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Final Report: Telehealth Work Package A

Prepared for the Commonwealth Department of Health and Aged Care, Canberra

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Integrity
IMPACT
Innovation

Executive Summary

Introduction

The uptake of telehealth by Australians has been considerable, representing 17.2% of all consultations in 2022. By provider, in 2022, telehealth consultations represented: 21.9% of all GP consultations, 13.7% of specialist consultations, 27.1% of mental health consultations, 28.3% of nurse practitioner consultations and 14.5% of allied health consultations.(1)

In October 2020, The Institute for Evidence-Based Healthcare was contracted by the then-Department of Health, to complete a review of the evidence for the effectiveness, safety and economic impacts of the provision of primary and allied healthcare via telehealth. The Institute completed the Review in February 2021. Since that Review, over two years of additional evidence on the effectiveness and safety of telehealth has been published. The present Telehealth Review therefore aims both to update the findings of the previous review, and to expand its scope with several topics identified as of interest by the Department, by addressing 3 questions:

Question A1. **Updated reviews and new topics**: To update the findings of the previous Telehealth Review, by identifying, assessing the quality of, and synthesising additional evidence that has emerged in the last 2 years, on the topics addressed in the original Telehealth Review (2020-21).

Question A2. **Comparison of telehealth modalities**. To identify, assess the quality of, and synthesise any existing randomised controlled trial and systematic review evidence, comparing telehealth (e.g. video) to telehealth (e.g. phone) provision of care; topic not considered in the original Review.

Question A3. **Special Outcomes**. To identify, assess the quality of, and synthesise any existing randomised controlled trial and systematic review evidence, on the impact of telehealth consultations on the following areas of interest: 1) Changes in the frequency of patient attendance; 2) Escalation to emergency department presentations.

Methods

The systematic reviews and evidence syntheses were reported in compliance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement.(2) The protocol was developed prospectively, and provided to the Department of Health and Aged Care prior to commencement of the reviews. The following databases were searched: PubMed (MEDLINE), Embase, and CENTRAL via the Cochrane Library. The search dates were: for question A1, which updates the evidence from the completion of the original Telehealth Review (2020-21) until the present, the searches were from 18 November 2020 (end-date of the search in original Telehealth Review) until 11 January 2023. For question A2, the search dates were from inception until 10 February 2023. For question A3, the search dates were from inception until 11 January 2023.

Results

Search Results

For **Question A1 (Updated reviews and new evidence comparing telehealth (via telephone or video to face-to-face delivery of care in primary and allied healthcare)**, we identified 564 systematic reviews from databases, 1770 randomised controlled trials from databases, and 255 randomised controlled trials through clinical trial registries. After deduplication and screening, we included 21 new references: 1 overview of 53 systematic reviews; 12 systematic reviews; and 8 randomised controlled trials. The PRISMA flowchart detailing this process is presented in Appendix 5 – PRISMA flow charts (search results and screening process).

For **Question A2 (Comparison of delivery of by one telehealth modality (e.g. videoconferencing) to another telehealth modality (e.g. teleconferencing), in primary and allied healthcare)**, we identified and screened 2571 articles. 16 randomised controlled trials (20 publications) were included in the final review. The PRISMA flowchart detailing this process is presented in Appendix 5 – PRISMA flow charts (search results and screening process).

For **Question A3 (Comparison of telehealth (telephone or video) to face-to-face delivery of care in areas of special interest)**, we rescreened the search results of the original Telehealth Review (2020-21) – a total of 7655 references after deduplication – and we screened the references identified for the present review – 1950 references after deduplication (as described above in Question A1). We included a total of 7 references: 6 RCTs on the topic of changes in frequency of patient attendance and 1 scoping review on the topic of escalation to emergency department. The PRISMA flowchart detailing this process is presented in Appendix 5 – PRISMA flow charts (search results and screening process).

Summary of the evidence and findings, by topic:

The overall findings, by topic, are summarised in Table 1, below.

- **Telehealth**: indicates care provided by telephone and videoconferencing.
- **Teleconferencing**: healthcare provided via telephone.
- **Videoconferencing**: healthcare provided by video technology.

Table 1 Summary of results for questions A1, A2, A3

QUESTION A1. Updated reviews and new evidence comparing telehealth (via telephone or video to face-to-face delivery of care in primary and allied healthcare		
New Topics (not synthesised in 2021)	**Evidence**	**Summarised findings**
CVD management	1 SR	**Key message:** Telehealth-enhanced interventions for CVD management might be effective in improving physical and quality of life. **Context:** 21 meta-analysed studies evaluated multiple interventions, e.g., telerehabilitation, telemonitoring, telephone counselling, text messaging, etc. Live telehealth to face-to-face comparison was not extensively evaluated.
Weight management	1 SR	**Key message:** Telephone and face-to-face consultations were equally effective for both short and long-term outcomes for weight management. **Context:** Included studies evaluated multiple telehealth interventions, e.g., video, telephone, Internet-based, mobile, text messaging. Only 1 study directly compared phone to face-to-face care delivery.
Physiotherapy	1 overview of 53 reviews	**Key message**: In variety of physical therapy areas, mixed quality evidence shows that telerehabilitation appears to be comparable or better than the conventional methods of rehabilitation. **Context**: Of the 53 reviews, 31 compared telerehabilitation vs in-person rehabilitation, and of those, 2 evaluated synchronous studies; remainder evaluated a mix of synchronous and asynchronous telehealth.
Traumatic brain injury	1 SR	**Key message:** Telehealth is acceptable and feasible and can be as effective as face-to-face delivery of care to traumatic brain injury patients. **Context:** Studies evaluated a mix of telehealth interventions, including telephone, online, text messages, videoconferencing. Of 17 included studies, 2 compared telehealth to equivalent face-to-face care.
Updated Topics (synthesised in 2021)	**Evidence**	**Summarised findings**
Diagnostic accuracy and assessments	1 SR of 21 studies and reviews	**Key message:** Diagnostic accuracy requiring history only is similar for telehealth but has limitations when physical examination is necessary. **Context:** Evidence covered 3 areas: (1) diagnosis via history of verbal assessment (no physical examination); (2) planned physical exam or assessment; (3) consultation without preplanned assessment or exam (new presentations). Most studies evaluated preplanned assessments. History taking and verbal assessment can be conducted by telephone, but only some elements of physical examination are sufficiently reliable and valid.
Antibiotic use in Primary Care	1 SR + 1 new study	**Key message:** Antibiotic prescribing may be higher in telehealth (phone, video or mixed) consultations than in face-to-face consultations **Context:** 1 SR (1 RCT, 12 cohort studies) + 1 electronic health record study, for conditions including: sinusitis, pharyngitis, bronchitis, AOM, conjunctivitis and UTIs.

COPD: Exercise Therapy/ Pulmonary rehabilitation	1 SR	**Key message:** Videoconferencing is similarly effective to face-to-face consultations for exercise therapy and pulmonary rehabilitation. **Context:** 1 SR (15 studies); only 1 study compared video to face-to-face exercise therapy in COPD patients with severe COPD.
Musculoskeletal management	1 SR* + 1 RCT	**Key message:** Face-to-face rehabilitation is no different to telerehabilitation (by video or phone) for physical function and pain **Context:** 6 RCTs (SR = 5 + 1 new; 4 video/2 phone), of rehabilitation in preparation for or post-surgery, or in patients with back pain.
PTSD treatment	1 SR* + 3 RCT	**Key message:** Videoconferencing is similarly effective to face-to-face care for PTSD **Context:** 16 RCTs (SR = 13 + 3 new), all US-based, all including veterans or serving military personnel.
Depression treatment	1 SR*	**Key message:** Telehealth (via video- or teleconferencing) is similarly effective to face-to-face psychological treatment of depression **Context:** 9 RCTs (4 phone, 5 video), all US-based, 2/9 RCTs in children or adolescents, rest in adults.
Anxiety disorders treatment	1 SR* + 1 RCT	**Key message:** Telehealth CBT (by video or phone) is similarly effective to face-to-face CBT for patients with anxiety disorders. **Context:** 6 RCTs (SR = 5 + 1 new; 4 video, 2 telephone), in both children and adult populations.
Insomnia treatment	1 updated SR*	**Key message:** Telehealth (by video or phone) is similarly effective to face-to-face care for psychological treatment of insomnia **Context:** 4 RCTs (3 video, 1 phone), all very recent (from 2019 onwards) and all US-based.
Mental health: less common conditions	1 SR* + 1 new RCT	**Key message:** Telehealth psychotherapy (by video or phone) is as effective as face-to-face for most groups **Context:** 13 RCTs (SR = 12 + 1 new), majority evaluating video, for a range of mental health conditions, e.g., addition, eating disorders, childhood mental health and chronic conditions.
Topics unchanged from 2021 Review	**Evidence**	**Summarised findings**
Diagnostic accuracy in primary care: Single consultation	1 RCT	**Key message:** Videoconferencing was less accurate than face-to-face for primary care consultations for children with acute conditions **Context:** One US-based RCT of 492 children (<18 years), in emergency and primary care setting.
GP primary care satisfaction: Single consultation	1 RCT	**Key message:** Videoconferencing is similar to face-to-face for primary care consultations, but with some downsides **Context:** One UK-based cross-over RCT of 152 adult patients and 4 physicians in primary care practice.
GP Triage (Boggan SR)	1 SR	**Key message:** Remote triage in acute primary care (via teleconferencing) is similar to face-to-face care **Context:** 3 of 8 included studies were RCTs comparing live phone to face-to-face care (including the ESTEEM trial, see below).
GP Triage (ESTEEM trial)	1 RCT (cluster)	**Key message:** GP teleconferencing triage and nurse teleconferencing triage have similar outcomes and costs **Context:** UK-based; compared GP-led teleconferencing (7017 patients), nurse-led teleconferencing (7525 patients) and usual care (7719 patients). Analyses from the NHS perspective.
Acute physiotherapy triage	1 RCT (2 publications)	**Key message:** Teleconferencing physiotherapy triage is clinically effective and safe in delivering care for primary care patients with musculoskeletal problems **Context:** A UK-based RCT, of 2249 adults. Analyses from the NHS perspective.
Asthma: GP check ups	1 SR	**Key message:** Teleconferencing is similarly effective to face-to-face check-ups for control and exacerbations of asthma in adult or children outpatients. **Context:** 6 included RCTs (1 video, 5 telephone), of 2100 participants in aggregate.

Cardiovascular: Anticoagulant management	1 RCT	**Key message:** Teleconferencing interventions are a viable approach to manage oral anticoagulation **Context:** 1 US-based RCT of 192 patients conducted with patients receiving long-term warfarin therapy at a Veterans Affairs hospital.
Diabetes management	1 SR (de novo**)	**Key message:** Telehealth (by phone or video) is similarly effective to face-to-face for glycaemic control and satisfaction with care in Type 1 and Type 2 Diabetes **Context:** 4 RCTs (3 video, 1 phone), of 307 adults and adolescents, evaluating impacts up to 3 months.
Speech Pathology treatment	1 SR (de novo**)	**Key message:** Telehealth (by phone or video) is similarly effective to face-to-face care for improving speech therapy outcomes **Context:** 8 RCTs, including: 2 trials for stuttering conditions, 3 for patients with Parkinson's disease, and 3 for other conditions. 7 evaluated video, 1 evaluated phone. 4 of 8 RCTs were Australia-based.
Pain management	1 SR (de novo**)	**Key message:** Videoconferencing may be slightly less effective than face-to-face care for pain management **Context:** 7 RCTs (565 participants) of adults or children, evaluating outcomes up to 12 months.
Antenatal and postnatal care	2 RCTs	**Key message:** Telehealth as a hybrid face-to-face/online model for antenatal and postnatal care is comparable to face-to-face only. **Context:** 1 US-based RCT of women aged 18-36 (antenatal, n=300); 1 Catalonia-based RCT of 1598 postpartum women.
QUESTION A2. Comparison of delivery of by one telehealth modality (e.g. videoconferencing) to another telehealth modality (e.g. teleconferencing), in primary and allied healthcare		
Topic	**Evidence**	**Summarised findings**
Telehealth via video vs via phone for delivery of care in primary and allied healthcare	16 RCTs	**Key message:** 16 RCTs (1719 people) synthesised, showed no difference between phone and video for: smoking-related outcomes; depression outcomes, quality of life; healthcare utilisation; satisfaction with care. **Context:** Studies from USA, UK, Canada and Australia; most covered outpatient followup (13/16) or smoking cessation (3/16). None reported on diagnosis or initiating new treatment; none were set in primary care. One trial was overall rated low risk of bias; the remainder were rated at high risk of bias or had some concerns.
QUESTION A3. Comparison of telehealth (telephone or video) to face-to-face delivery of care in areas of special interest		
Topic	**Evidence**	**Summarised findings**
Changes in frequency of patient attendance	6 RCTs	**Key message:** Telehealth is similarly effective to face-to-face clinic consultations for attendance outcomes using randomized controlled trials (RCTs) from known systematic reviews **Context:** Six RCTs compared live telehealth (phone or video) to face-to-face provision of care, in patients with depression, PTSD, diabetes and COPD.
Escalation to Emergency Department presentations	1 Scoping Review	**Key message:** Telehealth may reduce emergency departments visits from residential aged care facilities, but there is a need for economic analysis and further research. **Context:** A scoping review of 31 studies, of which 4 were RCTs. The 4 RCTs evaluated: hospital avoidance outcomes (2 trials), adverse drug effects (1 trial), and pressure ulcers (1 trial).

SR = systematic review; RCT = randomized controlled trial; SR* refers to refers to systematic reviews that were conducted de novo by the Institute of Evidence-Based Healthcare team whilst conducting the Telehealth Review (2020-21) and were unpublished at the time, but which have since been published; **"de novo" denotes systematic reviews conducted by IEBH whilst conducting the previous Telehealth Review (2020-21), which are not yet published.

Interpretation of the findings

The original report (Telehealth Review 2020-21) reached a number of conclusions about the effectiveness of telehealth which remain valid. Briefly, those conclusions were that telehealth – either by videoconferencing or teleconferencing – appears to provide equivalent clinical outcomes for many types of clinical encounter, particularly for ongoing clinical care. For initial diagnosis, telehealth has some limitations, in particular where physical examination is required as part of the diagnostic process. While visual examination can be carried out via videoconferencing, this appears generally less satisfactory (less reliable and accurate) than examination face-to-face; and hands-on physical examination is limited to self-examination or some examination by carers.

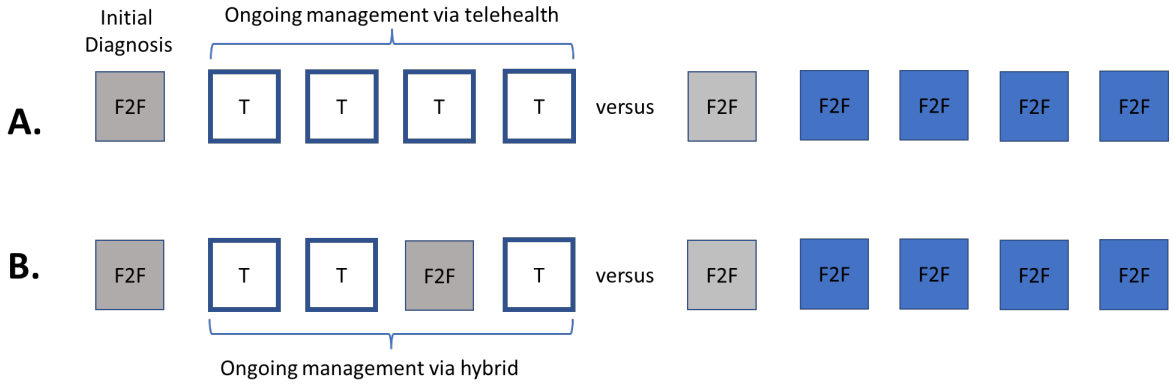

Figure 1 Comparisons of telehealth (T) versus face-to-face (F2F) consultations. (A) An initial diagnosis followed by management via T or F2F, or (B) by hybrid.

For continuing care for management of an established diagnoses (Figure 1 above), telehealth appears equivalent for most clinical outcomes, has similar cost to health services, increases convenience and access for patients, which is particularly important for rural patients and patients who have difficulty travelling to clinical appointments. Savings for health care services may occur with travel for home visits, e.g. in context of palliative care. Note that, while costs of the same consultation service are similar for telehealth and face-to-face consultations, the increase in access from telehealth has resulted in an approximately 10% increase in GP services in Australia. The net costs of this (from flow on decreases or increases) is unclear.

This update has strengthened several of those conclusions, and not reversed any. In addition, since the previous Telehealth Review, new research has been published, that provides new conclusions.

Effectiveness

This review includes 4 new topics (CVD management, weight management, physiotherapy, and traumatic brain injury) and has new trials for 7 of the previous topics (musculoskeletal management, PTSD treatment, depression treatment, anxiety disorders, insomnia treatment, and mental health miscellaneous). Overall, the findings are similar – that for ongoing management telehealth provides similar clinical effectiveness when substituted for face-to-face care (see A and B in Figure 1 above).

Some reviews also consider telehealth as add-on care. For example, telehealth-enhanced interventions for CVD management might be effective in improving physical and quality of life.

Diagnostic Accuracy assessments

Diagnostic assessments via telehealth is an area with limited research, particularly for real patient consultations. The most common type of study looked at specific pre-planned assessments. While history taking and verbal assessments can be done acceptably by telehealth, only some elements of physical examination are sufficiently reliable and valid. These may also be considered as a hierarchy of progressive difficulty and requirements from: (i) history only (via telephone), (ii) visual inspection (videoconference) (iii) physical examination (by self-examination or by a carer), (iv) examination with equipment (pre-provided, e.g. with monitor tools).

Specific planning of physical assessments is often required to manage the increasing difficulties in the hierarchy from (ii) to (iv), but this also suggests further research may overcome some of these limitations. We conclude the diagnosis by telehealth can be considered in 3 categories:

A. Diagnosis via history of verbal assessment tool only – with no physical examination – where assessments limited to question-and-answer, such as cognitive assessments, telehealth appears equivalent to face-to-face.

B. Planned visual or physical examination or assessment – without additional history – has mixed outcomes. For example, assessments for ankle fracture, low back pain, facial nerve palsy, and many elements of sleep apnoea were poor. Some planned assessments, such as sit-to-stand, and Parkinson's functioning were acceptable. For some this required specialized equipment – such as pulse oximeters, sphygmomanometers, and visual acuity charts – and suggests this inaccuracy may be overcome, but this would rarely be available in most patient settings for GPs.

C. Consultation without pre-planned assessment or examination – that is, consultation for new presentations. Only 1 adequate study looked at diagnosis of new presentations, and found modest disagreement between telehealth and face-to-face assessment but with errors in both modes. However, when hands-on physical examination is an essential component of the diagnosis then telehealth is likely to be problematic.

Comparison of telephone to videoconference

This review found that 16 trials with moderate to high risk of bias, demonstrating that telephone and videoconference consultations have no major differences on clinical effectiveness and healthcare use (cost effectiveness) outcomes for a range of different conditions (e.g. depression and smoking cessation) and outcomes, e.g. quality of life, healthcare utilisation, and satisfaction with care. Note that this equivalence was found for ongoing care of patients with chronic conditions (see Figure 1, above), not acute care, which may require visual or physical examination for diagnosis.

Attendance for ongoing management

Trials which reported attendance rates for both arms generally found no differences in attendance between face-to-face at the clinic and home telehealth using either a video or telephone when comparing the same dose of intervention. Note that this equivalence is for ongoing care of patients with chronic conditions. The studies do not address the issue of increasing access for those unable to access face-to-face medical services.

Escalation to emergency department from long-term care

A review found only four trials. Two examined hospital avoidance: one trial found that providing additional telehealth support reduced the likelihood of having care escalated to a hospital than residents taken directly to the emergency department; the other (stepped wedge RCT) did not find a

significant difference in hospitalisation rate in residents receiving off-hours physician coverage by telehealth compared to residents of homes receiving standard physician coverage. A trial of pharmacist-led telehealth services found that the telehealth group had a lower incidence of alert-specific ADEs than usual care. The last trial of a hospital-based multidisciplinary wound care team via telehealth for treating pressure ulcers compared to usual care found no significant differences in reducing pressure ulcers, emergency department visits, wound healing times and hospitalisations. They concluded that telehealth support may reduce some emergency department visits, but further research and economic analyses are needed.

Introduction

Telehealth in Australia dates back to the 1920s, and the use of telegraph by the Flying Doctor Services.(3) Nearly a century later, in 2013, the Australasian Telehealth Society urged wider adoption of telehealth in Australia.(4) With the declaration by the WHO of the COVID-19 pandemic in March 2020,(5) the temporary payment of benefits for telehealth was enabled on the Medicare Benefits Schedule. This enabled the provision of telehealth care services by general practitioners, specialists, and allied healthcare professionals.(6)

In October 2020, The Institute for Evidence-Based Healthcare was contracted by the then-Department of Health, to complete a review of the evidence for the effectiveness, safety and economic impacts of the provision of primary and allied healthcare via telehealth. The Institute completed and provided the Review to the Department in February 2021.(7) In December 2021, the Australian Government announced an investment of $106M over 4 years, to support the permanent implementation telehealth services in Australia as part of the Medicare Benefits Schedule.(8)

The uptake of telehealth by Australians has been considerable, representing 17.2% of all consultations in 2022 – over 39.9M consultations by phone, and over 5.6M consultations by video. By provider, in 2022, telehealth consultations represented: 21.9% of all GP consultations, 13.7% of specialist consultations, 27.1% of mental health consultations, 28.3% of nurse practitioner consultations and 14.5% of allied health consultations.(1)

However, since the time of the previous Telehealth Review in 2021, over two years of additional evidence on the effectiveness and safety of telehealth has been published. The present Telehealth Review therefore aims both to update the findings of the previous review, and to expand its scope with several topics identified as of interest by the Department.

The present document reports on a series of systematic reviews and evidence syntheses, to address 3 questions of interest to the Department:

Question A1. Updated reviews and new evidence comparing telehealth (via telephone or video) to face-to-face delivery of care in primary and allied health. Aim: to update the findings of previous Telehealth Review, by identifying, assessing the quality of, and synthesising additional evidence generated since the previous Telehealth Review (2020-21), on topics in scope for that review.

Question A2. Comparison of delivery of by one telehealth modality (e.g. videoconferencing) to another telehealth modality (e.g. teleconferencing), in primary and allied healthcare. Aim: to identify, assess the quality, and synthesise randomised controlled trial and systematic review evidence, which compares one telehealth modality (e.g. video) to another (e.g. telephone) for the provision of care – a comparison that was considered out of scope in the original Telehealth Review (2020-21).

Question A3. Comparison of telehealth (telephone or video) to face-to-face delivery of care in areas of special interest. Aim: to identify, assess the quality of, and synthesise any existing randomised controlled trial and systematic review evidence, on the impact of telehealth consultations on the following areas of interest: 1) Changes in the frequency of patient attendance; 2) Escalation to emergency department presentations.

For the purposes of the present report: "telehealth" is used to refer collectively to synchronous ('live') provision of care using either the telephone (i.e., teleconferencing or telephone consultation) or video (i.e., videoconferencing or video consultation).

Methods

The systematic reviews and evidence syntheses were reported in compliance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (2) – see Appendix 1 – PRISMA Reporting Checklist. Due to short timelines the protocol was not registered on PROSPERO or any other registry, however, the protocol was developed prospectively and provided to the Department of Health and Aged Care prior to commencement of the reviews. We used the 2weekSR – two-week systematic review – methodology to conduct the systematic reviews.(9) Where a deviation from the methods specified in the protocol occurred during the conduct of the systematic reviews, this is reported in the relevant methods section.

Inclusion and exclusion criteria

Many of the inclusion and exclusion criteria used to screen the literature for includable studies, were shared by the 3 questions of interest: A1, A2, A3. The shared criteria are identified in the dark blue cells, in Table 2, below. The differences between the inclusion criteria for the 3 questions are identified in the light blue cells. Full inclusion and exclusion criteria are described below (*Table 2*).

Table 2 Summary of the inclusion and exclusion criteria for Questions A1, A2, A3

Included	Question A1	Question A2	Question A3
P – Population	Participants of any age, gender, condition, receiving primary care from a GP, allied healthcare provider, nurse practitioner, midwife or similar.		
I – Intervention	Telehealth	Telehealth	Telehealth
C – Comparator	Face-to-Face	Telehealth	Face-to-Face
O – Outcomes	Clinical effectiveness, patient safety, cost-effectiveness, satisfaction with care		• Patient attendance • Escalations to ED
S – Study design	Any study design for study reporting diagnostic outcomes Systematic reviews or randomised controlled trials for all other outcomes		

Participants

These inclusion criteria applied to all 3 questions: A1, A2, A3 (outlined above, *Table 2*).

To be included, studies had to involve participants of any age, gender, or condition. Studies in tertiary care (in-hospital patients) were excluded. Studies involving patients discharged from the hospital and undergoing care by one of the included care providers (see below) were included, however.

The following care providers (or their equivalents in other healthcare systems) were included:

- General Practitioner: e.g. family physician, general practitioner, etc.
- Allied healthcare provider: e.g. psychologist, occupational therapist, physiologist, practice nurse, speech pathologists, dieticians, Aboriginal and Torres Strait Islander healthcare practitioners and workers, etc.
- Nurse practitioner
- Midwife

Clinician-to-clinician consultations not involving patients (e.g. GP to midwife) were excluded.

Specialist-provided care (e.g. by psychiatrists, dermatologists, rheumatologists, etc.) was excluded, unless the care *also* included both the patient and one of the includable providers (i.e., the care involved, for example, a patient, a GP, and a psychiatrist).

Intervention

These inclusion criteria applied to all 3 questions: A1, A2, A3 (see *Table 2*).

Included studies were those evaluating the effectiveness of real-time (synchronous) consultations via video or telephone. Consultations involving asynchronous provision of care (e.g. store and forward of patient generated data) were excluded.

Studies evaluating the following interventions were excluded: mobile apps, virtual reality, texting (e.g. reminders), online based platforms (e.g. information and support systems), telemonitoring, and studies of novel (non-standard) interventions.

Consultations could include single or multiple episodes of care, but the compared groups had to receive similar care in terms of frequency, duration, and healthcare provider.

Comparator

Comparators varied for questions A1, A2, A3 (*Table 2*), thus each is described separately.

Comparator for question A1

We included studies comparing consultations via video or telephone, to face-to-face (in-person) consultations. The care provided in both groups had to be similar in terms of frequency, duration, and healthcare provider.

Comparator for question A2

We included studies comparing one type of telehealth (e.g. telephone consultation / teleconferencing) to another type of telehealth (e.g. video consultation / videoconferencing). The care provided in both groups had to be similar in terms of frequency, duration, and healthcare provider.

Comparator for question A3

We included studies comparing consultations via video or telephone, to face-to-face (in-person) consultations. The care provided in both groups had to be similar in terms of frequency, duration, and healthcare provider.

Outcomes

Comparators varied for questions A1, A2, A3 (*Table 2*), and thus are described separately.

Outcomes for question A1 and A2

The includable outcomes comprised conventional safety and effectiveness outcomes, which – by necessity – varied by the individual condition and/or clinical area. The primary outcome was clinical effectiveness (details depending on condition/clinical area). Secondary outcomes included: patient safety, cost-effectiveness, and satisfaction with care. For diagnostic accuracy studies, the outcomes included comparative accuracy of diagnosis for face-to-face vs telehealth care.

Outcomes for question A3

The includable outcomes comprised clinical effectiveness, safety, cost-effectiveness, and satisfaction, and/or diagnostic aspects, pertaining specifically to one of the following topics: changes in the frequency of patient attendance; or escalation to emergency department presentations.

Study design

These inclusion criteria applied to all 3 questions: A1, A2, A3 (*Table 2*).

We included the following study designs:

- **Randomised controlled trials (RCTs)** which included more than 10 participants and were of any randomised design, including parallel, cluster, crossover, factorial, or mixed
- **Systematic reviews**
- **Any study design** if the study reported on diagnostic accuracy of telehealth vs. face-to-face provision of care, as long as all other inclusion criteria are met

All other study designs (non-randomised trials, observational studies, qualitative-only studies) and all other types of reviews (e.g. literature, scoping, etc.) were excluded.

Publication type and language

These inclusion criteria applied to all 3 questions: A1, A2, A3 (*Table 2*).

We did not impose restrictions by language (i.e., if the publication met the inclusion criteria but was published in a language other than English, it is includable). We included only those publications that were published in full. That is, we excluded publications available as abstract only (e.g., conference abstract) with no additional results information available about the study's results (e.g., from a clinical trial registry record).

Search strategies to identify the relevant studies

The following databases were searched: PubMed (MEDLINE), Embase, and CENTRAL via the Cochrane Library (which includes the clinicaltrials.gov and the World Health Organisation's International Clinical Trial Registry Platform, ICTRP).

The search dates were as follows: for question A1, which updates the evidence from the completion of the original Telehealth Review (2020-21) until the present, the searches were from 18 November 2020 (end-date of the search in original Telehealth Review) until 11 January 2023. For question A2, the search dates were from inception until 10 February 2023. For question A3, the search dates were from inception until 11 January 2023.

Search strings for each question and each source searched are reproduced in full in Appendices 2-4.

Study selection and screening

Pairs of review authors (PG, TA, MB, HG, OB) independently screened the titles and abstracts for inclusion against the inclusion criteria. One review author (JC) retrieved full-texts, and pairs of review authors (PG, TA, MB, HG, OB) screened the full-texts for inclusion. Any disagreements were resolved by discussion, or reference to another author. The selection process was recorded in sufficient detail to complete a PRISMA flow diagram (see Appendix 5 – PRISMA flow charts (search results and screening process)) and a list of studies excluded at full-text stage are provided in Appendix 6 – Key Excluded Studies: systematic reviews and randomised trials.

Data extraction

We used a data extraction form to extract data from each included study. The form was piloted on 2 studies. Pairs of review authors (PG, TA, MB, HG, OB) independently extracted the data, and where discrepancies were identified, they were resolved by discussion or by reference to another author. Data was extracted on each study's: characteristics and methods; participants; interventions and comparator(s); primary outcome; secondary outcome(s).

Assessment of the risk of bias

Randomised controlled trials

The risk of bias of included randomised controlled trials was assessed independently by author pairs (PG, TA, MB, HG, OB), using the Cochrane Risk of Bias Tool 1. (Risk of Bias Tool 1 was used in preference to the Risk of Bias Tool 2, as the former allows for the rating of biases from funding or conflict of interest under the "other bias" domain; Tool 2 does not include this domain). All disagreements about ratings were resolved by discussion or by referring to a third author.

The following domains were assessed:

1. Random sequence generation
2. Allocation concealment
3. Blinding of participants and personnel
4. Blinding of outcome assessment
5. Incomplete outcome data
6. Selective outcome reporting
7. Other bias (focusing on potential biases due to funding or conflict of interest).

Each potential source of bias was graded as low, high, or unclear, and each judgement supported by a quote from the relevant trial.

In a deviation from the protocol, for question A2 only, the Risk of Bias Tool used was Cochrane Risk of Bias Tool 2 due to first author preference.

Systematic reviews

The risk of bias of included systematic reviews was assessed independently by author pairs (PG, TA, MB, HG, OB) using the AMSTAR tool 1. Rating discrepancies were resolved by consensus or by referring to a third author. Where the AMSTAR rating was 7 or above, the systematic review was included, and considered for updating, if additional evidence was identified through the searches.

Data synthesis

The approach to the synthesis of the identified evidence depended on whether the topic was a new topic or one that was previously synthesised; whether a systematic review on that topic was or was not identified; and whether RCT evidence was – or was not – identified for that topic (see Figure 2).

The combination of these factors yielded four possible data synthesis scenarios:

- No change to the existing summary (of previously identified systematic review or randomised controlled trial evidence) – red box in *Figure 2*
- A summary of a newly identified, existing systematic review – green box in *Figure 2*
- An update of an existing, good quality systematic review, with RCT evidence published subsequent to that review – blue box in *Figure 2*
- A new systematic review – pink box in *Figure 2*

As the approach to evidence synthesis will differ for each of the four options, they are described separately, below.

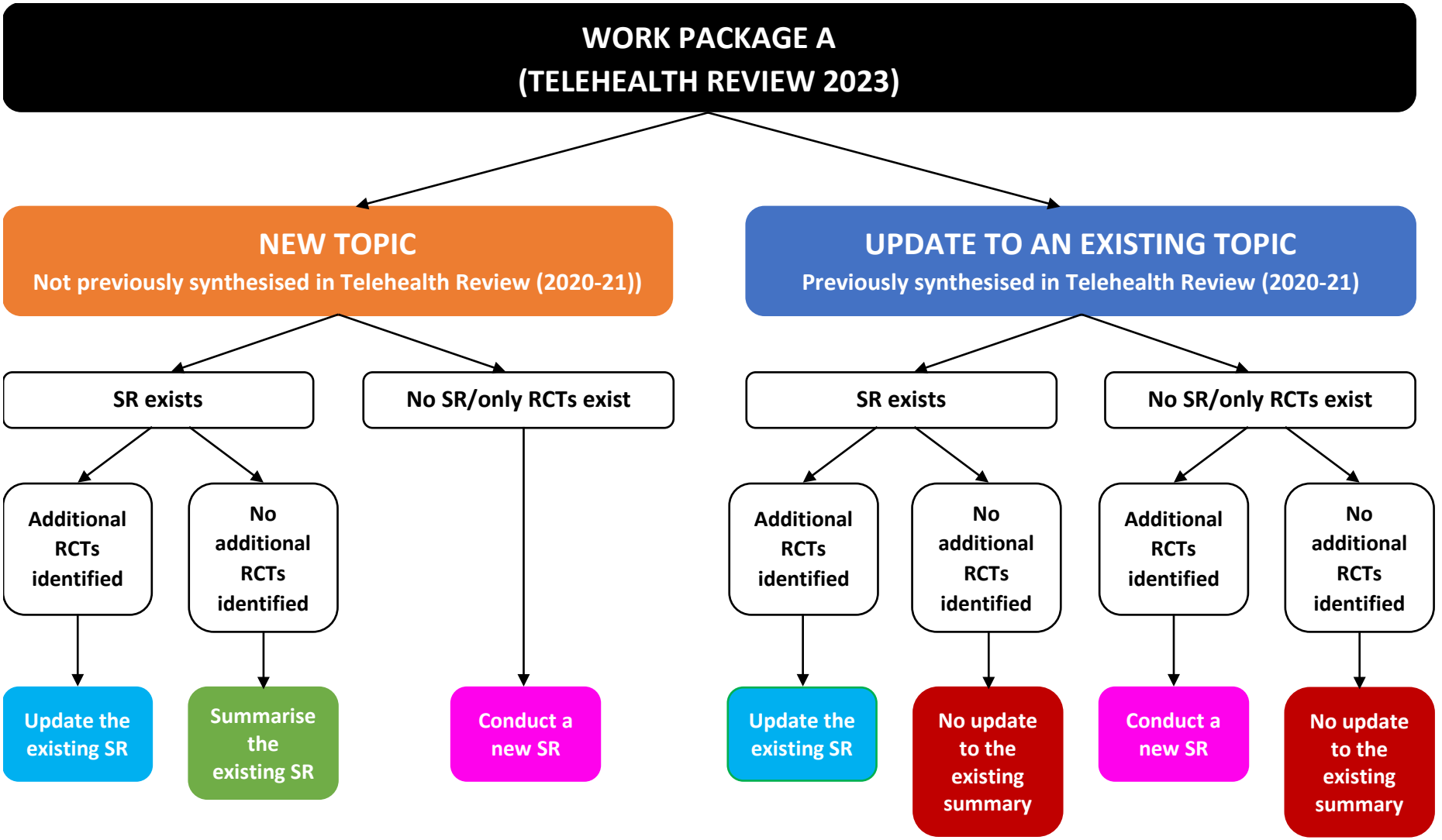

Figure 2: The possible approaches to synthesis and reporting of the evidence, depending on novelty of the topic and evidence types previously identified

Cases of: a previously summarised topic with no subsequent evidence identified

This approach applied to the following situations:

- The topic was previously summarised in the Telehealth Review 2020-21; a systematic review on that topic was identified or conducted, and no additional RCT evidence was identified on this topic in the searches conducted as part of the Telehealth Review 2023
- The topic was previously summarised in the Telehealth Review 2020-21; only RCT evidence existed at the time of the Telehealth Review 2020-21, and no additional RCT evidence was identified on this topic in the searches conducted as part of the Telehealth Review 2023

If no additional RCT evidence was identified for a topic previously summarised in the Telehealth Review 2020-21, the summary provided in the previous Telehealth Review was replicated in the Telehealth Review 2023. The content of the summary was updated to indicate the currency of the search dates to 2023, and a statement was provided clarifying that no additional evidence has been identified to change the previous conclusions.

