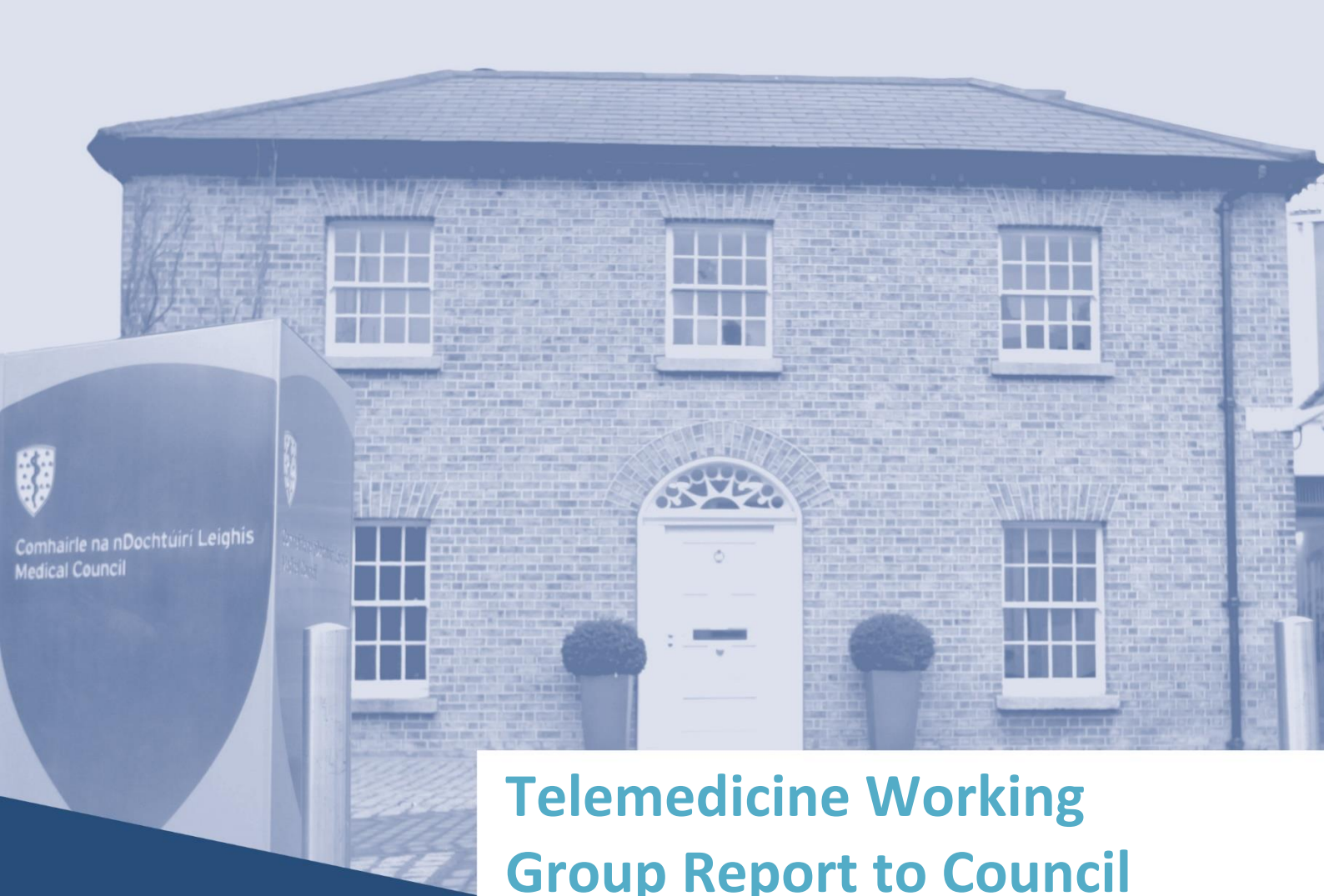




Telemedicine Working Group Report to Council

Appendix B

A systematic search of the literature observing the positive and negative aspects associated with telemedicine in 2020



