable to telemedicine. Robust encryption and data

protection protocols are essential to prevent breaches and maintain confidentiality.

5 | PATIENT–PROVIDER RELATIONSHIP

Telemedicine in sexual health care, as in other specialties, presents distinct challenges and considerations for the patient–provider relationship. It can influence dynamics of trust, communication, and continuity of care. A recent body of research shows a rise in medical mistrust, driven by factors such as inequitable access, lower levels of patient-centered communication, and historical mistreatment of minority groups, particularly Black and Latinx populations[34]. Telemedicine has great potential for improving access, and how it is implemented can significantly affect the quality of patient–provider relationships. The US Department of Health and Human Services reports a surge in telehealth use among Medicare beneficiaries, with encounters increasing from around 840 000 in 2019 to 52.7 million in 2020, suggesting that telemedicine may help foster trust by making care more accessible and providing a convenient platform for education and open dialog[35].

Communication barriers in telemedicine remain, particularly in interpreting nonverbal cues. However, as Habib et al. noted, telemedicine can also improve patients' understanding and adherence to treatment plans[36]. Regarding continuity of care, views are mixed; while some argue that telemedicine might disrupt care, particularly in rural areas and primary care settings[15], others highlight its critical role in maintaining continuity during crises, such as pandemics or natural disasters[16,19]. Overall, telemedicine holds promise as a tool to supplement traditional care, but it requires careful implementation to balance patient convenience, trust, and the integrity of care continuity.

6 | PRIVACY AND CONFIDENTIALITY VIOLATIONS

Telemedicine interactions must be appropriately encrypted, firewalls sustained and updated, and any video, audio, and patient records stored safely[17]. Only Institutional Review Board regulated databases should be used for program evaluation, external reporting, or research[20].

Healthcare Portability and Accountability Act of 1996 (HIPAA) considers fines of more than $50 000 per breach, with a maximum penalty of $1.5 million, for HIPAA privacy violations[37]. IBM Security reported that the healthcare industry had $7.13 million worth of data breach in 2020. Unfortunately, there was no corresponding increase in the US displayed in the average percentage of IT budgets spent on cybersecurity by firms[38]. Hackers begin to increase their attacks on the health care sector for a variety of reasons:

(a) Black market selling of personal health information (PHI). This is defined as data, such as medical identification numbers, health insurance, mental health records, and admission and discharge dates, which are more specific and cannot be changed[39].

(b) The personally identifiable information like credit cards and government ID numbers that can sell for $1–$2, while PHI can sell for $363[18].

7 | LEGALITY ACROSS THE GLOBE

Telemedicine goes beyond geographical boundaries, raising important questions about jurisdiction and the legal liabilities of healthcare providers. Cross-border consultations can create conflicts concerning applicable laws and the management of malpractice claims. To address these challenges, establishing clear regulatory frameworks and agreements between countries is essential. Such measures can help mitigate legal risks and provide a solid foundation for telemedicine practices across borders[40–42].

Countries and organizations are increasingly developing ethical guidelines to address the unique challenges posed by telemedicine, including tele-sexual medicine. For instance, the Health Professions Council of South Africa has published comprehensive guidelines that focus on privacy, data protection, and informed consent in telemedicine practices. Similarly, the Indian Medical Council Act has been amended to incorporate telemedicine guidelines, though there are still gaps in fully addressing all ethical considerations. The lack of standardized global practices underscores the need for multilateral agreements to harmonize legal frameworks, reduce provider liability, and enhance patient trust in telemedicine across jurisdictions. These guidelines are essential for standardizing practices and ensuring ethical compliance across various regions and healthcare systems, providing a framework to safeguard patient rights and enhance the quality of care[41,43,44].

8 | MINORITIES AND LOW SOCIOECONOMIC STATUS

In general, some populations are not offered telemedicine services due to lacking knowledge or the required technology caused by the acquisition of limited resources[45]. This digital divide can disproportionately affect minorities and patients of low socioeconomic status, who may face barriers in accessing the necessary devices or internet connectivity for tele-sexual medicine. However, in Urology practice, a recent study analyzed “interstate” telehealth use by Medicare beneficiaries before and after COVID-19. Since the existence of

telemedicine across states briefly rose during the COVID-19 pandemic, a higher percentage of out-of-state telehealth users lived in rural areas compared with beneficiaries of Medicare Urology services who did not receive care outside of their state (28% vs. 23%)[1]. Thus, interstate telemedicine solves a rather complicated problem for rural areas requiring specialized, urological care.