Cases of: a new topic for which a good quality systematic review was identified, with no subsequent RCTs identified

This approach applied to the following situations:

- The topic was a new topic (i.e. one not previously summarised in the Telehealth Review 2020-21), for which a good quality systematic review was identified, but no further RCT evidence was identified (post-that review)

A one-page summary of that systematic review was produced, to summarise the evidence on the topic. The summary contained the following information:

- AMSTAR rating of the review
- Review question and scope: population and setting, intervention, comparison, and included study designs
- Review methods: sources searched, volume of evidence identified
- Main results of the review
- Conclusions
- Commentary on the review and its findings

Cases of: a good quality systematic review identified, with subsequent RCT evidence identified

This approach applied to the following situations:

- The topic was a new topic not summarised previously in the Telehealth Review 2020-21; a systematic review on the topic was identified, and additional RCT evidence was identified (subsequent to that review)
- The topic was previously summarised in the Telehealth Review 2020-21; a systematic review on that topic was identified or conducted as part of Telehealth Review 2020-21, and additional RCT evidence was identified on this topic in the searches conducted as part of the Telehealth Review 2023

A one-page summary of that systematic review was produced (if a new topic) or reproduced (if a previously summarised topic), to summarise the systematic review evidence on the topic. The summary contained the following information:

- AMSTAR rating of the review
- Review question and scope: population and setting, intervention, comparison, and included study designs
- Review methods: sources searched, volume of evidence identified
- Main results of the review
- Update of the results of the review: where applicable and feasible, we will attempt to update the review's findings with the additional evidence, by updating the meta-analyses with the subsequently identified RCT evidence.
- Conclusions
- Commentary on the review and its findings

Cases of: conduct of a new systematic review

This approach applied to the following situations:

- The topic was a new topic not previously summarised in the Telehealth Review 2020-21, for which no existing systematic reviews are identified, but existing RCTs are identified
- The topic was previously summarised in the Telehealth 2020-21 review, although at the time only limited RCT evidence was identified, and additional RCTs were identified as part of the Telehealth Review 2023

Data synthesis

Review Manager 5.4 was used to calculate the treatment effect. For dichotomous outcomes, we used risk ratios (where the number of individuals with an event is reported) or rate ratios (where the number of events is reported). For continuous outcomes, we used mean difference (where outcome is reported using the same scale by multiple studies) or standardised mean difference (where outcome is reported using different scales by multiple studies). Meta-analyses were undertaken where ≥2 studies or comparisons report the same outcome, and random effects model was used. Where paucity of data or other factors preclude meta-analyses, data was synthesised narratively.

Unit of analysis

The individual was used as the unit of analysis, where possible. However, where data on the number of individuals with primary and secondary outcomes of interest was not available, we extracted and synthesised the information as it was presented in the original study (e.g., the number of repeat GP consultations in each trial arm, mean difference between groups, etc.).

Dealing with missing data

Due to very short timelines, we did not attempt to contact investigators or study sponsors to provide missing data.

Assessment of heterogeneity and reporting biases

We used the I^2 statistic to measure heterogeneity among the included trials. For meta-analyses involving more than 10 trials, we created a funnel plot.

Subgroup and sensitivity analyses

Where data was sufficient, we conducted subgroup analyses by time-points at which the outcome was reported (e.g., immediately post-intervention, at 3 months, 6 months, etc.), and by telehealth modality use (e.g. telephone, video).

Where a meta-analysis included a study with 3 or more domains rated at high risk of bias, sensitivity analyses were performed to assess the impact of including vs excluding of that study on the effect size estimate.

Results

Results are reported separately, by question, in the following sequence:

QUESTION A1. Updated reviews and new evidence comparing telehealth (via telephone or video to face-to-face delivery of care in primary and allied healthcare		
Topic Area	**Evidence**	**Status**
CVD management	1 SR	New topic, not synthesised in Telehealth Review 2021
Weight management	1 SR	New topic, not synthesised in Telehealth Review 2021
Physiotherapy	1 overview (53 reviews)	New topic, not synthesised in Telehealth Review 2021
Traumatic brain injury	1 SR	New topic, not synthesised in Telehealth Review 2021
Diagnostic accuracy and assessments	1 SR of 21 studies and reviews	Synthesised in Telehealth Review 2021; new evidence identified
Antibiotic use in Primary Care	1 SR + 1 new study	Synthesised in Telehealth Review 2021; new evidence identified
COPD: Exercise Therapy/ Pulmonary rehabilitation	1 SR	Synthesised in Telehealth Review 2021; new evidence identified
Musculoskeletal management	1 SR* + 1 RCT	Synthesised in Telehealth Review 2021; new evidence identified
PTSD treatment	1 SR* + 3 RCT	Synthesised in Telehealth Review 2021; new evidence identified
Depression treatment	1 SR*	Synthesised in Telehealth Review 2021; new evidence identified
Anxiety disorders treatment	1 SR* + 1 RCT	Synthesised in Telehealth Review 2021; new evidence identified
Insomnia treatment	1 updated SR*	Synthesised in Telehealth Review 2021; new evidence identified
Mental health: less common conditions	1 SR* + 1 new RCT	Synthesised in Telehealth Review 2021; new evidence identified
Diagnostic accuracy in primary care: Single consultation	1 RCT	Synthesised in Telehealth Review 2021; no new evidence identified
GP primary care satisfaction: Single consultation	1 RCT	Synthesised in Telehealth Review 2021; no new evidence identified
GP Triage (Boggan SR)	1 SR	Synthesised in Telehealth Review 2021; no new evidence identified
GP Triage (ESTEEM trial)	1 RCT (cluster)	Synthesised in Telehealth Review 2021; no new evidence identified
Acute physiotherapy triage	1 RCT (2 publications)	Synthesised in Telehealth Review 2021; no new evidence identified
Asthma: GP check ups	1 SR	Synthesised in Telehealth Review 2021; no new evidence identified
Cardiovascular: Anticoagulant management	1 RCT	Synthesised in Telehealth Review 2021; no new evidence identified
Diabetes management	1 SR (de novo**)	Synthesised in Telehealth Review 2021; no new evidence identified
Speech Pathology treatment	1 SR (de novo**)	Synthesised in Telehealth Review 2021; no new evidence identified
Pain management	1 SR (de novo**)	Synthesised in Telehealth Review 2021; no new evidence identified
Antenatal and postnatal care	2 RCTs	Synthesised in Telehealth Review 2021; no new evidence identified
QUESTION A2. Comparison of delivery of videoconferencing to teleconferencing, in primary and allied healthcare		
Telehealth via video vs phone for primary and allied care	16 RCTs	Comparison considered out of scope in Telehealth Review 2021
QUESTION A3. Comparison of telehealth (telephone or video) to face-to-face delivery of care in areas of special interest		
Changes in frequency of patient attendance	6 RCTs	Special topic of interest, not considered in Telehealth Review 2021
Escalation to Emergency Dept presentations	1 Scoping Review	Special topic of interest, not considered in Telehealth Review 2021

Question A1: Updated reviews and new evidence comparing telehealth (via telephone or video) to face-to-face delivery of care in primary and allied health - new topics, not previously synthesised in Telehealth Review 2021

Cardiovascular Disease Management

Telehealth-enhanced interventions (NB: also includes telemonitoring and mobile-based interventions outside the scope of the present review) for CVD management might be effective in improving physical and quality of life.

Evidence

Existing systematic review [Han 2021], [AMSTAR 7/11]

Review question and scope

Population and setting: Older adults with cardiovascular disease.
Intervention: Telehealth-enhanced management of CVD (NB: including remote consultation, as well as telemonitoring and mobile-based interventions)
Comparison: Usual care delivered through face-face consultations.
Outcomes: Blood pressure, body mass index, hospital admission rates, mortality, quality of life, and cost effectiveness.
Design: Randomised controlled trials.

Review methods

The Library of Congress, LISTA (EBSCO), PubMed (NLM), and Web of Science databases were searched with a date limitation from 1 January 2000 until 5 August 2021 for RCTs. Overall, 21 RCTs evaluating 7602 adults with CVD were included in meta-analyses. Risk of bias was assessed using the Cochrane risk of bias tool.

Main results

Studies evaluated a mix of interventions, including: telerehabilitation, telephone monitoring, telephone counselling, text messaging, web communication, and others, for CVD management. [N.B. some of these are outside the scope of the present review.] Overall, telehealth-enhanced management of CVD was associated a reduction in systolic blood pressure of 2.4 mmHg: 95% CI (-4.0 to -0.9). Telehealth-enhanced interventions were associated with improved quality of life scores (0.01; 95% CI 0.01 to 0.02; 4 RCTs) and mental health scores (-3.1; 95% CI -4.9 to -1.3; 3 RCTs). However, there was no statistically significant difference in BMI between telehealth enhanced interventions and usual care[1]. (Table 3)

Three RCTs (involving 1407 adults) evaluated web-based consultations (or telehealth with or without providing blood pressure devices) versus usual care (i.e., face-to-face consultations) on blood pressure levels[234]. There were no statistically significant reductions in blood pressure levels in this subgroup of RCTs. Further, two studies evaluated the cost effectiveness analysis of telehealth enhanced interventions. A cost effectiveness analysis of cardiac telerehabilitation versus face-to-face cardiac rehabilitation found that telerehabilitation was significantly more cost-effective than usual care (ICER of €–21707 per QALY)[5]. In a large cluster RCT, Henderson et al concluded that telehealth services (including telemonitoring activities) for managing adults with chronic conditions including heart failure was not cost effective compared to usual care[6].

Table 3: Summary of Findings of Han 2021 review of telehealth-enhanced interventions for CVD

Outcomes	Studies (N)	Difference [Time] (95%CI)	Comments
Systolic Blood Pressure (mmHg)	21	-2.4 (-4.0 to -0.9)	A subgroup analysis based on follow-up duration (3 months, 6-8 months, 12 months) showed similar results (I^2 90%).
BMI (kg/m^2)	6	-0.3 (-0.8 to 0.2)	(I^2 = 53%).
Mental health (CSE-D-10, points)	3	-3.1 (-4.9 to -1.3)	(I^2 = 90%).
Quality of life (EQ-5D, points)	5	0.05 (-0.06 to 0.17)	A sensitivity analysis excluding an extreme outlier found a statistically significant improvement in quality-of-life scores.
Cost effectiveness (ICER per QALY)	2	£92000 €–21707	Inconclusive results which might be attributed to the differences in the intervention and population evaluated.

ICER Incremental Cost Effectiveness Ratio

Conclusion

For older adults with cardiovascular disease, telehealth-enhanced interventions (including telemonitoring and mobile-based interventions) appeared better than usual care in improving patient outcomes including blood pressure, metabolic, and quality of life outcomes. The cost effectiveness of telehealth-enhanced intervention for CVD management is inconclusive. There are major limitations that should be taken into consideration in interpreting the results of this review, including high heterogeneity among included studies, in term of population (e.g., primary prevention versus adults with heart disease), interventions (e.g., high-tech devices for telemonitoring and alert system versus simple text-based reminders), outcomes measures (e.g., assumptions used for cost effectiveness analysis), and follow-up duration.

Commentary

The effect of replacing face-to-face with telehealth is not extensively evaluated. Evidence from a few RCTs found that there was no statistically significant differences in blood pressure control. Overall, telehealth-enhanced interventions (including telemonitoring and mobile-based) for CVD management might be effective in improving physical and quality of life. A systematic review and meta-analysis of 72 studies (both interventional and observational studies) including 127869 participants found similar results[7]. For example, combined remote monitoring and consultation found to be associated with 17% and 29% reductions in the risk of mortality and hospitalisation related to CVD among patients with heart failure. However, there is no high-quality direct evidence on the effect of telehealth consultation for the management of CVD in primary care. Therefore, caution should be exercised when generalising these results to Australian primary care contexts.

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Weight management

Telephone and face-to-face consultations were equally effective for both short and long-term outcomes for weight management.

Evidence

Existing systematic review [Huang 2019], [AMSTAR 9/11]

Review question and scope

Population and setting: overweight or obese adults, diabetes and hypertension patients
Intervention: telehealth interventions (videoconferencing or teleconferencing; N.B. Internet-based system, mobile telephone, text messaging were also included)
Comparisons: face-to-face equivalent
Outcomes: change in body mass index (BMI)
Designs: randomised controlled trials

Review methods

Medline, Cochrane Library, EMBASE, and CINAHL Plus were searched from inception until 31 Aug 2014 for randomised controlled trials that compared telehealth interventions with usual care or standard treatment in adults and reported a change in BMI. Twenty-five randomised controlled trials comprising 6253 people were included in the qualitative and quantitative analyses. Cochrane Risk of bias tool was used to assess the quality of the studies.

Main results

The included studies used variety of telehealth interventions for weight loss, increasing physical activity, diabetes and hypertension control. Meta-analysis of the 25 studies had an acceptable level of heterogeneity ($Q=31.38$, $df=24$, $I^2=23.52\%$, $p=0.14$). Random effects model of analysis showed the telehealth group reduced their BMI by 0.5 compared to the control group (pooled difference in means -0.49, 95% CI: -0.63 to -0.34, $p<0.001$).

However, only one study directly compared an intervention via telephone delivery to face-to-face delivery (2). Perri et al conducted a 6-month weight-loss program based on problem-solving counselling delivered in 26 biweekly sessions in a three-arm RCT in rural setting: telephone counselling (n=72), face-to-face counselling (n=83), and education control group (n=79). At the end of the 6-month intervention, all three groups lost significant amount of weight (mean 10.0±0.4kg), however, at the end of the 12-month follow up since intervention conclusion, participants who received either telephone or face-to-face counselling regained less weight (1.3±0.6 and 1.2±0.7 kg) compared with those in the education control condition (3.7±0.6 kg; Ps=0.02 and 0.03, respectively).

Conclusion

Through the systematic review, we identified only one RCT that directly compared telephone delivery to face-to-face delivery of the same intervention for weight-loss. The results show telephone and face-to-face consultations were equally effective for both short and long-term outcomes.

References

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Physiotherapy

In a variety of physical therapy areas, mixed quality evidence shows that telerehabilitation appears to be comparable or better than the conventional methods of rehabilitation.

Evidence

Existing systematic review [Seron 2021], [AMSTAR 7/11]

Review question and scope

Population and setting: patients of any age with any conditions who need physical therapy
Intervention: telerehabilitation in physical therapy
Comparisons: face-to-face care
Outcomes: Primary: clinical effectiveness, functionality, and quality of life. Secondary: adherence, satisfaction, and safety outcomes.
Designs: systematic reviews

Review methods

Medline/PubMed, EMBASE, and Cochrane Library were searched from inception up to 4 May 2020. for systematic reviews of telerehabilitation by physical therapy. Fifty-three systematic reviews were included in qualitative analyses. Cochrane Risk of bias tool was used to assess the quality of the studies.

Main results

Of the 53 reviews, 15 were on cardiorespiratory rehabilitation, 14 on musculoskeletal conditions, and 13 on neurorehabilitation. The other 11 reviews addressed other types of conditions and rehabilitation. Twenty-seven of the reviews include meta-analysis. Of the 30 systematic reviews with low risk of bias, 17 reported no differences between the groups while 13 reviews evaluated showed results in favour of telerehabilitation versus face-to-face rehabilitation or no rehabilitation. Thirty-five systematic reviews with unclear or high risk of bias showed mixed results.

Interpreting these reviews is complicated by a lack of clarity about the control and “usual care” groups. However, overall, the reviews suggest that:

- for musculoskeletal conditions, telerehabilitation appears comparable or better than the conventional rehabilitation to reduce pain and improve physical function.
- in patients with COPD, pulmonary telerehabilitation appears to have results similar to conventional rehabilitation in reducing dyspnoea (see COPD Summary).
- in patients with osteoarthritis in the knee and non-specific low-back pain, telerehabilitation could improve functionality in addition to improving quality of life in patients with nonspecific low-back pain, osteoarthritis in the knee, and total arthroplasty in the knee and hip.
- in patients with multiple sclerosis, telerehabilitation seems to contribute to balance and to increasing the levels of physical activity, but its contribution in terms of balance, functionality, and quality of life in patients with stroke is unclear.
- cardiac telerehabilitation is possibly better than face-to-face cardiac rehabilitation at reducing mortality by any cause and seems to contribute to a better ability to exercise and health related quality of life (see CVD Summary).
- telerehabilitation could be effective at reducing overweight and obesity, as well as improving the physical capacity and quality of life in cancer survivors.

Conclusion

In variety of physical therapy areas, mixed quality evidence shows that telerehabilitation appears to be comparable or better than the conventional methods of rehabilitation.

Commentary

Without in-depth analysis of the included systematic reviews, we could not determine how many of the original RCTs compared telehealth intervention with similar face-to-face intervention. There are total of 755 primary studies included in these 55 systematic reviews. If further evidence on this topic were considered important, we recommend screening the full list of primary studies or alternatively, conduct a full systematic search to answer the question on effectiveness of telehealth physiotherapy compared to face-to-face physiotherapy.

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Traumatic brain injury

Telehealth is acceptable and feasible and can be as effective as face-to-face delivery of care to traumatic brain injury patients.

Evidence

Existing systematic review [Suarilah 2022], [AMSTAR 8/11]

Review question and scope

Population and setting: traumatic brain injury (TBI) survivors
Intervention: telehealth interventions (e.g. telephone calls, computer-assisted online, videoconference, text messages)
Comparisons: equivalent face-to-face care
Outcomes: neurobehavioral symptom, depression, symptom management self-efficacy
Designs: randomised controlled trials

Review methods

Cochrane, Academic Search Complete, Cumulative Index to Nursing and Allied Health Literature (CINAHL), EMBASE, MEDLINE, PubMed, and Web of Science were searched from inception until January 2022 for randomised controlled trials. Seventeen randomised controlled trials comprising 3158 people were included in the qualitative and quantitative analyses. Cochrane Risk of Bias tool was used to assess the quality of the studies.

Main results

Among the 17 included studies, 14 studies were RCTs, and 3 studies were quasi-experimental. However, only two of the 17 studies compared telehealth delivery of interventions to equivalent face-to-face care:

- Fann *et al* (RCT) tested effectiveness of telephone delivered cognitive behavioural therapy (CBT-T, n=40) compared to face-to-face CBT (CBT-IP, n=18) and usual care (UC = no CBT, n=42) for people with major depressive disorder (MDD) within 10 years following TBI diagnosis (2). The main outcomes were change in depression severity on the clinician-rated 17 item Hamilton Depression Rating Scale (HAMD-17) and the patient-reported Symptom Checklist-20 (SCL-20) over 16 weeks. Unfortunately, they do not report the main outcomes as a direct comparison of CBT-T and CBT-IP groups, but instead compared combined CBT participants to UC group, or CBT groups to UC separately. There were no statistically significant differences on HAMD-17 score between any groups, but a significant difference on SCL-20 between all CBT vs UC. Overall, CBT-T was acceptable and feasible, >80% of the patients were moderately or very satisfied with it.
- Man *et al* (quasi-experimental) tested problem-solving skill training on people with acquired brain injury in four intervention groups: online training (n=25), computer-assisted training (n=28), face-to-face (n=30), and control group (no training, n=20) (3). At 4 months follow up, all training groups improved problem-solving skills, and therapist-administered group showed significantly better improvements in self-efficacy in problem-solving.

Conclusion

This review included two studies that compared telehealth delivered interventions to equivalent face-to-face care. Telehealth delivery is acceptable and feasible and can be as effective as face-to-face delivery.

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Question A1: Updated reviews and new evidence comparing telehealth (via telephone or video) to face-to-face delivery of care in primary and allied health - updated topics, previously covered in Telehealth Review 2021 (new evidence found)

Diagnostic Accuracy and Assessments – UPDATE of topic 4.2 from Telehealth Review 2020-21

Diagnostic accuracy requiring history only is similar for telehealth, but has limitations when physical examination is necessary.

Evidence

New Narrative Review of 21 relevant studies and reviews

Review methods

For studies of diagnostic accuracy of telehealth in primary care, we found few includable studies. Of 495 screened in the initial report, 18 studies were relevant: 1 systematic review and 17 other primary studies. We supplemented the main search with a search specifically for studies which compared diagnostic accuracy between remote- and face-to-face consultation in primary care, and found 8 additional includable studies. The systematic review focused only on videoconferencing, and for the 17 other primary studies: 14 examined videoconferencing, 2 used teleconferencing, and 1 was unclear.

For this update, we identified 3 additional studies – two trials (sleep disordered breathing and sit-to-stand test), and a systematic review on visual acuity assessment.

Most of these studies only consider interrater reliability between two examiners in artificial study set ups designed to evaluate diagnostic assessments for specific clinical problems, and several required equipment being available at the patient end.

Main results

We have grouped the studies into:
A. Diagnosis via history of verbal assessment tool only – with no physical examination
B. Planned physical examination or assessment – without additional history
C. Consultation without pre-planned assessment or examination – that is, consultation for new presentations.

A. Diagnosis via history or verbal assessment tool

A systematic review [Brearly 2017] included 12 studies which investigated the reliability, using a telephone interview procedure, of cognitive, functional, and behavioural scales in an elderly population with normal aging and dementia. These 12 studies of adult **neurocognitive tests** found that videoconferencing results were generally similar to face-to-face testing, but most studies involved small numbers of patients.

A study [Evan 2004] in two UK general practices a single interviewer assessed 98 consecutive attenders twice within 48 h with the order of face-to-face and teleconferencing being alternated. The patients underwent a 12-item **General Health Questionnaire and the Revised Clinical Interview Schedule** (CIS-R). There was no evidence that the mode of administration led to a bias in scores on the CIS-R, whereas for the GHQ, those over 60 tended to score higher on the teleconferencing. Face-to-face and teleconferencing scores and case definition showed good agreement between for both GHQ and CIS-R. Notably participants had a strong preference for face-to-face interviews.

Several studies compared assessment via **depression rating scales** done face-to-face versus by teleconferencing. These generally found good agreement. For example, a study [Burke 1995] of 101 geriatric patients attending an outpatient assessed the Geriatric Depression Rating Scale administered by teleconferencing several days before, then several days after, a face-to-face assessment. Good agreement between the 2 teleconferencing assessments and the face-to-face assessment was found for most items. Smaller studies assessing the Hamilton Depression Rating Scale (HAMD) found similar results: one of 21 patients with an affective disorder [Kobak 2004], and another of 64 patients with a DSM-IV mood disorder [Kobak 2008].

A study [Reese 2013] of diagnosis in 10 children (3–5 years old) with **developmental delays** and 11 age-matched children with a diagnosis of **autism**: 5 clinicians, who were blinded to which diagnosis the children had received, assessed the children. No significant difference was found in reliability of diagnostic accuracy, Autism.

Diagnostic Observation Schedule (ADOS) observations, ratings for Autism Diagnostic Interview parent report of symptoms, and parent satisfaction between conditions.

A & B. Mixed history and physical examination

A telehealth trial in Rochester (Yurcheshen 2021) studied the accuracy of identification of **risk for sleep disordered breathing** using a telehealth platform compared to providers using face-to-face encounters. In this study, 90 participants referred to a comprehensive university sleep program were evaluated by a face-to-face clinician, then randomized to a second clinician who performed an evaluation online. Both evaluations included a history and physical exam. The outcomes included: pretest probability for obstructive sleep apnoea, level of daytime sleepiness, snoring volume, apnoeas witnessed by a third party, modified Mallampati score, presence/absence of tonsils, degree of overjet bite, and severity of apnoea based on home sleep testing. Agreement (as measured by Kappa values) were generally higher for historical elements and lower for physical exam findings. These Kappas ranged from 0.70 (apnoeas witnessed by a third party) indicating high agreement to -0.044 (degree of maxillary overjet) indicating agreement less than chance. The authors concluded that: "A relatively high degree of interrater reliability for historical elements suggests that the accuracy of telehealth for OSA is tempered by a suboptimal physical exam."

B. Physical examination or assessment

A study of 50 (Atkan 2022) patients with type 2 diabetes investigated the agreement between tele-assessment and face-to-face assessments of a **30s Sit-to-Stand (STS) test**. This test asks patients to rise up straight from a standard chair (with 45–47 cm seat height) and sit down again as many times as they can in 30 seconds. Each test was performed two times separated by 1hr: a face-to-face and an Internet-connected video call examination (tele-assessment). Two physiotherapists conduct these evaluations; each was blinded to the other, with the order of the evaluations randomized.

Agreement was good between tele-assessment and face-to-face assessment. The 30s sit-to-stand test score was 12.4 ± 1.8 for face-to-face and 12.2 ± 1.6 for tele-assessment: mean differences = 0.20 ± 0.88, (limits of agreement = +1.93 to − 1.53). Excellent interrater reliability was found for scores of the 30-s STS test [ICC = 0.93 (95% CI: 0.88; 0.96)].

A systematic literature of **visual acuity (VA) testing** for the assessment of ocular function [Samanta 2023] was performed in April 2020 using PubMed, Embase and Medline. The 14 studies included patients aged 3-97, with and without correction, with known ocular pathology.

The best reproducibility and correlation with in-clinic acuities were with the Peek Acuity application which measured distance vision on a Samsung Galaxy S3. The mean difference for home testing

compared with clinic was 0.055 Logarithm of the Minimum Angle of Resolution (LogMAR), and test-retest variability was ±0.029 LogMAR for 95% confidence interval limits. The authors concluded that Peek Acuity performed no worse than Snellen and ETDRS charts.

A US prospective study of the **Ottawa Ankle Rule** (which predicts the likelihood of ankle fracture) in an Emergency Department compared the results in 97 patients assessed both face-to-face and via videoconferencing. The agreement was often poor: kappa 0.61 for tenderness of the lateral malleolus, 0.41 for tenderness of the medial malleolus, and 0.53 for weight bearing. However, this made only a modest difference to the Xray ordering rates, and the false negative rate was 24% in the videoconferencing group and 15% in the face-to-face group. (Sikka, SAEM19).

Three studies assessed **low back pain**. A study of 47 patients [Peterson 2014] with LBP of less than 90 days' duration underwent both telerehabilitation and face-to-face assessments, and classified into 3 intervention groups: mobilization/manipulation, specific exercise, and stabilization, with an overall agreement of 68%. A study of 15 patients with low back pain [Palacín-Marín 2013], compared back examination by face-to-face and videoconferencing, found that videoconferencing was equivalent for 7 of 9 measures, but modest for lateral flexion and the Sorensen test of trunk extensor muscles. However, this required specialized software and internet connection for parts of the testing. A study of 25 patients [Truter 2014] compared face-to-face assessment with videoconferencing conducted with the participant standing on a reference line on the floor of the clinic with a camera which recorded movements and clinical measurements such as SLR leg angle were extracted from the recorded video once the participant had left, by the TR PT using the inbuilt software tools in the eHAB units. This found agreements between 25% (for lumbar lordosis) to 75% (for pelvic tilt).

A study of 17 patients with **heart failure** [Hwang 2017], compared 3 functional tests (timed up and go (time), six-minute walk (distance), grip strength (kilograms) by face-to-face and videoconferencing, found good agreement between the measures, but required a laptop computer for the patient assessment, plus an automatic sphygmomanometer and a finger pulse oximeter.

A study of 12 patients [Hoffmann 2008] with **Parkinson's disease**, where measurement of hand function and Activities of Daily Living (ADL; measured by the Functional Independence Measure [FIM] and 14 items of the Unified Parkinson's Disease Rating Scale [UPDRS]) were conducted using two methods: half by face-to-face while another assessor simultaneously scored the same assessments via a telerehabilitation system; half via telerehabilitation system while a face-to-face assessor simultaneously scored the assessments. They found high agreement between the two methods for hand function, and most measures of ADL, except for four of the UPDRS items (handwriting, speech volume, speech slurring/expression, bradykinesia).

A study of 10 patients [Hoffmann 2007] who had a **stroke**, where measurement of upper limb joint range of motion was by face-to-face (using a universal goniometer) and videoconferencing (using an internet-based goniometer). Measurements were similar between the two methods. The mean absolute difference between universal goniometer and Internet-based goniometer measurements was small for all movements, ranging from 1.1–2.4. For all movements, except wrist extension in the unaffected arm, the limits of agreement between the two methods of measurement ranged from –5.9 to 5.9, which was within the pre-determined clinically acceptable limit of 6.

A study of 12 patients [Russell 2013] with **Parkinson's disease** where physical assessments (timed stance test, Timed "Up and Go" test, step test, steps in 360-degree turn, Berg Balance Scale, and lateral and functional reach tests) were conducted using two methods. Participants were simultaneously examined by a face-to-face therapist and a remote therapist via a telerehabilitation

system. The authors found that the mean difference between all the assessments conducted by two methods was within clinically acceptable limits. Caveats of the study include small sample size.

A study [Tan 2019] of 28 patients with **facial nerve paralysis** (FNP) asked 7 clinicians to assess in a face-to-face clinic using standardized grading systems then (3 months later) repeat the assessment in videoconferencing recordings of the same patients. Though reliability was good for several components, it was poor to fair for resting symmetry, and concluded that "Video assessment … was as reliable as face-to-face but with insufficient agreement, especially in the assessment of synkinesis."

A study of 11 patients [Hill 2009] with an acquired **apraxia of speech** were assessed simultaneously via telerehabilitation and face-to-face methods on the Apraxia Battery for Adults. The Kappa statistics indicated moderate to very good agreement (0.59–1.00) between the two methods.

C. Consultation without preplanned examination

The McConnachie study [Summary 4.1] appears to be the largest and most relevant study of diagnostic accuracy in primary care as it involved a **consecutive presentation of real patient encounters** to a general clinic. The only other study of primary care diagnoses across a range presenting problems was from a primary care outpatient clinic in Japan [Ohta, 2017]. This study compared diagnosis of 2 general medicine diagnoses by teleconferencing (TD) and face-to-face (FD) with final diagnosis in 97 patients (mean age of 52 years). Levels of agreement (as Kappa coefficients) were 0.75 for TD and FD and 0.81 for both, the final diagnoses and the TD and FD diagnoses, revealing a good level of diagnostic agreement. Diagnostic error occurred with both modes: the correct diagnosis rate for TD was 80.4% (78/97 cases) and for FD was 82.5% (80/97 cases) – slightly but not statistically significantly lower for TD. Errors for TD where FD was correct included cases where physical examination would likely help such as gall stones and kidney stones.

Conclusion

Diagnostic assessments via telehealth has limited research, particularly for real patient consultations. Most of the studies have looked at specific preplanned assessments.

A. Diagnosis via history of verbal assessment tool only – with no physical examination. For assessments limited to question-and-answer, such as cognitive assessments, telehealth appears equivalent to face-to-face.

B. Planned physical examination or assessment – without additional history. When physical examination is required, the few studied done suggest lower agreement and accuracy. For example, assessment for ankle fracture, low back pain, facial nerve palsy, and many elements of sleep apnoea was poor, while assessments such as sit-to-stand, and Parkinson's functioning were acceptable. Some research using specialized equipment – such as pulse oximeters, sphygmomanometers, and visual acuity charts - and suggests this inaccuracy may be overcome, but this would rarely be available in most patient settings for GPs, although some patients may have this equipment at home.

C. Consultation without preplanned assessment or examination – that is, consultation for new presentations. Only 1 adequate study looked at diagnosis of new presentations, and found modest disagreement between telehealth and face-to-face assessment but with errors in both modes. However, when hands-on physical examination is an essential component of the diagnosis then telehealth is likely to be problematic.

Commentary

While history taking and verbal assessments can be done acceptably by telehealth, only some elements of physical examination are sufficiently reliable and valid. Specific planning of physical assessments is often required, but this also suggests further research may overcome some of these limitations.

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Antibiotic use in Primary Care – UPDATE of topic 4.4 from Telehealth Review 2020-21

Antibiotic prescribing may be higher in telehealth (phone, video or mixed) consultations than in face-to-face consultations.

Evidence

Existing systematic review [Bakhit, 2021], [AMSTAR 10/11] + 1 new study [Ray 2021]

Review question and scope

Population and setting: adult or paediatric primary care patients
Intervention: Telehealth (teleconferencing or videoconferencing)
Comparison: face-to-face consultation or usual care
Designs: RCTs, non-randomised controlled trials, controlled before/after, interrupted time series

Review methods

A database search of PubMed, Embase, and Cochrane, supplemented by backwards (cited) and forwards (citing) citation analysis, clinical registry search, and the preprint search via Europe PMC, from inception to 23 February 2021 found 13 eligible studies: 1 randomised trial and 12 cohort studies. For the only RCT identified (using the Cochrane Risk of Bias tool), the overall risk of bias was generally unclear. Blinding of the patients and healthcare providers was not possible. For the remaining 12 studies, Risk of Bias (using the ROBINS-I tool) was mostly of moderate or serious risk of bias- issues with study designs, no appropriate analysis methods were used or adjusting for important baseline confounding factors such as age, the severity of infection, and reported comorbidities.

