World Academy of Science, Engineering and Technology
International Journal of Medical and Health Sciences
Vol:18, No:04, 2024

Impact of Primary Care Telemedicine Consultations On Health Care Resource Utilisation: A Systematic Review

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Abstract : Background: The adoption of synchronous and asynchronous telemedicine modalities for primary care consultations has exponentially increased since the COVID-19 pandemic. However, there is limited understanding of how virtual consultations influence healthcare resource utilization and other quality measures including safety, timeliness, efficiency, patient and provider satisfaction, cost-effectiveness and environmental impact. Aim: Quantify the rate of follow-up visits, emergency department visits, hospitalizations, request for investigations and prescriptions and comment on the effect on different quality measures associated with different telemedicine modalities used for primary care services and primary care referrals to secondary care Design and setting: Systematic review in primary care Methods: A systematic search was carried out across three databases (Medline, PubMed and Scopus) between August and November 2023, using terms related to telemedicine, general practice, electronic referrals, follow-up, use and efficiency and supported by citation searching. This was followed by screening according to pre-defined criteria, data extraction and critical appraisal. Narrative synthesis and metanalysis of quantitative data was used to summarize findings. Results: The search identified 2230 studies; 50 studies are included in this review. There was a prevalence of asynchronous modalities in both primary care services (68%) and referrals from primary care to secondary care (83%), and most of the study participants were females (63.3%), with mean age of 48.2. The average follow-up for virtual consultations in primary care was 28.4% (eVisits: 36.8%, secure messages 18.7%, videoconference 23.5%) with no significant difference between them or F2F consultations. There was an average annual reduction of primary care visits by 0.09/patient, an increase in telephone visits by 0.20/patient, an increase in ED encounters by 0.011/patient, an increase in hospitalizations by 0.02/patient and an increase in out of hours visits by 0.019/patient. Laboratory testing was requested on average for 10.9% of telemedicine patients, imaging or procedures for 5.6% and prescriptions for 58.7% of patients. When looking at referrals to secondary care, on average 36.7% of virtual referrals required follow-up visit, with the average rate of follow-up for electronic referrals being higher than for videoconferencing (39.2% vs 23%, p=0.167). Technical failures were reported on average for 1.4% of virtual consultations to primary care. When using carbon footprint estimates, we calculate that the use of telemedicine in primary care services can potentially provide a net decrease in carbon footprint by 0.592kgCO2/patient/year. When follow-up rates are taken into account, we estimate that virtual consultations reduce carbon footprint for primary care services by 2.3 times, and for secondary care referrals by 2.2 times. No major concerns regarding quality of care, or patient satisfaction were identified. 5/7 studies that addressed cost-effectiveness, reported increased savings. Conclusions: Telemedicine provides quality, cost-effective, and environmentally sustainable care for patients in primary care with inconclusive evidence regarding the rates of subsequent healthcare utilization. The evidence is limited by heterogeneous, small-scale studies and lack of prospective comparative studies. Further research to identify the most appropriate telemedicine modality for different patient populations, clinical presentations, service provision (e.g. used to follow-up patients instead of initial diagnosis) as well as further education for patients and providers alike on how to make best use of this service is expected to improve outcomes and influence practice.

Keywords : telemedicine, healthcare utilisation, digital interventions, environmental impact, sustainable healthcare
Conference Title : ICTTT 2024 : International Conference on Telecare, Telehealth and Telemedicine
Conference Location : Athens, Greece
Conference Dates : April 04-05, 2024