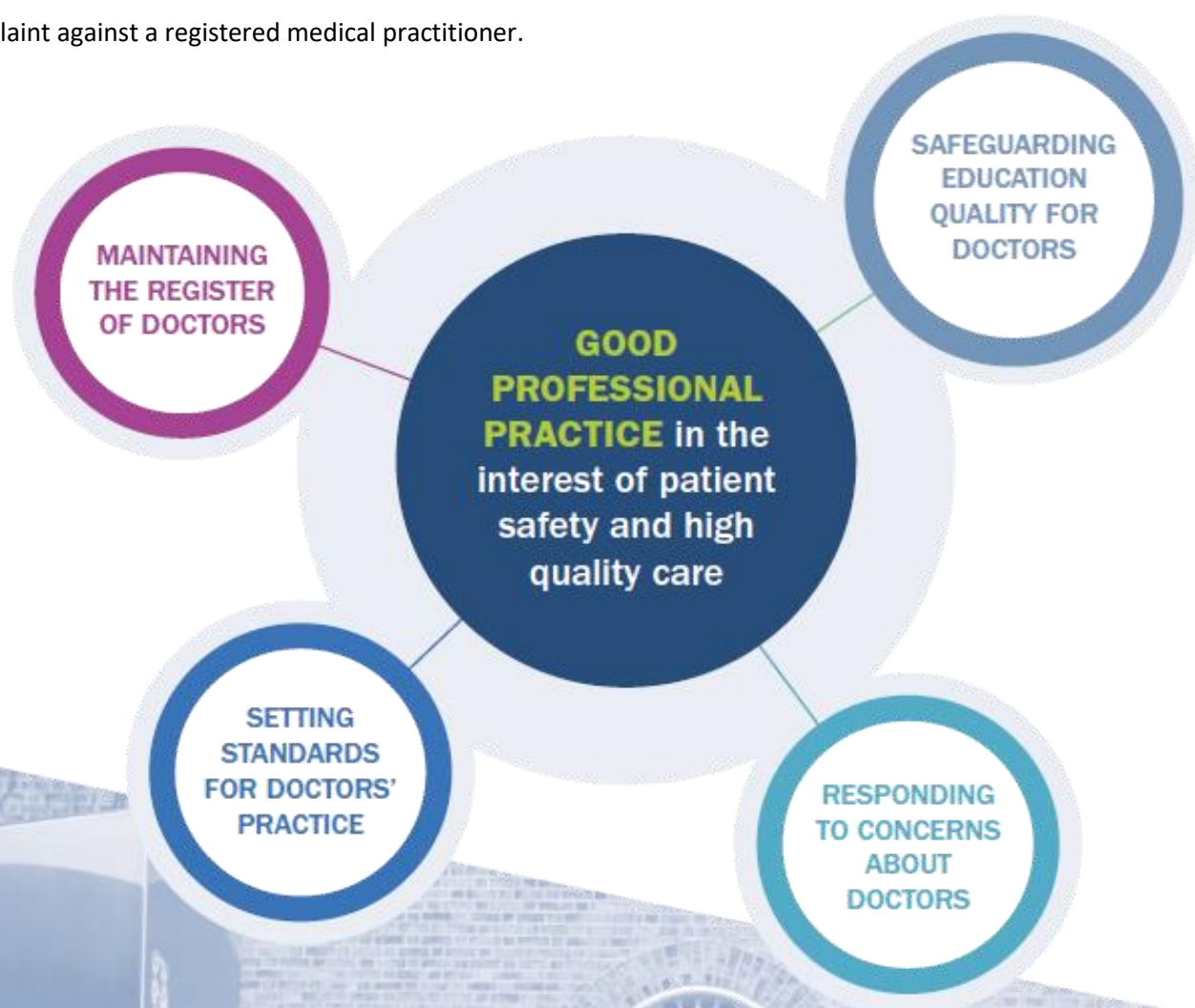
Comhairle na nDochtúirí Leighis
Medical Council

About the Medical Council

The Medical Council is the regulatory body for doctors. It has a statutory role in protecting the public by promoting the highest professional standards amongst doctors practising in the Republic of Ireland.

The Council has a majority of non-medical members. The 25-member Council consists of 13 non-medical members and 12 medical members. The Council receives no State funding and is funded primarily by doctors' registration fees.

The Medical Council maintains the Register of Medical Practitioners - the Register of all doctors who are legally permitted to carry out medical work in Ireland. The Council also sets the standards for medical education, training, and lifelong learning of registered medical practitioners in Ireland. It is charged with promoting good medical practice and provides professional and ethical guidance. The Medical Council is also where the public, profession and services may make a complaint against a registered medical practitioner.