Main results

13 studies included by Bakhit et al. 2021 are presented here (see Table 4). Of the 13 studies: 3 studies compared telephone consultations, 2 studies compared video consultations, and 7 compared mixed types of consultations, to face-to-face consultations. The review identified 1 RCT that assessed the impact of telehealth compared with face-to-face consultations on antibiotic prescribing, which found a non-significant 25% relative increase in antibiotics. The remaining 12 studies were observational and did not control well for confounding and therefore at high risk of bias. The analysis presented below (by condition) did not show a consistent pattern for antibiotic prescribing. Generally, there are fewer diagnostic tests performed with TH consultations compared with face-to-face. Uscher-Pines (US, 2016) reported that the percentage of adults who were diagnosed with pharyngitis and received an appropriate group A Streptococcus (strep) test to confirm the diagnosis were higher in the face-to-face group [face-to-face group (n = 2297, 49.5%) vs telehealth group (n = 4, 3.4%)].

Table 4: Antibiotics prescribed for acute infections

Conditions	Studies (N)	Odds Ratio TH/F2F* (95%CI)	Comments
Randomised controlled trial			
Any infection	1	**1.25** (0.73, 2.2)	More AB prescribing in TH consultations, but not significant
Before-after studies			
Acute sinusitis	1	**0.78** (0.69, 0.89)	Significantly less AB prescribing in TH consultations
Cross-sectional studies			
Acute sinusitis	6	**0.83** (0.68, 1.0)	Higher, but not significant, AB prescribing in F2F consultations
Pharyngitis	4	**0.39** (0.95, 2.05)	Higher, but not significant, AB prescribing in TH consultations
Bronchitis	3	**0.98** (0.6, 1.6)	No significant difference in AB prescribing
AOM	2	**1.3** (1.11, 1.46)	Significantly more AB prescribing in TH consultations
Conjunctivitis	2	**1.8** (0.7, 4.5)	Higher, but not significant, AB prescribing in TH consultations
UTI	2	**1.4** (0.7, 2.9)	Higher, but not significant, AB prescribing in TH consultations

TH: telehealth; F2F: face-to-face; AB: Antibiotics; UTI: Urinary tract infections; AOM: Acute otitis media
* Odds Ratio < 1.0 means less antibiotics with telehealth; > 1.0 means more antibiotics with telehealth

We also found one new study (Ray 2021) which examined antibiotic prescribing for acute respiratory tract infections during COVID (and hence cannot be added to the pooled analysis). Calculated estimates from the study data shows a higher proportion of antibiotic prescribing occurred in the f2f group (n= 1318/2428) compared to telehealth (n=693/1782) (54% vs 39%), with guideline-concordant antibiotic management occurring in 93% of telehealth group compared to 91% of the f2f group, but this is difficult to interpret with the different case mix in the pandemic.

Conclusion

The impact of telehealth on prescribing appears to vary between conditions, with more increases than reductions.

Commentary

A high risk of bias exists due to the non-controlled study design of most included studies. Further research, particularly in Australia, is urgent.

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COPD: Exercise Therapy/Pulmonary rehabilitation – UPDATE of topic 4.10 from Telehealth Review 2020-21

Videoconferencing is similarly effective to face-to-face consultations for exercise therapy and pulmonary rehabilitation.

Evidence

Existing systematic review [Bonnevie 2021], [AMSTAR 8/11]

Review question and scope

Population and setting: People with stable COPD referred for exercise therapy
Intervention: home-based exercise therapy delivered using advanced telehealth technology (ATT)
Comparisons: no exercise therapy, inpatient or outpatient exercise therapy, and home-based exercise therapy without ATT
Outcomes: Exercise capacity, quality of life, functional dyspnoea, cost-effectiveness and various secondary outcomes.
Study designs included in the review: randomised controlled trials

Review methods

MEDLINE, CENTRAL, Science Direct, Scopus, PEDro, Greylist and OpenGrey were searched from inception to May 2020 for randomised parallel or cross-over trials. Fifteen eligible trials involving 1,522 participants were included and assessed using the Cochrane Risk of bias tool.

Main results

The review identified one study [Hansen 2020] that directly compared videoconferencing-based to face-to-face exercise therapy (see Table 5), rated as high risk of bias. This trial compared home-based exercise therapy supervised by a health professional via videoconferencing (60 minutes, 3 times per week including 20 minutes of education) with face-to-face health professional supervised exercise therapy sessions (60 minutes, 2 times per week + 1 x 60-90 minute education session) in 134 people with severe COPD. There was no difference between the study groups for the primary outcome, change in the 6-Minute Walking Distance from baseline to 10 weeks; nor differences between study groups on secondary outcomes at 22 weeks follow-up. (Table 5)

In the seven other studies, exercise therapy via telehealth was compared with no exercise therapy, and found improved quality of life, reduced shortness of breath, and better 6-minute walk tests. Studies of unsupervised exercise therapy with telehealth feedback compared to supervised telehealth exercise therapy found no important differences.

Table 5: Summary of findings of Hansen 2020 trial of exercise therapy for COPD via videoconferencing vs face-to-face

Outcomes	Patients	Increase by 22 weeks		Difference (95% CI)	Comments
		Face-to-face rehabilitation	Tele-rehabilitation		
Hospital admissions for COPD exacerbation	67/67	36	38	P=0.97; NS	**No difference**
6 Minute Walking Distance	67/67	11 metres	22 metres	11 (-12 to 34) NS	From a baseline average of 327m
30 sec-Sit To Stand, reps	67/67	1.5 repeats	1.1 repeats	-0.4 (-1.4 to 0.7) NS	From a baseline average of 9.8
Quality of Life (EQ-5D, VAS, points)	67/67	4.2	3.5	-0.8 (-7.5 to 5.8) NS	From a baseline average of 53
Adherence Measures					
Completed	67/67	43/67	57/67	P < 0.01	
Average Sessions attended	67/67	16 (of 20)	25 (of 30)		**Total time similar** as F2F sessions were longer

Conclusion

For patients diagnosed with severe COPD in the community, exercise therapy and/or pulmonary rehabilitation delivered by videoconferencing appears better than no exercise therapy. Home-based exercise therapy supervised by a health professional via videoconferencing was no better than face-to-face health professional supervised exercise therapy sessions, (1 randomised controlled trial) for people with severe COPD, showing no difference between study groups in walking capacity (as measured by a change in 6- minute walking distance at 10 weeks or at 22 weeks follow-up), quality of life and physical activity level at 22 weeks. While the effect is similar, telehealth would likely extend access for many community patients – e.g. those who are very sick – and therefore potentially reduce societal burden from disease and treatment.

Commentary

Exercise therapy / pulmonary rehabilitation is a highly effective treatment for COPD, improving function, quality of life, and reducing hospital readmission [Puhan 2016]. However, low uptake, insufficient attendance and high drop-out rates are characteristic of conventional Pulmonary Rehabilitation programs. The one trial comparing home-based exercise therapy provided by videoconferencing with face-to-face exercise therapy found no differences in health outcomes but higher attendance in the telerehabilitation group. Alternative models of delivery, such as telehealth, could improve access to, and therefore the population impact of, exercise therapy and pulmonary rehabilitation.

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Musculoskeletal management – UPDATE of topic 4.11 from Telehealth Review 2020-21

Face-to-face rehabilitation is no different to telerehabilitation (by video or phone) for physical function and pain.

Evidence

Initial systematic review (conducted by the Institute for Evidence-Based Healthcare; now published): Krzyzaniak 2023 [AMSTAR 10/11] + 1 new RCT [Dadarkhah 2021]

Review question and scope

Population and setting: Adults outpatients (> 18 years) with musculoskeletal conditions including post-operative rehabilitation.
Intervention: Exercise program or functional rehabilitation via telehealth
Comparison: Exercise program or functional rehabilitation via face-to-face
Designs: Parallel randomised (RCTs)

Review methods

The initial systematic review searched Cochrane CENTRAL, Medline, and Embase, to November 2020, and grey literature identified 4 RCTs (from 8 studies) focusing on telerehabilitation for musculoskeletal conditions, and a forward and backward citation search identified 1 additional relevant study. The risk of bias was generally low across studies, except for lack of blinding.

Main results

The initial systematic review which contained four randomized trials directly compared telerehabilitation via videoconferencing to an equivalent face-to-face intervention for physiotherapy management, while the one remaining study delivered telerehabilitation via teleconferencing. All studies focused on patient rehabilitation in preparation for or post knee arthroplasty as a result of significant osteoarthritis. One study also evaluated "pre" rehabilitation for patients undergoing a hip arthroplasty. All studies found no clinically or statistically significant differences between telerehabilitation and face-to-face delivery, with standardised mean differences ranging from -0.24 to +0.16, see Table 6. Costs were also reported in one study, which was reported in the full systematic review.

Table 6 Outcomes for telerehabilitation versus face-to-face following total knee arthroplasty

Outcomes	Studies (N)	Difference Post treatment (95%CI)	Comments
Pain (WOMAC sub-scale)	2 RCTs (221)	SMD* = 0.12 (–2.3, 2.6)	No statistically significant difference, favours **face-to-face**
Physical Function (WOMAC sub-scale)	2 RCTs (221)	SMD* = -0.24 (-3.6, 3.1)	No statistically significant difference, favours **telehealth**
QoL – Physical (SF-36, QoL Brief)	2 RCTs (73)	SMD* = -0.16 (–0.72, 0.40)	No statistically significant difference, favours **telehealth**
QoL - Mental (SF-36, QoL Brief)	2 RCTs (73)	SMD* = 0.14 (-–0.32, 0.60)	No statistically significant difference, favours **face-to-face**

WOMAC = Western Ontario and McMaster Universities Arthritis Index scale; **SF-36** = Short Form 36 Health Survey; **QoL Brief** = World Health Organization Quality of Life brief questionnaire **SMD** = standardised mean difference (-ve value favours telehealth)

The new RCT by Dadarkhah, 2021, is a superiority randomized controlled trial in Iran that compared the telerehabilitation of 56 patients with chronic non-specific low back pain using remote exercise at home compared to face-to-face exercise rehabilitation. Those who were in the remote group carried out the exercise at home 2 times a day for 4 weeks with telephone calls, 3 days per week for 4 weeks. Those in the face-to-face exercise group received the same exercises at the clinic, 3 times per week for 4 weeks. The primary outcome was the intensity of the low back pain measured by VAS and the secondary outcome was a disability score using the Oswestry Disability Questionnaire score. The new randomized controlled trial (Dadarkhah, 2021) generally had an unclear risk of bias as it demonstrated an unclear risk of bias within 3 out of the 7 domains using Cochrane's ROB-1 tool, and a high risk of bias for one domain (lack of blinding).

Table 7 Outcomes from Dadarkhah, 2021

Outcomes	N	**Difference (baseline to 3 month) Follow up (95%CI)	Comments
Pain score (VAS)	56	MD* = -0.1 (-0.53, 0.33)	No statistically significant difference, **favours telehealth**
Disability score (Oswestry)	56	MD* = 0.6 (-6.12, 7.32)	No statistically significant difference, **favours face-to-face**

*MD=Mean difference, **difference=telehealth-face-to-face (-ve value favours telehealth)

Table 7, above outlines the results of the new RCT. The new RCT by Dadarkhah, 2021, demonstrated no statistically significant differences (p-value=0.93) between remote and face-to-face (MD=-0.1, 95% CI; -0.53 to 0.33) changed pain scores. There were also no statistically significant differences (p=0.74) between remote and face-to-face exercise (MD=0.6, 95% CI; -6.12 to 7.32) for the disability scores from between baseline and 3 months post-intervention.

Conclusion

The initial systematic review demonstrated that five small RCTs, the delivery of rehabilitation via a telehealth to mostly patients post knee surgery appears to be no different to conventional therapy delivered face-to-face for physical function and pain outcomes after total knee replacement. We have not found any evidence to support the use of telerehabilitation for other musculoskeletal conditions, but this should be the subject of future research.

Furthermore, the additional new RCT, Dadarkhah, 2021 found no difference between the efficacy of remote telerehabilitation versus face-to-face rehabilitation for the treatment of low back pain persisting 12 weeks or longer. Face-to-face rehabilitation was not found to be superior to remote telerehabilitation.

Commentary

The new randomized controlled trial [Dadarkhah 2021] gave additional evidence that chronic non-specific back pain is consistent with previous findings which is based on the delivery of rehabilitation to mostly patients with post knee surgery that also demonstrated there was no difference between telehealth and conventional therapy.

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PTSD treatment – UPDATE of topic 4.13 from Telehealth Review 2020-21

Videoconferencing is similarly effective to face-to-face care for PTSD.

Evidence

Initial systematic review (conducted by the Institute for Evidence-Based Healthcare; now published) Scott et al 2022 [AMSTAR 10/11] + 3 new RCTs [Acierno 2021], [Morland 2022], [Peterson 2022]

Review question and scope

Population and setting: People of any age, gender, with PTSD
Intervention: Video-consultation delivery of psychotherapy for PTSD
Comparison: Face-to-face delivery of psychotherapy at similar intensity for PTSD
Design: Parallel randomised controlled trials (RCTs)

Review methods

For the initial review, searches of Cochrane CENTRAL, Medline, and Embase to November 2020, and forward/backward (citation analysis) in January 2021, identified 13 trials (27 references). For the present update, 3 additional RCTs (3 references) were identified. The total, the evidence as of March 2023 consists of 16 RCTs (30 references). The findings from the additional RCTs have been integrated into the meta-analyses where feasible, and the updated results are presented below.

Main results

Trials evaluated a variety of psychotherapies, including cognitive behavioural therapy, cognitive processing therapy, behavioural activation, therapeutic exposure, prolonged exposure, and others. All trials compared videoconferencing to face-to-face delivery of care. Trials most often reported on the impact of care on: PTSD severity, depression severity, quality of life, therapeutic alliance and satisfaction with treatment. The small differences between telehealth and face-to-face groups were not statistically or clinically significant for any of the outcomes (Table 8).

Table 8 Updated outcomes for telehealth (by video) versus face-to-face care for patients with PTSD

Outcomes	Studies (No. of patients)	Difference post treatment (95%CI)	Comments
PTSD severity immediately post-intervention	12 RCTs (1010)	SMD -0.01 (-0.19 to 0.17)	No statistically significant difference, **does not favour either group**
PTSD severity 6 month follow-up	6 RCTs (714)	SMD -0.08 (-0.23 to 0.07)	No statistically significant difference, favours **video**
Depression severity immediately post-intervention	8 RCTs (643)	SMD 0.04 (-0.21 to 0.29)	No statistically significant difference, favours **face-to-face**
Quality of life % score increase (SF-36) Post-intervention	1 RCT (18)	Physical 4.4% TH vs 4.5% F2F Mental: 46% TH vs 38% F2F	**Similar improvements** for both groups, differences between groups cannot be determined from reported data
Therapeutic alliance Post-intervention	5 RCTs (505)	SMD -0.04, (-0.24 to 0.16)	No statistically significant difference, favours **video**
Satisfaction with care Post-intervention	4 RCTs (454)	SMD 0.02 (-0.17 to 0.22)	No statistically significant difference, favours **face-to-face**

RCT=randomised controlled trial, **SMD**=standardised mean differences; **MD**=mean difference; **SF36-P**: 36 item Short form survey

Conclusion

In patients with PTSD, there is no clinically or statistically significant difference between videoconferencing and face-to-face therapy for reducing the severity of PTSD, depression and other key outcomes.

Commentary

The addition of 3 new RCTs since the systematic review did not change the conclusions of the original review. There continues to be no evidence that face-to-face therapy is better than videoconferencing for reducing the severity of PTSD, depression and other key outcomes, in patients with PTSD.

References

1. Scott AM, Bakhit M, Greenwood H, Cardona M, Clark J, Krzyzaniak N, Peiris R, Glasziou P. Real-Time Telehealth Versus Face-to-Face Management for Patients With PTSD in Primary Care: A Systematic Review and Meta-Analysis. J Clin Psychiatry. 2022 May 23;83(4):21r14143. doi: 10.4088/JCP.21r14143. PMID: 35617629.
2. Acierno R, Jaffe AE, Gilmore AK, Birks A, Denier C, Muzzy W, et al. A randomized clinical trial of in-person vs. home-based telemedicine delivery of Prolonged Exposure for PTSD in military sexual trauma survivors. J Anxiety Disord. 2021;83:102461
3. Morland LA, Knopp KC, Khalifian CE, Macdonald A, Grubbs KM, Mackintosh MA, et al. A randomized trial of brief couple therapy for PTSD and relationship satisfaction. J Consult Clin Psychol. 2022;90(5):392-404.
4. Peterson AL, Mintz J, Moring JC, Straud CL, Young-McCaughan S, McGeary CA, et al. In-office, in-home, and telehealth cognitive processing therapy for posttraumatic stress disorder in veterans: a randomized clinical trial. BMC psychiatry. 2022;22(1):41.

Depression treatment – UPDATE of topic 4.14 from Telehealth Review 2020-21

Telehealth (via videoconferencing or teleconferencing) is similarly effective to face-to-face psychological treatment of depression

Evidence

Initial systematic review (conducted by the Institute for Evidence-Based Healthcare; now published): Scott et al 2022 (updated) [AMSTAR 10/11]

Review question and scope

Population and setting: People of any age, gender, with depression
Intervention: Telehealth (videoconferencing or teleconferencing) delivery of psychotherapy
Comparison: Face-to-face delivery of psychotherapy at similar intensity
Design: Parallel randomised controlled trials

Review methods

Searches of Cochrane CENTRAL, Medline, and Embase to November 2020, and forward / backward (citation analysis) in January 2021, identified 9 RCTs (28 references). Risk of bias was generally low across the studies, except for lack of participant blinding and high attrition. For the present update, the original searches were updated to March 2023. No additional RCTs were identified, thus, the original conclusions remain unchanged.

Main results

9 trials compared either teleconferencing (n=4) or videoconferencing (n=5) delivery to face-to-face delivery. Trials evaluated a variety of psychotherapies, including cognitive behavioural therapy, problem solving therapy, and behavioural activation. Trials reported on: depression severity (9 trials, 6 meta-analysable), quality of life (1 trial), therapeutic alliance (1 trial), and treatment satisfaction (3 trials, 2 meta-analysable). The small differences between telehealth and face-to-face groups were not statistically or clinically significant for any of the outcomes (Table 9).

Table 9 Outcomes for telehealth versus face-to-face care for patients with depression

Outcomes	Studies (N)	Difference Post treatment (95%CI)	Comments
Depression severity: immediately post-treatment*	4 RCTs (541)	SMD -0.04 (-0.21 to 0.13)	No statistically significant difference, favours **telehealth**
Depression severity: 6 months post-treatment*	2 RCTs (373)	SMD 0.05 (-0.56 to 0.66)	No statistically significant difference, favours **face-to-face**
Quality of life (SF-36)	1 RCT (241)	"None of the scores showed significant difference between groups"	No statistically significant difference between groups, **direction not reported**
Therapeutic alliance: client - 14 weeks (WAI-C)	1 RCT (325)	MD 0.77 (-0.84 to 2.4)	No statistically significant difference, favours **telehealth**
Therapeutic alliance: therapist - 14 weeks (WAI-T)	1 RCT (325)	MD 0.61 (-1.3 to 2.5)	No statistically significant difference, favours **telehealth**
Treatment satisfaction – 12 months**	1 RCT (204)	SMD -0.05 (-0.33 to 0.22)	No statistically significant difference, favours **telehealth**

*Depression severity measured using a mix of scales, including: **PHQ9** = Patient Health Questionnaire-9, **HAMD** = Hamilton Depression Rating Scale; **BDI** = Beck Depression Inventory-II; **CESD** = Centre for Epidemiological Studies Depression scale; **SF-36**:
**Treatment satisfaction measured using CSQ (Client Satisfaction Questionnaire) and CPOSS (Charleston Psychiatric Outpatient Satisfaction Scale); 36 item Short-Form Survey; WAI-C = Working Alliance Inventory-Client; WAI-T = Working Alliance Inventory-Therapist; SMD = standardised mean difference

Conclusion

There is no difference between telehealth (by teleconferencing or videoconferencing) and face-to-face therapy for reducing the severity of depression and other key outcomes, in patients with depression.

Commentary

As no additional trials meeting the inclusion criteria have been published since the previous report, the conclusions remain unchanged.

References

1. Scott AM, Clark J, Greenwood H, Krzyzaniak N, Cardona M, Peiris R, Sims R, Glasziou P. Telehealth *v.* face-to-face provision of care to patients with depression: a systematic review and meta-analysis. Psychol Med. 2022 Oct;52(14):2852-2860. doi: 10.1017/S0033291722002331. Epub 2022 Aug 12. PMID: 35959559; PMCID: PMC9693715.

Anxiety Disorders Treatment – UPDATE of topic 4.15 from Telehealth Review 2020-21

Telehealth CBT (by video or phone) is similarly effective to face-to-face CBT for patients with anxiety disorders.

Evidence

Initial systematic review (conducted by the Institute for Evidence-Based Healthcare; now published): Krzyzaniak 2021 [AMSTAR 10/11] + 1 new RCT [Bouchard 2022]

Review question and scope

Population and setting: Children (4-8) or adults (>16 years) at university psychology clinics or outpatient treatment units with primary diagnosis of DSM axis-1 anxiety disorders
Intervention: 10-12 sessions of Cognitive Behavioural Therapy (CBT) delivered by teleconferencing or videoconferencing (CBT type varied by target group, e.g., children received family-based CBT)
Comparison: Face-to-face CBT at similar intensity
Design: Randomised controlled trials

Review methods

The initial review completed a search of Cochrane CENTRAL, Medline, and Embase, to November 2020, and of grey literature which identified 3 RCTs focusing on telehealth for anxiety disorders. A forward and backward citation search identified a further 2 relevant studies. The risk of bias was generally low across studies, except for non-blinding.

Bouchard, 2022, was a non-inferiority randomized controlled trial in Canada that compared the effectiveness of 15 sessions of weekly cognitive-behaviour psychotherapy (CBT) in adults on those with a diagnosis of generalized anxiety disorder (GAS) delivered by videoconference versus being delivered face-to-face at a clinic. The primary outcome measure was GAD severity using the ADIS-IV which was measured immediately at post-treatment, and a follow-up at 6 months, and 12-months. The new randomized controlled trial (Bouchard, 2022) was judged to have an overall high risk of bias as it demonstrated a high risk of bias within 2 out of the 7 domains on the assessment using Cochrane's ROB-1 tool.

Main results

The initial systematic review contained five RCTs comparing CBT delivered by telehealth (3 via videoconferencing and 2 via teleconferencing) to the same therapy delivered face-to-face found no difference in patient outcomes by mode of CBT delivery (Table 10). Each study found no significant differences between distance and face-to-face delivery modes, and distance delivery was as effective as face-to-face therapy for improving clinical patient outcomes (OCD scores and Depression scores include components for anxiety). Other outcomes such as quality of life, client satisfaction and working alliance also saw a similar pattern of results.

Table 10 Outcomes for telehealth versus face-to-face for CBT therapies for treatment of anxiety disorders

Outcomes	Studies (Time; N)	Difference Post treatment (95%CI)	Difference Follow up** (95%CI)	Comments
OCD scores (Y-BOCS, CY-BOCS, CSR)	3 RCTs (Post-treatment 156; 6 Months 136)	SMD* = 0.14 (-0.17, 0.45)	SMD* = 0.10 (-0.24, 0.44)	No statistically significant difference, **favours face-to-face**
Anxiety scores (DASS-A)	1 RCT (Post-treatment 23; 1.5 Months 16)	SMD* = -0.47 (-6.94, 6.00)	SMD* = -1.53 (-7.93, 4.87)	No statistically significant difference, **favours telehealth**
Depression scores (BDI-II, BDI-Y, DASS-D)	3 RCTs (Post-treatment 157; 3 Months 140)	SMD* = -0.02 (-0.44, 0.39)	SMD* = -0.25 (-0.58, 0.09)	No statistically significant difference, **favours telehealth**

Y-BOCS = Yale-Brown Obsessive Compulsive Scales (self report version); **CY-BOCS** = Children's Yale-Brown Obsessive Compulsive Scales; **BDI-II** = Beck depression Inventory, **DASS** = Depression Anxiety Stress Scale (**DASS-D** = depression subscale; **DASS-A** = anxiety subscale); * **SMD** = standardised mean difference (-ve value favours telehealth); * ** Follow up varied by outcomes: OCD=6 months; Anxiety=1.5 months; Depression=3 months

Table 11 Outcomes from Bouchard, 2022

Outcomes	N	***Difference Post treatment (95%CI)	***Difference Follow up** (95%CI)	Comments
Anxiety score (ADIS-IV)	148	MD* = -0.02 (-0.73, 0.69)	MD* = -0.29 (-0.98, 0.40)	No statistically significant difference, **favours telehealth**

*MD=Mean difference, **follow up at 6 months, ***difference=telehealth-face-to-face

Table 11 above displays the results of the new RCT by Bouchard, 2022. This study demonstrated that the treatment was statistically non-inferior when delivered by videoconferencing compared to face-to face. The mean difference in anxiety scores between telehealth and face-to-face from pre- to post-treatment is -0.02 (95% CI; -0.73 to 0.69) and the mean difference between these groups from pre to 6 months follow up is -0.29 (95% CI; -0.98 to -0.40) in favour of telehealth. Based on the non-inferiority tests, the ADIS-IV mean scores improved from pre- to post-treatment on average by 44.5% in the videoconferencing group and improved by 42.4% in the face-to-face group.

Conclusion

The initial systematic review demonstrated that five small studies showed a similar pattern of results, which indicated that CBT delivered by videoconferencing or teleconferencing appeared as effective as face-to-face CBT in reducing clinically relevant symptoms for children and adults with anxiety conditions.

The new study by Bouchard 2022 demonstrated that CBT for generalized anxiety disorder (GAS) delivered by videoconferencing in adults can be just as effective as face-to-face therapy for reducing the severity of symptoms.

Commentary

Although the new randomized controlled trial [Bouchard 2022] was rated at high risk of bias, its findings are consistent with those previously found. Therefore, we can continue to conclude that that CBT delivered by videoconferencing or teleconferencing appears as effective as face-to-face CBT in reducing clinically relevant symptoms for children and adults with anxiety conditions. This

means that for treatment of anxiety disorders clinicians and consumers could choose communication modalities that are most appropriate for their clinical relationship.

References

1. Krzyzaniak N, Greenwood H, Scott AM, Peiris R, Cardona M, Clark J, et al. The effectiveness of telehealth versus face-to face interventions for anxiety disorders: A systematic review and meta-analysis. J Telemed Telecare. 2021:1357633x211053738.
2. Bouchard S, Dugas MJ, Belleville G, Langlois F, Gosselin P, Robillard G, et al. A Multisite Non-Inferiority Randomized Controlled Trial of the Efficacy of Cognitive-Behavior Therapy for Generalized Anxiety Disorder Delivered by Videoconference. J Clin Med. 2022;11(19).

Insomnia treatment – UPDATE of topic 4.16 from Telehealth Review 2020-21

Telehealth (by video or phone) is similarly effective to face-to-face care for psychological treatment of insomnia.

Evidence

Initial systematic review (conducted by the Institute for Evidence-Based Healthcare; unpublished): Scott 2022 (updated with 1 additional RCT)

Review question and scope

Patients and setting: patients with insomnia (as defined by each study) receiving primary care
Intervention: cognitive behavioural therapy for insomnia (CBT-I) by telehealth (teleconferencing or videoconferencing)
Comparison: CBT-I provided face-to-face
Designs: Parallel group randomised controlled trials

Review methods

Search of literature databases, and a forward and backward citation search on the included trials, yielded 3 trials which met the inclusion criteria. Fourth, additional trial (Gehrman 2021) was published subsequently to the initial systematic review, and its findings have been integrated below.

Main results

All 4 trials compared the delivery of CBT-I via telehealth (3 videoconferencing, 1 teleconferencing) to face-to- face. 3 trials reported on insomnia severity, showing small but non-significant differences between the telehealth and face-to-face groups at immediately and at 3 months post-treatment. 2 trials reported sleep quality scores, with small but non-significant differences between two groups at post-intervention and 3 months. There were small but non-significant differences in quality of life (physical and mental). Two trials reported contradictory evidence on satisfaction: one finding no difference between groups, and one finding less satisfaction with telehealth. (Table 12).

Table 12 Outcomes for telehealth versus face-to-face care for patients with insomnia

Outcomes	Studies (N)	Difference post treatment (95%CI)	Comments
Insomnia severity: 0-2 weeks post-intervention (ISI scores: range 0-28)	3 RCTs (164)	MD 1.13 (-0.29 to 2.55)	No statistically significant difference, favours face-to- face
Insomnia severity: at 3 months (ISI scores)	3 RCTs (145)	MD 0.93 (-1.45 to 3.31)	No statistically significant difference, favours face-to- face
Sleep Quality: 0-2 weeks post-intervention (PSQ)	2 RCTs (71)	MD 0.80 (-1.20 to 2.79)	No statistically significant difference, favours face-to- face
Sleep Quality: at 3 months (PSQ: range 0-21)	2 RCTs (51)	MD 0.93 (-1.45 to 3.31)	No statistically significant difference, favours face-to- face
Quality of life (Physical) 3 months (SF-12)	3 RCTs (145)	MD 0.24 (-2.15 to 2.62)	No statistically significant difference, favours face-to- face
Quality of life (Mental) 3 months (SF-12)	3 RCTs (145)	MD -0.45 (-3.62 to 2.73)	No statistically significant difference, favours telehealth
Satisfaction with treatment	2 RCTs (83)	1) No difference (p=0.16) 2) Lower in TH (p<0.01)	Contradictory evidence in satisfaction with telehealth care

SMD: standardised mean difference; **MD**: mean difference; **CI**: confidence interval; **n**: number; **SF-12**: 12 item short-form survey, **ISI**: Insomnia Severity Index scores (range 0-28); **PSQ**: Pittsburgh Sleep Quality scores (range 0-21)

Conclusion

Although the totality of the evidence consists of 4 very recent RCTs (all between 2019-2021), these suggest no clinically important difference between telehealth and face-to-face delivery of care for insomnia in the key outcomes.

Commentary

The addition of the fourth RCT to the previous review (which included 3 RCTs) increased the sample sizes in the meta-analyses, slightly decreasing the width of the 95% confidence intervals. **The conclusions are unchanged from those in Telehealth Review 2020-21.**

Reference

1. Scott AM, Peiris R, Cardona M, Greenwood H, Krzyzaniak N, Clark J, Glasziou P. (unpublished). Telehealth versus face-to-face delivery of cognitive behavioural therapy for insomnia (CBT-I): a systematic review and meta-analysis of randomised controlled trials

Mental health: less common conditions – UPDATE of topic 4.17 from Telehealth Review 2020-21

For most target groups, telehealth psychological therapy (by video or phone) is as effective as face-to-face therapy.

Evidence

Initial systematic review (conducted by the Institute for Evidence-Based Healthcare; now published): Greenwood 2022 [AMSTAR 10/11] + 1 new RCT [Lleras 2020]

Review question and scope

Patient or population: Children, adolescents or adults in psychology clinics or outpatient treatment units with psychological needs or psychiatric diagnoses (excluding depression, PTSD, and anxiety conditions)
Intervention: Psychological therapies relevant to target condition delivered via teleconferencing or videoconferencing, varied program lengths.
Comparison: Face-to-face delivery of psychological therapy of equivalent or comparable intensity and duration relevant to target condition.
Design: Randomised controlled trials

Review methods

The initial review searched Cochrane CENTRAL, Medline, and Embase, to November 2020, and grey literature. It identified 12 RCTs (reported in 15 articles) focusing on telehealth for a range of mental health disorders, and evaluating psychotherapies including: substance abuse counselling, CBT, CBIT, BFST, stress management. The risk of bias was generally unclear across studies, but risk for non-blinding was high.

Lleras, 2020, a new randomised controlled trial, was a superiority trial from Spain, of 269 women who had a cancer diagnosis and high level of emotional distress. It compared the effectiveness of 12 weekly PPC group therapy sessions delivered by videoconference to their delivery face-to-face at a clinic. The main outcomes were severity scores for anxiety and depression (HADS), post-traumatic stress (PCL-C) and post-traumatic growth (PTGI), assessed at post-treatment, and at 3 months follow-up. The study had an overall high risk of bias due to high risk of bias within three out of the seven domains on the assessment using Cochrane's ROB-1 tool.

Main results

The initial systematic review contained a total of 12 studies: 7 used videoconferencing, 3 used teleconferencing, 1 used both, and in 1 it was unclear which modality was used. From the direct comparisons of 12 RCTs, telehealth interventions for miscellaneous psychological conditions appear to be comparable to therapy delivered face-to-face for symptom severity, function, and improvement (Table 12). Each study found small and non-significant differences between the two modes of therapy. Other outcomes such as client satisfaction and working alliance also saw a similar pattern of results. Three studies reported on the costs of telehealth vs. face-to-face care, and although no statistical significance was reported in either of these studies, it appears that telehealth is either no different or less costly than face-to-face treatment for minority mental conditions.

Table 13 Outcomes for telehealth versus face-to-face for treatment of mental health conditions

Outcomes	Studies (Time; N)	Difference post treatment (95%CI)	Difference follow up** (95%CI)	Comments
Severity scores (CFS, CGI-S, BSI, YGTSS, PHQ-15, HADS)	7 RCTs (Post-treatment 335; 12 Months 106)	SMD* = 0.05 (-0.17, 0.27)	SMD* = 0.15 (-0.23, 0.53)	No statistically significant difference, **favours face-to-face**
Function scores (CGAS, MOS, GAF, VR-36)	5 RCTs (Post-treatment 237; 12 Months 105)	SMD* = 0.13 (-0.16, 0.42)	SMD* = 0.08 (-0.3, 0.47)	No statistically significant difference, **favours face-to-face**
Improvement scores (CGI-I, SRGIS, MAC – H/H)	2 RCTs (Post-treatment 157)	SMD* = -0.0 (-0.4, 0.39)	N/A	No statistically significant difference

CFS = Chalder Fatigue Scale; **CGI-S/I** = Clinical Global Impression Scale-Severity/Improvement; **BSI** = Brief Symptom Inventory; **YGTSS** = Yale Global Tic Severity Scale; **PHQ-15** = Patient Health Questionnaire-15; **HADS** = Hospital Anxiety and Depression Scale; **CGAS** = Children's Global Assessment Scale; **MOF** =Medical Outcomes Survey; **GAF** = Global Assessment of Functioning; **SRGIS** = Self-rated Global Improvement Scale; **MAC – H/S** = Mental Adjustment to Cancer: standardised mean difference (-ve value favours telehealth); ** Follow up was at 12 months.

