Established in 1871

Swiss Medical Weekly

Formerly: Schweizerische Medizinische Wochenschrift

An open access, online journal • www.smw.ch

Review article: Biomedical intelligence | Published 09 March 2022 | doi:10.4414/SMW.2022.w30148
Cite this as: Swiss Med Wkly. 2022;152:w30148

Feasibility, acceptability and needs in telemedicine for palliative care

A pre-implementation phase scoping review

Andreas S. Ebneter[a], Thomas C. Sauter[b], Andri Christen[a], Steffen Eychmueller[a]

[a] University Centre for Palliative Care, Inselspital University Hospital Bern, Switzerland
[b] Department of Emergency Medicine, Inselspital University Hospital Bern, Switzerland

Correspondence:
Andreas Samuel Ebneter, MD
Inselspital / Universitätsspital Bern
CH-3010 Bern
andreas-samuel.ebneter[at]insel.ch

Summary

BACKGROUND: Telemedicine in palliative care was initially developed in countries where geography or resources limit access to care services. Recently, largely owing to the COVID-19 pandemic, this technology is being increasingly used in highly urbanised countries such as Switzerland. However, there is still scepticism regarding whether these tools can be used effectively in palliative care, a relationship-based speciality that is generally highly dependent on compassion, communication and direct human interaction. The objective of this review was to analyse the needs, elements of feasibility, and reasons for acceptance or possible barriers before the implementation of a telemedicine intervention in Switzerland.

METHODS: The method used was a scoping review, following the PRISMA-ScR reporting guidelines. We searched the PubMed, Ovid SP, Medline, Cochrane and Scopus databases for relevant reports. Charting and analyses of the data were done by a single researcher. A total of 520 records were screened and assessed for eligibility. Finally, 27 studies and 4 registry entries were included. Main reasons for exclusion were wrong population and intervention.

RESULTS: The prevailing study type was the single-arm intervention study. Most studies originated from countries with geographic barriers to access. Feasibility was good in 69% of all studies. Good acceptability (84.1–100%) was confirmed in the majority of the studies. The needs of the patients or the healthcare professionals were directly addressed in only five (16%) studies. Three needs were consistently reported: communication, coordination and technical reliability

CONCLUSION: Despite a broad range of studies on telemedicine in palliative care, patients' needs are rarely addressed. Therefore, especially in countries such as Switzerland, a needs assessment is recommended before the implementation of a new telemedicine intervention, to guarantee high feasibility and acceptability.

Introduction

Telemedicine is a growing field. According to the definition of the World Health Organization (WHO), telemedicine encompasses virtual communication and remote monitoring tools in the large field of digital health intervention [1]. Historically, virtual communication was only rarely used by healthcare professionals [2]. Today, this communication modality is widely accepted by patients and caregivers, and is gaining acceptance from professionals [3]. The two main drivers of this development have been first, general technological advances in digitalisation [4] and second, the acceleration in use due to the COVID-19 pandemic [5, 6].

In general medicine, these interventions are commonly used in medical specialities such as psychiatry, dermatology, neurology, radiology and rehabilitation [7]. There are some proven benefits of telemedicine in general practice, but these cannot be generalised well due to the heterogeneity of the tools and populations [8].

In palliative care, recent reviews of the subject show good feasibility and some evidence of the effectiveness of telemedicine [3, 9, 10]. The review of Gordon et al. showed that a clear majority of patients were satisfied with these tools and view them as potentially equal to fact-to-face contact [10]. The meta-review of Finuance mainly explored aspects of the effectiveness of a variety of telemedicine technologies, ranging from social media to video-conferencing. The main focus of the studies was video-conferencing, and the positive effects described related primarily to psychological symptoms, communication, information sharing and use of resources [3].

Most of the studies focused on feasibility and acceptability and did not evaluate the formal needs of patients and healthcare providers before design of the intervention, probably because there was an immediate necessity for the implementation of the tools (i.e., distance/COVID).

If there is no existing telemedicine policy or overall concept, many digital tools are used for the convenience of patients or providers, but the actual needs of patients/caregivers remain unknown.

Countries with easy access to health care, such as Switzerland, have been less pressured by necessity to use telemedicine. This situation allows to carefully prepare and tailor digital health interventions from the outset, beginning with an assessment of the feasibility and of the patients/caregivers and health care provider's needs.