Contents

Introduction	3
Search Strategy.....	5
Thematic Analysis	7
Efficacy	7
Minimising contact.....	9
Connecting rural and disadvantaged communities	10
Accessibility	10
Cost	11
Future direction	11
Conclusion	13
References.....	15

Introduction

In a time when the medical advice is to self-isolate if symptomatic with Coronavirus disease 2019 (COVID-19) and to practice social distancing in an attempt to avoid the spread, the use of telemedicine as a form of treatment is more prevalent. Telemedicine is a term coined in the 1970s, meaning 'healing at a distance' (Strehle & Shabde, 2006). Contemporaneously, it often signifies the use of ICT to improve patient outcomes by increasing access to care and medical information. As per the World Health Organisation (WHO), telemedicine is defined as "the delivery of health care services, where distance is a critical factor, by all health care professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interests of advancing the health of individuals and their communities" (WHO, 2010, p 9). The WHO (2010) determined that telemedicine fulfils four key purposes, including:

1. Providing clinical support;
2. Overcoming geographical barriers, connecting users who are not in the same physical location;
3. Using of various types of ICT;
4. Improving health outcomes.

The WHO (2010) also offer a distinction between telemedicine and telehealth. Telemedicine is restricted to service delivery by physicians, while telehealth is deemed to include services provided by health professionals in general (including nurses, pharmacists, and others). Telemedicine, telehealth and virtual care are used interchangeably and synonymously in the literature (WHO, 2010).

This report is presented against the backdrop of a global pandemic which has led to significant limitation of physical human interaction in Ireland and internationally. COVID-19 was identified in Wuhan, China, in December 2019. The WHO declared COVID-19 a Public Health Emergency of International Concern on the 30th January, 2020, before upgrading it to a global pandemic on the 11th of March. At the time of writing, living with COVID-19 is very much a part of day-to-day life, requiring the medical profession to put in place measures that ensure patients receive treatment, while avoiding in-person visits and face-to-face consultations.

As the regulatory body for doctors, the Medical Council has a statutory role in protecting the public through promoting the highest professional standards amongst doctors. A Telemedicine Working Group was established by the Medical Council in 2019 to report to Council on recommendations on Telemedicine. The purpose of the working group was set out in its terms of reference and included examining issues relating to telemedicine, both commercial and non-commercial.

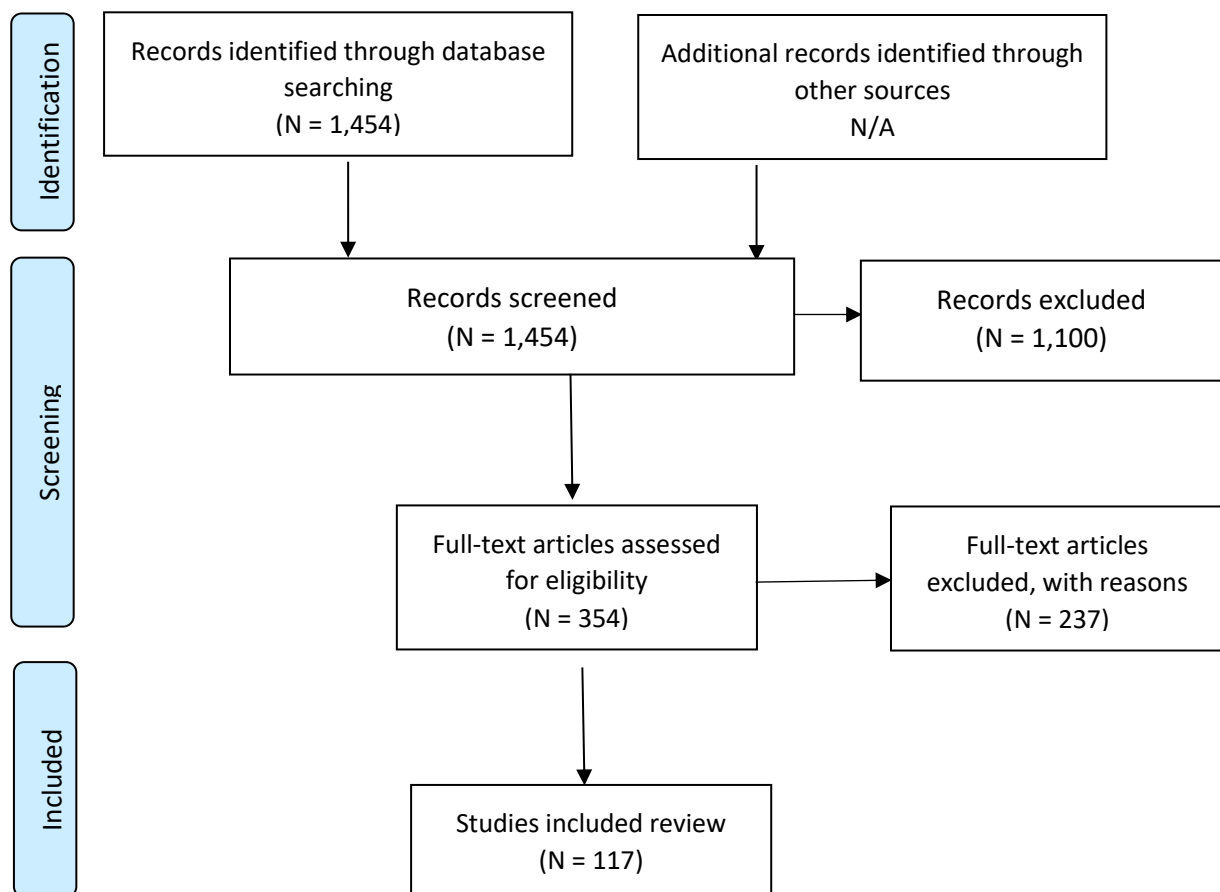
The terms of reference were amended to also seek to take into consideration developments in telemedicine that have occurred in light of the COVID-19 pandemic.