Tele-sexual medicine has the potential to significantly improve access to care for minorities and low socioeconomic status patients by overcoming geographic and logistical barriers[46]. For instance, it can provide access to specialized sexual health services for individuals living in rural or underserved areas, where such services may be limited or unavailable. Additionally, tele-sexual medicine can reduce the need for travel, which can be a significant burden for those with limited financial resources.

While telemedicine offers substantial benefits, the challenges of technology access and digital literacy remain significant hurdles for some populations[46,47]. To support continued use in the future, there must be targeted efforts to bridge the digital divide, such as providing subsidies for technology and internet access, and educational programs to improve digital literacy. While tele-sexual medicine can enhance access to care for minorities and low socioeconomic status patients, its long-term success depends on addressing the existing inequities in technology access and ensuring that these innovations benefit all communities.

9 | CONCLUSION

Telemedicine has proven to be an invaluable tool in sexual medicine, offering increased accessibility and convenience for patients, particularly during the COVID-19 pandemic. However, its widespread adoption brings forth several ethical challenges, including concerns about privacy, equity, and informed consent. Moving forward, it is crucial to refine hybrid care models that combine in-person and virtual visits to ensure comprehensive care while addressing the limitations of telemedicine in sexual health.

For practitioners utilizing telemedicine in sexual medicine, it is essential to maintain a focus on patient-centered care, ensuring that ethical considerations are integrated into practice. Practitioners should prioritize securing patient consent, ensuring data privacy, and addressing disparities in access to technology.

AUTHOR CONTRIBUTIONS

Muhammed A. M. Hammad and Mana Almuhaideb participated in the study conceptualization and methodology. Muhammed A. M. Hammad and Dhiresh Bandaru participated in the investigation and original draft preparation. Dhiresh Bandaru, Elia Abou Chawareb, and Faysal A. Yafi participated in review and editing and visualization. Faysal A. Yafi and Muhammed A. M. Hammad provided supervision and project administration. All authors have read and agreed to the published version of the manuscript.

CONFLICT OF INTEREST STATEMENT

Faysal A. Yafi—Coloplast: Advisory board, speaker; Endo: Advisory board; Haleon: Advisory board; Halozyme: Advisory board, speaker; Masimo: Intellectual property; Softwave: Advisory board; Sprout: Consultant; Vertica: Research investigator; Xialla: Advisory board. The remaining authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author.

ETHICS STATEMENT

Neither ethics approval nor patient consent was required for this article, using publicly available records.

REFERENCES

1. Institute of Medicine (US) Committee on Evaluating Clinical Applications of Telemedicine. Evolution and current applications of telemedicine. In: Field MJ, editor. Telemedicine: a guide to assessing telecommunications in health care. Washington, DC: National Academies Press; 1996. p. 2. Available from NCBI website (books/NBK45445).
2. Zundel KM. Telemedicine: history, applications, and impact on librarianship. Bull Med Libr Assoc. 1996 Jan;84(1):71–9.
3. Bashshur R, Lovett J. Assessment of telemedicine: results of the initial experience. Aviat Space Environ Med. 1977 Jan;48(1):65–70.
4. Doarn CR. Development of telemedicine and NASA's contribution. Aerosp Med Hum Perform. 2015 May;86(5):504–5.
5. Voran D. Telemedicine and beyond. Mo Med. 2015 Mar–Apr;112(2):129–35.
6. Shaver J. The state of telehealth before and after the COVID-19 pandemic. Prim Care Clin Off Pract. 2022 Dec;49(4):517–30.
7. Ben-Arye E, Gressel O, Ben-Arye E, Samuels N. Feasibility of an online integrative oncology treatment program during COVID-19. J Pain Symptom Manage. 2021 Feb;61(2):e1–3.
8. Sell NM, Silver JK, Rando S, Draviam AC, Mina DS, Qadan M. Prehabilitation telemedicine in neoadjuvant surgical oncology patients during the novel COVID-19 coronavirus pandemic. Ann Surg. 2020;272(2):e81–3.
9. Koukourikis P, Rha KH. Robotic surgical systems in urology: what is currently available? Investig Clin Urol. 2021;62(1):14–22.
10. Zeng N, Liu MC, Zhong XY, Wang SG, Xia QD. Knowledge mapping of telemedicine in urology in the past 20 years: a bibliometric analysis (2004–2024). Digit Health. 2024;10:20552076241287460.
11. Rabinowitz MJ, Kohn TP, Ellimoottil C, Alam R, Liu JL, Herati AS. The impact of telemedicine on sexual medicine at a major academic center during the COVID-19 pandemic. Sex Med. 2021 Jun;9(3):100366.
12. Khera M, Bernie HL, Broderick G, Carrier S, Faraday M, Kohler T, et al. Sexual Medicine Society of North America (SMSNA)/American Urological Association (AUA) telemedicine and men's health white paper. J Sex Med. 2024;21(4):318–32.
13. Ayoub CH, El-Asmar JM, Abdulfattah S, El-Hajj A. Telemedicine and telementoring in urology: a glimpse of the past and a leap into the future. Front Surg. 2022;9:811749.