The development of a complex intervention such as telemedicine should be based on a thorough understanding and the experience of existing practice models. The results of this review can be the basis for planning and tailoring a specific telemedicine intervention for palliative care patients, caregivers and professionals. According to the MORE Care Guidelines [11], we regard this review as the preliminary step in the evaluation for such an intervention in a practice environment where it has not yet been implemented.

Therefore, the objective of this review was to evaluate the existing literature on the feasibility and acceptability of a telemedicine intervention in palliative care with a focus on the needs of patients/caregivers and healthcare professionals in both in- or outpatient palliative care by addressing the following question:

What are the known needs, elements of feasibility,and reasons for acceptance of a telehealth intervention in palliative care?

Methods

This review follows the recommendation of Munn et al. [12], the PRISMA 2020 Statement [13] and PRISMA-ScR [14] guideline/checklist (appendix 1) and was registered as a project on the OSF registry (10.17605/OSF.IO/KJ346).

Eligibility criteria

All reports that involved adult (>18 years) palliative care patients, caregivers and healthcare professionals in an in- or outpatient palliative care service were included. Supportive care and general medicine patients without the designation of palliative were not included. No language or study design restrictions were applied. Telemedicine interventions of interest were virtual visits, virtual peer-to-peer communication and remote monitoring (2.4.1–2.4.4 of the WHO telemedicine classification) [1]. All other interventions, especially telephone-based or asynchronous digital communication modalities, were not eligible. To be included, the reports/studies had to present a measurement of "feasibility", "acceptability" or "needs" as an outcome**.** Studies with only indirect markers, for example, simple satisfaction surveys or using consistent adherence as a surrogate marker for feasibility and acceptability, were excluded.

Databases and search strategy

The PubMed, Ovid SP, Medline, Cochrane and Scopus databases where searched on 29 April 2021 for reports matching the terms of the inclusion criteria. Prospero, Clinicaltrials.gov, and OFS were searched for studies/reviews on telemedicine in palliative care. The PubMed database was searched with the following main search terms using the advanced search function: ((Telemedicine) OR (Telehealth) OR (Digital health interventions)) AND (Palliative Care)) AND ((Feasibility) OR (Acceptability) OR (needs)). Dates were restricted to 2010 or later. The Ovid SPN and Scopus databases were searched with the same search strategy. Registries were searched more broadly, with the terms "Telemedicine and Palliative Care." The Cochrane library was searched with the use of the terms "Digital" and "Telemedicine."

Details of the search strategy can be found in appendix 2.

Study selection

Studies were selected in two steps by a single researcher (AE). A second researcher (SE) resolved uncertainties through discussions with the first when necessary. The titles and abstracts of all reports from the literature search were screened for eligibility using the following inclusion criteria: (1) population (adult in/outpatient palliative care patient/caregivers and professionals) and (2) intervention (telemedicine as defined by the WHO).

This was followed by a full-text analysis of the eligible reports. All inclusion criteria were sequentially applied in this second step : first, by assuring the full text still matched the right population and intervention; second, by assessing them for one of the predefined outcomes ("feasibility", "acceptability", "needs").

Data extraction

Charting was done by a single researcher (AE), using the spreadsheet function of Excel, according to PRISMA [15]. A second researcher (AC) double-checked the methodological characteristics of the charted studies. We collected data on each report (author, year, study design), such as the population (origin, age, setting and sample size), the intervention (technology, main purpose, follow-up time), and, finally, the outcomes and key findings (feasibility, acceptability and needs). For records from registries, we collected information about the author, project start, expected finishing year, study design, population (origin, type and sample size), the intervention (technology), and outcomes (feasibility, acceptability and needs). No protocol deviation was noted.