The group aimed to produce a position paper on the uses of telemedicine with recommendations for the Council, the Ethics Committee (not guidance, but information to be used when reviewing the Ethical Guide), the RCPC, the PPC, the Department of Health, the Minister for Health, Sláintecare, postgraduate training bodies and any other stakeholder group identified during the work of the group. This position paper, subject to Council approval, would also be published on our website, the group will also prepare a guide for patients on the uses of telemedicine and a guide for doctors.

To inform this, the group wished to examine the methods of telemedicine utilised in other jurisdictions. The group additionally sought to examine issues relating to registration, provision of service, our ethical guidance, an international review, positive uses of telemedicine, telemedicine use in practice, telemedicine between patients and consultants (with or without GPs) and other issues deemed relevant in the initial scoping phase of the group's lifespan. To best support the group in reaching these aims, the research department of the Medical Council's executive utilised a systematic approach to reviewing literature regarding the positive and negative aspects associated with telemedicine following the outbreak of COVID-19.

Search Strategy

A systematic approach to searching the literature was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The PRISMA statement provides a framework for conducting a comprehensive and reproducible review of research studies on a topic. Pubmed, JAMA, EBSCO and the BMJ databases were searched using the search terms 'telemedicine', 'telehealth' and 'virtual care'. Articles included in the review included those written in English and addressing the subject matter of positive and/or negative aspects of telemedicine delivery. Only articles published between the 31/12/2019 and 06/08/2020 were considered for review. A total of 1,454 articles were retrieved. Following analysis of titles and abstracts, 354 articles were considered for review. Two-hundred and thirty-seven (N = 237) articles were excluded for not meeting the inclusion criteria, leaving a total of 117 studies for inclusion. A PRISMA flow diagram provides graphical representation of citations reviewed and decisions made.



Of the 117 studies analyzed, 59 were reviews of the literature, including literature reviews (N = 28), systematic reviews (N = 27), scoping reviews (N = 3) and one meta-analysis (1).

Twenty-four of the studies accessed used qualitative methods (N = 24), sixteen studies used quantitative methods (N = 16), twelve were cross-sectional studies (N = 12), five of the studies accessed used mixed methods (N = 5) and one article was a case study (N = 1).

Thematic Analysis

A thematic analysis of identified articles was conducted. The key themes across the literature regarding the positive and negative aspects of telemedicine included:

- Efficacy;
- Minimising contact;
- Connecting rural and disadvantaged communities;
- Accessibility;
- Cost;
- Future direction.