14. Hammad MAM, El-Achkar A, Nguyen T, Barham DW, Tran J, Jenkins L, et al. The pandemic, telemedicine, and andrology: what have we learned? Sex Med Rev. 2023;11(3):231–9.
15. Glauser W. Virtual care has potential to fragment primary care and disturb continuity of care, warn doctors. Can Med Assoc J. 2019;191(37):E1038–9.
16. Pasipanodya EC, Shem K. Provision of care through telemedicine during a natural disaster: a case study. Spinal Cord Ser Cases. 2020 Jul 9;6(1):60.
17. Health Insurance Portability and Accountability Act. HIPAA guidelines on telemedicine. Accessed Jan 2, 2025.
18. Camarines TM, Camarines JCM. Discussing data security and telehealth during the COVID-19 pandemic. J Public Health. 2022 Aug 25;44(3):e449–50
19. Emedoli D, Houdayer E, Rosa PAD, Zito A, Brugliera L, Cimino P. Continuity of care for patients with dementia during COVID-19 pandemic: flexibility and integration between in-person and remote visits. Front Public Health. 2024;11:1301949.
20. Eckenwiler L. Moral reasoning and the review of research involving human subjects. Kennedy Inst Ethics J. 2001 Mar;11(1):37–69.
21. Wackerbarth JJ, Fantus RJ, Darves-Bornoz A, Hehemann MC, Helfand BT, Keeter MK, et al. Examining online traffic patterns to popular direct-to-consumer websites for evaluation and treatment of erectile dysfunction. Sex Med. 2021 Feb;9(1):100289.
22. Saffati G, Naeem T, Kassab J, Orozco Rendon D, Green C, Liphsultz LI, et al. Will you go the distance? A satisfaction survey of telemedicine in sexual medicine. Sex Med. 2023 Dec 18;11(6):qfad060.
23. Keenan AJ, Tsourtos G, Tieman J. The value of applying ethical principles in telehealth practices: systematic review. J Med Internet Res. 2021 Mar 30;23(3):e25698.
24. Hsiao V, Chandereng T, Huebner JA, Kunstman DT, Flood GE, Tevaarwerk AJ, et al. Telemedicine use across medical specialties and diagnoses. Appl Clin Inform. 2023 Jan;14(1):172–84.
25. Naik N, Nandyal SR, Nayak SG, Shah M, Ibrahim S, Hameed BMZ, et al. Telemedicine and telehealth in urology: uptake, impact and barriers to clinical adoption. Front Surg. 2022 Jun 30;9:911206.
26. Almannie R, Almuhaideb M, Alzahrani M, Binsaleh S, Alyami F. “Tele-urology”: is the COVID-19 pandemic a wake-up call? Urol Ann. 2021;13(2):89–94.
27. Dubin JM, Wyant WA, Balaji NC, Ong WLK, Kettache RH, Haffaf M, et al. Telemedicine usage among urologists during the COVID-19 pandemic: cross-sectional study. J Med Internet Res. 2020;22(11):e21875.
28. Andino JJ, Zhu Z, Surapaneni M, Dunn RL, Ellimoottil C. Interstate telehealth use by medicare beneficiaries before and after COVID-19 licensure waivers, 2017–20: study examines interstate telehealth use by Medicare beneficiaries before and after COVID-19 led to relaxed licensure rules. Health Aff. 2022;41(6):838–45.
29. Chaet D, Clearfield R, Sabin JE, Skimming K. Ethical practice in Telehealth and Telemedicine. J Gen Intern Med. 2017 Oct;32(10):1136–40.