Results

We found 643 records and 61 registry entries. After removal of duplicates, a total of 520 records (459 reports, 61 registry entries) were screened for eligibility. Of these, 411 (388 report, 44 registry entries; 79%) were excluded, mainly because they did not correspond to the required population or were not related to telemedicine. After excluding one conference paper, 67 further records were excluded (54 studies, 13 registry entries) mainly because they did not match the predefined intervention or outcome (feasibility, acceptability and needs) criteria. Of the 98 (19% of initial yield) remaining full-text reviewed records, 27 reports and 4 registry entries were selected for the analysis. Details are described in a PRISMA 2020 flow diagram [16] (fig. 1)

In the 27 reports, the 3 most common designs were single-arm intervention studies (9; 33%) [17–25], reviews (6; 22.2%) [3, 26–30], and qualitative studies (4; 14.8%) [31–34]. The remainder were cohort, cross-sectional studies or reports / expert opinions [35–41], with only one randomised controlled study [42]. The quality of the original studies was categorised according to the PDQ® level of evidence, a four-level grading scale developed by the National Cancer Institute specifically for studies in the field of supportive and palliative care [43]. There was only one level I original study [20], whereas 15 were level II, 5 were level III and the rest were level IV. Only four registry entries of ongoing studies were included, three reviews [44–46] and one pilot study [47]. All four should be completed by 2022.

A summary of the characteristics of the selected studies was created as a simplified table containing the following items: author, year, study design, population, intervention, and outcome (as a dichotomised value: present / not present) (tables 1 and 2). A comprehensive overview of the different users, independence of use and main elements of the three outcomes (feasibility, acceptability, and needs) can be found in appendix 3.

Virtual visits, defined as digital video consultations between patient and healthcare provider were the most frequently used (70.4%) form of telemedicine [17, 19–21, 23, 25–28, 30, 31, 33–39, 42]. The outpatient setting was mostly studied, with only two interventional trials [19, 20] focusing on the inpatient setting. Geographically, most studies were conducted in countries with large geographic

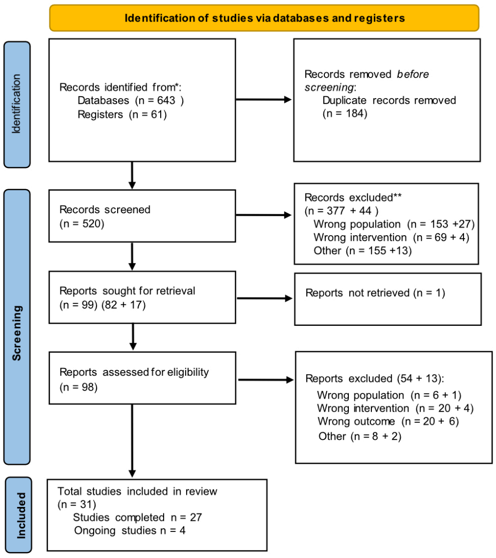
Table 1:
Characteristics of the sources of evidence in the included studies/reports (summary).

Author(s)/year	Study design	Population	Setting	Intervention	Feasibility	Acceptability	Needs
Finucane et al. (2021)	Systematic review	Mixed	Mixed	Mixed	√	√	
Jess et al. (2019)	Systematic review	Adult	Mixed	Video consultation	√	√	
Zheng et al. (2016)	Systematic review	Mixed	Mixed	Video consultation	√	√	
Hoek et al. (2017)	Randomised controlled trial	Adult, oncology	Outpatient	Video consultation		√	
Chávarri-Guerra et al. (2021)	Cohort study	Adult, oncology	Outpatient	Video consultation / telephone	√		
Jiang et al. (2020)	Cohort study	Adult, oncology	Outpatient, rural	Video consultation	√	√	
Nkhoma et al. (2021)	Cross sectional survey	Adult	Public facilities	Telemedicine in general		(√)	√
Phongtankuel et al. (2018)	Cross sectional survey	Adult	Outpatient	Mobile app	√	√	√
Cheung et al. (2021)	Non-randomised trial	Adult, non-oncological	Outpatient (dayclinic), rural	Video consultation	√	√	
Bentley et al. (2020)	Single-arm intervention study	Adult	Outpatient	Video consultation	√	√	
Bonsignore et al. (2018)	Single-arm intervention study	Adult	Outpatientrural	Video consultation; remote monitoring	(√)	(√)	
Elk et al. (2020)	Single-arm intervention study	Adult	Inpatient	Video consultation	(√)	√	√
Kuntz et al. (2020)	Single-arm intervention study	Adult	Inpatient	Video consultation	√	√	
Moore et al. (2020)	Single-arm intervention study	Adult	Mixed	Video consultation	√	√	
Schoppee et al. (2020)	Single-arm intervention study	Adult	Outpatient	Data-transmision	√	√	
Slavin-Stewart et al. (2020)	Single-arm intervention study	Adult, oncology	Outpatient	Video consultation	√	√	
Tieman et al.(2016)	single-arm intervention study	adult, oncology	outpatient	Telemedicine in general	(√)	√	
Weck et al. (2019)	Single-arm intervention study	Adult, non-oncological	Outpatient	Video consultation	√	√	
Funderskov et al. (2019)	Qualitative study	Adult	Outpatient	Video consultation	√	√	
Portz et al. (2020)	Qualitative study	Adult	Mixed	Telemedicine in general			√
Read Paul et al. (2019)	Qualitative study	Adult, oncology	Outpatient	Video consultation	√	√	
Tasneem et al. (2019)	Qualitative study	Adult, oncological	Outpatient, urban	Video consultation	√	√	(√)
Steindal et al. (2020)	Review-other	Adult	Outpatient	Video consultation	√	√	
Sutherland et al. (2020)	Review-other	Mixed	Mixed	Video consultation	√		
Widberg et al. (2020)	Review-other	Adult	Mixed	Telemedicine in general	√	√	
Calton et al. (2019)	Other	Adult	n/a	Video consultation	(√)	(√)	(√)
Hawkins et al. (2020)	Other	Adult	n/a	Video consultation			(√)