Efficacy

Sixty-one of the studies accessed referenced the efficacy of telemedicine, with overwhelming consensus that telemedicine is effective in a number of settings, including diabetes care (Duruturk, 2020; Fatyga et al., 2020; Ghosh et al., 2020), cardiometabolic diseases (Cheikh-Moussa et al., 2020), osteoporosis management (Paskins et al., 2020), ALS symptom management (Haulman et al., 2020), urological conditions (Tamayo et al., 2020; Novara et al., 2020), epilepsy (Panda et al., 2020; Conde-Blanco et al., 2020; Sattar et al., 2020), aftercare for patients with heart failure (Zhu et al., 2020), therapy (Hilty et al., 2020) retinopathy (Ullah et al 2020), dentistry (Ghai et al., 2020), many musculoskeletal conditions (Cottrell et al., 2020) and physical rehabilitation (Salawu et al., 2020; Negrini et al., 2020). The application of telemedicine is best summarised by Roncero et al., (2020), who concluded that it is beneficial for patients with any kind of disorder.

From a patient perspective, satisfaction with telemedicine was predicted by factors such as ease of access (Elliot et al., 2020; Bianchi et al., 2020) and effective scheduling (Daggubati et al., 2020). Patients also noted that key aspects of medical communication, particularly skills that demonstrate patient-centred relationship building, were further predictive of effective virtual care (Elliot et al., 2020). O'Cathail et al., (2020) observed that patients were keen to engage with virtual care, particularly as an option to support traditional care models. Cheng et al., (2020) argued that telemedicine facilitated accessible and timely consultations without compromising the quality of care, adding that patients self-rated their experiences as 'excellent'. This satisfaction was further echoed by Daggubati et al., (2020) who advised that telemedicine is possibly preferential for the future of patients receiving neuro-oncological care. Virtual care was predictive of patients becoming more engaged with their treatment, with Klösch et al., (2020) observing that patients who used virtual care reported that it had a positive influence on their state of health and understanding of their care. In addition, Basit et al., (2020) argued that telemedicine may improve medication adherence, while Almathami et al., (2020) also observed that virtual care encouraged patients to become more active in their treatment.

From a clinician perspective, it was broadly agreed that telemedicine facilitates effective communication between clinician and patient, with Entezarjou et al., (2020) determining that virtual care is a useful communication tool especially when combined with usual care. In addition, Panda et al., (2020) observed that 96% caregivers were satisfied with the quality of medical advice they were able to provide using virtual care. The use of virtual care also enables the establishment of the clinician-patient relationship without a previous in-person encounter (Elliot et al., 2020), while facilitating flexibility in the clinician's the working day (Olwill et al., 2020). Telemedicine was regarded as efficient from the clinician's perspective, with no associated increased workload when compared to face-to-face consultations (Smrke et al., 2020), though Helou et al., (2020) noted that there exists scepticism as to the practicability of telemedicine from a surgical standpoint.

Five of the studies assessed the efficacy of virtual care with respect to patients receiving treatment for mental ill-health. In a sample of patients undergoing therapy for opioid use, Guille et al., (2020) determined that those receiving virtual care were less likely to relapse compared to those who experienced in-person care. Place et al., (2020) argued that, in a sample of patients experiencing depressive symptoms, those who accessed a mobile monitoring system, with clinician access, presented with a significant improvement in depressive symptoms and psychological health compared to patients receiving usual care. Büscher et al., (2020) expanded, adding that Internet-CBT interventions are associated with significant reductions in suicidal ideation compared with usual care conditions. The authors concluded that internet-CBT interventions have the potential to reduce suicide mortality, taking into consideration their potential scalability (Büscher et al., 2020). Roberge et al., (2020) also noted that, in a sample of patients with a self-harm diagnosis, those who had access to virtual care experienced much fewer follow-up encounters compared to the usual care group, though not in a manner that was statistically significant. In a sample of care-givers supporting patients with advanced heart failure, Dionne-Odom et al., (2020) observed that quality of life, measured using the 15-item Bakas Caregiving Outcomes Scale (BCOS), improved in those who had access to virtual care compared to the control group who did not.

