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REVIEW ARTICLE

Emergency Care via Video Consultation: Bridging Healthcare Gaps with Telemedicine

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ABSTRACT

The integration of video consultations (VCs) in emergency care has emerged as a transformative approach, particularly post-COVID-19, to address challenges in healthcare access, specialist shortages, and emergency department congestion. This review explores the global and Indian experiences with emergency video consultations, assessing their impact on healthcare access in rural and underserved areas, workflow optimization in urban emergency departments, and specialist availability for time-sensitive conditions. Key findings indicate that VCs reduce referral rates, enhance patient satisfaction, and improve resource allocation. However, challenges such as technical limitations, digital inequality, and cultural barriers persist. Advances in artificial intelligence (AI), wearable technology, and government initiatives like India's eSanjeevani platform provide promising pathways to expand and optimize VC integration in emergency care. Future efforts should focus on addressing connectivity issues, integrating culturally appropriate protocols, and leveraging AI for improved triage accuracy. By fostering an ecosystem of research, technological advancement, and supportive policies, video consultations could reshape emergency care, enhancing equitable healthcare access across India's diverse regions.

KEYWORDS

• Emergency care • Video consultation • Telemedicine • Healthcare access • Rural healthcare • Emergency triage

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INTRODUCTION

The utilization of video consultations (VCs) in emergency care has accelerated, especially post-COVID-19, driven by advancements in telemedicine and the need for rapid, accessible care. Any Registered Medical Practitioner enrolled in the State Medical Register or the Indian Medical Register is permitted to provide telemedicine consultations to patients from rural areas, the elderly, and working professionals. Emergency video consultations allow patients to receive remote medical assessments, reducing the strain on healthcare facilities and enabling timely interventions in acute cases. Video consultations expand access to emergency care, especially for patients in rural and underserved areas where travel to healthcare facilities might be time-consuming or challenging[1]. This accessibility is particularly beneficial for elderly patients and those with limited mobility. By triaging cases and addressing less critical conditions remotely, VCs can reduce patient congestion in emergency departments, preserving resources for more severe cases. This shift has shown a marked reduction in wait times and faster service for on-site patients. Studies report higher satisfaction among patients due to the convenience of VCs and reduced costs associated with transportation and lost work time. In India, the adoption of telemedicine has been instrumental in expanding access to healthcare, especially in rural and remote areas where medical infrastructure and specialist availability are often limited. The Government of India released telemedicine practice guidelines in 2020, providing a framework that enables the wider application of telemedicine across the country[2]. The integration of video consultations in emergency care, though still emerging, has shown significant potential to improve healthcare access and optimize emergency resources. The integration of video consultations in emergency care has gained international momentum as an effective means to expand healthcare access, alleviate emergency department congestion, and improve patient outcomes. Countries worldwide, spanning both rural and urban settings, have adopted video consultations to provide timely care and address specialist shortages. In India, video consultations are emerging as a critical tool to bridge healthcare access gaps between urban and rural areas. Recent studies highlight telemedicine's role in emergency care by enabling remote specialist consultations, facilitating rapid triage, and supporting patient management during critical events.

Benefits of Video Consultation in Emergency Care

Bridging Gaps in Rural Healthcare Access

A review assessed the impact of video consultations on improving emergency response times and outcomes for patients in remote areas. The study focused on tele-emergency services where general practitioners in rural clinics used video consultations to consult with emergency medicine specialists in urban hospitals. This approach reduced transport times and allowed patients to receive critical interventions, such as thrombolysis for stroke, locally. The study reported a decrease in patient transfer rates and an improvement in time-to-treatment for rural stroke patients, indicating the effectiveness of telemedicine in improving emergency outcomes in remote settings[3]. Curfman *et al*. (2022) conducted a study in the rural regions of Alberta, focusing on pediatric emergency care. The study demonstrated that video consultations allowed local clinicians to connect with pediatric emergency specialists, improving diagnosis accuracy and care quality. Video consultations also enhanced parental satisfaction by avoiding the need for long-distance travel to tertiary care centres. This study reported that 80% of cases were managed without transfer to urban centres, emphasizing the utility of video consultations in rural pediatric emergency care[4].

In India, where approximately 65% of the population resides in rural areas, video consultations can alleviate the gap in emergency care access. In rural regions, limited availability of emergency services often results in delays that compromise patient outcomes. Video consultations enable rural clinics and community health centres to access specialist advice in real-time, helping local healthcare providers initiate timely treatment. Hospitals without in-house specialists, video consultations enabled general practitioners to consult remotely with specialists, leading to more accurate diagnoses and treatment plans. This will reduce referral rates to urban tertiary care centres, allowing rural hospitals to manage cases locally more effectively, a reduction in

unnecessary patient transfers and improved patient satisfaction. Additionally, by using teleconsultation, rural hospitals could stabilize patients before transfer when transfers were needed, significantly improving the chances of positive outcomes[5].