Table 2:
Characteristics of the sources of evidence in the included ongoing studies (summary).

Author(s)/start–end	Study design	Population	Setting	Intervention	Feasibility	Acceptability	Needs
Steindal et al. (2020–2021)	Systematic review	Adult	Outpatient	Mixed		√	
Longo et al. (2020–2021)	Systematic review	Adult	Outpatient	Mixed	√	√	
Hutchinson et al. (2020–2021)	Systematic review	All ages	?	Mixed	√	√	
University of California(2021–2021)	Pilot study	Adult	Outpatient	Video consultation	√	√	

Figure 1: PRISMA flow diagram, adapted from http://www.prisma-statement.org.



distances (appendix 4). The clients were primarily patients and/or caregivers (70%) [17–25, 27–30, 33, 34, 36, 37, 39, 41, 42]. The most common providers were physicians alone (33%) [17–20, 27, 33, 34, 37, 39] and the core palliative care team (physician and nurse) (40%) [21, 23–25, 28–31, 36, 38, 42]. Four reports (15%) [3, 26, 35, 40] described multiple/mixed providers, and only one study (4%) [22] involved nursing providers exclusively.

Independence of use, meaning that the tools were used independently by the patient or caregiver, was reported in eight studies [17, 18, 22, 24, 36, 40–42].

Feasibility

Feasibility was a specific outcome in 23 (85%) of the 27 studies included [3, 17–31, 33–37, 39, 41] and was mainly (82%) assessed with purpose-designed questionnaires or questions. Most studies define “feasibility” as the technical efficacy of the digital connection and the telemedicine intervention. Only one study [21] used a validated tool, the Telehealth Usability Questionnaire [48]. Technical feasibility rated by the patient and healthcare professional was found to be good in 74% of the assessed interventions [3, 17, 18, 20, 21, 23–31, 33–37, 39]; most patients described a good user experience. The reliability of the connection, security and usability were the main elements of concern for the patient and healthcare professional [33, 41]. As an example, the study by Read et al. [33], which analysed client to provider telemedicine in a rural setting, proved that effective communication was possible with only a few technical issues.

Acceptability

Acceptability was described as a specific outcome in 24 (89%) of the 27 studies analysed [3, 17–31, 33–35, 37, 39–42]. The assessment tools were more heterogeneous than those used for feasibility; four were validated questionnaires [19, 21, 22, 42], and the rest were interviews [18, 25, 32–34, 40] and purpose-built questionnaires. The definition of acceptability was more variable, mostly referring to three themes: general satisfaction, positive acceptance as a communication tool and not inferior to physical visits.

General satisfaction ranged from 84.1–100% in the original studies that specifically analysed this item [21, 29, 39], and this was confirmed by two reviews [29, 30].