30. Hull SC, Oen-Hsiao JM, Spatz ES. Practical and ethical considerations in telehealth: pitfalls and opportunities. Yale J Biol Med. 2022 Sep 30;95(3):367–70.
31. Chaudhry B, Wang J, Wu S, Maglione M, Mojica W, Roth E, et al. Systematic review: impact of health information technology on quality, efficiency, and costs of medical care. Ann Intern Med. 2006 May 16;144(10):742–52.
32. Chung J, Thompson HJ, Joe J, Hall A, Demiris G. Examining Korean and Korean American older adults' perceived acceptability of home-based monitoring technologies in the context of culture. Informatics Health Soc Care. 2017 Jan;42(1):61–76.
33. Ernstmann N, Wirtz M, Nitzsche A, Gross SE, Ansmann L, Gloede TD, et al. Patients' trust in physician, patient enablement, and health-related quality of life during colon cancer treatment. J Cancer Educ. 2017 Sep;32(3):571–9.
34. Boulware LE, Cooper LA, Ratner LE, LaVeist TA, Powe NR. Race and trust in the health care system. Public Health Rep. 2003;118(4):358–65.
35. ASPE. Medicare beneficiaries' use of Telehealth in 2020: trends by beneficiary characteristics and location. 2021 Dec 3. Available from ASPE website.
36. Habib S, Alsulaim KB, Mobeirek OA, Alsaeed AM, Albawardi FA, Alqahtani YK, et al. Barriers and facilitators of telemedicine among physicians at a university hospital. Cureus. 2023;15(9):e45078.
37. CMS. HHS finalizes historic rules to provide patients more control of their health data. 2020 Mar 9. Available from CMS website.
38. BusinessMirror. ‘IT security budget stagnant despite rise in cyber attacks’. 2024 Aug 29. Available from businessmirror website. Accessed 29 Aug 2024.
39. HIPAA. Personally identifiable information: HIPAA compliance key facts. 2020 Jan 13. Available from paubox website.
40. Stanberry B. The legal and ethical aspects of telemedicine. J Telemed Telecare. 1998;4(Suppl 1):95–7.
41. Aneja J, Arora S. Telemedicine and ethics: opportunities in India. Indian J Med Ethics. 2021 Oct–Dec;VI(4):314–20.
42. Tachakra S, Mullett ST, Freij R, Sivakumar A. Confidentiality and ethics in telemedicine. J Telemed Telecare. 1996;2(Suppl 1):68–71.
43. Scilit. The development of ethical guidelines for telemedicine in South Africa. 2019 Jun 1. Available from scilit website.
44. Nittari G, Khuman R, Baldoni S, Pallotta G, Battineni G, Sirignano A, et al. Telemedicine practice: review of the current ethical and legal challenges. Telemed J E Health. 2020 Dec;26(12):1427–37.
45. Riazi H, Larijani B, Langarizadeh M, Shahmoradi L. Managing diabetes mellitus using information technology: a systematic review. J Diabetes Metab Disord. 2015 Jun 3;14:49.
46. Haimi M. The tragic paradoxical effect of telemedicine on healthcare disparities—a time for redemption: a narrative review. BMC Med Inform Decis Mak. 2023 May 16;23(1):95.
47. Tong L, George B, Crotty BH, Somai M, Taylor BW, Osinski K, et al. Telemedicine and health disparities: Association between patient characteristics and telemedicine, in-person, telephone and message-based care during the COVID-19 pandemic. IPEM Transl. 2022 Nov-Dec;3:100010.