Table 14 Outcomes from Lleras, 2020

Outcomes	N	Difference Follow up** *b (95%CI)	P value	Comments
Severity score (HADS)	269	1.36 (0.55,3.27)	0.16	No statistically significant difference
Severity Score (PCL-C)	269	1.20(-2.2,4.60)	0.69	No statistically significant difference
Severity score (PTGI)	269	-0.59(-6.40,5.22)	0.84	No statistically significant difference

*coefficient for fixed effect of therapy PPC vs OPPC ** Follow up was at 3 months

There were significant baseline differences between the two treatment groups in Lleras 2020. Therefore, fixed effect models were developed to perform analyses to test the effect of interventions (between face-to-face and online) and adjusted for age, education, and work status. The results of the linear fixed effect models are in Table 14 above. There was no significant fixed effect of therapy between face-to-face and online group found for the HADS total score (b=1.36, P=0.16, 95% CI=-0.55 to 3.27). For the effect of treatment on PTSS (PCL-C), there was no statistical difference between the two treatment arms (b=1.20, p=0.69, 95% CI=-2.20 to 4.60), or for post-traumatic growth, PTGI (b=-0.59, P=0.84, 95% CI=-6.40 to 5.22).

Conclusion

The new RCT by Lleras showed no significant differences between video and face-to-face CBT for reducing symptoms in women who had a cancer diagnosis and high level of emotional distress

Overall, our findings indicate that the delivery of mental health psychotherapies to patients with mental health conditions is comparable in outcomes and costs to face-to-face therapies. This supports findings of psychotherapy delivered via telehealth for anxiety, depression, and PTSD (see other evidence summaries).

Commentary

The telehealth delivery of mental health psychotherapies to patients with minor mental health conditions has comparable outcomes to face-to-face delivery of therapies. Given the various outcome measures and clinical groups, the generalisability of these findings to serious mental health conditions, i.e., schizophrenia, bipolar disorder, etc, may be limited.

References

1. Greenwood H, Krzyzaniak N, Peiris R, et al. Telehealth Versus Face-to-face Psychotherapy for Less Common Mental Health Conditions: Systematic Review and Meta-analysis of Randomized Controlled Trials. *JMIR mental health*. 2022;9(3):e31780-e31780.
2. Lleras de Frutos M, Medina JC, Vives J, Casellas-Grau A, Marzo JL, Borràs JM, et al. Video conference vs face-to-face group psychotherapy for distressed cancer survivors: A randomized controlled trial. Psycho-Oncology. 2020;29(12):1995-2003.

Question A1: Updated reviews and new evidence comparing telehealth (via telephone or video) to face-to-face delivery of care in primary and allied health - topics unchanged from Telehealth Review 2021 (no new evidence found)

Diagnostic accuracy in primary care: Single consultation (was: topic 4.1 in Telehealth Review 2020-21)

Videoconferencing was less accurate than face-to-face for primary care consultations for children with acute conditions.
This topic was previously synthesised in the Telehealth Review 2020-21. No new evidence has been found to update the topic. The conclusions are unchanged, and current to 2023.

Evidence

No existing systematic review; relevant evidence: McConnochie, 2006.

Review question and scope

Patient: children (< 18 years) with an acute illness
Setting: emergency/primary paediatric care
Intervention: videoconferencing
Comparison: face-to-face consultation
Outcome: agreement between intervention and comparison with: (i) diagnosis (ii) treatment
Design: randomised trial of 2nd assessment

Review methods

From one USA paediatric primary practice, and a hospital emergency department, 1450 children were eligible, but 591 could be assessed by the research assistant, and 481 families consented. Children were seen twice for acute conditions: first face-to-face by their usual physicians then (ii) by experienced general paediatricians (study physicians) randomly assigned to either face-to-face or via videoconferencing with a telehealth assistant.

Main results

For the 492 visits studied, agreement on diagnosis of study physicians with usual physicians was 89%: with the difference in the proportion of visits with disagreements between telehealth study and face-to-face study evaluations (13.8% vs 8.3%, respectively, p=0.05), especially greater for ear problems (see Table 15). Disagreement proportions for prescriptions were similar (32% vs 27% respectively).

Table 15 From McConnochie, 2006 Table 2 - Agreement Primary Diagnosis: Telehealth Versus Face-to-face Study Physicians

Findings	Telehealth (N = 239), n (%)	Face-to-face (N = 253), n (%)	Total (N = 492), n (%)
Overall findings*			
Agreement	206 (86.2)	232 (91.7)	438 (89.0)
Disagreement	33 (13.8)	21 (8.3)	54 (11.0)
Findings by clinical grouping			
URI-Ear group only†			
Disagreement	16 (17.6)	7 (6.3)	23 (11.4)
All other groups (except URI-Ear) ‡			
Disagreement	17 (11.5)	14 (9.9)	31 (10.7)

Conclusion

Even with a telehealth assistant who had ENT tools and camera, diagnosis appears less acute via videoconferencing than face-to-face. **The conclusions are unchanged from those in Telehealth Review 2020-21.**

Commentary

Videoconferencing was less accurate than face-to-face, particularly for ear problems (although it should be noted that ear diagnosis is notoriously variable between physicians). Despite these differences in diagnosis, the management was little different between the groups.

References

1. McConnochie KM, Conners GP, Brayer AF, Goepp J, Herendeen NE, Wood NE, et al. Differences in diagnosis and treatment using telemedicine versus in-person evaluation of acute illness. Ambul Pediatr. 2006;6(4):187-95; discussion 96-7.

GP primary care satisfaction: Single consultation (was: topic 4.3 in Telehealth Review 2020-21)

Videoconferencing is similar to face-to-face for primary care consultations, but with some downsides.
This topic was previously synthesised in the Telehealth Review 2020-21. No new evidence has been found to update the topic. The conclusions are unchanged, and current to 2023.

Evidence

No systematic review: relevant study Dixon & Stahl, 2009.

Review question and scope

Population and setting: adult (> 18 years) existing patients of the primary care practice in the UK
Intervention: videoconferencing
Comparison: face-to-face consultation
Design: randomised cross-over trial

Review methods

From one general practice, 152 of 175 patients approached were interviewed and examined twice: in both (i) face-to-face and (ii) videoconferencing settings, the order being randomized. After each consultation, patients and clinicians completed a questionnaire about satisfaction and preferences.

Main results

Physicians were very satisfied with videoconferencing but preferred face-to-face overall (P<0.0001; Table 16). For videoconferencing, the physical examination, and the ability to order appropriate laboratory tests were the least satisfying elements of the encounter. Patients were also very satisfied with videoconferencing but overall preferred face-to-face (P<0.0001).

Table 16 Outcomes for face-to-face versus videoconferencing satisfaction

Outcomes	Number people	Absolute effects* (95% CI)		Mean Difference (p-value)	Comments
		Face-to-face	Video-consultation		
Patient satisfaction	152 patients	4.6	4.3	0.3 (p<0.001)	Small difference **favouring F2F**
Physician satisfaction	4 Drs	4.8	4.3	0.5 (p<0.001)	Small difference **favouring F2F**

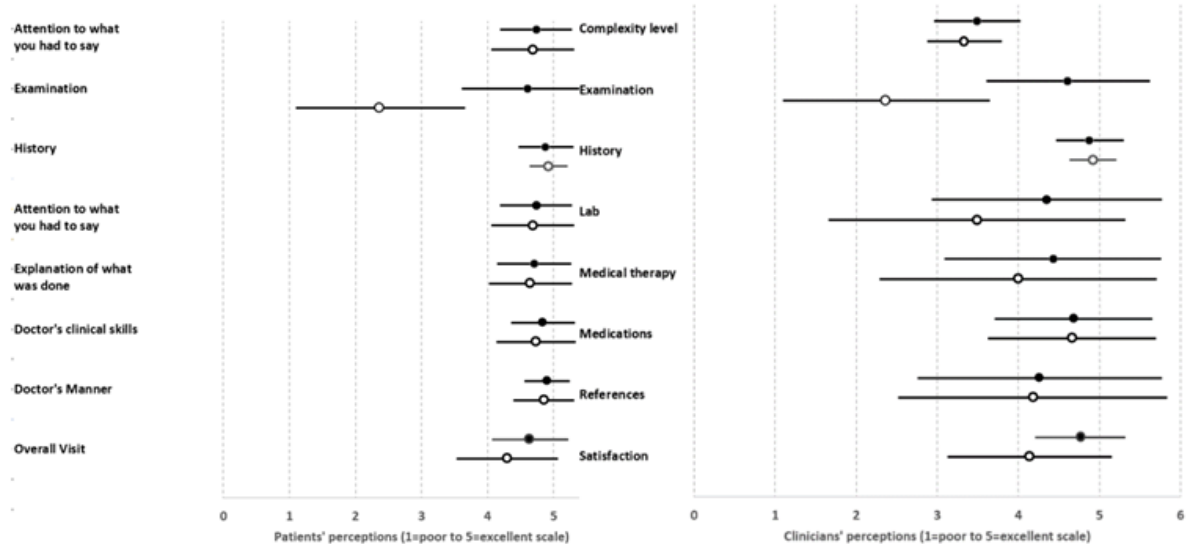

Figure 3 Perspectives on face-to-face and virtual visits for (A, left) patients (B, right) clinicians (1=poor to 5=excellent) (from Figure 4 in Dixon); note difference in Examination for both patients and clinicians

Conclusion

Patient and physician satisfaction were slightly less for telehealth, with clinicians and patients particularly concerned about the (limitations of) hand-on physical examination. **The conclusions are unchanged from those in Telehealth Review 2020-21.**

References

1. Dixon RF, Stahl JE. A randomized trial of virtual visits in a general medicine practice. J Telemed Telecare. 2009;15(3):115-7.

GP Triage (Boggan systematic review) (was: topic 4.5 in Telehealth Review 2020-21)

Remote triage in acute primary care (via teleconferencing) is similar to face-to-face care.
This topic was previously synthesised in the Telehealth Review 2020-21. No new evidence has been found to update the topic. The conclusions are unchanged, and current to 2023.

Evidence

Existing Systematic Review [Boggan, 2020] [AMSTAR 8/11]

Review question and scope

Population and setting: adults ≥ 18yo + their families and caregivers in outpatient general setting (family, general internal, integrative and urgent medicine + ED)
Intervention: teleconferencing triage services
Comparison: face-to-face or usual care or waitlist control
Designs: RCTs, non-randomised controlled trials, controlled before/after, interrupted time series

Review methods

Searched Medline, EMBASE until 27 July 2018, plus references from high-quality systematic reviews and studies identified by stakeholders during topic development. 8 studies met the inclusion criteria: 1 individual RCT, 4 cluster RCTs, 2 controlled before/after studies, 1 interrupted time series.

Of the 5 included RCTs, 1 compared teleconferencing triage by nurses at own (registered) practice vs at the NHS Direct service, and 1 compared teleconferencing triage by GPs at own practice vs those from a deputising service; those 2 RCTs were excluded from the present review.

Main results

3 RCTs included by Boggan et al meet the inclusion criteria for the present review (see Table 17). All 3 trials compared teleconferencing care to face-to-face care. 2 RCTs compared the impact of teleconferencing to face-to-face care on subsequent attendance at emergency departments, finding no significant difference. 1 trial evaluated primary care contacts subsequent to teleconferencing advice or face-to-face care, finding no difference between groups. None of the included studies found statistically significant differences in safety outcomes. Findings of the Campbell et al 2014 trial (ESTEEM trial) are summarised separately below due to its considerable size.

Table 17 Characteristics of included studies (Boggan)

Study & design	Intervention & Comparator, N	Key outcomes	Results
McKinstry 2002 Parallel RCT	Phone-consultation advice (N=182) vs Face-to-face consultation (N=188)	Subsequent primary care contacts (mean, SD) Subsequent ED contacts (mean, SD)	Phone 0.6 (SD 0.8) vs F2F 0.4 (SD 0.7); **difference NS** Phone 0.0 (SD 0.2) vs F2F 0.0 (SD 0.1); **difference NS**
Lattimer 1998 Cluster RCT	Phone-consultation nurse triage (N=7184) vs UC (N=7303)	Attendance at ED unit within 3 days of call	Phone: 412 events vs UC 398 events (391 adjusted for differences in denominator); **increase in Phone arm** within statistical limits of equivalence
Campbell 2014 RCT	Phone-consultation GP triage (N=7017) vs Phone-consultation Nurse triage (N=7525) vs UC (N=7719)	Please see a separate 1 page summary of the Campbell 2014 (ESTEEM trial) in section 4.6 GP Triage (Campbell 2014 – the ESTEEM trial)	

ED=emergency department; SD=standard deviation; UC=usual care; NS=not significant

Conclusions

3 RCTs found that telehealth (via teleconferencing) provides similar clinical outcomes, compared to face-to-face care, in the outpatient general medical setting. **The conclusions are unchanged from those in Telehealth Review 2020-21.**

Commentary

The evidence and conclusions pertain to care provided over the teleconferencing; none of the included RCTs evaluated the provision of telehealth by videoconferencing.

References

1. Boggan JC, Shoup JP, Whited JD, Van Voorhees E, Gordon AM, Rushton S, et al. Effectiveness of Acute Care Remote Triage Systems: a Systematic Review. J Gen Intern Med. 2020;35(7):2136-45.

GP Triage (Campbell 2014 – the ESTEEM trial) (was: topic 4.6 in Telehealth Review 2020-21)

GP teleconferencing triage and nurse teleconferencing triage appear similar for outcomes and costs.
This topic was previously synthesised in the Telehealth Review 2020-21. No new evidence has been found to update the topic. The conclusions are unchanged, and current to 2023.

Evidence

No systematic review identified; relevant article: Campbell, 2015 from Boggan, 2020 review (summary above).

Review question and scope

Design: cluster RCT of GP practices in the United Kingdom
Population: patients who telephoned a practice, seeking a same-day face-to-face consultation with a GP
Interventions: 1) GP-led teleconferencing triage; 2) Nurse-led computer-supported teleconferencing triage; 3) Usual care
Outcomes: 1^{O}: primary care contacts in 28 days after the patient's index appointment request; 2^{O}: patient safety, experience of care, resource use and costs
Economic analysis: a cost-consequence analysis from the perspective of the UK's NHS

Methods

GP-led teleconferencing triage arm (13 GP practices, 7017 patients) (GPLT): patients who rang a practice requesting a same-day appointment, were called back by a GP within 1-2 hours. The GP could: give self-care advice, book a face-to-face or teleconferencing visit with a doctor or nurse that day, or another day.
Nurse-led, computer-supported teleconferencing triage (15 GP practices, 7525 patients) (NLT): as above, however, patients were called back by a nurse. The Plain Healthcare Odyssey Patient Assess was used to support nurses to assess and decide about the clinical needs of the patient.
Usual care (14 GP practices, 7719 patients) (UC): practices continued patient management as usual after the patient rang the practice requesting a same-day appointment.

Main results

GPLT had 33% more primary care contacts over the 28-day follow-up, and NLT 48% more, compared to UC. GPLT had 38% more GP total contacts (face-to-face and teleconferencing combined), and NLT had 16% fewer GP contacts, than UC (see Table 18). GP face-to-face contacts were reduced by 39% compared to UC, 20% compared to NT. There were 8 deaths in the trial, ruled by independent adjudicators not to be associated with the trial. There was no increased risk of A&E visits during follow-up. There was no difference in ease of receiving prompt care between the GPLT and UC arms, although NLT patients found this significantly more difficult. NLT patients were less satisfied with care, compared to UC and GPLT. Mean overall care costs for the 28-day follow-up were similar in all 3 arms: 75 pounds. (Table 18)

Table 18 GP Triage (Campbell 2014 – the ESTEEM trial)

	GPLT Mean (SD)*	NLT Mean (SD)	UC Mean (SD)	GPLT vs UC RR (95% CI)*	NLT vs UC RR (95% CI)	NT vs GPLT RR (95% CI)
Total primary care contacts on days 1-28	2.65 (1.7)	2.82 (1.7)	1.91 (1.4)	1.33 (1.30 to 1.36)	1.48 (1.44 to 1.52)	1.04 (1.01 to 1.08)
Overall GP contacts (F2F & telephone) on days 1-28	2.19 (1.29)	1.34 (1.08)	1.56 (1.01)	1.38 (1.28 to 1.50)	0.84 (0.78 to 0.91)	0.61 (0.56 to 0.66)
Overall GP contacts (F2F only) on days 1-28	0.92 (0.91)	1.19 (0.89)	1.46 (0.85)	0.61 (0.54 to 0.69)	0.80 (0.71 to 0.90)	1.30 (0.15 to 1.46)
Deaths	N=5 (0.7/1000 patients)	N=2 (0.3/1000 patients)	N=1 (0.1/1000 patient)	------	------	------
At least 1 A&E visit within 28 days	N=171 (3.3%)	N=156 (2.9%)	N=166 (3%)	1.18 (0.87 to 1.61)	1.09 (0.80 to 1.49)	0.92 (0.67 to 1.26)
				MD (95% CI)	MD (95% CI)	MD (95% CI)
How easy was it to receive prompt care**	------	------	------	0.39 (-3.01 to 3.80)	7.02 (3.60 to 10.45)	6.63 (3.23 to 10.03)
How satisfied were you with care received***	------	------	------	1.33 (-0.69 to 3.35)	3.94 (1.88 to 5.99)	2.60 (0.58 to 4.63)
Cost of care (£) over 28 days: mean (SD) [95th %-ile range]	75.21 (65.45) [14.03 to 205.31]	75.68 (63.09) [7.62 to 184.90]	75.41(57.19) [43.00 to 172.00]	------	------	------

GPLT=GP-led triage; NLT=Nurse-led triage; UC=usual care; SD=standard deviation; RR=rate ratio; 95% CI=95% confidence interval; *unless otherwise noted; **Scale of 1-100, increasing difficulty;*** Scale of 1 to 100, increasing dissatisfaction.

Conclusion

GPLT and NLT increased the number of primary care contacts compared with UC. Whilst GPLT had 38% higher total GP contacts (face-to-face and teleconferencing combined), it had 39% fewer face-to-face only contacts, suggesting a redistribution of the contact types. NLT had a lower rate of total GP contacts (by 16%) and GP face-to-face only contacts (by 20%). Triage appears safe and acceptable to patients (although more so when done by GPs than by nurses), and the overall costs of care were similar compared to usual care. **The conclusions are unchanged from those in Telehealth Review 2020-21.**

References

1. Campbell JL, Fletcher E, Britten N, Green C, Holt T, Lattimer V, et al. The clinical effectiveness and cost-effectiveness of telephone triage for managing same-day consultation requests in general practice: a cluster randomised controlled trial comparing general practitioner-led and nurse-led management systems with usual care (the ESTEEM trial). Health Technol Assess. 2015;19(13):1-212, vii-viii.

Acute physiotherapy triage (was: topic 4.7 in Telehealth Review 2020-21)

Teleconferencing physiotherapy triage is clinically effective and safe in delivering care for primary care patients with musculoskeletal problems.
This topic was previously synthesised in the Telehealth Review 2020-21. No new evidence has been found to update the topic. The conclusions are unchanged, and current to 2023.

Evidence

No systematic review; relevant articles Salisbury, 2013a; Salisbury, 2013b

Review question and scope

Population and setting: Adults (aged ≥ 18 years) with a MSK problem, referred by general practitioners (GP) or self-referred for physiotherapy at community physiotherapy services in four different areas in England.
Intervention: PhysioDirect – initial physiotherapy assessment via teleconferencing triage, sent exercise advice, and where necessary, referred for face-to-face care or a teleconferencing follow up call.
Comparison: Usual care - waiting list for a face-to-face physiotherapist appointment.
Design: Pragmatic, individually randomised controlled trial, incorporating economic evaluation.

Review methods

Adults referred by their GP or self-referred for physiotherapy management of a musculoskeletal problem were randomised 2:1 to PhysioDirect (described above) or usual care. Outcomes were assessed at baseline, six weeks, and six months. Economic evaluation was analysed from the NHS perspective, and included the direct cost of physiotherapy and primary care consultations, medication prescribed, and hospital care.

Main results

There was no difference between PhysioDirect and usual care for physical component score at six months' follow-up (see Table 19). There were no significant differences between study groups for any scales from the SF-36v2 questionnaire, or time lost from work at six months. For process outcomes, PhysioDirect patients had fewer face-to-face appointments and physiotherapy consultations overall, shorter waiting times and lower rates of non-attendance. Patients in both groups were equally satisfied with access to care. While PhysioDirect patients were slightly less satisfied with their consultations and overall than usual care patients, they were still more likely to prefer the PhysioDirect service in the future. No adverse events were detected in either arm of the trial.

The direct costs of physiotherapy were slightly greater for PhysioDirect arm than usual-care, however sensitivity analyses after the trial ended suggested that it would be slightly less expensive than usual care. The QALYs gained in the PhysioDirect arm were similar to those of usual care. The incremental cost per QALY gained was £2889, the net monetary benefit was £117 (95% CI –£86 to £310) based on a willingness to pay of £20,000 and there was an 88% probability that PhysioDirect was cost-effective at this willingness-to-pay threshold.

Table 19 Outcomes for teleconferencing PhysioDirect versus usual care for initial physiotherapy assessments

Outcomes	Mean score		Difference in means (95% CI)	Effect p value	Comments
Primary outcome	**PD (n = 1,506)**	**F2F (n = 743)**			
SF-36v2 physical **6 months**	43.5	44.2	-0.01 (-0.80 to 0.79)	p = 0.99	NS difference, **equally effective**
Secondary outcomes					
Patient satisfaction with **consultation**	75.7	79.2	-3.4 (-5.9 to 0.97)	p = 0.005	Significantly **favours F2F**
Overall patient satisfaction	75.9	79.7	-3.8 (-7.3 to -0.3)	p = 0.031	Significantly **favours F2F**
Time lost from work **at 6 months**	Days = 7.0	Days = 7.1	0.08 (-3.21 to 3.35)	p = 0.94	NS difference, **no difference** in time lost from work
Process outcomes					
Patient preference for PD	n = 393 (40%)	n = 131 (27%)	1.98 (1.43 to 2.74)	p < 0.001	Significantly **favours telehealth**
Number of consultations	n = 2.9	n = 3.3	0.87 (0.80 to 0.94)	p = 0.001	Significantly **favours telehealth**
Non-attendance rates	IRR = 0.09	IRR = 0.12	0.55 (0.41 to 0.73)	p < 0.001	Significantly **favours telehealth**
Economic outcomes	**Mean among PhysioDirect group**	**Mean among usual-care group**	**Incremental difference (95% CI)**		**Comments**
Cost of physiotherapy (£)	£87	£79	£8 (0.69 to 15.3)		PhysioDirect had **higher overall cost of therapy**
Cost of physiotherapy (£): sensitivity analysis	£72.2	£76.6	-£4.4 (-11.25 to 2.57)		Cost of care **favour PhysioDirect,** NS difference
QALYs	0.332	0.325	0.007 (-0.003 to 0.016)		**No difference** in QALYs gained

Abbreviations: NS = non-significant difference; F2F = face-to-face intervention; PD = PhysioDirect intervention

Conclusion

The provision of teleconferencing physiotherapy assessments was equally clinically effective compared with usual care. While teleconferencing triage was observed to have slightly lower patient satisfaction for the consultation itself and the service overall, PhysioDirect patients were significantly more likely to prefer the teleconferencing service. PhysioDirect is probably cost-effective compared with usual care. **The conclusions are unchanged from those in Telehealth Review 2020-21.**

References

1. Salisbury C, Foster NE, Hopper C, Bishop A, Hollinghurst S, Coast J, et al. A pragmatic randomised controlled trial of the effectiveness and cost-effectiveness of 'PhysioDirect' telephone assessment and advice services for physiotherapy. Health Technol Assess. 2013;17(2):1-157, v-vi.
2. Salisbury C, Montgomery AA, Hollinghurst S, Hopper C, Bishop A, Franchini A, et al. Effectiveness of PhysioDirect telephone assessment and advice services for patients with musculoskeletal problems: Pragmatic randomised controlled trial. BMJ (Online). 2013;346(7893).

Asthma: GP check-ups (was: topic 4.8 in Telehealth Review 2020-21)

Teleconferencing is similarly effective to face-to-face check-ups for control and exacerbations of asthma.
This topic was previously synthesised in the Telehealth Review 2020-21. No new evidence has been found to update the topic. The conclusions are unchanged, and current to 2023.

Evidence

Existing systematic review [Kew, 2016] [AMSTAR 11/11]

Review question and scope

Patient or population: adults or children outpatients with asthma
Intervention: check-ups for asthma conducted using technology (e.g., teleconferencing, email)
Comparison: check-ups for asthma conducted face-to-face
Designs: Parallel randomised controlled trials (RCTs)

Review methods

Identified randomized trials from the Cochrane Airways Review Group Specialised Register (CAGR) up to 24 November 2015. Six studies (2100 participants) met the inclusion criteria.

Main results

Of the 6 included studies, 1 used videoconferencing, and 5 used teleconferencing. Telehealth and face-to-face check-ups were similarly effective for asthma control (Asthma Control Questionnaire - ACQ) and for quality of life (Asthma Quality of Life Questionnaire – AQLQ; see Table 20). In the face-to-face check-up groups, 21 participants out of 1000 had exacerbations that required oral steroids over three months, which was slightly fewer than to 36 (95% CI 9 to 139) out of 1000 for the remote check-up group, but this difference was not statistically significant.

Table 20 Outcomes for remote versus face-to-face check-ups for asthma

Outcomes	Studies (people)	Absolute effects* (95% CI)		Effect (95% CI)	Comments
		Face-to-face check-up	Remote check-up		
ACQ Scale 0-6; low=better **12 months**	1 RCT (146)	The mean ACQ score improved by **0.11**	The mean ACQ score improved by **0.18**	Mean ACQ score improved by **0.07 more** (-0.35 to +0.21)	**No difference** and CIs ruled out significant harm of remote check-ups.
ALQ Scale 1-7; high=better **8 months**	3 RCTs (544)	The mean AQLQ score was **5.5**	The mean AQLQ score was **5.58**	Mean AQLQ score was **0.08 better** (-0.14 to +0.30)	**No difference** and CIs ruled out significant harm.
Lung function (FEV_1) **6 months**	1 RCT (253)	The mean trough FEV_1 improved by **20 mL**	The mean trough FEV_1 improved by **186 mL**	The mean trough FEV_1 was **166 mL better** (78 to 256)	**Remote check-ups** had better lung function in one study
Exacerbation requiring oral corticosteroids **3 months**	1 RCT (278)	21 per 1000	36 per 1000	Odds ratio 1.74 (0.41 to 7.4)	Very imprecise
Exacerbation requiring hospital admission **6 months**	3 RCTs (651)	5 per 1000	3 per 1000	Odds ratio 0.63 (0.06 to 6.3)	Very few events – **no conclusion** could be drawn

ACQ = Asthma control; ALQ = asthma-related quality of life

Conclusion

Current randomised evidence does not demonstrate any important differences between face-to-face and remote asthma check-ups in terms of exacerbations, asthma control or quality of life. There is insufficient information to rule out differences in efficacy, or to say whether remote asthma check-ups are a safe alternative to being seen face-to-face. **The conclusions are unchanged from those in Telehealth Review 2020-21.**

References

1. Kew KM, Cates CJ. Remote versus face-to-face check-ups for asthma. Cochrane Database Syst Rev. 2016;4:Cd011715.

Cardiovascular: Anticoagulant management (was: topic 4.9 in Telehealth Review 2020-21)

Teleconferencing interventions are a viable approach to manage oral anticoagulation.
This topic was previously synthesised in the Telehealth Review 2020-21. No new evidence has been found to update the topic. The conclusions are unchanged, and current to 2023.

Evidence

No systematic review identified; relevant article Staresinic, 2006 from systematic review by Lee, 2018 [AMSTAR score 7/11]

Review question and scope

Patient or population and setting: adults (> 18 years) on warfarin for at least 3 months before enrolment at hospital clinic where patients are referred to by the primary care provider.
Intervention: Interim teleconferencing follow-up service with quarterly face-to-face clinic visits.
Comparison: Usual anticoagulant service for face-to-face delivered by allied health professionals (e.g., pharmacists) in collaboration with a medico.
Design: Parallel randomised (RCT)

Review methods

A search of Medline, EMBASE, Cochrane CENTRAL register of controlled trials, from 1996 to March 6, 2017 identified only 1 RCT which met the inclusion criteria. Many studies on cardiovascular conditions were excluded due to the setting (hospital-based) or additional technology used (internet-based self-management without clinician, use of equipment for data storage and transmission, or mobile apps and text communication) which are not routine care in the Australian context, and therefore not within scope of this review.

Main results

One randomized trial of 192 patients compared teleconferencing follow-up to an equivalent face-to-face intervention for anticoagulation management (evaluation of prothrombin time (expressed as INR) and clinical status every 4 weeks on both groups) and found that the average INR measured over the entire course of the study was the same for both groups, and the time in therapeutic range was as similar for both groups, with the exception of IT participants in the higher intensity anticoagulation of 2.5 to 3.5 INR target range following intervention (Table 21)

Table 21 Outcomes for tele-anticoagulation versus face-to-face for people on indefinite warfarin treatment (for VTE, stroke, AF, valve replacement)

Outcomes	Studies (people)	Absolute effects* (95% CI)		Effect (p value)	Comments
		Face-to-face check-up	Phone-consultation (IT group)		
Percentage of time in therapeutic range*	1 RCT (192)	55% (26%-94%)	58% (28%-91%)	3% (p=0.28)	**No significant difference**
Thromboembolic events		9 (4%)	4 (2%)	2% (p=0.16)	**No significant difference**
Serious bleeding events n(proportion as %) **36 M**		42 (18%)	47 (20%)	2% (p=0.65)	**No significant difference**

*INR=international normalised ratio (ratio of 2.0-3.0 are considered in the effective therapeutic range)

Conclusion

Interim (intermittent) teleconferencing follow-up appears to be comparable to face-to-face sessions at most INR levels, and generated fewer urgent care/office visits. The IT group receiving higher intensity anticoagulation experienced greater anticoagulation control and fewer complications. **The conclusions are unchanged from those in Telehealth Review 2020-21.**

Commentary

Other studies in the original review by Lee investigating the effectiveness of telehealth interventions for oral anticoagulation were excluded as the were of cohort and other observational designs.

References

1. Staresinic AG, Sorkness CA, Goodman BM, Pigarelli DW. Comparison of outcomes using 2 delivery models of anticoagulation care. Arch Intern Med. 2006;166(9):997-1002.
2. Lee M, Wang M, Liu J, Holbrook A. Do telehealth interventions improve oral anticoagulation management? A systematic review and meta-analysis. J Thromb Thrombolysis. 2018;45(3):325-36.

Diabetes management (was: topic 4.12 in Telehealth Review 2020-21)

Telehealth (by phone or video) is similarly effective to face-to-face for glycaemic control and satisfaction with care in Type 1 and Type 2 Diabetes.
This topic was previously synthesised in the Telehealth Review 2020-21. No new evidence has been found to update the topic. The conclusions are unchanged, and current to 2023.

Evidence

Initial systematic review (conducted by the Institute for Evidence-Based Healthcare): Cardona 2022 (unpublished)

Review question and scope

Population and setting: adults (> 18 years) with T2D and Adolescents (12-19 years) with T1D in Community clinics/primary care
Intervention: real-time diabetes education and counselling/behavioural healthcare by allied health or nursing via videoconferencing or teleconferencing
Comparison: face-to-face behavioural care or usual diabetes education
Designs: Parallel randomised controlled trials (RCTs)

Review Methods

Search of Cochrane CENTRAL, Medline, and Embase to November 2020 identified 6 systematic reviews (209 studies) and 28 additional single RCTs covering various telehealth approaches. Of the full set only 4 randomised trials (307 participants, 146 adults and 161 adolescents) met the inclusion criteria. Included trials evaluated immediate and short-term impact (3 months) of allied health/nursing support for diabetes self-management via education/coaching in adults; and psychologists support for treatment adherence of youth via family behavioural therapy.

Main Results

Three randomised trials compared videoconferencing (e.g., Skype) and one compared teleconferencing to an equivalent face-to-face intervention for diabetes management (up to 10 sessions over 12 weeks). Three trials reported on glycaemic values found that both modalities significantly reduced HbA1c between baseline and last follow-up for adults or adolescents but neither mode of intervention delivery was more favourable. Two trials were pooled and showed no significant differences between groups at post-interventions (MD –0.03, 95%CI -0.63 to 0.57) or at 3 months follow-up (MD –0.27, 95%CI -0.38 to 0.92). One trial could not be pooled but showed no significant differences either in mean between groups for HbA1c% value changes from baseline (Telephone difference p=0.236, face-to-face difference p=0.344) or in mean glycaemia post-intervention (8.66+2.96 for telephone, vs 8.63 +3.46 for face-to-face).

Telehealth vs face-to-face for diabetes: adherence to therapy sessions: Two RCTs reported that adherence to 10 family-based therapy sessions for adolescents was not significantly different between telehealth and face-to-face modes (MD in number of sessions attended 0.8 p>0.05).

Telehealth vs face-to-face for diabetes: satisfaction with care: One study using the diabetes treatment satisfaction questionnaire reported that telehealth education and coaching by nurses is at least as satisfactory as the equivalent face-to-face modality both immediately (MD 0.05, 95% CI -0.70, 0.80) and 3 months after intervention (MD 0.44, 95% CI -0.32, 1.20).

Conclusion

Diabetes education/coaching by teleconferencing or videoconferencing using a nurse or diabetes educator is comparable to face-to-face sessions for the improvement of metabolic control in adults with T2D and adolescents with T1D and is acceptable, generating good satisfaction scores. Adherence in adolescent did not vary between delivery modes. While the impact on glycaemic control appears to be small (≤1.0% HbA1c reductions) previous evidence suggests these small improvements have clinical importance in the long term (10). **The conclusions are unchanged from those in Telehealth Review 2020-21.**

Commentary

No Australian studies met the eligibility criteria.

References

1. Cardona M, Scott AM, Krzyzaniak N, Greenwood H, Clark J, Glasziou P. (unpublished). Diabetes management via telehealth or face-to-face in primary health services: comparative glycaemic control, patient adherence and satisfaction with care: A systematic review.