Generally, patients, caregivers, and healthcare professionals alike accepted these tools as a valid way of communication [27]. The acceptance of it as a communication tool is confirmed on different levels; patients experienced a feeling of connectedness [37]. The addition of a visual component enhanced the experience of the patient [25] and the discussion of concerns is possible [33]. In the context of a family meeting, understanding was good and the virtual visit helped to increase trust in the treatment in a positive way; interestingly, the sharing of wishes and hopes was only possible for 50% of the participants [20].

There is substantial evidence that virtual visits can be seen as equal to physical visits in an appropriate setting [24, 29, 35, 37, 39]. Three sources even mentioned that some patients preferred (42–77%) telemedicine over physical visits in a variety of different settings [24, 37, 39].

Needs

Only seven studies (26%) with different methodologies (two cross-sectional surveys, one single-arm intervention study, two qualitative studies and two expert opinions) assessed the needs of patients, caregivers and healthcare professionals regarding telemedicine tools [19, 32, 34, 35, 38, 40, 41]. Even fewer (four, 15%) assessed the needs in the context of a digital health intervention directly [19, 32, 40, 41], and all of these used qualitative methods. The definition of “needs” is broad and heterogeneous, and generally refers to the preference of the client. Direct evidence of need was any qualitative statement from a stakeholder (patient, caregiver or healthcare professional) that expressed a wish or a need for a specific function in the tool; indirect evidence was statements regarding preferences for or essential elements of a telemedicine tool. Most stakeholders were able to identify at least one or several potential or actual needs for digital tools in palliative care. In addition, being able to access a service at home without the need for travel seemed to be included in the indirectly mentioned needs [34].

Independent of the role of the stakeholder (patient, caregiver, healthcare professional or policy-maker), the three most commonly mentioned needs were: improvement of communication, coordination of care and technical usability.

First, under improvement of communication, visual contact, increased accessibility (including after-hours) and better follow-up seemed to be the most important needs in this theme [32, 40, 41].

Second, under coordination of care, several studies described needs related to coordination, for example, scheduling, central triage, collaboration between different health services and resources planning [32, 40, 41]. This need is equally important to the patient and the family caregiver, and focuses on improving care at home. For the healthcare professional and policy maker, an additional focus is to improve the performance of the service by analysing trends and resource needs and being able to access recent data [40].

Third, under technical usability, one need that was stated either directly or indirectly is the technical reliability and security of the tools. These tools should provide a stable connection, be simple to use and ensure privacy. It should be accessible to a broad population and there should be support from digital natives in the use of it. Finally, and importantly, the tools should be affordable [19, 40].

In addition, another indirectly mentioned need is the availability of a service at home without the need for travel [34].

A critical view from one study was that participants who stated few needs regarding digital communication tools (continuity of care, visual identification of the person as a healthcare professional and presence of family) focused more on potential discomfort with digital tools and cultural incomprehension [19].

Discussion

In essence this review showed that telemedicine seems to be a feasible digital health intervention in palliative care and that patients, caregivers and health professionals are accepting it. The question of which needs should be considered could be answered only partially because few studies addressed the key needs of telemedicine in this population.

Feasibility and acceptability

In line with the most recent meta-reviews [3], this review confirmed the feasibility of telemedicine as a communication tool in palliative care. In addition to ease of use and stability of the internet connection, adequate training of healthcare professionals is important. The question of whether these tools can be reliably used without the help of a third party remains. The patient or caregiver was aided by the healthcare person with the set-up of the tool in more than half of the home deployments.

There seemed to be a high rate of acceptability. Especially related to communication, the patients were confident that these interventions do not significantly affect their experience of quality of communication compared with a face-to-face consultation [35]. A greater proportion of patients even perceived the virtual visit to be comparable to physical visits, referring to the visual connection [27, 29]. Therefore, we suggest that the visual component of the communication is of great importance, and one can argue that the advantages will outweigh the inconvenience (lack of physical connection) or the fear of information breaches. There was a difference between the acceptability among the patients/caregiver (clients) and the healthcare professionals), with the latter being somewhat more critical of the new tools [37].