Elsewhere, there were contradictory findings as to whether the use of telehealth improves symptom management and perceived quality of life (Steindal et al., 2020). Challenges with diagnosis were described, particularly with phone consultations (Olwill et al., 2020) and evidence regarding the usability and effectiveness of teleophthalmology for the elderly population was found to be lacking (Fatehi et al., 2020). Additionally, there were concerns that virtual care may diminish the therapeutic alliance between patient and clinician, with Costanzo et al., (2020) advising that the use of telemedicine may have a negative emotional impact on patients due to the lack of face-to-face contact, thereby negatively impacting therapeutic effectiveness. The impact of a lack of face-to-face interaction was explored by Endler et al., (2020) who observed distress in women accessing non-interactive abortion medication services, relating to a lack of medical guidance. Conde-Blanco et al., (2020) suggested that extended exposure to telemedicine, appropriate patient selection and treatment appropriate to the patient's presentation may improve results and patient and physician satisfaction. Furthermore, there are significant gaps in the literature relating to the benefits of using telemedicine in populations with

hearing, cognitive, or visual impairments and in those with limited health literacy (Paskins et al., 2020). Almathami et al., (2020) also acknowledged that patients who preferred face-to-face consultation showed resistance to online consultation.

Minimising contact

Twenty-seven of the studies identified referenced the effects of minimising patient contact. As per Sorensen et al., (2020), the public perception of telemedicine in a U.S. digitally literate cohort is that it is an acceptable substitute for in-person visits. Bleyel et al., (2020) underlined the need to minimize technical disruptions during video consultations and to ensure optimal resemblance to face-to-face settings. Dijkstra et al., (2020) argued that eHealth and telemedicine are 'essential' for effective patient care given the current implications regarding lack of physical human contact. This was echoed by Monaghesh et al., (2020), who reiterated that virtual care will be an important tool in caring services in the future, ensuring patient safety through minimising contact during the COVID-19 outbreak. This was reinforced by Mann et al., (2020) who observed an 80% decline in face-to-face consultations since the outbreak of COVID-19 in March and separately by Barney et al., (2020), who observed that telemedicine represented 97% of patient encounters in the month of April, such was the uptake of telemedicine.

Rodriguez-Socarrás et al., (2020) observed that telemedicine facilitates clinical support at a distance, thereby assuring continuity of care (Boehm et al., 2020; Loeb et al., 2020), limiting the risk of viral transmission (Al-Shamsi et al., 2020; Fieux et al., 2020) while also reducing the burden placed on hospitals (Bokolo et al., 2020; Lie et al., 2020). The potential reduction of face-to-face consultation was identified by Vecchione et al., (2020) Hashim et al., (2020), Catanese et al., (2020), Singh et al., (2020) and Sutherland et al., (2020) as a benefit to telemedicine, with the elimination of viral transmission cited as the main benefit by each. Bhatia et al., (2020) and Rodriguez-Socarrás et al., (2020) both identified that telemedicine minimises unnecessary care, while Aguilera et al., (2020) observed that virtual care affords the opportunity for clinicians to immediately disseminate information. These benefits are further highlighted when observing the practice of contacting and evaluating a patient when they present with 'persistent unfavourable changes' in their monitoring parameters by telehealth, as outlined in Halatchev et al., (2020). Colombo et al., (2020) put forth the potentiality for a hybrid model of care for physical testing, arguing that the feasibility for conducting blood tests at a remote location or at the patients' home be explored. Xu et al., (2020) expanded, adding that the continuous monitoring of a patient's key symptoms through virtual care reduces the risks of delayed hospitalization due to disease progression for patients with COVID-19 quarantined at home.

The potential damage to the patient-doctor relationship was highlighted by Babbage et al., (2020), with Jiménez-Rodríguez et al., (2020) arguing that the use of telemedicine can potentially create a perceived psychological distance between clinician and patient. Babbage et al., (2020) added that while virtual care may create a perceived gap between the clinician and the patient, the use of virtual care is predictive of patients making independent health care decisions

due to the perceived distance, while acknowledging that the use of technology can make care more accessible, increase patient autonomy of their healthcare and provide peer-support for people with health issues (Babbage et al., 2020).