Alleviating Urban Emergency Department Burden

Urban hospitals, particularly those in metropolitan cities, face an overwhelming influx of patients in emergency departments (EDs). By triaging cases through video consultations, hospitals can streamline in-person visits and reduce overcrowding, ensuring critical cases receive prompt attention[6] By conducting video consultations for triage, it will reduce ED crowding and shorten waiting times. Video triage allowed lower acuity cases to receive virtual consultations, reserving in-person resources for high-acuity cases, reduction in ED congestion, with a significant decrease in wait times for both virtual and in-person patients. Also increase in patient satisfaction, as virtual consultations reduced time spent in crowded waiting areas.

Enhancing Access to Specialist Consultations

India faces a shortage of emergency medicine specialists, with most available resources concentrated in urban centres. Video consultations help connect patients with specialists, such as cardiologists and neurologists, in real-time, which is especially valuable for time sensitive conditions like stroke and acute myocardial infarction.

The Telemedicine Practice Guidelines (2020) emphasize that health emergencies typically require in-person or face-to-face consultations for immediate and comprehensive management. However, telemedicine, including video consultations (VC), plays a critical adjunctive role in addressing urgent healthcare needs, especially in situations where in-person care may not be immediately accessible.

Role of Telemedicine in Emergencies:

Triage and Initial Assessment

Telemedicine enables healthcare providers to conduct a preliminary evaluation of the patient's condition. Through VC, physicians can assess symptoms, vitals (if monitored), and the urgency of care required. This assists in prioritizing patients for in-person interventions.

Guidance During Transport: In rural or remote areas where emergency services may take time to arrive, telemedicine allows healthcare professionals to guide caregivers or first responders on immediate life-saving measures until the patient reaches a healthcare facility.

Continuity of Care in Non-Critical Situations: Not all emergencies demand immediate hospitalization. Telemedicine can help manage non-critical cases by offering prescriptions, follow-up advice, or recommending the nearest appropriate care center.

Specialist Access: During emergencies, VC facilitates consultations with specialists who may not be physically available. This is particularly important for conditions like strokes or cardiac events, where timely specialist input can significantly improve outcomes.

Pandemic and Disaster Scenarios: In public health crises, such as the COVID-19 pandemic, where physical access to healthcare facilities is restricted or overwhelmed, telemedicine plays a vital role in managing and monitoring emergency and non-emergency cases.

The eSanjeevani platform, developed under the Ministry of Health and Family Welfare (MoHFW), Government of India, exemplifies how telemedicine is integrated into the healthcare system. Through its two models eSanjeevani OPD and eSanjeevani AB-HWC patients can consult certified medical professionals remotely, including in emergency like situations where immediate guidance or triage is needed. The platform has been instrumental in connecting patients in rural areas with qualified healthcare providers, ensuring timely interventions, and mitigating the burden on tertiary care centers.

Thus, while telemedicine is not a replacement for in-person care in emergencies, it serves as a critical tool for bridging healthcare access, enabling early intervention, and supporting the continuum of care[2].

Challenges in Emergency Video Consultation

Technical Limitations and Digital Divide

One major challenge is the variability in access to technology. Patients in remote or low-income settings may lack stable internet connections or compatible devices, impacting their ability to participate in VCs effectively.

Despite improvements in digital infrastructure, reliable internet connectivity remains a challenge in rural India, affecting the feasibility of video consultations. Poor connectivity can disrupt consultations, compromising diagnostic accuracy and patient-provider communication[7]. Additionally, many patients, especially in rural areas, lack access to devices like smartphones, which limits their ability to engage in video consultations.

Language and Cultural Barriers

India's linguistic diversity poses a unique challenge in healthcare communication. Emergency consultations often involve complex medical instructions, and the absence of interpreters or multilingual medical staff can lead to misunderstandings. Furthermore, cultural norms regarding healthcare practices can impact how patients approach virtual consultations, making it essential to tailor telemedicine protocols to suit local contexts[8]. Miscommunication was a significant barrier, especially in regions with high linguistic diversity. Healthcare providers noted that patient understanding was often compromised due to the lack of interpreters or multilingual staff. The study suggested that telemedicine platforms should consider incorporating language support or translation services to overcome these barriers. It recommended the recruitment of multilingual healthcare providers and the development of standardized, easily understandable visuals for use during emergency video consultations[8].