Speech Pathology treatment (was: topic 4.18 in Telehealth Review 2020-21)

Telehealth (by phone or video) is similarly effective to face-to-face care for improving speech therapy outcomes.
This topic was previously synthesised in the Telehealth Review 2020-21. No new evidence has been found to update the topic. The conclusions are unchanged, and current to 2023.

Evidence

Initial systematic review (conducted by the Institute for Evidence-Based Healthcare): Scott 2022 (unpublished)

Review question and scope

Population and setting: patients of all ages, with conditions seen by speech-language pathologists
Intervention: Telehealth (video- or teleconferencing) speech language pathology (SLP) services
Comparison: Face-to-face delivery of comparable speech language pathology services
Design: Parallel group randomised controlled trials (RCTs)

Review methods

Searches of Cochrane CENTRAL, Medline, and Embase to November 2020, and forward / backward (citation analysis) in January 2021, identified 8 RCTs (10 references). Risk of bias was generally low across the included studies, except for lack of participant blinding.

Main results

Two trials evaluated SLP for stuttering conditions, 3 trials for patients with Parkinson's disease, and 3 trials for other conditions (1 trial each for: speech sound impairments in children, dysphagia, and dysphonia). Four of the 8 trials were conducted in Australia. Seven trials compared videoconferencing to face-to-face delivery of care; 1 trial compared teleconferencing to face-to-face delivery. There were no clinically important or statistically significant differences between groups in % syllables stuttered (patients with stutter), change in sound pressure level monologue (patients with Parkinson's disease), GFTA-2 scores (children with speech sound impairments), VHI-10 scores (elderly with voice handicap) or swallowing ability (patients with post-stroke dysphagia; Table 22)

Table 22 Outcomes for telehealth versus face-to-face speech language pathology treatment

Outcomes	Studies (N)	Mean Difference (MD) post treatment (95%CI)	Comments
% syllables stuttered 6-9 mo. follow-up	2 RCTs (80)	MD 0.65 (-0.21 to 1.51)	No statistically significant difference, **favours face-to-face**
% syllables stuttered 12-18 mo. follow-up	2 RCTs (69)	MD 0.10 (-0.39 to 0.58)	No statistically significant difference, **favours face-to-face**
Change in SPL monologue Post-intervention	2 RCTs (65)	MD 0.64 (-1.20 to 2.48)	No statistically significant difference, **favours face-to-face**
GFTA-2 scores Post-intervention	1 RCT (14)	MD -0.06 (-0.18 to 0.06)	No statistically significant difference, **favours telehealth**
VHI-10 scores Post intervention	1 RCT (69)	MD 3.3 (-2.0 to 8.6)	No statistically significant difference, **favours face-to-face**
Swallowing ability of >80% accuracy Post-intervention	1 RCT (30)	87% TH participants vs 80% F2F	No statistically significant difference, **favours telehealth**

SPL=sound pressure levels; GFTA-2=Goldman-Fristoe Test of Articulation; VHI-10 Voice Handicap Index score; TH=telehealth; F2F=face-to-face

Conclusion

Based on eight small, randomized trials, there is no important difference in a range of clinical outcomes between telehealth and face-to-face care, for delivery of speech language therapies for a variety of patient groups and conditions. **The conclusions are unchanged from those in Telehealth Review 2020-21.**

References

1. Scott AM, Clark J, Cardona M, Peiris R, Krzyzaniak N, Greenwood H, Glasziou P. (unpublished) Telehealth versus face-to-face delivery of speech language pathology services: a systematic review and meta-analysis.

Pain management (was: topic 4.19 in Telehealth Review 2020-21)

Videoconferencing may be slightly less effective than face-to-face care for pain management.
This topic was previously synthesised in the Telehealth Review 2020-21. No new evidence has been found to update the topic. The conclusions are unchanged, and current to 2023.

Evidence

Initial systematic review (conducted by the Institute for Evidence-Based Healthcare): Peiris 2022 (unpublished)

Review question and scope

Population and setting: adults or children requiring pain management in primary care
Intervention: (group or individual) pain management conducted using teleconferencing or videoconferencing
Comparison: (group or individual) pain management conducted face-to-face
Study design: Parallel randomised controlled trials (RCTs) and crossover trial

Review Methods

Search of Cochrane CENTRAL, Medline, and Embase to November 2020 identified no systematic reviews and 2 RCTs that met inclusion criteria. Forward-backward citation analysis identified a further 5 RCTs, giving a total of 7 RCTs (565 participants). Study quality was overall moderately high, except for blinding.

Main Results

Telehealth and face-to-face check-ups were similarly effective in the first six months for physical function, pain control and satisfaction with treatment among patients undergoing physical rehabilitation. All 7 studies looked at videoconferencing, and one of those also had a teleconferencing comparator. For patients undergoing psychotherapy for chronic pain, there was no difference in improvement of depression, anxiety, or other mental health outcomes, see Table 23. However, longer term follow-up in single RCTs showed better outcomes for people on the face-to-face modality, for pain severity (at 12 months) and physical function (6 months).

Table 23 Outcomes for telehealth versus face-to-face for patients receiving pain management

Outcomes	Studies (Time; N)	Difference post treatment (95% CI)	Difference follow-up** (95% CI)	Comments
Pain scores (BPI, NPRS, WOMAC-P)	7 RCTs (565) (Post-treatment 279; 6 months 349)	SMD* = 0.30 (-0.20, 0.79)	6 months SMD* = -0.07 (-0.28, 0.14)	No statistically significant difference. Post treatment, favours **face-to-face.** 6 month follow up, **favours telehealth.**
	1 RCT (12 months; 56)		SMD* = 1.42 (0.83, 2.01)	12 mo follow up **favours face-to-face**
Quality of life scores (QOLI, SPQU, KOOS-Q)	3 RCTs (344) (Post-treatment 61; 1-2 months 263)	SMD* = -1.96 (-2.5, -1.4)	1-2 months SMD* = 0.09 (-0.15, 0.34)	Post treatment favours **face-to-face**. No significant difference at 1-2 mo, **favours telehealth**
Physical function scores (WOMAC-F, MPI-A, RI-PA)	5 RCTs (432) (2 RCTs post-treatment 146, 3 RCTs 4 months 286,	SMD* = -0.04 (-0.37, 0.28)	4 months SMD* = 0.16 (-0.2, 0.51)	No statistically significant difference. Post treatment, favours **telehealth**. 4 month follow up **favours face-to-face.**
	1 RCT (6 months; 128)		SMD* = 0.5 (0.14, 0.85)	follow f**avours face-to-face**
Mental function scores (PHQ-9, ERQ, RI-CT)	3 RCTs (227) (1 RCT post-treatment 128; 1 RCT 3Ms – 23)	SMD* = -0.38 (-4.5, 3.7)	3 months SMD* = 3.5 (-6.1, 13.1)	No statistically significant differences. Post treatment favours **telehealth;** 6 month follow up **favours face-to-face.**
Satisfaction with treatment (CSQ, KTN)	5 RCTs (Post treatment; 286)	Not meta-analysed. 4 RCTs asked about satisfaction with the Telehealth format or technology, and reported satisfaction by participants.		

BPI = Brief Pain Inventory; NPRS = numeric pain rating scale; WOMAC = Western Ontario & McMaster Universities Osteoarthritis Index (WOMAC-P = pain subset, WOMAC-F = function subset); QOLI = Quality of Life Inventory; SPQU = Spitzer Quality-of-Life Uniscale; KOOS-Q = Knee injury & Osteoarthritis Outcome Score, quality-of-life subscale; MPI-A = Multidimensional Pain Inventory, activity subscale; RI = Relaxation Inventory (RI-PA = physical assessment subscale, RI-CT = cognitive tension subscale); PHQ-9 = Patient Health Questionnaire 9 for depression; ERQ = Emotion Regulation Questionnaire; CSQ = Client Satisfaction Questionnaire, KTN = Kentucky Telecare Network)
* **SMD** = standardised mean difference; ** Follow up varied by outcomes: Pain=6 months; Quality of Life=1-2 months; Physical function and mental function =3 months

Conclusions

Telehealth is similarly effective to face-to-face for the management of acute and chronic pain through consultation or psychotherapy in various contexts such as consults, post-surgical rehabilitation programs, pre-habilitation of medical patients, or psychotherapy for up to 6 months. Face-to-face management is better than telehealth for pain severity at 12 months, for physical function at 6 months, and for quality of life immediately after the intervention. **The conclusions are unchanged from those in Telehealth Review 2020-21.**

Comments

The only Australian study included dealt with acute pain following total knee arthroplasty.

References

1. Peiris R, Scott AM, Cardona M, Clark J, Krzyzaniak N, Greenwood H, Glasziou P. (unpublished). Comparative clinical effectiveness and acceptability of telehealth vs. face-to-face visits to primary health services for the management of pain: Systematic review and meta-analysis.

Antenatal and postnatal care (was: topic 4.20 in Telehealth Review 2020-21)

Telehealth as part of a hybrid face-to-face and online model for antenatal and postnatal care are comparable to face-to-face only care.
This topic was previously synthesised in the Telehealth Review 2020-21. No new evidence has been found to update the topic. The conclusions are unchanged, and current to 2023.

Evidence

No systematic review identified; relevant articles [Butler Tobah 2019] and [Seguranyes, 2014]

Review question and scope

Patient or population: pregnant women [1] and postpartum women [2]
Interventions: teleconferencing alone, or videoconferencing supplementing face-to-face
Comparison: exclusive face-to-face routine primary care
Design: randomised controlled trial

Review methods

A systematic search of Cochrane CENTRAL, Medline, and Embase, from inception to November 2020 found only two RCTS which met the inclusion criteria relevant to this review.

Main results

Antenatal care (1 RCT)

Butler Tobah et al conducted an RCT comparing usual obstetric care to a novel obstetric care model (OB Nest) which included a hybrid mix of 8 face-to-face appointments with midwife or obstetrician, 6 online appointments and direct text communication with a nurse, access to a women's online forum. There was no significant difference in adherence to vaccination guidelines, screening for depression or Group B strep, perceived quality of care, or in the incidence of Caesarean deliveries, preterm birth, birth weight or APGAR scores between the two groups. Telehealth yielded higher satisfaction and lower stress levels than usual care, but there were cases of gestational diabetes in the OBNest group and not in the usual care group (see Table 24).

Table 24 Outcomes for videoconferencing/teleconferencing versus face-to-face for antenatal care

Outcomes	Studies (people)	Absolute effects		Effect MD (95%CI)	Comments
		Face-to-face check-up	Telehealth (OBNest)		
Satisfaction %	RCT [1] (300)	78.9	93.9	15.0 (13.4 to 16.6)	**Favours telehealth**
Pregnancy-related stress **36 weeks**		0.40	0.34	-0.06 (-0.11 to -0.01)	**Favours telehealth**
Gestational diabetes %		0.0	4.5	p <0.01	**Favours F2F**

Postnatal care (1 RCT):

Seguranyes et al multicentre, 'parallel controlled' RCT compared postpartum midwifery follow-up via video/phoneconferencing with face-to-face follow-up (primary care centre or home visit) and followed them up for 6 weeks postpartum. There was no statistically significant difference between groups for satisfaction with care and accessibility, type of infant feeding, or frequency of

consultations on maternal, and feeding issues (see Table 25). Telehealth yielded fewer face-to-face consultations but higher virtual contact rates with nurses.

Table 25 Summary of Outcomes for video/teleconferencing versus face-to-face for post-natal care

Outcomes at 6 weeks	Studies (people)	Absolute effects		Effect MD (95%CI)	Comments
		Face-to-face usual care	Telehealth as required + F2F		
Fewer F2F consults	RCT [2] (1,598)	1.17	1.0	0.17 (0.06 to 0.27)	**Favours telehealth**
Frequency of postnatal consults		1.22	2.74	1.52 (1.38 to 1.66)	Significantly more in Telehealth
Mean consults on neonatal issues		0.97	1.75	0.78 (0.56 to 0.99)	Significantly more in telehealth

Conclusion

Antenatal care:

Overall, the OB Nest TM model compared favourably to usual care for acceptability and stress levels among participants, and clinical outcomes were comparable to usual care. **The conclusions are unchanged from those in Telehealth Review 2020-21.**

Postnatal care:

Women in the telehealth group had more frequent consults, despite having fewer face-to-face consults when compared to the control group. Feeding outcomes and satisfaction with care were similar between groups. **The conclusions are unchanged from those in Telehealth Review 2020-21.**

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Question A2: Comparison of telephone versus video telehealth consultations: a systematic review and meta-analysis

Sixteen randomised controlled trials (20 publications), with 1719 people in aggregate, were included in the qualitative and quantitative analyses. Meta-analyses show:

- **No difference between telephone and video on smoking-related outcomes**
- **No difference between telephone and video on depression outcomes**
- **No difference between telephone and video for quality-of-life outcomes**
- **No difference between telephone and video for healthcare utilisation**
- **No difference between telephone and video for satisfaction with care**

Comparison of telephone versus video telehealth consultations: a systematic review and meta-analysis

Abstract

Objective: To identify, assess the quality of, and synthesise any existing randomised controlled trials, which compares synchronous telephone versus video telehealth consultations.

Methods: PubMed (MEDLINE), Embase, and CENTRAL via the Cochrane Library (which includes the clinicaltrials.gov and the World Health Organisation's International Clinical Trial Registry Platform, ICTRP) were searched from inception until 10 Feb 2023 for randomised controlled trials. Forward and backward citation analysis was conducted on included randomised controlled trials to ensure all relevant studies have been identified. Cochrane Risk of Bias-2 tool was used to assess the quality of the studies.

Results: Sixteen randomised controlled trials in 20 publications comprising 1719 people were included in the qualitative and quantitative analyses. Ten studies were conducted in the United States, three in the UK, 2 in Canada and 1 in Australia. Most of the studies (n=13) cover hospital-based outpatient follow ups, monitoring, and rehabilitation; 3 other studies that were conducted in the community, and were all smoking cessation studies. In half of the studies (n=8), nurses delivered the care. Almost all studies had high or unclear risk of bias mainly due to bias in the randomization process and selection of reported results. None of the studies reported on patient safety or adverse events. We did not find any study on telehealth interventions for diagnosis, initiating new treatment, or were set in primary care.

Conclusion: This review found no major differences between telephone and video consultations, on clinical effectiveness, patient satisfaction, and healthcare use (cost effectiveness) outcomes. However, there was notable absence of direct comparison studies of phone vs video consultations in primary care setting.

Key words: telehealth, telemedicine, telerehabilitation, systematic review,

Introduction

Telehealth (the provision of healthcare via telephone or video) has been routinely used for healthcare delivery for decades, but the COVID-19 pandemic accelerated the uptake of telehealth in many care settings globally (1). Telehealth consultations have shown to be equivalent to face-to-face care for clinical effectiveness, patient satisfaction and cost outcomes, in many different areas, including mental health and primary care (2).

However, very few studies have synthesised and directly compared the effectiveness of telephone versus video telehealth modalities. Studies that have examined this are generally narrowly focussed on specific care providers such as nurses (3), or on specific conditions such as chronic conditions (4).

Given the now widespread use of telehealth and the predominance of telephone over video consultations (1), it is important to assess the effectiveness and acceptability of telehealth delivered via telephone compared to video. We therefore aimed to identify, assess the quality of, and synthesise any existing randomised controlled trials, which compares synchronous telephone versus video provision of care.

Methods

The systematic review was reported in compliance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (5). The protocol was developed prospectively and is registered on the Open Science Framework (https://osf.io/74wxf). We used the two-week systematic review (2weekSR) methodology to conduct the systematic review (6). This systematic review was conducted as part of a larger work package to update the evidence for telehealth for the Australian Department of Health and Aged Care.

Inclusion and exclusion criteria

We included randomised controlled trials of any design, including parallel, cluster, crossover, factorial, or mixed. Studies had to include more than 10 participants, and directly compare telephone consultations with video telehealth consultations. All other study designs (non-randomised trials, observational studies, qualitative-only studies) and all other types of reviews (e.g., literature, scoping, etc.), commentaries or opinion pieces were excluded.

Participants

We included studies with participants of any age, gender, care setting, or health condition. Studies set inside tertiary care (in-hospital patients) were excluded. However, studies involving patients discharged from the hospital and undergoing care by one of the included care providers were included. Care providers could include, but were not limited to, general practitioner (GP), allied healthcare provider, nurse practitioner, midwife, and specialist physicians (e.g., psychiatrists, dermatologists, rheumatologists). Telehealth consultations between patients and clinicians were included, clinician to clinician consultations not involving patients were excluded.

Intervention

We included studies that evaluated the effectiveness of real-time (synchronous) consultations via telephone calls, including diagnosis, treatment and follow up. Consultations involving asynchronous provision of care (e.g., store and forward of patient generated data) were excluded. Studies evaluating the following interventions were also excluded: mobile apps, virtual reality, texting (e.g., reminders), online based platforms (e.g., information and support systems), and studies of novel (non-standard) interventions. Consultations could include single or multiple episodes of care, but the compared groups had to receive similar care in terms of frequency, duration, and healthcare provider.

Comparator

We included comparators that evaluated the effectiveness of real-time (synchronous) consultations via video, on any device type, for diagnosis, treatment, and follow-up. We included only direct comparison between telephone and video telehealth consultations; indirect comparisons (of video to face-to-face or phone to face-to-face care) were excluded.

Outcomes

We included studies that reported on our primary outcome of interest, which was clinical effectiveness (details depend on condition/clinical area), and secondary outcomes, which were patient safety, cost-effectiveness, patient and clinician satisfaction with care. For diagnostic accuracy studies, the outcomes would include comparative accuracy of diagnosis for telephone vs video telehealth care.

Search strategy

PubMed (MEDLINE), Embase, and CENTRAL via the Cochrane Library (which includes the clinicaltrials.gov and the World Health Organisation's International Clinical Trial Registry Platform, ICTRP) were searched from inception until 10 February 2023. Full search strategies are provided in the Appendix. Forward and backward citation analysis was conducted on included randomised controlled trials to ensure all relevant studies have been identified.

Study restrictions

We did not impose any restriction by language (i.e., if the publication met the inclusion criteria but was published in a language other than English, it was includable). We included studies that were published in full. We excluded publications available as abstract only (e.g., conference abstract) with no additional results or information available about the study's results (e.g., from a clinical trial registry record).

Study selection and screening

Review authors (OB, HG) independently screened the titles and abstracts, and full-text articles for inclusion. Any disagreements were resolved by discussion or by consulting a third author (PG). Two authors (MB, TA) screened trials database search results. A list of studies excluded at full-text stage are provided in the Appendix.

Data extraction

Review authors (OB, HG, MB) independently extracted the data on study characteristics and methods; participants; interventions and comparator(s); primary outcome; secondary outcome(s).

Assessment of risk of bias

The risk of bias of included randomised controlled trials was assessed independently by two authors (MB, TA) using the Cochrane Risk of Bias Tool 2 (7). Five domains on bias arising from randomization process, bias due to deviations from intended intervention, bias due to missing outcome data, bias in measurement of the outcome, and bias in selection of the reported results were assessed, and bias was graded as low, high, or some concerns.

Data synthesis

Due to high heterogeneity and low number of studies in subgroups, we synthesised the data narratively with forest plots without meta-analyses (summary diamonds).

Results

Search results

We screened 2571 articles, which included 1225 references from citation searching and 209 from clinical trials registry search. Of the total of 40 full text articles we screened, 16 randomised controlled trials in 20 publications comprising 1719 people were included in the final review (see Figure in Appendix 5). The list of excluded studies is provided in the Appendix, with reasons.

Characteristics of included studies

Characteristics of included studies are shown in Table 26, below. Ten studies were conducted in the United States (8-20), three in the UK (21-24), 2 in Canada (25, 26) and 1 in Australia (27). Most of the telehealth interventions (n = 13) covered hospital-based outpatient follow ups, monitoring, and rehabilitation (8-13, 16-26). The other 3 studies were conducted in the community setting, and all were smoking cessation studies (14, 15, 27). Nine studies had 3-arm design that compared video and telephone interventions with either treatment as usual, waitlist, or minimal information (i.e., pamphlet) (8-10, 12, 13, 16-19, 22, 23, 27). Four studies involved patients' carers (11, 22-24, 26). In 8 studies nurses (9-13, 18-21, 26), 4 studies counsellors or therapists (8, 14, 15, 27), 3 studies specialist clinicians ((16, 23, 24) and in 1 study physiotherapist (25) delivered the interventions.

Table 26 Characteristics of included studies

Study ID	RCT design	Follow up duration	Number of participants total, (T, V)	Population	Intervention and comparator	Reported outcomes
Byaruhanga 2021 (27) **Australia**	Parallel 3-arm	4 months	699 (229, 201)	Smokers over 18, who live in rural and remote area, with access to phone, internet, and e-mail	Up to 6 sessions of 15 minutes long Smoking cessation video counselling delivered by smoking cessation advisors via video communication technology (e.g., Skype) vs same via telephone	7-day point prevalence abstinence, prolonged abstinence, and quit attempts
Cacioppo 2021 (8) **USA**	Parallel 3-arm	6 months	119 (37, 38)	Cancer patients who speak english and eligible for cancer genetic testing	One session of genetic counselling by genetic counsellors via HIPAA compliant videoconferencing software or telephone at the oncology clinic in addition to generic information flyer	Genetic counselling service uptake, satisfaction with telemedicine
Chambers 2006 (21) **UK**	Parallel 2-arm	12 months	30 (15, 15)	Patients receiving parenteral nutrition	standard care and follow-up according to usual protocol, with videophone or telephone to the nutrition nurse specialist (NNS): weekly for 1 month, fortnightly for 1 month, once a monthly for 4 months, quarterly for the rest of the study	In-patient days
Egner 2003 (9) **USA**	Parallel 3-arm	24 months	27 (11, 9)	Multiple sclerosis patients who had recent functional setback in disease process and with expanded disability status scale of ≥7	structured in-home education and counselling session delivered via video or telephone by a rehabilitation nurse.	Depression, fatigue, health-related quality of life
Fincher 2009 (10) **USA**	Parallel 3-arm	One-off intervention and outcome survey	75 (25, 25)	Parkinson's disease patients who take ≥3 medications, have access and ability to hear on regular phones and videophones	20-minute standardized PD medication counselling session by nurse via videophone or telephone	Patient satisfaction

Hastings 2021 (11) **USA**	Parallel 2-arm	3 and a half months	40 dyads (20, 20)	veterans aged 65 years or older with complex medical conditions and suspected mild cognitive impairment and their care partners	12-week care management intervention: monthly video or telephone calls from a study nurse covering medication management, cardiovascular disease risk reduction, physical activity, and sleep behaviours	Feasibility, acceptability, usability
Jerant 2001 (13), 2003 (12) **USA**	Parallel 3-arm	12 months	37 (12, 13)	40 years or older congestive heart failure (CHF) patients who speak english	home telecare delivered via a 2-way video-conference device with an integrated electronic stethoscope or nurse telephone calls	Healthcare costs, patient satisfaction
Kim 2018 (14) **USA**	Parallel 2-arm	6 months	42 (21, 21)	18-75 years old women living with HIV, who smokes ≥5 cigarettes/day, who have smartphones, speak english, and willing to set a quit date within 4 weeks from the 1st session	8 weekly counselling sessions (10-30 minutes) by counsellor for smoking cessation by telephone-based video or telephone calls along with open-label nicotine patches, also for 8 weeks	Biochemically verified 2- and 6-month abstinence
Kim 2016 (15) **USA**	Parallel 2-arm	3 months	49 (25, 24)	18–65-year-old Korean American women who had smoked ≥10 cigarettes/day for last 6 months, who have access to video calls, without contraindication to nicotine patch, not pregnant or lactating, and willing to set a quit date within 4 weeks	8 weekly counselling sessions (30 minutes) by therapists for a deep culturally adapted smoking cessation intervention by video or telephone call app along with open-label nicotine patches, also for 8 weeks. Self-help materials and family coaching was provided two times before and after quit day	Biochemically verified and self-reported 3-month abstinence
Kingery 2021 (16) (Manjunath 2021 (17)) **USA**	Parallel 3-arm	One-off intervention and outcome survey	2551 (119, 71)	Outpatient orthopaedic surgery patients	Video or phone follow up call by the surgeon	Patient satisfaction
McCrossan 2012 (23), 2015 (22) **UK**	Parallel 3-arm	41 months	83 (24, 35)	Infants with major congenital heart disease and their carers	Videoconferencing or telephone support with a clinician weekly or twice-weekly, and urgently if needed.	Healthcare resource use, inpatient days

Morgan 2008 (24) UK	Parallel 2-arm	One and a half month	30 (14, 16)	Infants with major congenital heart disease and their carers	Home-monitoring via videoconferencing or telephone calls following discharge from hospital, started twice-weekly then as needed by physicians	Anxiety levels of families
Phillips 2001 (18) USA	Parallel 3-arm	12 months	111 (36, 36)	18-60 years old patients with newly acquired spinal cord injury	Individual educational rehabilitation sessions with a nurse via video or telephone calls once a week for 5 weeks, then fortnightly for 1 month	Depression, quality of life, annual hospital days
Renard 2022 (25) Canada	Parallel 2-arm		20 (10, 10)	Rehabilitation patients with non-urgent conditions who have access to internet/computer, who can follow instructions for exercises at home	Up to 6 sessions of videoconference or telephone call follow ups with a physiotherapist	Qualitative analysis of feasibility, clinical effectiveness, patient satisfaction
Wakefield 2008 (20), 2009 (19) USA	Parallel 3-arm	12 months	148 (47, 52)	Heart failure patients	Home monitoring via videophone or telephone three times the first week after discharge, and then weekly for 11 weeks (14 contacts over 3 months by study nurse	6-month mortality, self-efficacy, satisfaction with care
Young 2007 (26) Canada	Parallel 2-arm	One and a half month	43 dyads (22, 21)	Paediatric orthopaedic surgery patients and their care givers	Videophone or telephone follow up post-discharge on day 3 and as needed for 6-weeks by orthopaedic clinic nurse	Qualitative exploration of families' experience

Risk of bias

Overall, most studies had high risk of bias or some concerns due to two domains: randomization processes were not clearly reported in 12 studies, and we could not clearly determine bias in selection of reported results in 9 studies. Bias due to deviations from intended interventions, missing outcome data, and bias in measurement of the outcome were mostly low (Figure 4).

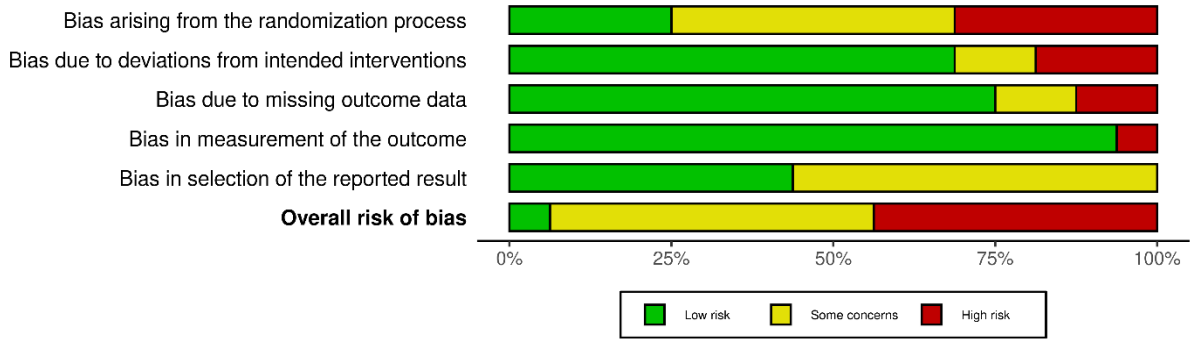

Figure 4 Risk of bias

Primary outcome: Clinical effectiveness

Three trials that were conducted in the community report smoking cessation outcomes (14, 15, 27). They found no significant difference between telephone and video interventions on smoking-related outcomes (Figure 5).

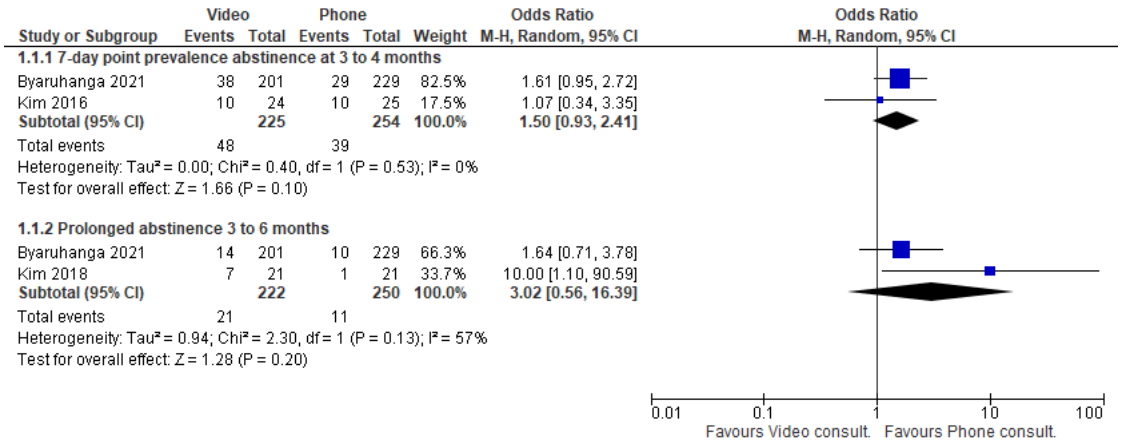

Figure 5 Smoking cessation outcomes

For depression outcomes (measured using the Centre for Epidemiological Studies-Depression (CES-D) scores), two studies found no significant difference between telephone and video interventions (9, 18) (Figure 6).

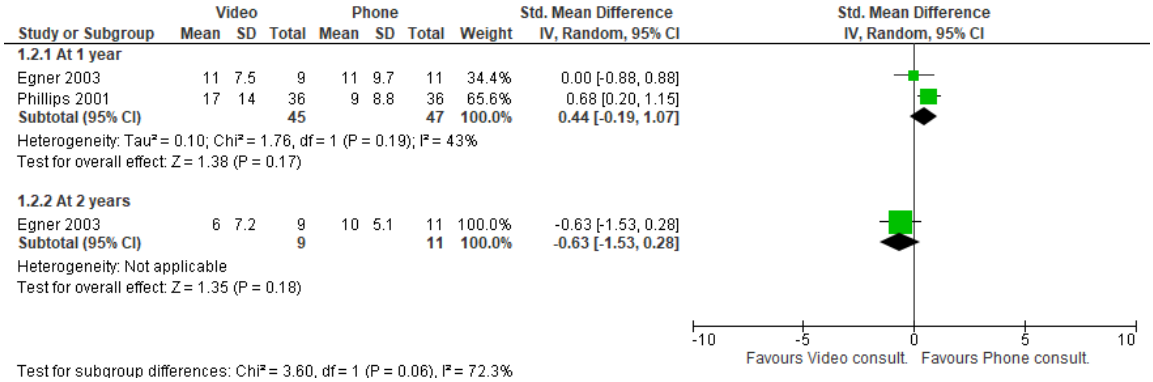

Figure 6 Depression outcome

Four studies reported quality of life outcomes (9, 12, 18, 19). There was no difference in quality of well-being scores between telephone and video interventions (Figure 7). However, patients in the telephone group scored overall a half a point more on the Minnesota Living with Heart Failure Questionnaire scores (which ranges from 0-105, with higher scores indicating better quality of life). Although statistically significant, half a point is not likely to be clinically significant.

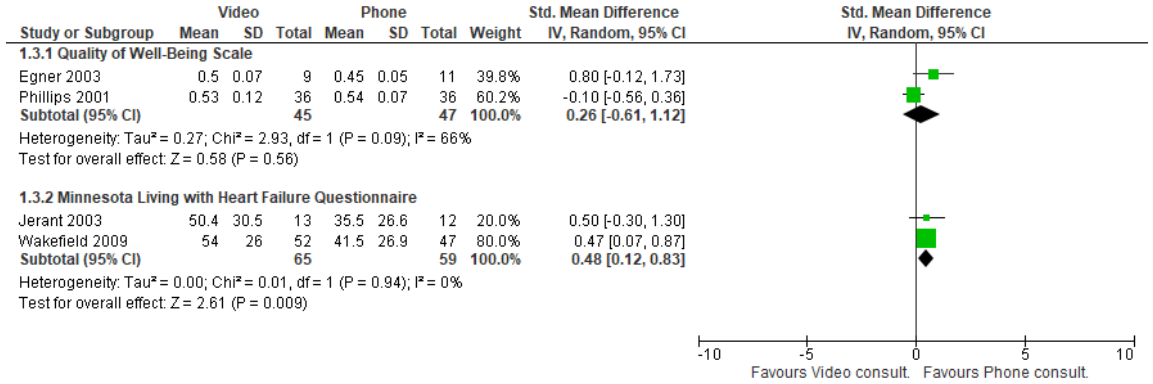

Figure 7 Quality of life outcomes

Secondary outcome: Healthcare utilisation

Three studies reported outcomes associated with healthcare utilisation, specifically, in-patient days of the two intervention groups (18, 21, 22). These study participants had either parenteral nutrition, chronic heart failure, or spinal cord injury, and were monitored in the community. There was no significant difference between telephone and video intervention groups regarding number of in-patient days (Figure 8).

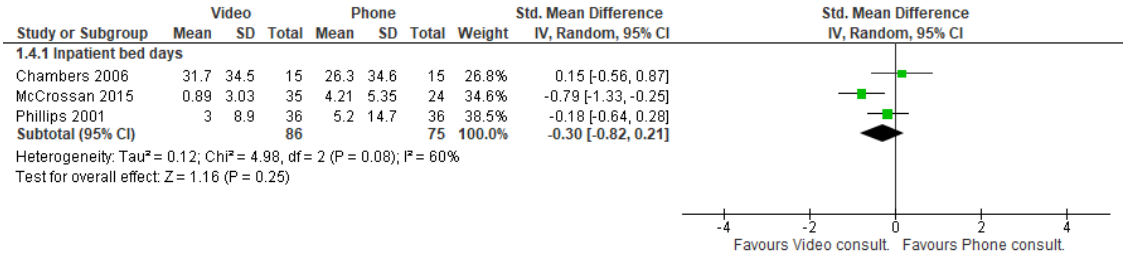

Figure 8 Healthcare utilization outcome

Two other studies compared the total healthcare costs of the two intervention groups (13, 22). In a study with chronic heart failure patients (13), the video care group total healthcare charges were higher than the telephone care group. This is in contract to a study with paediatric cardiology patients, where the total healthcare costs were a quarter of the telephone care group's (22). In both studies, telephone and video interventions cost much less than usual care.