Connecting rural and disadvantaged communities

Virtual care was described by Schwamm et al., (2020) as collapsing ‘the barriers of time and distance’, increasing availability and savings in terms of cost and time. Indeed, Jnr (2020), Lavin et al., (2020), Lapointe et al., (2020), Aguilera et al., (2020) observed that virtual care afforded additional benefits to those in rural regions. Lavin et al., (2020) expanded on this, adding that telehealth services and virtual clinics offer accessible disease management pathways for patients living in health resource limited areas. Gohari et al., (2020) concluded that travel could be reduced by a minimum of 26.5% and a maximum 85% for those in rural communities. Contreras et al., (2020) anticipate that telemedicine will mature due to the proliferation of interconnected consumer health devices and high-speed 5G data connectivity in the coming decade, representing a distinct disadvantage to those without access to such resources. Babbage et al., (2020) specifically referenced that access to technology can be limited in rural communities. In two separate studies led by Tao, telemedicine was observed to improve the delivery of services to people living in remote and poverty areas (Tao et al., 2020), while separately observing that virtual health can help solve regional disparities and address the shortage of health personnel for those living in remote areas, while promoting the homogenisation of healthcare services (Tao et al., 2020). Challenges identified included practical barriers to engagement with telemedicine, with 41.4% of Medicare beneficiaries lacking access to a desktop or laptop computer with a high-speed internet connection at home, while a further 40.9% lacked a smartphone with a data plan enabling internet access (Roberts et al., 2020). Reed et al., (2020) echoed this, adding that patients who chose to use telemedicine were more likely to live in neighbourhoods with high rates of residential internet access in a manner that was statistically significant when compared to patients whose neighbourhoods had low internet access.

Accessibility

Two individual barriers were identified regarding accessibility, including privacy and familiarity with technology. In addition, it was observed that privacy was a concern for a younger cohort, while familiarity with technology was a concern primarily for an older cohort. Singh et al., (2020) acknowledged that widespread use of telemedicine and emerging apps has the potential to lead to data privacy breaches. They advise balancing the dual principles of erring on the side of collecting and using data conducive to the protecting of lives, while cautiously working to prevent the potential for abuse by developing new rules and regulations against the misuse of these data, particularly during times of public health emergencies (Singh et al., 2020). The issue of privacy was identified as an issue for younger patients by Blower et al., (2020). In their scoping review, Blower et al., (2020) concluded that young people’s main concerns with telemedicine related to the privacy, reliability and trustworthiness of technology accessing information. This concern was similarly

expressed by Sutherland et al., (2020) from a health professional's perspective and reaffirmed by Ye et al., (2020) who determined that it was critical to establish security and privacy protecting systems to protect against patient information leakage. By way of avoiding any such complications, Sutherland et al., (2020) advised that any software employed utilise the highest level of security to ensure the confidentiality of patient appointments.

Reed et al., (2020) also observed that patients aged 65 years and over were less likely than patients aged 18 to 44 years to choose telemedicine. In a separate study, Lam et al., (2020) observed that 32% of older adults were unwilling to use technology, even those who had access to support in setting up a video visit. For older patients, Lam et al., (2020) observed that telephone was the preferred method of contact, with 20% of older patients unwilling to be contacted via telephone. Upon evaluation, Lam et al., (2020) acknowledged that the primary barriers to engaging with virtual care in older adults included difficulties with hearing and communicating, while 38% of older patients were unwilling to use telemedicine owing to inexperience with technology.

Cost

Fourteen studies identified referenced finance, with Schwamm et al., (2020), Hazenberg, et al., (2020), Laferriere et al., (2020), Bianchi et al., (2020) and Smrke et al., (2020) making direct reference to the savings associated with travel. When compared to face-to-face care, Schieltz et al., (2020) observed that telehealth services predicted similar reductions to deleterious health behaviour in patients, at a significantly lower cost while Vidal-Alaball et al., (2020) also determined that telemedicine was effective and able to provide efficient care at a lower cost. Through randomised control trial, Vestergaard et al., (2020) observed that the use of telemedicine reduces total healthcare costs by 35%.

Jnr (2020) referenced 'the wide availability of telemedicine' as another positive aspect. This is contradicted by Ullah et al., (2020) who determined that telemedicine was not readily available to those living in low socioeconomic regions. This was further reinforced by Babbage et al., (2020), who argued that, while technology can reduce the cost of healthcare for some, the costs associated with installing, maintaining, and servicing certain technology can be prohibitive to a private individual. From a preoperative standpoint, Bridges et al., (2020) determined it was unclear whether virtual care would be financially favourable for hospital systems, due to factors such as the institution's needs, patient population and surgical cancellation rate.