Privacy and Regulatory Compliance

Video consultations raise concerns about data privacy and patient confidentiality. Although healthcare providers employ encrypted platforms, breaches can occur, leading to potential violations of healthcare privacy regulations[9]. The absence of a comprehensive digital privacy law in India, coupled with the sensitive nature of emergency consultations, raises concerns about data security and compliance. Although the 2020 guidelines include some privacy measures, enforcement and monitoring remain challenges in decentralized healthcare systems[2].

Diagnostic Limitations

The lack of physical presence restricts physicians' ability to conduct comprehensive examinations, posing a risk in accurately diagnosing conditions requiring physical assessment. For instance, conditions that benefit from tactile assessment or detailed imaging may not be suitable for VCs, underscoring the need for stringent triage processes.

Applications of Video Consultation in Emergency Medicine

Triage and Acute Assessment

Video consultations are increasingly utilized for remote triage, enabling healthcare providers to assess the severity of cases before patients arrive at the emergency department. This allows prioritization of urgent cases, optimizing emergency resources[10].

Specialized Remote Consultations

Emergency VCs facilitate specialist consultations, such as neurology for stroke or cardiology for suspected heart attacks, which can significantly improve patient outcomes. Studies show that remote neurological assessments via VCs have helped decrease the door-to-needle time for stroke patients receiving thrombolysis[3]. Video consultations have been shown to significantly enhance stroke care in rural hospitals by connecting them with specialized stroke centers. This approach enables timely assessments and administration of thrombolysis within the optimal treatment window. The use of video consultations improves patient outcomes, including increased survival rates and reduced post-stroke disability, while also minimizing delays caused by the need for travel to urban centers. This method demonstrates high efficacy in managing time-sensitive emergency conditions[3].

Mental Health Emergency Interventions

Video consultations have played a crucial role in managing emergency mental health cases, particularly during periods of heightened demand for services. Mental health teams have effectively used video consultations to support patients experiencing acute psychiatric crises, providing counseling, medication adjustments, and referrals. This approach has significantly reduced the number of patients visiting emergency departments for mental health crises and improved patient safety by offering immediate support. Many patients have also reported feeling better prepared to manage crises due to the timely intervention facilitated by remote consultations[11]. Organizations like

the National Institute of Mental Health and Neurosciences (NIMHANS) have developed telepsychiatry platforms, providing emergency mental health support to patients experiencing acute crises, to address the increased mental health needs during the COVID-19 pandemic. This program provided video consultations for emergency mental health crises, especially in areas with limited access to psychiatric care[2].

Recent Advances and Future Directions

Government Initiatives and Public-Private Partnerships

The Indian government has introduced initiatives like the eSanjeevani platform, a nationwide telemedicine service, to bring healthcare services to remote areas. These initiatives, when integrated with video consultations for emergency care, hold the potential to standardize and expand access. Collaboration with private telemedicine providers can also support scaling up these services[2].

Wearable Technologies and Remote Monitoring

Wearables such as heart rate monitors and pulse oximeters enable more comprehensive assessments during VCs. These devices allow real-time data collection, making remote emergency assessments more accurate and actionable[12]. The growing use of affordable wearable devices like blood pressure monitors and pulse oximeters in India allows for more comprehensive patient monitoring during video consultations. These devices are especially valuable in managing chronic emergencies, such as hypertensive crises. The patients with chronic conditions were equipped with wearables that transmitted real-time vitals during video consultations, such as blood pressure and oxygen saturation. Patients with wearables had more accurate assessments of their conditions, which may lead to better treatment decisions. This technology showed potential in managing chronic emergency cases, allowing patients in rural areas to access consistent monitoring without frequent hospital visits.

Integration of Artificial Intelligence (AI) and Machine Learning

Emerging technologies like AI-driven diagnostic tools are enhancing video consultations by providing predictive analytics and diagnostic support. Algorithms can aid in triage, suggesting probable diagnoses based on symptom patterns and risk factors[13].

CONCLUSION

Emergency video consultations have reshaped acute care, offering timely support to patients and addressing specialist shortages. While challenges like diagnostic limitations, connectivity issues, language barriers, and digital inequality persist, advancements in AI, wearable technology, and government-led initiatives in India offer solutions to overcome these hurdles. Studies in India highlight how telemedicine reduces referral rates, improves specialist access, and optimizes emergency department workflows, underscoring its potential impact. By focusing on research, tailored technology integration, and supportive policies, emergency video consultations could significantly transform emergency care across India's diverse regions, fostering equitable and efficient healthcare access.

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