Acceptability seemed to be influenced by barriers and facilitators for both the patients/caregivers and the healthcare professionals. The recent systematic review by Disalvo et al. [49] provided an overview of these. Their findings confirmed the results of this review through emphasising the importance of an efficient infrastructure (system level), positive attitude and adequate training (clinician level and patient level). The main differences compared with our study were (a) the large array of technologies, including e-mail, telephone and SMS text messaging, (b) the inclusion of all ages, (c) the focus on barriers and facilitators and not, like our study, on needs.

Needs

A direct needs assessment did not seem to be a priority in the studies that evaluate telemedicine in palliative care. This is remarkable, especially since it is generally acknowledged that a needs assessment is necessary before the implementation of any digital health intervention [50, 51]. The reason for this might be linked to the fact that most of these tools were born out of necessity (distance, pandemic) and that the barrier to access was considered a generally accepted need that overrules other individual needs of patients, caregivers, and healthcare professionals. Nonetheless, the studies that addressed needs directly or indirectly as an outcome show three important factors, namely communication, coordination and technical aspects (usability).

Almost all digital health interventions have a dominant communication element and good communication is the major element in palliative care [3, 40]. This review showed that most needs seem to relate to the quality of the interaction (visual, follow-up possibility) and the accessibility.

Coordination is a major challenge in palliative care as many members of the interdisciplinary team interact with the so-called “unit of care”, the patient and the caregiver. Therefore, it is not surprising that multiple needs were described, ranging from simple scheduling to coordination of care at home. Both patients/caregivers and healthcare professionals attached equal importance to coordination [40].

Technical reliability is important for the “perceived ease of use” and “behavioural intention to use” aspect of the acceptance of the technology (TAM-Model) [52]. Low quality connections and unreliable digital tools are a source of frustration; therefore, addressing these issues is important. As mentioned before, in the majority of cases, a third person assisted with the set-up of the tool, which strongly indicates that patients do not use the tool autonomously, or at least not during the first virtual visit.

Being able to access a service from home was a factor towards acceptability [49], but it was rarely evaluated as a need. If asked, patients agreed that there is a need for digital health interventions to facilitate their lives at home [34], for example, by having follow-up visits without the necessity to travel [40]. This corresponds to the general preference for home care in palliative care, even in end-of-life situations [53].

Notably, only a few studies reflected a critical view of the tools [19]. Our hypothesis is that, as most of the studies focused on quality control, there might be a selection bias in the population because of the inclusion of participants less critical of technology, and a possible publication bias. Another reason could be that the convenience (ease of access, less travel) largely outweighed any negative points, thereby reducing any criticism.

Impact on the planning of the implementation of such a tool

Implementing telemedicine in a medical system that has good availability of care and openness to digitalisation is only low to moderate [54] is a challenge. This holds true for the healthcare system in Switzerland, where digital tools were viewed critically by healthcare professionals and patients alike before the pandemic [55–57]. In contrast to other countries, this critical view seems to have been only slowly changing since the onset of the COVID-19 pandemic [54].

Feasibility seems largely proven, and the components to ensure acceptability are known and likely to be universal [49]. Therefore, we propose that the potential of telemedicine to improve palliative care in Switzerland should be evaluated, in regard to the need, feasibility and acceptability of such a service. Should there be a clear need for it, a secure and easy-to-use telemedicine intervention in palliative care should be evaluated for its efficacy.

Limitations

This review has several limitations. First, the scientific evidence was mainly based on low to moderate quality studies. Most studies were single-arm quality-control/implementation studies, and comparison groups were lacking; therefore, their results should be viewed with caution. The reason is probably that most studies evaluated existing tools, which were born out of necessity (distance or epidemic (COVID-19)) and, thus, they should be interpreted in that specific context.

This leads us to the second limitation, namely, generalisability. As most studies were conducted in countries with significant distances or low-density medical environments, it is difficult to generalise to settings with a highly developed medical service density, such as central Europe.

Third, the method used in this review could cause a selection and detection bias because only a single author selected and charted the information. Additionally, the search strategy was not as large as in other reviews. The results of other reviews addressing the most commonly assessed outcomes (feasibility and acceptability only) are similar to our review, therefore we believe that the relevant literature was identified by our work.

Conclusion

The growing field of telemedicine has arrived in a relationship-based speciality such as palliative care. The necessity created by long distances and restricted access due to the pandemic are two of the major drivers of this development. Telemedicine is feasible and accepted as a means of communication in such settings, but a direct need assessment before a new deployment of such a tool was only rarely done.