Secondary outcome: Satisfaction with care

Six studies report on patient satisfaction with care, of which three are comparable and shown in Figure 9 (10, 12, 19). In the other three studies the patients were equally satisfied with both telephone and video telehealth in resolving their questions and concerns (16, 23, 24).

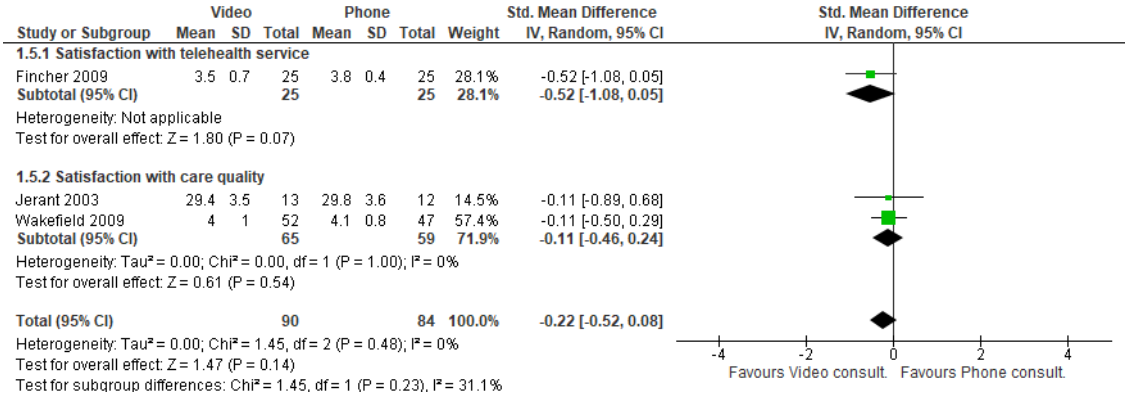

Figure 9 Patient satisfaction with telehealth

Seven studies addressed acceptability and feasibility of the telehealth interventions (11, 14, 15, 23-26). Both telephone and video interventions were largely and equally acceptable, however, the main challenges for feasibility were access to video-call equipment and individual patient's condition severity and self-efficacy. Clinicians also found videoconferencing acceptable and were more confident in making clinical judgements via the video call that telephone (23, 24).

None of the included studies reported on clinician satisfaction, patient safety or adverse events, telehealth interventions for diagnosis or initiating new treatment, or were set in primary care.

Discussion

This systematic review of 16 RCTs synthesised the available evidence on direct comparison of telephone and video telehealth consultations. There were no major differences on clinical effectiveness, patient satisfaction, and healthcare use (cost effectiveness) outcomes between the two modalities. Both telephone and video consultations were acceptable and feasible. Most of the studies had moderate to high risk of bias, thus reducing the quality of the evidence to low.

This review has many strengths. We prospectively developed and registered its protocol, conducted a rigorous search to find all available evidence, and reported the review in compliance with the PRISMA guidelines. Clear, strict inclusion and exclusion criteria allowed for studies in a variety of different health conditions to be synthesized. Furthermore, we only included RCTs and assessed the risk of bias of all included studies.

However, there are some limitations to our findings. All included studies were conducted in developed countries and most included fewer than 50 participants, therefore limiting the generalizability of the findings. Half of the studies were conducted prior to 2012 – before smartphones were in widespread use – and used a special video call devices installed in patients' homes, which would pose a challenge for scalability of the intervention. However, with the increasing ownership of personal smartphones, video communications have become more accessible. We also could not perform meta-analyses due to anticipated high heterogeneity and low number of studies in the relevant subgroups.

Many prior studies have demonstrated that telephone and video telehealth consultations separately, can be as safe and effective as face-to-face delivery in terms of acceptability, effectiveness, and safety outcomes, for a wide variety of conditions such as diabetes (28, 29) and mental health (2, 30, 31). This review demonstrated that when compared directly, telephone and video consultations are equally acceptable and effective.

Although the transition to telehealth happened swiftly since the pandemic's onset, we did not find studies set in primary care that compared telephone consultations with video ones. Given the increase in convenience and accessibility, and decrease in cost for healthcare, video or phone consultations could be highly beneficial in primary care delivery. Hence, the need for high-quality, robustly designed studies in primary care settings is considerable.

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Question A3 – Comparison of telehealth (telephone or video) to face-to-face delivery of care in areas of special interest (patient attendance, escalation to emergency dept.).

Changes in frequency of patient attendance

Telehealth is similarly effective to face-to-face clinic consultations for attendance outcomes using randomised controlled trials (RCTs) from known systematic reviews.

Evidence

6 randomized controlled trials: [Alcantara 2016], [Freeman 2013], [Hansen 2020], [Himelhoch 2013], [Morland 2015], [Morland 2020]

Study question and scope

Population and setting: participants of any age, gender, condition
Intervention: care provided via telehealth (via telephone or videoconferencing)
Comparison: care provided face-to-face
Outcomes: patient attendance
Design: randomised controlled trials.

Review methods

Screen of the search results from the Telehealth Review (2020-21) as well as the search results of the present review (Telehealth 2023). We searched: PubMed (MEDLINE), Embase, and CENTRAL via the Cochrane Library (which includes the clinicaltrials.gov and the World Health Organisation's International Clinical Trial Registry Platform, ICTRP) up to 11 January 2023, and screened studies against the inclusion criteria specified in the Methods section of the present report.

Main results

Characteristics of studies

Six trials in systematic reviews of telehealth reported outcomes on attendance. Two studies looked at interventions with those who have depressive symptoms (Alcantara 2012 and Himelhoch 2013), two studies looked at interventions for PTSD (Morland 2015 and Morland 2020), one was an intervention for poor adherence in type 1 diabetic adolescents (Freeman 2013) along with one for tele rehab for COPD outpatients. The summary of the six included studies is provided below in Table 27.

Table 27 Summary overview of six included studies

Study (Location)	RCT design, N	Participants	Intervention	Telehealth modality & dose	Comparator modality & dose
Alcantara, 2016 (USA/Puerto Rico)	Parallel 3-arm, 257	Latinos aged 18+ with moderate/ severe depressive symptoms	ECLA (Engagement and counselling for Latinos)	Telephone, 1 per week session for 6-8 wks	F2F at clinic, 1 per week for 6-8 wks
Freeman, 2013, (USA)	Parallel 2-arm, 71	Adolescents (12-19) with poorly controlled T1DM	BFST-D-behavioural family systems therapy	Video (skype), 60-90 min, up to 10 x sessions, 12wks	F2F at clinic 60-90 min, up to 10 sessions, 12 wks
Hansen, 2020 (Denmark)	Parallel 2 arm, 134	Adult outpatients with COPD	Group based tele rehab	Video, group based, 35 min exercise, 3 times per wk for 10 wks	F2F clinic, (60 min exercise, 2 times per week) for 10 wks
Himelhoch, 2013 (USA)	Parallel 2-arm, 34	Urban, low-income, adults with HIV/AIDS & depression	Cognitive behavioural therapy	Telephone 45min, 1x/week, 11 sessions over 14 wks in total	F2F at clinic 45min, 11 sessions over 14 wks
Morland, 2015 (USA)	Parallel 2-arm, 126 non-inferiority	Female adult veterans with PTSD,	Cognitive processing therapy	Video 90min, 1x/wk, 12 sessions	F2F at clinic 90 min, 12 sessions
Morland, 2020 (USA)	Parallel 3-arm, 175	Veteran adults with PTSD	PE (prolonged exposure)	Video at home, video at office 90min, 1x/wk, 6-15 sessions total*dependent on treatment response	F2F at home 90min, 1x/wk, 6-15 sessions total *dependent on treatment response

It is important to highlight that the telehealth modality differs among the various studies as some utilise the telephone whereas others use video. Additionally, the comparator is face-to-face at the clinic, except for Morland 2020 whose comparator is face-to- face at home. In most studies, the intervention has the same length, dose, or duration in both groups, except in Hansen 2020, whose face-to-face group receives 120 min per week versus only 105 min per week of rehabilitation in the video group.

Risk of bias

All studies had an overall high risk of bias as they had a level of high bias in at least one domain. Freeman, 2013 had the most domains with a high risk of bias, with three out of the seven considered a high risk. Both Morgan 2015 and 2020 had two out of the seven domains with a high risk of bias.

Outcomes
Table 28, below, outlines the summary of results regarding the attendance outcome.

Mean number of total sessions
Out of those studies that looked at the mean number of total sessions, two studies found that there were no differences in attendance between face-to-face and telephone (Alcantara, 2016 (p=0.49) and Himelhoch, 2013 (p=0.2)). The study by Freeman 2013 had no information on the standard deviation of the mean number of total sessions for each group, so a formal statistical test could not be performed. However, the means do look fairly consistent between groups (7.56 for the face-to-face group vs 7.03 for the Skype group) with a mean difference between telehealth and face-to-face of only -0.53.

Number of patients who completed treatment
Morland, 2015, found that there was no difference between face-to-face (50 patients, 79%) and video (48 patients, 76%), p=0.67) when comparing the number of patients that completed at least 10 sessions.

Hansen, 2020, found that more patients in the video intervention (57 patients, 85%) completed their treatment compared to the face-face group (43 patients, 64%); p<0.01. This could have been due in part because the face-to-face intervention was slightly longer in duration each week (120 minutes) compared to the video (105 min). However, when considering the number of attendees of at least 70% of the total sessions, there were no differences between the face-to-face (42 patients, 63%) and the video (49 patients, 73%) group; p=0.27.

Morland, 2020, did find a difference between face-to-face at home (46 patients, 79 %) and video at home (36 patients, 62%); p=0.04 and between face-to-face at home (46 patients, 79%) and office-based video (27 patients, 46 %); p<0.001.

Table 28 Summary of Attendance in arms of trials to telehealth versus face-to-face

Study	Outcomes	Intervention Groups		*Difference (P value)	Comments
		F2F N=84 (%)	Telephone N=87(%)		
Alcantara, 2016	Mean number of total sessions	4.58 (3.2)	4.90 (2.8)	+0.32 (0.49)	**No difference**
	Mean number of missed sessions	2.01 (2.6)	1.66 (2.3)	-0.35 (0.34)	**No difference**
	Mean number of additional sessions	0.60 (0.9)	0.55 (0.8)	-0.05 (0.75)	**No difference**
Study	**Outcomes**	**Intervention Groups**		***Difference (P value)**	**Comments**
		F2F N=39	**Skype N=32**		
Freeman, 2013	Mean number of total sessions	7.56	7.03	-0.53	-
Study	**Outcomes**	**Intervention Groups**		***Difference (P value)**	**Comments**
		F2F N=67 (%)	**Video N=67 (%)**		
Hansen, 2020	Median number of total sessions	16 (of 20)	25 (of 30)	+9	Total time similar as F2F were longer sessions
	Number of patients that completed treatment	43 (64)	57 (85)	+14 (<0.01)	More patients in the video intervention completed their treatment
	Number who attended at least 70% of total sessions	42 (63)	49 (73)	+7 (0.27)	**No difference**
Study	**Outcomes**	**Intervention Groups**		***Difference (P value)**	**Comments**
		F2F N=18 (SD)	**Telephone N=16(SD)**		
Himelhoch, 2013	Mean number of total sessions	6.3 (3.1)	4.1 (2.7)	-2.2 (0.20)	**No difference**
Study	**Outcomes**	**Intervention Groups**		***Difference (P value)**	**Comments**
		Face-to-face N=63(%)	**Video N=63 (%)**		
Morland, 2015	Number of patients that completed at least 10 sessions	50 (79)	48 (76)	-2 (0.67)	**No difference**
	Number of patients who dropped out	6 (9.5)	5 (7.9)	-1 (0.75)	**No difference**

Study	Outcomes	Intervention Groups			*Difference (P value)	Comments
		F2F Home n=58 n (%)	Office based TH (OT) n=59 n (%)	Home based TH (HT) n=58 n (%)		
Morland, 2020	Number of patients that completed treatment	46 (79)	27 (46)	36 (62)	OT and F2F home= -19 (p<0.001) HT and F2F home= -10 (p=0.04)	There is a difference between F2F home and both office and home telehealth

*Difference=Telehealth vs face-to-face

Conclusions

For patients across several different clinical areas, attendance rates were not significantly different between face-to-face and telehealth groups. Attendance for face-to-face at home was found to be slightly significantly higher compared to at home video sessions. The conclusions are limited by the selective nature of the trials identified – that is, ones included in known telehealth reviews. Extending this to all trials of telehealth would entail a systematic review of all telehealth trials irrespective of the clinical topic area.

Commentary

Studies generally found no differences in attendance between face-to-face at the clinic and telehealth (video or phone) when comparing the same dose of intervention. Although face-to-face at home sessions were better than home telehealth in one of the studies, this comparison is not a main consideration or as relevant as comparing face-to-face at the clinic with home telehealth.

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Escalation to emergency department: Transfer of residents of residential aged care facilities to emergency departments

Telehealth may reduce emergency departments' (ED) visits from residential aged care facilities (RACFs), but there is a need for economic analysis and further research.

Evidence

No systematic review available; a relevant scoping review by Sunner 2002 summarised.

Study question and scope

Population and setting: Residential Aged Care Facilities (RACF) (aged ≥ 65 years)
Intervention/concept: decision-making and assessments using telehealth
Comparison: Usual care – direct transfer to the emergency department (ED)
Outcomes: Hospital avoidance, reducing adverse drug reactions, cost-effectiveness
Design: Individually and cluster randomised controlled trials.

Review methods

Medline, Embase and CINAHL were searched up to June 2022. The review explored the evidence for the effectiveness and experience of telehealth use, and impact on residential aged care facilities (RACF) staff's decision to transfer their residents to the emergency department. The review included 31 studies, of which only 4 were randomised trials, and their data are presented here.

Main Results

Two trials reported conflicting results regarding the hospital avoidance outcome. One RCT found that the telehealth groups were less likely to have their care escalated to a hospital than residents taken directly to ED, 27% vs 71% (OR 0.15, 95% CI 0.13-0.17). In contrast, the other Stepped Wedge RCT did not find a significant difference in hospitalisation rate in residents receiving off-hours physician coverage by telehealth compared to residents of homes receiving standard physician coverage.

One trial explored the impact of pharmacist-led telehealth services on reducing adverse drug reactions compared to usual care. The authors reported that the telehealth group had a lower incidence of alert-specific ADEs than usual care (adjusted incident rate ratio = 0.08; 95% CI 0.01–0.40).

One trial explored the cost-effectiveness of linking a hospital-based multidisciplinary wound care team via telehealth for treating pressure ulcers compared to usual care. No significant differences were found in reducing pressure ulcers, ED visits, wound healing times and hospitalisations.

Conclusions

The review concludes that telehealth support may reduce ED visits, but there is a need for economic analysis and further research on telehealth use in RACFs to help prevent unnecessary hospital admissions and readmissions and its potential utility in enhancing care delivery for an older population in RACFs.

Reference

1. Sunner C, Giles MT, Kable A, Foureur M. Does telehealth influence the decision to transfer residents of residential aged care facilities to emergency departments? A scoping review. Int J Older People Nurs. 2023 Jan;18(1):e12517. doi: 10.1111/opn.12517. Epub 2022 Nov 17. PMID: 36394230.

Discussion

This review aimed both to update the findings of the previous review, and to expand its scope with several topics identified as of interest by the Department. The conclusions in the first report were, briefly, that telehealth – either by videoconferencing or teleconferencing – appears to provide equivalent clinical outcomes for many types of clinical encounter, particularly for ongoing clinical care. For initial diagnosis, telehealth has some limitations, in particular where physical examination is required as part of the diagnostic process. While visual examination can be carried out via videoconferencing, this appears generally less satisfactory (less reliable and accurate) than examination face-to-face; and hands-on physical examination is limited to self-examination or some examination by carers. For continuing care for management of an established diagnoses, telehealth appears equivalent for most clinical outcomes, has similar cost to health services, increases convenience and access for patients, which is particularly important for rural patients and patients who have difficulty travelling to clinical appointments.

The present Work Package of the update aimed to address three questions: (1) **Updated reviews and new topics**: to update the findings of the previous Telehealth Review, by identifying, assessing the quality of, and synthesising additional evidence that has emerged in the last 2 years, on the topics addressed in the original Telehealth Review (2020-21). (2) **Comparison of telehealth modes**: to identify, assess the quality of, and synthesise any existing randomised controlled trial and systematic review evidence, comparing telehealth (e.g. video) to telehealth (e.g. phone) provision of care; a topic not considered in the original Review. (3) **Special Outcomes**: to identify, assess the quality of, and synthesise any existing randomised controlled trial and systematic review evidence, on the impact of telehealth consultations on the following areas of interest: 1) Changes in the frequency of patient attendance; 2) Escalation to emergency department presentations.

This update has strengthened several of the original conclusions, and not reversed any. In addition, since the previous Telehealth Review, new research has been published, that provides new conclusions:

1. **Effectiveness.** This review includes 4 new topics (CVD management, weight management, physiotherapy, and traumatic brain injury) with similar findings – that for ongoing management telehealth provides similar clinical effectiveness when substituted for face-to-face care.

2. **Diagnostic Accuracy assessments.** While history taking and verbal assessments can be done acceptably by telehealth, only some elements of physical examination are sufficiently reliable and valid, with progressive difficulty and requirements from: (i) history only (via telephone), (ii) visual inspection (videoconference) (iii) physical examination (by self-examination or by a carer), (iv) examination with equipment (pre-provided, e.g. with monitor tools).

3. **Comparison of telephone to videoconference.** From the 16 trials found, telephone and videoconference consultations appear to have no major differences on clinical effectiveness and healthcare use (cost effectiveness) outcomes for the ongoing management of a range of different conditions (e.g. depression and smoking cessation) and outcomes, e.g. quality of life, healthcare utilisation, and satisfaction with care.

4. **Attendance for ongoing management.** Trials which reported attendance rates for both arms generally found no differences in attendance between face-to-face at the clinic and home telehealth, using either a video or telephone, when comparing the same dose of

intervention. Note that this equivalence is for ongoing care of patients with chronic conditions. The studies do not address the issue of increasing access for those unable to access face-to-face medical services.

5. **Escalation to emergency department from long-term care.** A review of four trials, found two which examined hospital avoidance. One trial found that providing additional telehealth support reduced the likelihood of having care escalated to a hospital than residents taken directly to the emergency department; the other trial (a stepped wedge RCT) did not find a significant difference in hospitalisation rate. They concluded that telehealth support may reduce some emergency department visits, but further research and economic analyses are needed.

There are several limitations to our findings. First, the telehealth trials identified are limited to a small percent of all conditions and consultation types, so the results may not apply to all circumstances. Of particular note is that many of the studies are with patients with an established diagnosis. Second, we are limited to the outcomes that were measured and reported in the studies, which do not cover all the topics of interest, e.g., changes in test ordering or referral. Third, many of the studies were conducted prior to 2012 – before smartphones were in widespread use – and used a special video call devices installed in patients' homes, which would pose a challenge for scalability of the intervention. However, with the increasing ownership of personal smartphones, video communications have become more accessible. Finally, a related issue is the "learning curve" for telehealth. Prior to the pandemic, telehealth was uncommon, and hence clinical experience was limited. This has changed, and clinicians are likely to have learned and adapted to using telehealth.

The literature on telehealth is clearly growing rapidly, and worth periodically monitoring. However, there are some immediate syntheses which could enhance the findings of the current report.

1. The impact of telehealth for aged care facilities on transfers to Emergency Departments. In our recent update report on telehealth, we summarised a scoping review which had identified 4 trials, but had not appraised them nor summarised them in any detail. Since that scoping review, there has been at least one additional published trial, and may be others. Therefore a full systematic review on this question, which would include any controlled trials or quasi-experimental studies would be warranted.
2. Psychiatric diagnosis – initial accuracy, and pre-management assessment. While we have examined many trials on the management of mental health conditions, we did not explicitly examine the diagnostic prior to trial entry. This could be extracted for the existing trials. Related to this, we referred to a systematic review conducted in 2014 which found 16 studies (of 1879 screened) and concluded that: "There is insufficient evidence that diagnostic telephone interviews for the diagnosis of psychiatric disorders are valid, although results for depression and anxiety disorders seem promising." But this review is now outdated and a new review is warranted.
3. The "learning curve" for providing telehealth. It is not clear how much training in telehealth health care workers have prior to, or as part of, the trials. Again this data could be extracted from existing trials and analysed.

In conclusion, these reviews provide a good basis for where telehealth is and is not clinically effective, but there are also significant gaps that warrant further primary research and synthesis.

Appendix 1 – PRISMA Reporting Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Yes, but in methods due to the nature of the report.
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	Each 1-page summary includes key abstract sections and content.
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Introduction section.
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Introduction section.
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Methods: inclusion & exclusion criteria section.
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Methods: search strategies section.
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Appendices 2-4.
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Methods: study selection and screening section.
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Methods: data extraction section.
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Methods: data extraction section; top-level information only, due to breadth of included topics.
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Methods: data extraction section; top-level information only, due to breadth of included topics.
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Methods: Assessment of the risk of bias section.
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	Methods: Data synthesis section.
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Methods: Data synthesis section.

Section and Topic	Item #	Checklist item	Location where item is reported
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Methods: Data synthesis section.
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	Methods: Data synthesis section.
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Methods: Data synthesis section.
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	Methods: Data synthesis section.
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	Methods: Data synthesis section.
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	Not applicable.
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Not applicable.
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Appendix 5 (PRISMA flow charts)
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	Appendix 6 (Key Excluded Studies)
Study characteristics	17	Cite each included study and present its characteristics.	Individual topic summaries
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Individual topic summaries
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Individual topic summaries, where applicable
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Individual topic summaries, where applicable
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Individual topic summaries, where applicable
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Individual topic summaries, where applicable
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	Individual topic summaries, where applicable
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	Not applicable
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Not applicable
DISCUSSION			

Section and Topic	Item #	Checklist item	Location where item is reported
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Executive Summary section + individual topic summaries
	23b	Discuss any limitations of the evidence included in the review.	Executive Summary section + individual topic summaries
	23c	Discuss any limitations of the review processes used.	Executive Summary section + individual topic summaries
	23d	Discuss implications of the results for practice, policy, and future research.	Executive Summary section + individual topic summaries
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Protocol for the overall review was developed a priori but not registered. For Question A2, the protocol was registered on the Open Science Framework.
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	From study authors.
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Reported in the relevant methods section.
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	Appendix 8 – Funding and COI disclosures.
Competing interests	26	Declare any competing interests of review authors.	Appendix 8 – Funding and COI disclosures.
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	From study authors.

Appendix 2 – Search strategies to identify evidence for Question A1: Updated reviews and new evidence comparing telehealth (via telephone or video) to face-to-face delivery of care in primary and allied health

All searches cover the period of: 18 November 2020 (end-search date of the Telehealth Review 2020-21) to 11 January 2023

Searches for Randomised Controlled Trials

PubMed

("Telemedicine"[Mesh] OR "Videoconferencing"[Mesh] OR Telehealth[tiab] OR Telemedicine[tiab] OR Videoconferencing[tiab] OR ((Telephone[tiab]) AND (Consultation[tiab] OR face-to-face[tiab] OR in-person[tiab])) OR telephone-delivered[tiab])

AND

("Primary Health Care"[Mesh] OR "General Practice"[Mesh] OR rehabilitation[sh] OR "Outpatients"[Mesh] OR "Speech Therapy"[Mesh] OR Outpatient[tiab] OR “Primary health”[tiab] OR “Primary care”[tiab] OR “General practice”[tiab] OR “General practices”[tiab] OR “General practitioners”[tiab] OR “General practitioner”[tiab] OR “Family practice”[tiab] OR Physician[tiab] OR Physicians[tiab] OR Clinician[tiab] OR Clinicians[tiab] OR Therapist[tiab] OR Nurse[tiab] OR Nurses[tiab] OR Physiotherapist[tiab] OR Rehabilitation[tiab] OR Diabetes[tiab] OR Diabetic[tiab] OR Asthma[tiab] OR Depression[tiab] OR “Ïrritable bowel”[tiab] OR IBS[tiab] OR PTSD[tiab] OR “Chronic fatigue”[tiab])

AND

((Face to face[tiab]) OR “Usual care”[tiab] OR Visits[tiab] OR Visit[tiab] OR In-person[tiab] OR “In person”[tiab] OR ((Clinic[tiab] OR Centre[tiab] OR Home[tiab]) AND (Based[tiab] OR Contact[tiab])) OR Conventional[tiab] OR “Practice-based”[tiab] OR “Practice based”[tiab] OR Traditional[tiab] OR “Standard care”[tiab] OR Homecare[tiab] OR ((Routine[tiab] OR Home[tiab]) AND (Care[tiab])))

AND

("Delivery of Health Care"[Mesh] OR Delivery[tiab] OR Delivered[tiab] OR Via[tiab] OR Received[tiab])

AND

("Treatment Outcome"[Mesh] OR "Patient Satisfaction"[Mesh] OR Therapy[sh] OR Diagnosis[sh] OR “Clinical outcomes”[tiab] OR Treatment[tiab] OR Diagnostic[tiab] OR Efficacy[tiab])

AND

(Randomized controlled trial[pt] OR controlled clinical trial[pt] OR randomized[tiab] OR randomised[tiab] OR placebo[tiab] OR "drug therapy"[sh] OR randomly[tiab] OR trial[tiab] OR groups[tiab])

NOT

(Animals[Mesh] not (Animals[Mesh] and Humans[Mesh]))

NOT

(“Case Reports”[pt] OR Editorial[pt] OR Letter[pt] OR Meta-Analysis[pt] OR “Observational Study”[pt] OR “Systematic Review”[pt] OR “Case Report”[ti] OR “Case series”[ti] OR Meta-Analysis[ti] OR “Meta Analysis”[ti] OR “Systematic Review”[ti] OR “Systematic Literature Review”[ti] OR “Qualitative study”[ti] OR Protocol[ti])

CENTRAL

([mh Telemedicine] OR [mh Videoconferencing] OR Telehealth:ti,ab OR Telemedicine:ti,ab OR Videoconferencing:ti,ab OR ((Telephone:ti,ab) AND (Consultation:ti,ab OR “ face to face”:ti,ab OR “in person”:ti,ab)) OR “telephone delivered”:ti,ab)

AND

([mh "Primary Health Care"] OR [mh "General Practice"] OR [mh Outpatients] OR [mh "Speech Therapy"] OR Outpatient:ti,ab OR "Primary health":ti,ab OR "Primary care":ti,ab OR "General practice":ti,ab OR "General practices":ti,ab OR "General practitioners":ti,ab OR "General practitioner":ti,ab OR "Family practice":ti,ab OR Physician:ti,ab OR Physicians:ti,ab OR Clinician:ti,ab OR Clinicians:ti,ab OR Therapist:ti,ab OR Nurse:ti,ab OR Nurses:ti,ab OR Physiotherapist:ti,ab OR Rehabilitation:ti,ab OR Diabetes:ti,ab OR Diabetic:ti,ab OR Asthma:ti,ab OR Depression:ti,ab OR "Ïrritable bowel":ti,ab OR IBS:ti,ab OR PTSD:ti,ab OR "Chronic fatigue":ti,ab)

AND

(("Face to face":ti,ab) OR "Usual care":ti,ab OR Visits:ti,ab OR Visit:ti,ab OR "In person":ti,ab OR ((Clinic:ti,ab OR Centre:ti,ab OR Home:ti,ab) AND (Based:ti,ab OR Contact:ti,ab)) OR Conventional:ti,ab OR "Practice based":ti,ab OR Traditional:ti,ab OR "Standard care":ti,ab OR Homecare:ti,ab OR ((Routine:ti,ab OR Home:ti,ab) AND (Care:ti,ab)))

AND

([mh "Delivery of Health Care"] OR Delivery:ti,ab OR Delivered:ti,ab OR Via:ti,ab OR Received:ti,ab)

AND

([mh "Treatment Outcome"] OR [mh "Patient Satisfaction"] OR "Clinical outcomes":ti,ab OR Treatment:ti,ab OR Diagnostic:ti,ab OR Efficacy:ti,ab)

Embase

('Telemedicine'/exp OR 'Videoconferencing'/exp OR Telehealth:ti,ab OR Telemedicine:ti,ab OR Videoconferencing:ti,ab OR ((Telephone:ti,ab) AND (Consultation:ti,ab OR face-to-face:ti,ab OR in-person:ti,ab)) OR telephone-delivered:ti,ab)

AND

('Primary Health Care'/exp OR 'General Practice'/exp OR 'Outpatient'/exp OR 'Speech Therapy'/exp OR Outpatient:ti,ab OR "Primary health":ti,ab OR "Primary care":ti,ab OR "General practice":ti,ab OR "General practices":ti,ab OR "General practitioners":ti,ab OR "General practitioner":ti,ab OR "Family practice":ti,ab OR Physician:ti,ab OR Physicians:ti,ab OR Clinician:ti,ab OR Clinicians:ti,ab OR Therapist:ti,ab OR Nurse:ti,ab OR Nurses:ti,ab OR Physiotherapist:ti,ab OR Rehabilitation:ti,ab OR Diabetes:ti,ab OR Diabetic:ti,ab OR Asthma:ti,ab OR Depression:ti,ab OR "Ïrritable bowel":ti,ab OR IBS:ti,ab OR PTSD:ti,ab OR "Chronic fatigue":ti,ab)

AND

(("Face to face":ti,ab) OR "Usual care":ti,ab OR Visits:ti,ab OR Visit:ti,ab OR In-person:ti,ab OR "In person":ti,ab OR ((Clinic:ti,ab OR Centre:ti,ab OR Home:ti,ab) AND (Based:ti,ab OR Contact:ti,ab)) OR

Conventional:ti,ab OR Practice-based:ti,ab OR "Practice based":ti,ab OR Traditional:ti,ab OR "Standard care":ti,ab OR Homecare:ti,ab OR ((Routine:ti,ab OR Home:ti,ab) AND (Care:ti,ab)))

AND

('health care delivery'/exp OR Delivery:ti,ab OR Delivered:ti,ab OR Via:ti,ab OR Received:ti,ab)

AND

('Treatment Outcome'/exp OR 'Patient Satisfaction'/exp OR "Clinical outcomes":ti,ab OR Treatment:ti,ab OR Diagnostic:ti,ab OR Efficacy:ti,ab)

AND

(random* OR factorial OR crossover OR placebo OR blind OR blinded OR assign OR assigned OR allocate OR allocated OR 'crossover procedure'/exp OR 'double-blind procedure'/exp OR 'randomized controlled trial'/exp OR 'single-blind procedure'/exp NOT ('animal'/exp NOT ('animal'/exp AND 'human'/exp)))

AND [embase]/lim

Searches for Systematic Reviews

PubMed

("Telemedicine"[Mesh] OR "Videoconferencing"[Mesh] OR Telehealth[tiab] OR Telemedicine[tiab] OR Videoconferencing[tiab] OR ((Telephone[tiab]) AND (Consultation[tiab] OR face-to-face[tiab] OR in-person[tiab])) OR telephone-delivered[tiab])

AND

("Primary Health Care"[Mesh] OR "General Practice"[Mesh] OR rehabilitation[sh] OR "Outpatients"[Mesh] OR "Speech Therapy"[Mesh] OR Outpatient[tiab] OR “Primary health”[tiab] OR “Primary care”[tiab] OR “General practice”[tiab] OR “General practices”[tiab] OR “General practitioners”[tiab] OR “General practitioner”[tiab] OR “Family practice”[tiab] OR Physician[tiab] OR Physicians[tiab] OR Clinician[tiab] OR Clinicians[tiab] OR Therapist[tiab] OR Nurse[tiab] OR Nurses[tiab] OR Physiotherapist[tiab] OR Rehabilitation[tiab] OR Diabetes[tiab] OR Diabetic[tiab] OR Asthma[tiab] OR Depression[tiab] OR “Irritable bowel”[tiab] OR IBS[tiab] OR PTSD[tiab] OR “Chronic fatigue”[tiab])

AND

((Face to face[tiab]) OR “Usual care”[tiab] OR Visits[tiab] OR Visit[tiab] OR In-person[tiab] OR “In person”[tiab] OR ((Clinic[tiab] OR Centre[tiab] OR Home[tiab]) AND (Based[tiab] OR Contact[tiab])) OR Conventional[tiab] OR “Practice-based”[tiab] OR “Practice based”[tiab] OR Traditional[tiab] OR “Standard care”[tiab] OR Homecare[tiab] OR ((Routine[tiab] OR Home[tiab]) AND (Care[tiab])))

AND

("Delivery of Health Care"[Mesh] OR Delivery[tiab] OR Delivered[tiab] OR Via[tiab] OR Received[tiab])

AND

("Treatment Outcome"[Mesh] OR "Patient Satisfaction"[Mesh] OR Therapy[sh] OR Diagnosis[sh] OR “Clinical outcomes”[tiab] OR Treatment[tiab] OR Diagnostic[tiab] OR Efficacy[tiab])

AND

(Meta-Analysis[pt] OR “Systematic Review”[pt] OR Meta-Analysis[ti] OR “Meta Analysis”[ti] OR “Systematic Review”[ti] OR “Systematic Literature Review”[ti])

NOT

(“Case Reports”[pt] OR Editorial[pt] OR Letter[pt] OR “Observational Study”[pt] OR “Case Report”[ti] OR “Case series”[ti] OR “Qualitative study”[ti] OR Protocol[ti])

CDSR via the Cochrane Library

([mh Telemedicine] OR [mh Videoconferencing] OR Telehealth:ti,ab OR Telemedicine:ti,ab OR Videoconferencing:ti,ab OR ((Telephone:ti,ab) AND (Consultation:ti,ab OR “ face to face”:ti,ab OR “in person”:ti,ab)) OR “telephone delivered”:ti,ab)

AND

([mh "Primary Health Care"] OR [mh "General Practice"] OR [mh Outpatients] OR [mh "Speech Therapy"] OR Outpatient:ti,ab OR "Primary health":ti,ab OR "Primary care":ti,ab OR "General practice":ti,ab OR "General practices":ti,ab OR "General practitioners":ti,ab OR "General practitioner":ti,ab OR "Family practice":ti,ab OR Physician:ti,ab OR Physicians:ti,ab OR Clinician:ti,ab OR Clinicians:ti,ab OR Therapist:ti,ab OR Nurse:ti,ab OR Nurses:ti,ab OR Physiotherapist:ti,ab OR Rehabilitation:ti,ab OR Diabetes:ti,ab OR Diabetic:ti,ab OR Asthma:ti,ab OR Depression:ti,ab OR "Ïrritable bowel":ti,ab OR IBS:ti,ab OR PTSD:ti,ab OR "Chronic fatigue":ti,ab)

