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Clinical Outcomes and Resource Efficiency of a Telehealth Model for New Lower Gastrointestinal Bleeding Referrals: A Tertiary Colorectal Outpatient Service Audit

Introduction: The COVID-19 pandemic accelerated the adoption of telehealth in surgical disciplines, including colorectal care. This study audited the clinical effectiveness and resource implications of a dedicated telephone-based outpatient model for new lower gastrointestinal (LGI) bleeding referrals at a tertiary colorectal unit, while also exploring the potential future integration of Artificial Intelligence (AI) in enhancing diagnostic accuracy and triage processes.

Methods: A retrospective audit was conducted on patients referred to the Per Rectal (PR) Bleeding Telehealth Clinic at Northern Hospital, Victoria, from July 2021 to June 2023. Newly referred patients were included; those previously seen or awaiting procedures were excluded. Sensitivity, specificity, and ROC curve analyses evaluated the model's diagnostic performance. A cost-efficiency assessment was also performed. Additionally, the study outlines how future iterations of this telehealth model may benefit from AI-supported triaging tools, such as natural language processing (NLP)-based symptom extractors and machine learning algorithms trained on referral and outcome datasets.

Results: Of 239 referrals, 131 met inclusion criteria, with a 96% compliance rate. The telehealth model demonstrated 75.76% sensitivity and 52.46% specificity for identifying colorectal pathologies. Median time to first appointment dropped from 19 to 3.6 weeks post-implementation. Cost-benefit analysis showed reduced overheads with sustained service continuity. AI-enhanced tools could further improve diagnostic precision by analyzing structured and unstructured referral data to support clinician decision-making, reduce unnecessary endoscopies, and personalize patient pathways.

Conclusion: Telehealth is a clinically effective and resource-efficient adjunct for managing new LGI bleeding referrals. Integration of AI technologies holds promise for refining triage accuracy, minimizing delays, and supporting sustainable hybrid care models. Future research should explore the deployment of AI-driven decision support systems to complement clinician judgment in telehealth consultations.

Keywords: Telehealth, colorectal triage, AI in healthcare, lower gastrointestinal bleeding, NLP, outpatient services, COVID-19, virtual clinic.

Biography: Zainab Naseem is affiliated with the University of Sydney, Australia, where she is involved in academic and research-related activities. Her work reflects a strong commitment to advancing knowledge within her field while contributing to scholarly development and collaborative initiatives at the university. Zainab continues to build her expertise through research engagement, academic learning, and participation in professional development opportunities.