Many countries with dense, highly accessible medical systems, similar to the situation in Switzerland, have begun to adopt these tools. They do not have the same elements of necessity, such as in large countries. Therefore, a comprehensive, adaptive needs assessment should be done, involving both the users and providers in these countries, before or during the implementation of a new tool, especially in palliative care.

Financial disclosure

The review was founded by the University centre of palliative care.

Conflicts of interest

All authors have completed and submitted the International Committee of Medical Journal Editors form for disclosure of potential conflicts of interest. TCS holds the endowed professorship for emergency telemedicine at the University of Bern founded by the Touring Club Switzerland. The sponsor had no influence on the content of the research or the decision to publish. No other potential conflict of interest was disclosed.

References

1. WHO. WHO | Classification of digital health interventions v1.0. Available from: http://www.who.int/reproductivehealth/publications/mhealth/classification-digital-health-interventions/en/
2. Coyle N, Khojainova N, Francavilla JM, Gonzales GR. Audio-visual communication and its use in palliative care. J Pain Symptom Manage. 2002 Feb;23(2):171–5. http://dx.doi.org/10.1016/s0885-3924(01)00402-x. http://dx.doi.org/10.1016/S0885-3924(01)00402-X. PubMed. 0885-3924
3. Finucane AM, O'Donnell H, Lugton J, Gibson-Watt T, Swenson C, Pagliari C. Digital health interventions in palliative care: a systematic meta-review. NPJ Digit Med. 2021;4(1):64. Epub 2021/04/08. doi: http://dx.doi.org/10.1038/s41746-021-00430-7. . PubMed PMID: 33824407; PubMed Central PMCID: PMCPMC8024379.
4. Hurst EJ. Evolutions in Telemedicine: From Smoke Signals to Mobile Health Solutions. J Hosp Librariansh. 2016;16(2):174–85. http://dx.doi.org/10.1080/15323269.2016.1150750. 1532-3269
5. Ritchey KC, Foy A, McArdel E, Gruenewald DA. Reinventing Palliative Care Delivery in the Era of COVID-19: How Telemedicine Can Support End of Life Care. Am J Hosp Palliat Care. 2020;37(11):992-7. Epub 2020/08/09. doi: http://dx.doi.org/10.1177/1049909120948235. . PubMed PMID: 32762477; PubMed Central PMCID: PMCPMC7488822.
6. Schwamm LH, Erskine A, Licurse A. A digital embrace to blunt the curve of COVID19 pandemic. NPJ Digit Med. 2020;3:64. Epub 2020/05/08. doi: http://dx.doi.org/10.1038/s41746-020-0279-6. . PubMed PMID: 32377575; PubMed Central PMCID: PMCPMC7198549.
7. Shigekawa E, Fix M, Corbett G, Roby DH, Coffman J. The Current State Of Telehealth Evidence: A Rapid Review. Health Aff (Millwood). 2018 Dec;37(12):1975–82. http://dx.doi.org/10.1377/hlthaff.2018.05132. PubMed. 1544-5208
8. Bashshur RL, Howell JD, Krupinski EA, Harms KM, Bashshur N, Doarn CR. The Empirical Foundations of Telemedicine Interventions in Primary Care. Telemed J E Health. 2016;22(5):342-75. Epub 2016/04/30. doi: http://dx.doi.org/10.1089/tmj.2016.0045. . PubMed PMID: 27128779; PubMed Central PMCID: PMCPMC4860623.
9. Allen Watts K, Malone E, Dionne-Odom JN, McCammon S, Currie E, Hicks J, et al. Can you hear me now?: Improving palliative care access through telehealth. Res Nurs Health. 2021;44(1):226-37. Epub 2021/01/05. doi: http://dx.doi.org/10.1002/nur.22105. . PubMed PMID: 33393704; PubMed Central PMCID: PMCPMC7958991.
10. Gordon B, Mason B, Smith SL. Leveraging Telehealth for Delivery of Palliative Care to Remote Communities: A Rapid Review. J Palliat Care. 2021 Mar;8258597211001184:8258597211001184. http://dx.doi.org/10.1177/08258597211001184. PubMed. 2369-5293
11. Higginson IJ, Evans CJ, Grande G, Preston N, Morgan M, McCrone P, et al. Evaluating complex interventions in end of life care: the MORE-Care statement on good practice generated by a synthesis of transparent expert consultations and systematic reviews. BMC Med. 2013;11(1):111. Epub 2013/04/27. doi: http://dx.doi.org/10.1186/1741-7015-11-111. . PubMed PMID: 23618406; PubMed Central PMCID: PMCPMC3635872.
12. Munn Z, Peters MDJ, Stern C, Tufanaru C, McArthur A, Aromataris E. Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. BMC Med Res Methodol. 2018;18(1):143. Epub 2018/11/21. doi: http://dx.doi.org/10.1186/s12874-018-0611-x. . PubMed PMID: 30453902; PubMed Central PMCID: PMCPMC6245623.
13. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ. 2021;372:n71. Epub 2021/03/31.