AND

(("Face to face":ti,ab) OR "Usual care":ti,ab OR Visits:ti,ab OR Visit:ti,ab OR "In person":ti,ab OR ((Clinic:ti,ab OR Centre:ti,ab OR Home:ti,ab) AND (Based:ti,ab OR Contact:ti,ab)) OR Conventional:ti,ab OR "Practice based":ti,ab OR Traditional:ti,ab OR "Standard care":ti,ab OR Homecare:ti,ab OR ((Routine:ti,ab OR Home:ti,ab) AND (Care:ti,ab)))

AND

([mh "Delivery of Health Care"] OR Delivery:ti,ab OR Delivered:ti,ab OR Via:ti,ab OR Received:ti,ab)

AND

([mh "Treatment Outcome"] OR [mh "Patient Satisfaction"] OR "Clinical outcomes":ti,ab OR Treatment:ti,ab OR Diagnostic:ti,ab OR Efficacy:ti,ab)

Embase

('Telemedicine'/exp OR 'Videoconferencing'/exp OR Telehealth:ti,ab OR Telemedicine:ti,ab OR Videoconferencing:ti,ab OR ((Telephone:ti,ab) AND (Consultation:ti,ab OR face-to-face:ti,ab OR in-person:ti,ab)) OR telephone-delivered:ti,ab)

AND

('Primary Health Care'/exp OR 'General Practice'/exp OR 'Outpatient'/exp OR 'Speech Therapy'/exp OR Outpatient:ti,ab OR "Primary health":ti,ab OR "Primary care":ti,ab OR "General practice":ti,ab OR "General practices":ti,ab OR "General practitioners":ti,ab OR "General practitioner":ti,ab OR "Family practice":ti,ab OR Physician:ti,ab OR Physicians:ti,ab OR Clinician:ti,ab OR Clinicians:ti,ab OR Therapist:ti,ab OR Nurse:ti,ab OR Nurses:ti,ab OR Physiotherapist:ti,ab OR Rehabilitation:ti,ab OR Diabetes:ti,ab OR Diabetic:ti,ab OR Asthma:ti,ab OR Depression:ti,ab OR "Ïrritable bowel":ti,ab OR IBS:ti,ab OR PTSD:ti,ab OR "Chronic fatigue":ti,ab)

AND

(("Face to face":ti,ab) OR "Usual care":ti,ab OR Visits:ti,ab OR Visit:ti,ab OR In-person:ti,ab OR "In person":ti,ab OR ((Clinic:ti,ab OR Centre:ti,ab OR Home:ti,ab) AND (Based:ti,ab OR Contact:ti,ab)) OR Conventional:ti,ab OR Practice-based:ti,ab OR "Practice based":ti,ab OR Traditional:ti,ab OR "Standard care":ti,ab OR Homecare:ti,ab OR ((Routine:ti,ab OR Home:ti,ab) AND (Care:ti,ab)))

AND

('health care delivery'/exp OR Delivery:ti,ab OR Delivered:ti,ab OR Via:ti,ab OR Received:ti,ab)

AND

('Treatment Outcome'/exp OR 'Patient Satisfaction'/exp OR "Clinical outcomes":ti,ab OR Treatment:ti,ab OR Diagnostic:ti,ab OR Efficacy:ti,ab)

AND

([cochrane review]/lim OR [systematic review]/lim OR [meta analysis]/lim OR ((Search:ti,ab OR Searched:ti,ab) AND (PubMed:ti,ab OR MEDLINE:ti,ab)) OR (Systematic:ti,ab AND Review:ti,ab) OR 'Meta analysis':ti,ab OR Meta-analysis:ti,ab OR Review:ti OR ((Systematically:ti,ab OR Reviewed:ti,ab) AND (literature:ti,ab)))

Searches of clinical trial registries

The search of Cochrane CENTRAL (see “searches for Randomised Controlled Trials,” above) searched the following clinical trial registries:

1) ClinicalTrials.gov
2) WHO’s International Clinical Trials Registry Platform (WHO ICTRP)

Appendix 3 – Search strategies to identify evidence for Question A2: Comparison of delivery of by one telehealth modality (e.g. videoconferencing) to another telehealth modality (e.g. teleconferencing), in primary and allied healthcare

All searches cover the period of: inception of each source (database, registry) to 10 February 2023

Searches for Randomised Controlled Trials

PubMed

("Telemedicine"[Mesh] OR Telehealth[tiab] OR Telemedicine[tiab] OR ((Telephone[tiab]) AND (Consultation[tiab] OR face-to-face[tiab] OR in-person[tiab])) OR telephone-delivered[tiab])

AND

("Primary Health Care"[Mesh] OR "General Practice"[Mesh] OR rehabilitation[sh] OR "Outpatients"[Mesh] OR "Speech Therapy"[Mesh] OR Outpatient[tiab] OR “Primary health”[tiab] OR “Primary care”[tiab] OR “General practice”[tiab] OR “General practices”[tiab] OR “General practitioners”[tiab] OR “General practitioner”[tiab] OR “Family practice”[tiab] OR Physician[tiab] OR Physicians[tiab] OR Clinician[tiab] OR Clinicians[tiab] OR Therapist[tiab] OR Nurse[tiab] OR Nurses[tiab] OR Physiotherapist[tiab] OR Rehabilitation[tiab] OR Diabetes[tiab] OR Diabetic[tiab] OR Asthma[tiab] OR Depression[tiab] OR “Ïrritable bowel”[tiab] OR IBS[tiab] OR PTSD[tiab] OR “Chronic fatigue”[tiab])

AND

("Videoconferencing"[Mesh] OR Videoconferencing[tiab] OR Videoconference[tiab] OR Videoconferences[tiab] OR Video[tiab] OR Skype[tiab] OR Zoom[tiab])

AND

("Delivery of Health Care"[Mesh] OR Delivery[tiab] OR Delivered[tiab] OR Via[tiab] OR Received[tiab])

AND

("Treatment Outcome"[Mesh] OR "Patient Satisfaction"[Mesh] OR Therapy[sh] OR Diagnosis[sh] OR “Clinical outcomes”[tiab] OR Treatment[tiab] OR Diagnostic[tiab] OR Efficacy[tiab])

AND

(Randomized controlled trial[pt] OR controlled clinical trial[pt] OR randomized[tiab] OR randomised[tiab] OR placebo[tiab] OR "drug therapy"[sh] OR randomly[tiab] OR trial[tiab] OR groups[tiab])

NOT

(Animals[Mesh] not (Animals[Mesh] and Humans[Mesh]))

NOT

(“Case Reports”[pt] OR Editorial[pt] OR Letter[pt] OR Meta-Analysis[pt] OR “Observational Study”[pt] OR “Systematic Review”[pt] OR “Case Report”[ti] OR “Case series”[ti] OR Meta-

Analysis[ti] OR “Meta Analysis”[ti] OR “Systematic Review”[ti] OR “Systematic Literature Review”[ti] OR “Qualitative study”[ti] OR Protocol[ti])

CENTRAL

([mh Telemedicine] OR Telehealth:ti,ab OR Telemedicine:ti,ab OR ((Telephone:ti,ab) AND (Consultation:ti,ab OR “ face to face”:ti,ab OR “in person”:ti,ab)) OR “telephone delivered”:ti,ab)

AND

([mh "Primary Health Care"] OR [mh "General Practice"] OR [mh Outpatients] OR [mh "Speech Therapy"] OR Outpatient:ti,ab OR "Primary health":ti,ab OR "Primary care":ti,ab OR "General practice":ti,ab OR "General practices":ti,ab OR "General practitioners":ti,ab OR "General practitioner":ti,ab OR "Family practice":ti,ab OR Physician:ti,ab OR Physicians:ti,ab OR Clinician:ti,ab OR Clinicians:ti,ab OR Therapist:ti,ab OR Nurse:ti,ab OR Nurses:ti,ab OR Physiotherapist:ti,ab OR Rehabilitation:ti,ab OR Diabetes:ti,ab OR Diabetic:ti,ab OR Asthma:ti,ab OR Depression:ti,ab OR "Ïrritable bowel":ti,ab OR IBS:ti,ab OR PTSD:ti,ab OR "Chronic fatigue":ti,ab)

AND

([mh Videoconferencing] OR Videoconferencing:ti,ab OR Videoconference:ti,ab OR Videoconferences:ti,ab OR Video:ti,ab OR Skype:ti,ab OR Zoom:ti,ab)

AND

([mh "Delivery of Health Care"] OR Delivery:ti,ab OR Delivered:ti,ab OR Via:ti,ab OR Received:ti,ab)

AND

([mh "Treatment Outcome"] OR [mh "Patient Satisfaction"] OR "Clinical outcomes":ti,ab OR Treatment:ti,ab OR Diagnostic:ti,ab OR Efficacy:ti,ab)

Embase

('Telemedicine'/exp OR Telehealth:ti,ab OR Telemedicine:ti,ab OR ((Telephone:ti,ab) AND (Consultation:ti,ab OR face-to-face:ti,ab OR in-person:ti,ab)) OR telephone-delivered:ti,ab)

AND

('Primary Health Care'/exp OR 'General Practice'/exp OR 'Outpatient'/exp OR 'Speech Therapy'/exp OR Outpatient:ti,ab OR "Primary health":ti,ab OR "Primary care":ti,ab OR "General practice":ti,ab OR "General practices":ti,ab OR "General practitioners":ti,ab OR "General practitioner":ti,ab OR "Family practice":ti,ab OR Physician:ti,ab OR Physicians:ti,ab OR Clinician:ti,ab OR Clinicians:ti,ab OR Therapist:ti,ab OR Nurse:ti,ab OR Nurses:ti,ab OR Physiotherapist:ti,ab OR Rehabilitation:ti,ab OR Diabetes:ti,ab OR Diabetic:ti,ab OR Asthma:ti,ab OR Depression:ti,ab OR "Ïrritable bowel":ti,ab OR IBS:ti,ab OR PTSD:ti,ab OR "Chronic fatigue":ti,ab)

AND

(Videoconferencing/exp OR Videoconferencing:ti,ab OR Videoconference:ti,ab OR Videoconferences:ti,ab OR Video:ti,ab OR Skype:ti,ab OR Zoom:ti,ab)

AND

('health care delivery'/exp OR Delivery:ti,ab OR Delivered:ti,ab OR Via:ti,ab OR Received:ti,ab)

AND

('Treatment Outcome'/exp OR 'Patient Satisfaction'/exp OR "Clinical outcomes":ti,ab OR Treatment:ti,ab OR Diagnostic:ti,ab OR Efficacy:ti,ab)

AND

(random* OR factorial OR crossover OR placebo OR blind OR blinded OR assign OR assigned OR allocate OR allocated OR 'crossover procedure'/exp OR 'double-blind procedure'/exp OR 'randomized controlled trial'/exp OR 'single-blind procedure'/exp NOT ('animal'/exp NOT ('animal'/exp AND 'human'/exp)))

AND [embase]/lim

Searches for Systematic Reviews

PubMed

("Telemedicine"[Mesh] OR Telehealth[tiab] OR Telemedicine[tiab] OR ((Telephone[tiab]) AND (Consultation[tiab] OR face-to-face[tiab] OR in-person[tiab])) OR telephone-delivered[tiab])

AND

("Primary Health Care"[Mesh] OR "General Practice"[Mesh] OR rehabilitation[sh] OR "Outpatients"[Mesh] OR "Speech Therapy"[Mesh] OR Outpatient[tiab] OR “Primary health”[tiab] OR “Primary care”[tiab] OR “General practice”[tiab] OR “General practices”[tiab] OR “General practitioners”[tiab] OR “General practitioner”[tiab] OR “Family practice”[tiab] OR Physician[tiab] OR Physicians[tiab] OR Clinician[tiab] OR Clinicians[tiab] OR Therapist[tiab] OR Nurse[tiab] OR Nurses[tiab] OR Physiotherapist[tiab] OR Rehabilitation[tiab] OR Diabetes[tiab] OR Diabetic[tiab] OR Asthma[tiab] OR Depression[tiab] OR “Ïrritable bowel”[tiab] OR IBS[tiab] OR PTSD[tiab] OR “Chronic fatigue”[tiab])

AND

("Videoconferencing"[Mesh] OR Videoconferencing[tiab] OR Videoconference[tiab] OR Videoconferences[tiab] OR Video[tiab] OR Skype[tiab] OR Zoom[tiab])

AND

("Delivery of Health Care"[Mesh] OR Delivery[tiab] OR Delivered[tiab] OR Via[tiab] OR Received[tiab])

AND

("Treatment Outcome"[Mesh] OR "Patient Satisfaction"[Mesh] OR Therapy[sh] OR Diagnosis[sh] OR “Clinical outcomes”[tiab] OR Treatment[tiab] OR Diagnostic[tiab] OR Efficacy[tiab])

AND

(Meta-Analysis[pt] OR “Systematic Review”[pt] OR Meta-Analysis[ti] OR “Meta Analysis”[ti] OR “Systematic Review”[ti] OR “Systematic Literature Review”[ti])

NOT

(“Case Reports”[pt] OR Editorial[pt] OR Letter[pt] OR “Observational Study”[pt] OR “Case Report”[ti] OR “Case series”[ti] OR “Qualitative study”[ti] OR Protocol[ti])

CDSR via the Cochrane Library

([mh Telemedicine] Telehealth:ti,ab OR Telemedicine:ti,ab OR ((Telephone:ti,ab) AND (Consultation:ti,ab OR “ face to face”:ti,ab OR “in person”:ti,ab)) OR “telephone delivered”:ti,ab)

AND

([mh "Primary Health Care"] OR [mh "General Practice"] OR [mh Outpatients] OR [mh "Speech Therapy"] OR Outpatient:ti,ab OR "Primary health":ti,ab OR "Primary care":ti,ab OR "General practice":ti,ab OR "General practices":ti,ab OR "General practitioners":ti,ab OR "General practitioner":ti,ab OR "Family practice":ti,ab OR Physician:ti,ab OR Physicians:ti,ab OR Clinician:ti,ab OR Clinicians:ti,ab OR Therapist:ti,ab OR Nurse:ti,ab OR Nurses:ti,ab OR Physiotherapist:ti,ab OR Rehabilitation:ti,ab OR Diabetes:ti,ab OR Diabetic:ti,ab OR Asthma:ti,ab OR Depression:ti,ab OR "Ïrritable bowel":ti,ab OR IBS:ti,ab OR PTSD:ti,ab OR "Chronic fatigue":ti,ab)

AND

([mh Videoconferencing] OR Videoconferencing:ti,ab OR Videoconference:ti,ab OR Videoconferences:ti,ab OR Video:ti,ab OR Skype:ti,ab OR Zoom:ti,ab)

AND

([mh "Delivery of Health Care"] OR Delivery:ti,ab OR Delivered:ti,ab OR Via:ti,ab OR Received:ti,ab)

AND

([mh "Treatment Outcome"] OR [mh "Patient Satisfaction"] OR "Clinical outcomes":ti,ab OR Treatment:ti,ab OR Diagnostic:ti,ab OR Efficacy:ti,ab)

Embase

('Telemedicine'/exp OR 'Videoconferencing'/exp OR Telehealth:ti,ab OR Telemedicine:ti,ab OR Videoconferencing:ti,ab OR ((Telephone:ti,ab) AND (Consultation:ti,ab OR face-to-face:ti,ab OR in-person:ti,ab)) OR telephone-delivered:ti,ab)

AND

('Primary Health Care'/exp OR 'General Practice'/exp OR 'Outpatient'/exp OR 'Speech Therapy'/exp OR Outpatient:ti,ab OR "Primary health":ti,ab OR "Primary care":ti,ab OR "General practice":ti,ab OR "General practices":ti,ab OR "General practitioners":ti,ab OR "General practitioner":ti,ab OR "Family practice":ti,ab OR Physician:ti,ab OR Physicians:ti,ab OR Clinician:ti,ab OR Clinicians:ti,ab OR Therapist:ti,ab OR Nurse:ti,ab OR Nurses:ti,ab OR Physiotherapist:ti,ab OR Rehabilitation:ti,ab OR Diabetes:ti,ab OR Diabetic:ti,ab OR Asthma:ti,ab OR Depression:ti,ab OR "Ïrritable bowel":ti,ab OR IBS:ti,ab OR PTSD:ti,ab OR "Chronic fatigue":ti,ab)

AND

(Videoconferencing/exp OR Videoconferencing:ti,ab OR Videoconference:ti,ab OR Videoconferences:ti,ab OR Video:ti,ab OR Skype:ti,ab OR Zoom:ti,ab)

AND

('health care delivery'/exp OR Delivery:ti,ab OR Delivered:ti,ab OR Via:ti,ab OR Received:ti,ab)

AND

('Treatment Outcome'/exp OR 'Patient Satisfaction'/exp OR "Clinical outcomes":ti,ab OR Treatment:ti,ab OR Diagnostic:ti,ab OR Efficacy:ti,ab)

AND

([cochrane review]/lim OR [systematic review]/lim OR [meta analysis]/lim OR ((Search:ti,ab OR Searched:ti,ab) AND (PubMed:ti,ab OR MEDLINE:ti,ab)) OR (Systematic:ti,ab AND Review:ti,ab) OR

'Meta analysis':ti,ab OR Meta-analysis:ti,ab OR Review:ti OR ((Systematically:ti,ab OR Reviewed:ti,ab) AND (literature:ti,ab)))

Searches of clinical trial registries

The search of Cochrane CENTRAL (see "searches for Randomised Controlled Trials," above) searched the following clinical trial registries:

1) ClinicalTrials.gov
2) WHO's International Clinical Trials Registry Platform (WHO ICTRP)

Appendix 4 – Search strategies to identify evidence for Question A3: Comparison of telehealth (telephone or video) to face-to-face delivery of care in areas of special interest (patient attendance, escalation to emergency dept.).

All searches cover the period of: inception of each source (database, registry) to 11 January 2023

Searches for Randomised Controlled Trials

PubMed

("Telemedicine"[Mesh] OR "Videoconferencing"[Mesh] OR Telehealth[tiab] OR Telemedicine[tiab] OR Videoconferencing[tiab] OR ((Telephone[tiab]) AND (Consultation[tiab] OR face-to-face[tiab] OR in-person[tiab])) OR telephone-delivered[tiab])

AND

("Primary Health Care"[Mesh] OR "General Practice"[Mesh] OR rehabilitation[sh] OR "Outpatients"[Mesh] OR "Speech Therapy"[Mesh] OR Outpatient[tiab] OR “Primary health”[tiab] OR “Primary care”[tiab] OR “General practice”[tiab] OR “General practices”[tiab] OR “General practitioners”[tiab] OR “General practitioner”[tiab] OR “Family practice”[tiab] OR Physician[tiab] OR Physicians[tiab] OR Clinician[tiab] OR Clinicians[tiab] OR Therapist[tiab] OR Nurse[tiab] OR Nurses[tiab] OR Physiotherapist[tiab] OR Rehabilitation[tiab] OR Diabetes[tiab] OR Diabetic[tiab] OR Asthma[tiab] OR Depression[tiab] OR “Ïrritable bowel”[tiab] OR IBS[tiab] OR PTSD[tiab] OR “Chronic fatigue”[tiab])

AND

((Face to face[tiab]) OR “Usual care”[tiab] OR Visits[tiab] OR Visit[tiab] OR In-person[tiab] OR “In person”[tiab] OR ((Clinic[tiab] OR Centre[tiab] OR Home[tiab]) AND (Based[tiab] OR Contact[tiab])) OR Conventional[tiab] OR “Practice-based”[tiab] OR “Practice based”[tiab] OR Traditional[tiab] OR “Standard care”[tiab] OR Homecare[tiab] OR ((Routine[tiab] OR Home[tiab]) AND (Care[tiab])))

AND

("Delivery of Health Care"[Mesh] OR Delivery[tiab] OR Delivered[tiab] OR Via[tiab] OR Received[tiab])

AND

("Treatment Outcome"[Mesh] OR "Patient Satisfaction"[Mesh] OR "Anti-Bacterial Agents"[Mesh] OR "Diagnostic Imaging"[Mesh] OR "Pathology"[Mesh] OR "Emergency Medical Services"[Mesh] OR Therapy[sh] OR Diagnosis[sh] OR “Clinical outcomes”[tiab] OR Treatment[tiab] OR Diagnostic[tiab] OR Efficacy[tiab] OR Antibiotics[tiab] OR Antibiotic[tiab] OR Anti-Bacterial[tiab] OR Anti-Bacterials[tiab] OR Imaging[tiab] OR Attendance[tiab] OR Pathology[tiab] OR Emergency[tiab])

AND

(Randomized controlled trial[pt] OR controlled clinical trial[pt] OR randomized[tiab] OR randomised[tiab] OR placebo[tiab] OR "drug therapy"[sh] OR randomly[tiab] OR trial[tiab] OR groups[tiab])

NOT

(Animals[Mesh] not (Animals[Mesh] and Humans[Mesh]))

NOT

(“Case Reports”[pt] OR Editorial[pt] OR Letter[pt] OR Meta-Analysis[pt] OR “Observational Study”[pt] OR “Systematic Review”[pt] OR “Case Report”[ti] OR “Case series”[ti] OR Meta-Analysis[ti] OR “Meta Analysis”[ti] OR “Systematic Review”[ti] OR “Systematic Literature Review”[ti] OR “Qualitative study”[ti] OR Protocol[ti])

CENTRAL

([mh Telemedicine] OR [mh Videoconferencing] OR Telehealth:ti,ab OR Telemedicine:ti,ab OR Videoconferencing:ti,ab OR ((Telephone:ti,ab) AND (Consultation:ti,ab OR “ face to face”:ti,ab OR “in person”:ti,ab)) OR “telephone delivered”:ti,ab)

AND

([mh "Primary Health Care"] OR [mh "General Practice"] OR [mh Outpatients] OR [mh "Speech Therapy"] OR Outpatient:ti,ab OR "Primary health":ti,ab OR "Primary care":ti,ab OR "General practice":ti,ab OR "General practices":ti,ab OR "General practitioners":ti,ab OR "General practitioner":ti,ab OR "Family practice":ti,ab OR Physician:ti,ab OR Physicians:ti,ab OR Clinician:ti,ab OR Clinicians:ti,ab OR Therapist:ti,ab OR Nurse:ti,ab OR Nurses:ti,ab OR Physiotherapist:ti,ab OR Rehabilitation:ti,ab OR Diabetes:ti,ab OR Diabetic:ti,ab OR Asthma:ti,ab OR Depression:ti,ab OR "Ïrritable bowel":ti,ab OR IBS:ti,ab OR PTSD:ti,ab OR "Chronic fatigue":ti,ab)

AND

(("Face to face":ti,ab) OR "Usual care":ti,ab OR Visits:ti,ab OR Visit:ti,ab OR "In person":ti,ab OR ((Clinic:ti,ab OR Centre:ti,ab OR Home:ti,ab) AND (Based:ti,ab OR Contact:ti,ab)) OR Conventional:ti,ab OR "Practice based":ti,ab OR Traditional:ti,ab OR "Standard care":ti,ab OR Homecare:ti,ab OR ((Routine:ti,ab OR Home:ti,ab) AND (Care:ti,ab)))

AND

([mh "Delivery of Health Care"] OR Delivery:ti,ab OR Delivered:ti,ab OR Via:ti,ab OR Received:ti,ab)

AND

([mh "Treatment Outcome"] OR [mh "Patient Satisfaction"] OR [mh "Anti-Bacterial Agents"] OR [mh "Diagnostic Imaging"] OR [mh Pathology] OR [mh "Emergency Medical Services"] OR [mh /TH] OR [mh /DI] OR "Clinical outcomes":ti,ab OR Treatment:ti,ab OR Diagnostic:ti,ab OR Efficacy:ti,ab OR Antibiotics:ti,ab OR Antibiotic:ti,ab OR Anti-Bacterial:ti,ab OR Anti-Bacterials:ti,ab OR Imaging:ti,ab OR Attendance:ti,ab OR Pathology:ti,ab OR Emergency:ti,ab)

Embase

('Telemedicine'/exp OR 'Videoconferencing'/exp OR Telehealth:ti,ab OR Telemedicine:ti,ab OR Videoconferencing:ti,ab OR ((Telephone:ti,ab) AND (Consultation:ti,ab OR face-to-face:ti,ab OR in-person:ti,ab)) OR telephone-delivered:ti,ab)

AND

('Primary Health Care'/exp OR 'General Practice'/exp OR 'Outpatient'/exp OR 'Speech Therapy'/exp OR Outpatient:ti,ab OR "Primary health":ti,ab OR "Primary care":ti,ab OR "General practice":ti,ab OR "General practices":ti,ab OR "General practitioners":ti,ab OR "General practitioner":ti,ab OR "Family practice":ti,ab OR Physician:ti,ab OR Physicians:ti,ab OR Clinician:ti,ab OR Clinicians:ti,ab OR Therapist:ti,ab OR Nurse:ti,ab OR Nurses:ti,ab OR Physiotherapist:ti,ab OR Rehabilitation:ti,ab OR

Diabetes:ti,ab OR Diabetic:ti,ab OR Asthma:ti,ab OR Depression:ti,ab OR "Ïrritable bowel":ti,ab OR IBS:ti,ab OR PTSD:ti,ab OR "Chronic fatigue":ti,ab)

AND

(("Face to face":ti,ab) OR "Usual care":ti,ab OR Visits:ti,ab OR Visit:ti,ab OR In-person:ti,ab OR "In person":ti,ab OR ((Clinic:ti,ab OR Centre:ti,ab OR Home:ti,ab) AND (Based:ti,ab OR Contact:ti,ab)) OR Conventional:ti,ab OR Practice-based:ti,ab OR "Practice based":ti,ab OR Traditional:ti,ab OR "Standard care":ti,ab OR Homecare:ti,ab OR ((Routine:ti,ab OR Home:ti,ab) AND (Care:ti,ab)))

AND

('health care delivery'/exp OR Delivery:ti,ab OR Delivered:ti,ab OR Via:ti,ab OR Received:ti,ab)

AND

('Treatment Outcome'/exp OR 'Patient Satisfaction'/exp OR 'antiinfective agent'/exp OR 'Diagnostic Imaging'/exp OR Pathology/exp OR 'emergency health service'/exp OR 'Clinical outcomes':ti,ab OR Treatment:ti,ab OR Diagnostic:ti,ab OR Efficacy:ti,ab OR Antibiotics:ti,ab OR Antibiotic:ti,ab OR Anti-Bacterial:ti,ab OR Anti-Bacterials:ti,ab OR Imaging:ti,ab OR Attendance:ti,ab OR Pathology:ti,ab OR Emergency:ti,ab)

AND

(random* OR factorial OR crossover OR placebo OR blind OR blinded OR assign OR assigned OR allocate OR allocated OR 'crossover procedure'/exp OR 'double-blind procedure'/exp OR 'randomized controlled trial'/exp OR 'single-blind procedure'/exp NOT ('animal'/exp NOT ('animal'/exp AND 'human'/exp)))

AND [embase]/lim

Searches for Systematic Reviews

PubMed

("Telemedicine"[Mesh] OR "Videoconferencing"[Mesh] OR Telehealth[tiab] OR Telemedicine[tiab] OR Videoconferencing[tiab] OR ((Telephone[tiab]) AND (Consultation[tiab] OR face-to-face[tiab] OR in-person[tiab])) OR telephone-delivered[tiab])

AND

("Primary Health Care"[Mesh] OR "General Practice"[Mesh] OR rehabilitation[sh] OR "Outpatients"[Mesh] OR "Speech Therapy"[Mesh] OR Outpatient[tiab] OR “Primary health”[tiab] OR “Primary care”[tiab] OR “General practice”[tiab] OR “General practices”[tiab] OR “General practitioners”[tiab] OR “General practitioner”[tiab] OR “Family practice”[tiab] OR Physician[tiab] OR Physicians[tiab] OR Clinician[tiab] OR Clinicians[tiab] OR Therapist[tiab] OR Nurse[tiab] OR Nurses[tiab] OR Physiotherapist[tiab] OR Rehabilitation[tiab] OR Diabetes[tiab] OR Diabetic[tiab] OR Asthma[tiab] OR Depression[tiab] OR “Ïrritable bowel”[tiab] OR IBS[tiab] OR PTSD[tiab] OR “Chronic fatigue”[tiab])

AND

((Face to face[tiab]) OR “Usual care”[tiab] OR Visits[tiab] OR Visit[tiab] OR In-person[tiab] OR “In person”[tiab] OR ((Clinic[tiab] OR Centre[tiab] OR Home[tiab]) AND (Based[tiab] OR Contact[tiab])) OR Conventional[tiab] OR “Practice-based”[tiab] OR “Practice based”[tiab] OR Traditional[tiab] OR “Standard care”[tiab] OR Homecare[tiab] OR ((Routine[tiab] OR Home[tiab]) AND (Care[tiab])))

AND

("Delivery of Health Care"[Mesh] OR Delivery[tiab] OR Delivered[tiab] OR Via[tiab] OR Received[tiab])

AND

("Treatment Outcome"[Mesh] OR "Patient Satisfaction"[Mesh] OR "Anti-Bacterial Agents"[Mesh] OR "Diagnostic Imaging"[Mesh] OR "Pathology"[Mesh] OR "Emergency Medical Services"[Mesh] OR Therapy[sh] OR Diagnosis[sh] OR “Clinical outcomes”[tiab] OR Treatment[tiab] OR Diagnostic[tiab] OR Efficacy[tiab] OR Antibiotics[tiab] OR Antibiotic[tiab] OR Anti-Bacterial[tiab] OR Anti-Bacterials[tiab] OR Imaging[tiab] OR Attendance[tiab] OR Pathology[tiab] OR Emergency[tiab])

AND

(Meta-Analysis[pt] OR “Systematic Review”[pt] OR Meta-Analysis[ti] OR “Meta Analysis”[ti] OR “Systematic Review”[ti] OR “Systematic Literature Review”[ti])

NOT

(“Case Reports”[pt] OR Editorial[pt] OR Letter[pt] OR “Observational Study”[pt] OR “Case Report”[ti] OR “Case series”[ti] OR “Qualitative study”[ti] OR Protocol[ti])

CDSR via the Cochrane Library

([mh Telemedicine] OR [mh Videoconferencing] OR Telehealth:ti,ab OR Telemedicine:ti,ab OR Videoconferencing:ti,ab OR ((Telephone:ti,ab) AND (Consultation:ti,ab OR “ face to face”:ti,ab OR “in person”:ti,ab)) OR “telephone delivered”:ti,ab)

AND

([mh "Primary Health Care"] OR [mh "General Practice"] OR [mh Outpatients] OR [mh "Speech Therapy"] OR Outpatient:ti,ab OR "Primary health":ti,ab OR "Primary care":ti,ab OR "General practice":ti,ab OR "General practices":ti,ab OR "General practitioners":ti,ab OR "General practitioner":ti,ab OR "Family practice":ti,ab OR Physician:ti,ab OR Physicians:ti,ab OR Clinician:ti,ab OR Clinicians:ti,ab OR Therapist:ti,ab OR Nurse:ti,ab OR Nurses:ti,ab OR Physiotherapist:ti,ab OR Rehabilitation:ti,ab OR Diabetes:ti,ab OR Diabetic:ti,ab OR Asthma:ti,ab OR Depression:ti,ab OR "Ïrritable bowel":ti,ab OR IBS:ti,ab OR PTSD:ti,ab OR "Chronic fatigue":ti,ab)

AND

(("Face to face":ti,ab) OR "Usual care":ti,ab OR Visits:ti,ab OR Visit:ti,ab OR "In person":ti,ab OR ((Clinic:ti,ab OR Centre:ti,ab OR Home:ti,ab) AND (Based:ti,ab OR Contact:ti,ab)) OR Conventional:ti,ab OR "Practice based":ti,ab OR Traditional:ti,ab OR "Standard care":ti,ab OR Homecare:ti,ab OR ((Routine:ti,ab OR Home:ti,ab) AND (Care:ti,ab)))

AND

([mh "Delivery of Health Care"] OR Delivery:ti,ab OR Delivered:ti,ab OR Via:ti,ab OR Received:ti,ab)

AND

([mh "Treatment Outcome"] OR [mh "Patient Satisfaction"] OR [mh "Anti-Bacterial Agents"] OR [mh "Diagnostic Imaging"] OR [mh Pathology] OR [mh "Emergency Medical Services"] OR [mh /TH] OR [mh /DI] OR "Clinical outcomes":ti,ab OR Treatment:ti,ab OR Diagnostic:ti,ab OR Efficacy:ti,ab OR Antibiotics:ti,ab OR Antibiotic:ti,ab OR Anti-Bacterial:ti,ab OR Anti-Bacterials:ti,ab OR Imaging:ti,ab OR Attendance:ti,ab OR Pathology:ti,ab OR Emergency:ti,ab)

Embase

('Telemedicine'/exp OR 'Videoconferencing'/exp OR Telehealth:ti,ab OR Telemedicine:ti,ab OR Videoconferencing:ti,ab OR ((Telephone:ti,ab) AND (Consultation:ti,ab OR face-to-face:ti,ab OR in-person:ti,ab)) OR telephone-delivered:ti,ab)
AND

('Primary Health Care'/exp OR 'General Practice'/exp OR 'Outpatient'/exp OR 'Speech Therapy'/exp OR Outpatient:ti,ab OR "Primary health":ti,ab OR "Primary care":ti,ab OR "General practice":ti,ab OR "General practices":ti,ab OR "General practitioners":ti,ab OR "General practitioner":ti,ab OR "Family practice":ti,ab OR Physician:ti,ab OR Physicians:ti,ab OR Clinician:ti,ab OR Clinicians:ti,ab OR Therapist:ti,ab OR Nurse:ti,ab OR Nurses:ti,ab OR Physiotherapist:ti,ab OR Rehabilitation:ti,ab OR Diabetes:ti,ab OR Diabetic:ti,ab OR Asthma:ti,ab OR Depression:ti,ab OR "Ïrritable bowel":ti,ab OR IBS:ti,ab OR PTSD:ti,ab OR "Chronic fatigue":ti,ab)

AND

(("Face to face":ti,ab) OR "Usual care":ti,ab OR Visits:ti,ab OR Visit:ti,ab OR In-person:ti,ab OR "In person":ti,ab OR ((Clinic:ti,ab OR Centre:ti,ab OR Home:ti,ab) AND (Based:ti,ab OR Contact:ti,ab)) OR Conventional:ti,ab OR Practice-based:ti,ab OR "Practice based":ti,ab OR Traditional:ti,ab OR "Standard care":ti,ab OR Homecare:ti,ab OR ((Routine:ti,ab OR Home:ti,ab) AND (Care:ti,ab)))

AND

('health care delivery'/exp OR Delivery:ti,ab OR Delivered:ti,ab OR Via:ti,ab OR Received:ti,ab)