Future direction

Five studies referenced the future directions in care that telemedicine could shape and support. Lin et al., (2020) determined that utilising a patient-centred streaming system, adaptable to a changing environment, will ensure cataract services evolve into a robust practice model for the future. Gujral et al., (2020) made a similar assertion with respect to diabetes care, arguing that the future of diabetes care may shift toward a hybrid model combining in-person visits and

telemedicine. It is notable, however, that Gujral et al., (2020) followed this statement by underlining the key role that the research community will play in gathering information on the impacts of virtual care on diabetes treatment and outcomes with a view to improving shortfalls in the system as they arise. The importance of research into telemedicine was additionally referenced by two studies with both Vecchione et al., (2020) and Catanese et al., (2020) arguing that diagnostic and therapeutic algorithms must be explored to ensure the highest quality of continued of care. Most notably, irrespective of advancements or perceived advantages, Bianchi et al., (2020) concluded that virtual care should never replace face-to-face visits with a clinician entirely.

Conclusion

The outbreak and continued presence of COVID-19 has necessitated the medical profession re-evaluate the way care is delivered, leading to a widespread use of telemedicine and virtual care. Overwhelmingly, the consensus is that telemedicine is effective across a number of clinical situations. Throughout the literature, it was observed that virtual care facilitates connectivity in disadvantaged communities, minimises face-to-face contact and patient movement, is less costly for patients and clinicians and holds significant potential for expansion and evolution moving forward. Notwithstanding the positive aspects of virtual care that were observed and indeed prominent in literature, concerns were raised regarding patient privacy data sharing. Contradictory evidence was accessed with respect to the impact of virtual care on the patient-clinician relationship, though the majority of articles accessed argued that this relationship was not diminished as a result of using virtual care. More prevalent in the literature, however, was the sentiment that telemedicine should never be an outright replacement for face-to-face consultation in future, instead being observed as part of an overall comprehensive care, while currently minimising any potential spread of COVID-19.

One distinct disadvantage associated with the studies that employed experimental conditions is their use of control and experimental groups. The control group typically received face-to-face care and the experimental group received the telehealth intervention. Currently, patients are advised to avoid in-person care unless necessary, entailing that the conditions under which these experiments were conducted are not reflective of the current climate. However, Conteras et al., (2020) observed a dramatic increase in patients seeking virtual care following the institution of COVID-19 restrictions on in-person clinical encounters, indicating a willingness to engage with virtual methods of care. This patient willingness is more evident when Conteras et al., (2020) detailed that telemedicine utilization was not prominent prior to COVID-19.

In a blog post discussing the future direction of research into virtual care, [Jones and Scott](#) (2020) identified three major questions, including:

1. Can video consultations provide the same quality of communication as face-to-face consultations?
2. Which patient groups will benefit most from video consultations?
3. What solutions are needed to support video consultations in the long-term?

With respect to the quality of communication between patient and clinician, the literature would suggest that it is not diminished as a result of virtual care. However, Jones and Scott (2020) argue that it necessary to understand more about how professionals and patients communicate during video consultations and the extent to which it differs from face-to-face communication.

The literature also suggests that video consultations have an almost universal application, therefore it is perhaps not surprising that Jones and Scott (2020) suggest the clinical cohorts/circumstances in which video consultations are not appropriate be explored. While patient and clinician satisfaction with video consultations was prominent in this review, it must also be noted that they also attached significant value to factors such as the convenience, accessibility and cost effectiveness associated with virtual care. Jones and Scott (2020) warn that these perceived benefits to virtual care are not misconstrued with the quality of the consultation itself.

Moving forward, it is advisable that the observed concerns relating to data sharing and privacy be addressed in a manner that ensures the maintenance and support of patient safety. Furthermore, the technology used in virtual care should be accessible, usable and appropriate to the patient's needs. To that end, it is essential that clinicians, as well as patients, be adequately familiar with the operation and use of the relevant technology. With respect to clinicians, the introduction of standardised platforms and accredited training in the use of virtual methods of care will only serve to protect the patient, while also supporting the clinician's professional development.

The year that was 2020 will be remembered as one of significant societal, political and social upheaval. Nevertheless, the restrictions resultant from the COVID-19 pandemic have necessitated innovation from a variety of fields, including that of medicine. It is therefore imperative that the lessons learned, and the best practice observed, be carried forward and further developed in time, combined with best practice prior to COVID-19, with a view to protecting patients seeking care and supporting doctors in practice.

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