AND

('Treatment Outcome'/exp OR 'Patient Satisfaction'/exp OR 'antiinfective agent'/exp OR 'Diagnostic Imaging'/exp OR Pathology/exp OR 'emergency health service'/exp OR 'Clinical outcomes':ti,ab OR Treatment:ti,ab OR Diagnostic:ti,ab OR Efficacy:ti,ab OR Antibiotics:ti,ab OR Antibiotic:ti,ab OR Anti-Bacterial:ti,ab OR Anti-Bacterials:ti,ab OR Imaging:ti,ab OR Attendance:ti,ab OR Pathology:ti,ab OR Emergency:ti,ab)

AND

([cochrane review]/lim OR [systematic review]/lim OR [meta analysis]/lim OR ((Search:ti,ab OR Searched:ti,ab) AND (PubMed:ti,ab OR MEDLINE:ti,ab)) OR (Systematic:ti,ab AND Review:ti,ab) OR 'Meta analysis':ti,ab OR Meta-analysis:ti,ab OR Review:ti OR ((Systematically:ti,ab OR Reviewed:ti,ab) AND (literature:ti,ab)))

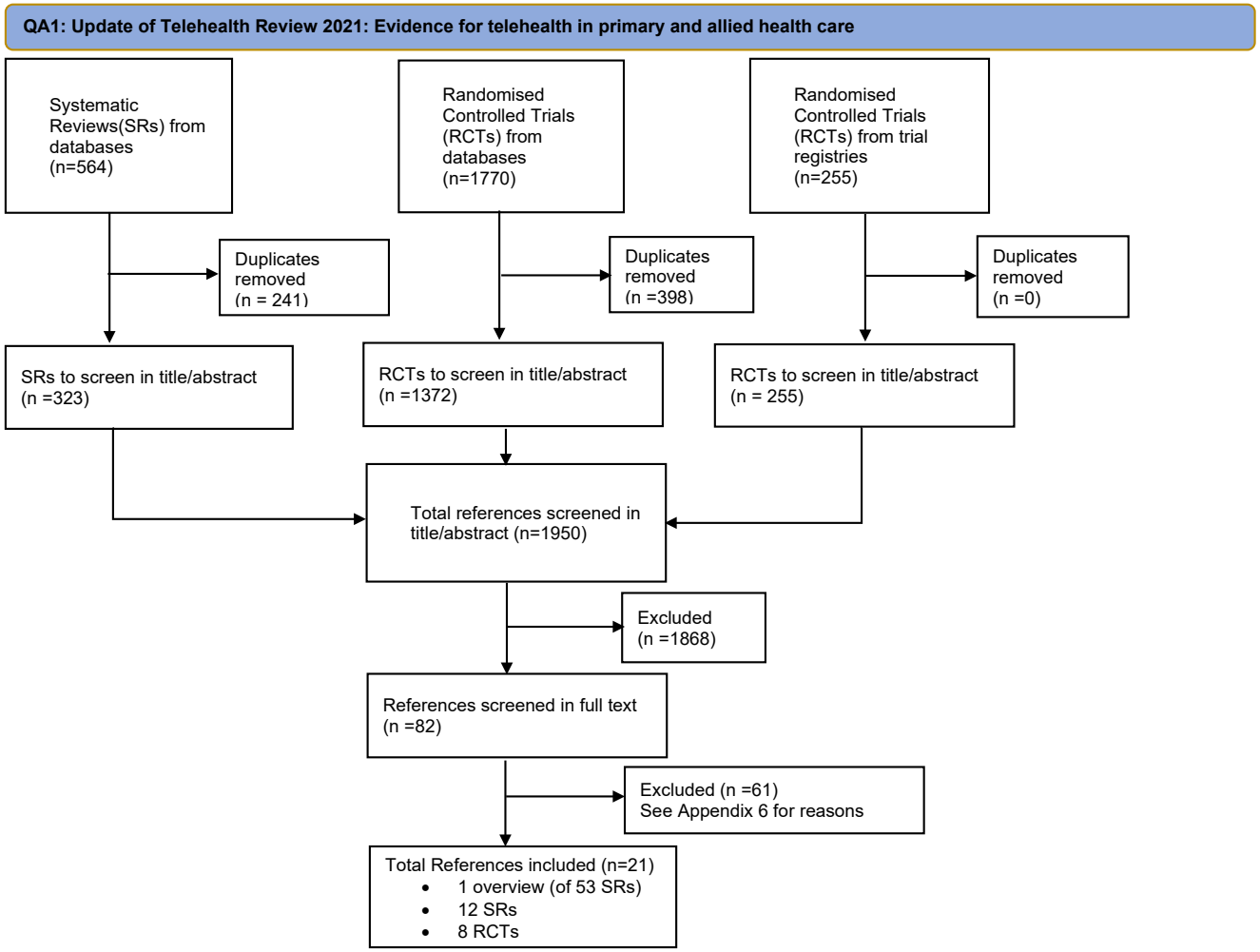
Searches of clinical trial registries

The search of Cochrane CENTRAL (see “searches for Randomised Controlled Trials,” above) searched the following clinical trial registries:

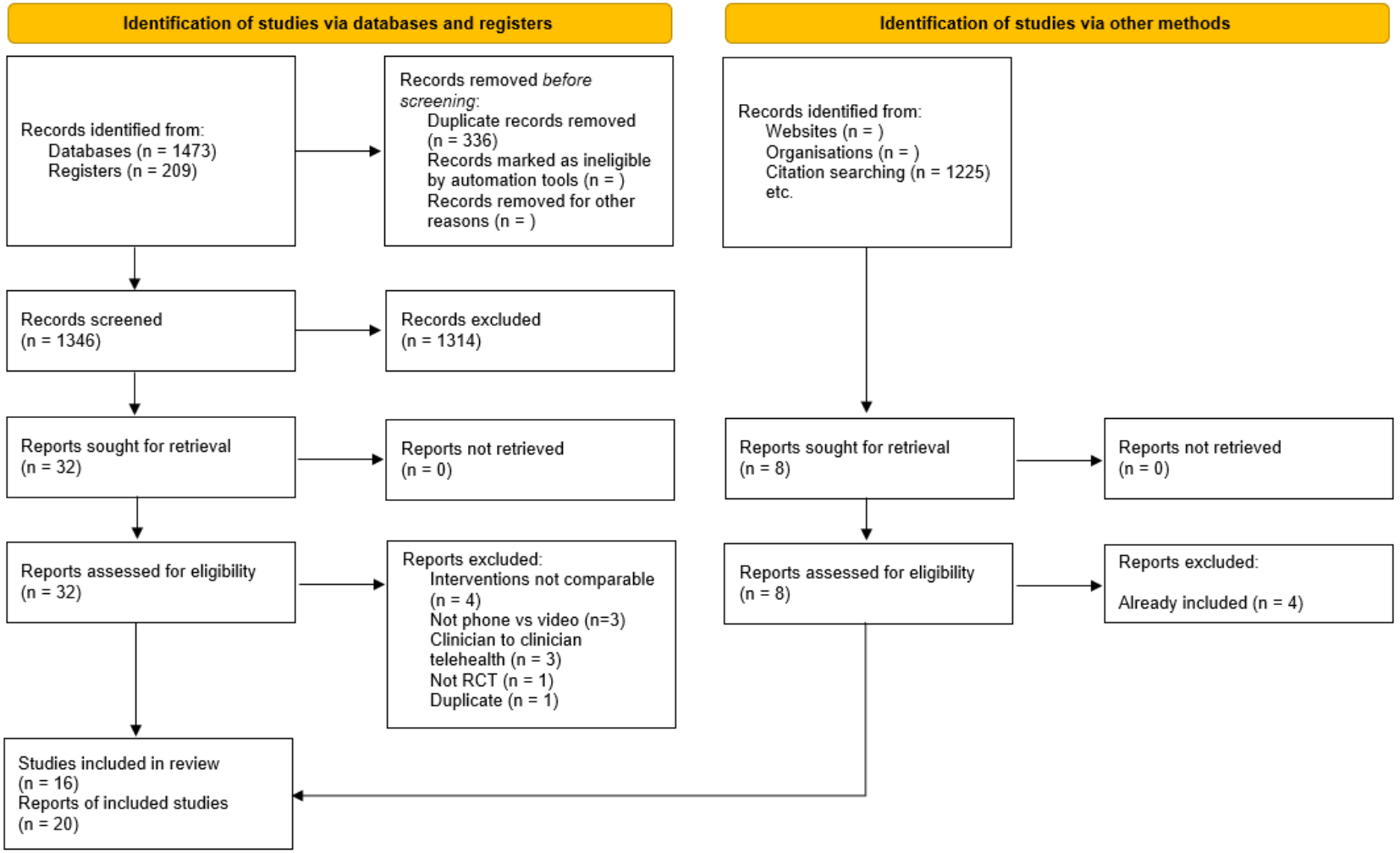
1) ClinicalTrials.gov
2) WHO’s International Clinical Trials Registry Platform (WHO ICTRP)

Appendix 5 – PRISMA flow charts (search results and screening process)

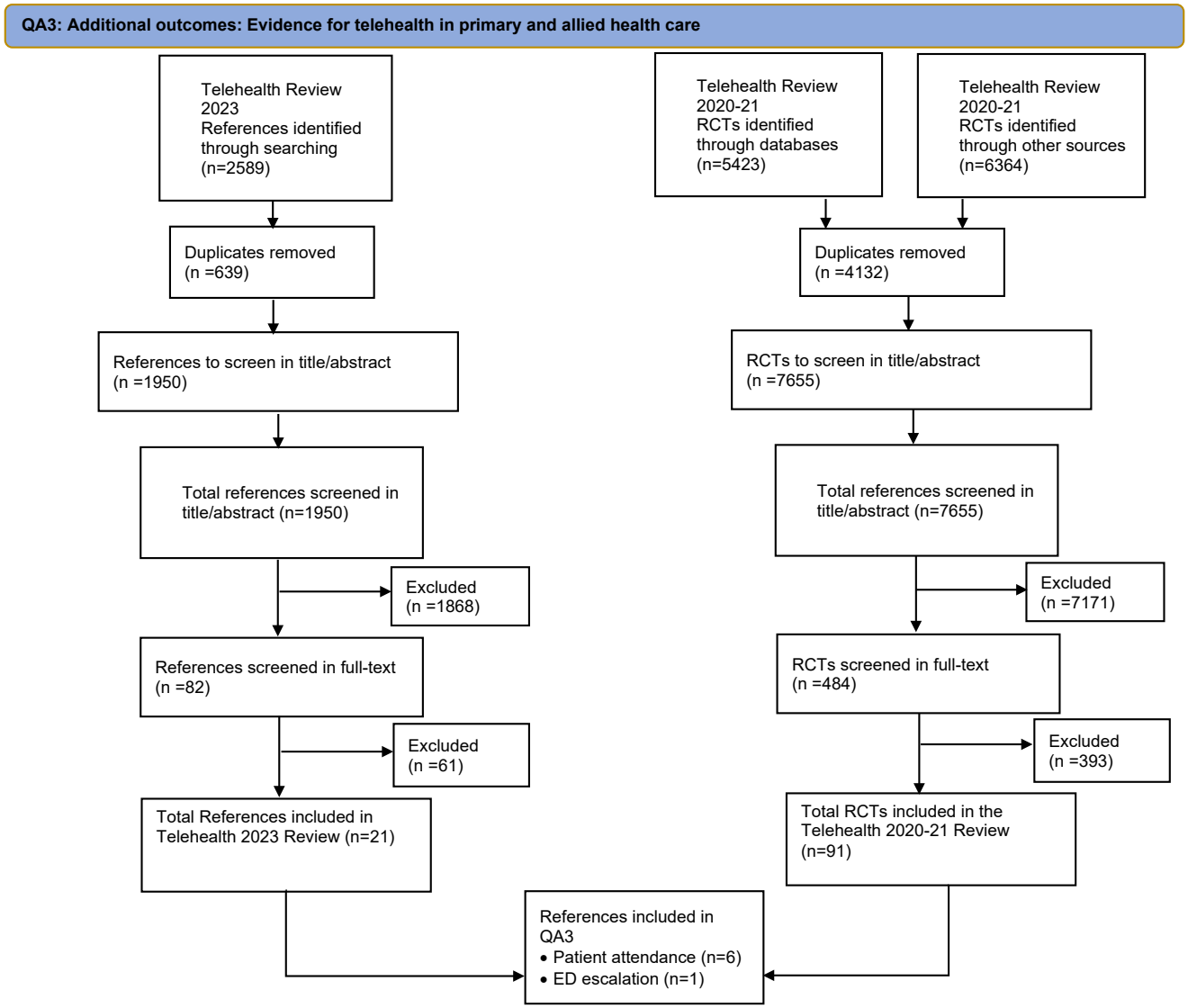
Question A1. Updated reviews and new evidence comparing telehealth (via telephone or video) to face-to-face delivery of care in primary and allied health.



Question A2. Comparison of delivery of by one telehealth modality (e.g. videoconferencing) to another telehealth modality (e.g. teleconferencing), in primary and allied healthcare.



Question A3. Comparison of telehealth (telephone or video) to face-to-face delivery of care in areas of special interest.



Appendix 6 – Key Excluded Studies: systematic reviews and randomised trials excluded at full-text screen stage

Key relevant systematic reviews excluded at full-text screening stage:

No.	Reference	Reason for exclusion
1	Amiri P, Niazkhani Z, Pirnejad H, ShojaeiBaghini M, Bahaadinbeigy K. Objectives, Outcomes, Facilitators, and Barriers of Telemedicine Systems for Patients with Alzheimer's Disease and their Caregivers and Care Providers: A Systematic Review. Archives of Iranian Medicine. 2022;25(8):564-73.	AMSTAR<7
2	Anderson A, O'Connell SS, Thomas C, Chimmanamada R. Telehealth Interventions to Improve Diabetes Management Among Black and Hispanic Patients: a Systematic Review and Meta-Analysis. J Racial Ethn Health Disparities. 2022;9(6):2375-86.	Interventions of included studies
3	Bellanti DM, Kelber MS, Workman DE, Beech EH, Belsher BE. Rapid Review on the Effectiveness of Telehealth Interventions for the Treatment of Behavioral Health Disorders. Mil Med. 2022;187(5-6):e577-e88.	AMSTAR<7
4	Bucki FM, Clay MB, Tobiczyk H, Green BN. Scoping Review of Telehealth for Musculoskeletal Disorders: Applications for the COVID-19 Pandemic. Journal of Manipulative and Physiological Therapeutics. 2021;44(7):558-65.	AMSTAR<7
5	Camden C, Pratte G, Fallon F, Couture M, Berbari J, Tousignant M. Diversity of practices in telerehabilitation for children with disabilities and effective intervention characteristics: results from a systematic review. Disabil Rehabil. 2020;42(24):3424-36.	AMSTAR<7
6	Chen LJ, Kamp K, Fang A, Heitkemper MM. Delivery Methods of Cognitive Behavior Therapy for Patients With Irritable Bowel Syndrome. Gastroenterol Nurs. 2022;45(3):149-58.	AMSTAR<7
7	Corso M, Cancelliere C, Mior S, Salmi LR, Cedraschi C, Nordin M, et al. Are Nonpharmacologic Interventions Delivered Through Synchronous Telehealth as Effective and Safe as In-Person Interventions for the Management of Patients With Nonacute Musculoskeletal Conditions? A Systematic Rapid Review. Arch Phys Med Rehabil. 2022;103(1):145-54.e11.	Comparators used in included studies
8	Eilidh C, Franklin V. Does a telemedicine approach improve glycaemic control and quality of life in children and adolescents with type 1 diabetes? Pediatric Diabetes. 2021;22(SUPPL 30):79.	Abstract Only
9	Farrell A, George N, Amado S, Wozniak J. A systematic review of the literature on telepsychiatry for bipolar disorder. Brain Behav. 2022;12(10):e2743.	AMSTAR<7
10	Fernandez E, Woldgabreal Y, Day A, Pham T, Gleich B, Aboujaoude E. Live psychotherapy by video versus in-person: A meta-analysis of efficacy and its relationship to types and targets of treatment. Clin Psychol Psychother. 2021;28(6):1535-49.	AMSTAR<7
11	Gandole S, Yadav V. REVIEW OF TELEREHABILITATION OF PHYSICAL THERAPY. Journal of Pharmaceutical Negative Results. 2022;13:3043-6.	AMSTAR<7
12	Gava V, Ribeiro LP, Barreto RPG, Camargo PR. Effectiveness of physical therapy given by telerehabilitation on pain and disability of individuals with shoulder pain: A systematic review. Clin Rehabil. 2022;36(6):715-25.	Interventions of included studies
13	Giovanetti AK, Punt SEW, Nelson EL, Ilardi SS. Teletherapy Versus In-Person Psychotherapy for Depression: A Meta-Analysis of Randomized Controlled Trials. Telemed J E Health. 2022;28(8):1077-89.	AMSTAR<7
14	Goodarzi Z, Holroyd-Leduc J, Seitz D, Ismail Z, Kirkham J, Wu P, et al. Efficacy of virtual interventions for reducing symptoms of depression in community-dwelling older adults: a systematic review. International psychogeriatrics. 2022:1-11.	Interventions of included studies
15	Guaiana G, Mastrangelo J, Hendrikx S, Barbui C. A Systematic Review of the Use of Telepsychiatry in Depression. Community Ment Health J. 2021;57(1):93-100.	AMSTAR<7
16	Huang J, Fan Y, Zhao K, Yang C, Zhao Z, Chen Y, et al. Do patients with and survivors of COVID-19 benefit from telerehabilitation? A meta-analysis of randomized controlled trials. Front Public Health. 2022;10:954754.	Comparators used in the studies
17	Ibeggazene S, Turner R, Rosario D, Bourke L. Remote interventions to improve exercise behaviour in sedentary people living with and beyond cancer: a systematic review and meta-analysis. BMC Cancer. 2021;21(1):308.	Intervention of studies

18	Kinley E, Skene I, Steed E, Pinnock H, McClatchey K. Delivery of supported self-management in remote asthma reviews: A systematic rapid realist review. Health Expect. 2022;25(4):1200-14.	AMSTAR<7
19	Lindenfeld Z, Berry C, Albert S, Massar R, Shelley D, Kwok L, et al. Synchronous Home-Based Telemedicine for Primary Care: A Review. Medical Care Research and Review. 2023;80(1):3-15.	AMSTAR<7
20	Lu AD, Veet CA, Aljundi O, Whitaker E, Smith WB, 2nd, Smith JE. A Systematic Review of Physical Examination Components Adapted for Telemedicine. Telemed J E Health. 2022;28(12):1764-85.	AMSTAR<7
21	Mabeza RMS, Maynard K, Tarn DM. Influence of synchronous primary care telemedicine versus in-person visits on diabetes, hypertension, and hyperlipidemia outcomes: a systematic review. BMC Prim Care. 2022;23(1):52.	AMSTAR<7
22	Matsumoto K, Hamatani S, Shimizu E. Effectiveness of Videoconference-Delivered Cognitive Behavioral Therapy for Adults With Psychiatric Disorders: Systematic and Meta-Analytic Review. J Med Internet Res. 2021;23(12):e31293.	Intervention of studies
23	McClellan MJ, Osbaldiston R, Wu R, Yeager R, Monroe AD, McQueen T, et al. The effectiveness of telepsychology with veterans: A meta-analysis of services delivered by videoconference and phone. Psychol Serv. 2022;19(2):294-304.	AMSTAR<7
24	McLean SA, Booth AT, Schnabel A, Wright BJ, Painter FL, McIntosh JE. Exploring the Efficacy of Telehealth for Family Therapy Through Systematic, Meta-analytic, and Qualitative Evidence. Clin Child Fam Psychol Rev. 2021;24(2):244-66.	Interventions of studies
25	Moreira AM, Marobin R, Escott GM, Rados DV, Silveiro SP. Telephone calls and glycemic control in type 2 diabetes: A PRISMA-compliant systematic review and meta-analysis of randomized clinical trials. Journal of telemedicine and telecare. 2022:1357633X221102257.	Study types; (comparator, intervention, Secondary care)
26	Naslund JA, Mitchell LM, Joshi U, Nagda D, Lu C. Economic evaluation and costs of telepsychiatry programmes: A systematic review. J Telemed Telecare. 2022;28(5):311-30.	Interventions of Included study
27	Robson N, Hosseinzadeh H. Impact of Telehealth Care among Adults Living with Type 2 Diabetes in Primary Care: A Systematic Review and Meta-Analysis of Randomised Controlled Trials. Int J Environ Res Public Health. 2021;18(22).	AMSTAR<7
28	Şahin E, Yavuz Veizi BG, Naharci MI. Telemedicine interventions for older adults: A systematic review. Journal of telemedicine and telecare. 2021:1357633X211058340.	AMSTAR<7
29	Sánchez-Gutiérrez C, Gil-García E, Rivera-Sequeiros A, López-Millán JM. Effectiveness of telemedicine psychoeducational interventions for adults with non-oncological chronic disease: A systematic review. J Adv Nurs. 2022;78(5):1267-80.	AMSTAR<7
30	Sekhon H, Sekhon K, Launay C, Afililo M, Innocente N, Vahia I, et al. Telemedicine and the rural dementia population: A systematic review. Maturitas. 2021;143:105-14.	Study types (NO RCTs)
31	Shahouzaie N, Gholamiyan Arefi M. Telehealth in speech and language therapy during the COVID-19 pandemic: a systematic review. Disabil Rehabil Assist Technol. 2022:1-8.	AMSTAR<7
32	Stavropoulos KKM, Bolourian Y, Blacher J. A scoping review of telehealth diagnosis of autism spectrum disorder. PLoS ONE. 2022;17(2 February).	AMSTAR<7
33	Sunner C, Giles MT, Kable A, Foureur M. Does telehealth influence the decision to transfer residents of residential aged care facilities to emergency departments? A scoping review. International journal of older people nursing. 2022:e12517.	AMSTAR<7
34	Suso-Martí L, La Touche R, Herranz-Gómez A, Angulo-Díaz-Parreño S, Paris-Alemany A, Cuenca-Martínez F. Effectiveness of Telerehabilitation in Physical Therapist Practice: An Umbrella and Mapping Review With Meta-Meta-Analysis. Phys Ther. 2021;101(5).	AMSTAR<7
35	Tao KFM, Brennan-Jones CG, Jayakody DMP, Swanepoel W, Fava G, Bellekom SR, et al. Validation of teleaudiology hearing aid rehabilitation services for adults: a systematic review of outcome measurement tools. Disabil Rehabil. 2022;44(16):4161-78.	AMSTAR<7
36	Tristão LS, Tavares G, Tustumi F, Bernardo WM, Duarte ML, Peccin MS, et al. Telemedicine for Diabetes Mellitus Management in Older Adults: Systematic Review. Current diabetes reviews. 2022.	Included study types
37	Turk K, Jacobson Vann J, Oppewal S. Antibiotic prescribing patterns and guideline-concordant management of acute respiratory tract infections in virtual urgent care settings. J Am Assoc Nurse Pract. 2022;34(6):813-24.	AMSTAR<7
38	Velayati F, Ayatollahi H, Hemmat M. A Systematic Review of the Effectiveness of Telerehabilitation Interventions for Therapeutic Purposes in the Elderly. Methods of information in medicine. 2020;59(2-3):104-9.	AMSTAR<7

Key relevant randomised controlled trials excluded at full-text screening stage:

No.	Reference	Reason for exclusion
1	Armstrong AW, Chambers CJ, Maverakis E, Cheng MY, Dunnick CA, Chren MM, et al. Effectiveness of Online vs In-Person Care for Adults with Psoriasis: A Randomized Clinical Trial. JAMA Network Open. 2018;1(6).	Comparator
2	Befort CA, Vanwormer JJ, Desouza C, Ellerbeck EF, Gajewski B, Kimminau KS, et al. Effect of Behavioral Therapy with In-Clinic or Telephone Group Visits vs In-Clinic Individual Visits on Weight Loss among Patients with Obesity in Rural Clinical Practice: A Randomized Clinical Trial. JAMA - Journal of the American Medical Association. 2021;325(4):363-72.	Intervention
3	Dobkin RD, Mann SL, Weintraub D, Rodriguez KM, Miller RB, St Hill L, et al. Innovating Parkinson's Care: A Randomized Controlled Trial of Telemedicine Depression Treatment. Mov Disord. 2021;36(11):2549-58.	Intervention
4	Fappa E, Yannakoulia M, Ioannidou M, Skoumas Y, Pitsavos C, Stefanadis C. Telephone counseling intervention improves dietary habits and metabolic parameters of patients with the metabolic syndrome: A randomized controlled trial. Review of Diabetic Studies. 2012;9(1):36-45.	Secondary Care
5	Fortier CB, Currao A, Kenna A, Kim S, Beck BM, Katz D, et al. Online Telehealth Delivery of Group Mental Health Treatment Is Safe, Feasible, and Increases Enrollment and Attendance in Post-9/11 U.S. Veterans. Behav Ther. 2022;53(3):469-80.	Study design
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11	Mohr DC, Ho J, Duffecy J, Reifler D, Sokol L, Burns MN, et al. Effect of telephone-administered vs face-to-face cognitive behavioral therapy on adherence to therapy and depression outcomes among primary care patients: A randomized trial. JAMA. 2012;307(21):2278-85.	Used in original SR
12	Molavynejad S, Miladinia M, Jahangiri M. A randomized trial of comparing video telecare education vs. in-person education on dietary regimen compliance in patients with type 2 diabetes mellitus: a support for clinical telehealth Providers. BMC Endocr Disord. 2022;22(1):116.	Intervention
13	Renard M, Gaboury I, Michaud F, Tousignant M. The acceptability of two remote monitoring modalities for patients waiting for services in a physiotherapy outpatient clinic. Musculoskeletal Care. 2022;20(3):616-24.	Intervention
14	Romijn G, Batelaan N, Koning J, van Balkom A, de Leeuw A, Benning F, et al. Acceptability, effectiveness and cost-effectiveness of blended cognitive-behavioural therapy (bCBT) versus face-to-face CBT (ftfCBT) for anxiety disorders in specialised mental health care: A 15-week randomised controlled trial with 1-year follow-up. PLoS One. 2021;16(11):e0259493.	Study design
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16	So H, Chow E, Cheng IT, Lau SL, Li TK, Szeto CC, et al. Use of telemedicine for follow-up of lupus nephritis in the COVID-19 outbreak: The 6-month results of a randomized controlled trial. Lupus. 2022;31(4):488-94.	Restricted to Covid-19
17	So H, Chow E, Cheng IT, Lau SL, Li TK, Szeto CC, et al. USE of TELEMEDICINE for FOLLOW-UP of LUPUS NEPHRITIS in the COVID-19 OUTBREAK: ONE-YEAR, PRAGMATIC RANDOMISED CONTROLLED TRIAL. Annals of the Rheumatic Diseases. 2022;81:440.	Poster Abstract
18	Taguchi K, Numata N, Takanashi R, Takemura R, Yoshida T, Kutsuzawa K, et al. Clinical Effectiveness and Cost-effectiveness of Videoconference-Based Integrated Cognitive Behavioral Therapy for Chronic Pain: Randomized Controlled Trial. J Med Internet Res. 2021;23(11):e30690.	Comparator
19	Tarakci E, Tarakci D, Hajebrahimi F, Budak M. Supervised exercises versus telerehabilitation. Benefits for persons with multiple sclerosis. Acta Neurol Scand. 2021;144(3):303-11.	Secondary Care
20	Tian Y, Zhang S, Huang F, Ma L. Comparing the blood glucose control efficacy of telemedicine with that of standard prenatal care in women with gestational diabetes mellitus: a randomized controlled trial. JMIR mHealth and uHealth. 2021.	Intervention
21	Valdiviezo WV, Aldaz EM, Paredes FP, De Las Mercedes Hernández Bandera N. Self-Management Of Patients With Mild Copd In Primary Care: A Random Controlled Trial. Journal of Pharmaceutical Negative Results. 2022;13:1904-14.	Comparator
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23	Yin W, Liu Y, Hu H, Sun J, Liu Y, Wang Z. Telemedicine management of type 2 diabetes mellitus in obese and overweight young and middle-aged patients during COVID-19 outbreak: A single-center, prospective, randomized control study. PLoS One. 2022;17(9):e0275251.	Intervention/restricted to Covid-19

Appendix 7 – Quality assessment (AMSTAR) of systematic reviews

AMSTAR scores of screened systematic reviews (Only those with score of 7 or more)

Systematic reviews included in report (score of 7 or more deemed high quality)													
Reference	**Area of practice**	**AMSTAR Question**											**Overall score**
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	
Anderson 2022. Telehealth Interventions to Improve Diabetes Management Among Black and Hispanic Patients: a Systematic Review and Meta-Analysis.	Diabetes	1	1	0	1	0	1	1	1	1	1	0	**8**
Bakhit 2021. Antibiotic prescribing for acute infections in synchronous telehealth consultations: a systematic review and meta-analysis	Antibiotic prescribing	1	1	1	1	1	1	1	1	1	1	0	**10**
Boggan, 2020. Effectiveness of Acute Care Remote Triage Systems: a Systematic Review.	GP & Nurse triage	1	0	1	1	0	1	1	1	1	1	0	**8**
Bonnevie 2021.Advanced telehealth technology improves home-based exercise therapy for people with stable chronic obstructive pulmonary disease: a systematic review.	COPD	1	1	1	1	0	1	1	0	1	1	0	**8**
Corso 2022. Are Nonpharmacologic Interventions Delivered Through Synchronous Telehealth as Effective and Safe as In-Person Interventions for the Management of Patients With Nonacute Musculoskeletal Conditions? A Systematic Rapid Review.	Musculoskeletal	1	1	0	1	0	1	1	1	1	0	0	**7**
Goodarzi 2022. Efficacy of virtual interventions for reducing symptoms of depression in community-dwelling older adults: a systematic review. International psychogeriatrics.	Depression	1	1	1	1	0	1	1	1	1	0	0	**8**
Greenwood 2022. Telehealth versus face-to-face psychotherapy for less common mental health conditions: systematic review and meta-	Mental misc	1	1	1	1	1	1	1	1	1	1	0	**10**

analysis of randomized controlled trials													
Han 2021. Effectiveness of telemedicine for cardiovascular disease management: systematic review and meta-analysis.	CVD management	1	0	0	1	0	1	1	1	1	1	0	**7**
Huang 2022. Do patients with and survivors of COVID-19 benefit from telerehabilitation? A meta-analysis of randomized controlled trials.	COVID-19	1	1	0	1	0	1	1	1	1	1	0	**8**
Huang 2019. The effectiveness of telemedicine on body mass index: A systematic review and meta-analysis. .	Weight management	1	1	1	1	0	1	1	1	1	1	0	**9**
Ibeggazene 2021. Remote interventions to improve exercise behaviour in sedentary people living with and beyond cancer: a systematic review and meta-analysis.	Exercise in Cancer	1	1	0	1	0	1	1	1	1	0	0	**7**
Kew, 2016. Remote versus face-to-face check-ups for asthma.	Asthma	1	1	1	1	1	1	1	1	1	1	1	**11**
Krzyzaniak 2021. The effectiveness of telehealth versus face-to face interventions for anxiety disorders: A systematic review and meta-analysis.	Anxiety	1	1	1	1	1	1	1	1	1	1	0	**10**
Krzyzaniak 2023. Telerehabilitation versus face-to-face rehabilitation in the management of musculoskeletal conditions: a systematic review and meta-analysis.	Musculoskeletal	1	1	1	1	1	1	1	1	1	1	0	**10**
Lee, 2018. Do telehealth interventions improve oral anticoagulation management? A systematic review and meta-analysis.	Anticoagulants	1	1	0	1	0	1	1	1	1	0	0	**7**

Matsumoto 2021. Effectiveness of Videoconference-Delivered Cognitive Behavioral Therapy for Adults With Psychiatric Disorders: Systematic and Meta-Analytic Review.	Mental misc.	1	1	1	0	0	1	1	1	1	1	0	**8**
McCleery 2021. Diagnostic test accuracy of telehealth assessment for dementia and mild cognitive impairment.	Diagnostic test accuracy	1	1	1	1	1	1	1	1	1	1	0	**10**
McLean 2021. Exploring the Efficacy of Telehealth for Family Therapy Through Systematic, Meta-analytic, and Qualitative Evidence.	Mental misc	1	1	1	1	0	1	1	1	1	1	0	**9**
Moreira 2022. Telephone calls and glycemic control in type 2 diabetes: A PRISMA-compliant systematic review and meta-analysis of randomized clinical trials. Journal of telemedicine and telecare.	Diabetes	1	1	0	1	0	1	1	0	1	1	0	**7**
Naslund 2022. Economic evaluation and costs of telepsychiatry programmes: A systematic review.	Economics	1	1	1	1	0	1	0	1	1	0	0	**7**
Scott 2022. Telehealth v. face-to-face provision of care to patients with depression: a systematic review and meta-analysis.	Depression	1	1	1	1	1	1	1	1	1	1	0	**10**
Scott 2022. Real-time telehealth versus face-to-face management for patients with PTSD in primary care: a systematic review and meta-analysis.	PTSD	1	1	1	1	1	1	1	1	1	1	0	**10**
Scott 2022. Telehealth versus face-to-face delivery of cognitive behavioural therapy for insomnia (CBT-I): a systematic review and meta-analysis of	Insomnia	1	1	1	1	1	1	1	1	1	1	0	**10**

randomised controlled trials. (unpublished)													
Seron 2021. Effectiveness of Telerehabilitation in Physical Therapy: A Rapid Overview.	Tele rehab in physical therapy	1	1	1	1	0	1	1	1	0	0	0	**7**
Suarilah 2022. Effectiveness of telehealth interventions among traumatic brain injury survivors: A systematic review and meta-analysis.	Traumatic brain injury survivors	1	1	0	1	0	1	1	1	1	1	0	**8**
Tristão 2022. Telemedicine for Diabetes Mellitus Management in Older Adults: Systematic Review.	Diabetes	1	1	0	1	0	1	1	1	1	0	0	**7**

Appendix 8 – Funding and Conflict of Interest Disclosures

The present review was commissioned by the Department of Health and Aged Care, Canberra, Australia. The present review is an update and extension to a previously commissioned review by the then-Department of Health, in 2020-21. Five authors of the present review (AMS, MB, HG, JC, PG) were also involved in the conduct of the previous review. The Department was involved in establishing the parameters of the study question (PICO). The Department was not involved in the conduct, analysis, or interpretation of the evidence syntheses' findings. The authors report no other actual or potential conflicts of interest.

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[N.B. References for the individual evidence syntheses/summaries are provided at the end of each]

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