doi: http://dx.doi.org/10.1136/bmj.n71. . PubMed PMID: 33782057; PubMed Central PMCID: PMCPMC8005924.

14. Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): checklist and Explanation. Ann Intern Med. 2018 Oct;169(7):467–73. http://dx.doi.org/10.7326/M18-0850. PubMed. 1539-3704
15. Page MJ, Moher D, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. PRISMA 2020 explanation and elaboration: updated guidance and exemplars for reporting systematic reviews. BMJ. 2021 Mar;372(160):n160. http://dx.doi.org/10.1136/bmj.n160. PubMed. 1756-1833
16. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ. 2021 Mar;372(71):n71. http://dx.doi.org/10.1136/bmj.n71. PubMed. 1756-1833
17. Bentley B, O'Connor M, Williams A, Breen LJ. Dignity therapy online: Piloting an online psychosocial intervention for people with terminal illness. Digit Health. 2020;6:2055207620958527. Epub 2020/10/06. doi: http://dx.doi.org/10.1177/2055207620958527. . PubMed PMID: 33014409; PubMed Central PMCID: PMCPMC7509717.
18. Bonsignore L, Bloom N, Steinhauser K, Nichols R, Allen T, Twaddle M, et al. Evaluating the Feasibility and Acceptability of a Telehealth Program in a Rural Palliative Care Population: TapCloud for Palliative Care. J Pain Symptom Manage. 2018 Jul;56(1):7–14. http://dx.doi.org/10.1016/j.jpainsymman.2018.03.013. PubMed. 1873-6513
19. Elk R, Emanuel L, Hauser J, Bakitas M, Levkoff S. Developing and Testing the Feasibility of a Culturally Based Tele-Palliative Care Consult Based on the Cultural Values and Preferences of Southern, Rural African American and White Community Members: A Program by and for the Community. Health Equity. 2020;4(1):52-83. Epub 2020/04/08. doi: http://dx.doi.org/10.1089/heq.2019.0120. . PubMed PMID: 32258958; PubMed Central PMCID: PMCPMC7104898.
20. Kuntz JG, Kavalieratos D, Esper GJ, Ogbu N, Jr., Mitchell J, Ellis CM, et al. Feasibility and Acceptability of Inpatient Palliative Care E-Family Meetings During COVID-19 Pandemic. J Pain Symptom Manage. 2020;60(3):e28-e32. Epub 2020/06/09. doi: http://dx.doi.org/10.1016/j.jpainsymman.2020.06.001. . PubMed PMID: 32505643; PubMed Central PMCID: PMCPMC7272163.
21. Moore SL, Portz JD, Santodomingo M, Elsbernd K, McHale M, Massone J. Using Telehealth for Hospice Reauthorization Visits: Results of a Quality Improvement Analysis. J Pain Symptom Manage. 2020;60(3):e22-e7. Epub 2020/06/12. doi: http://dx.doi.org/10.1016/j.jpainsymman.2020.06.002. . PubMed PMID: 32525082; PubMed Central PMCID: PMCPMC7276118.
22. Schoppee TM, Dyal BW, Scarton L, Ezenwa MO, Singh P, Yao Y, et al. Patients and Caregivers Rate the PAINReportIt Wireless Internet-Enabled Tablet as a Method for Reporting Pain During End-of-Life Cancer Care. Cancer Nurs. 2020;43(5):419-24. Epub 2019/09/14. doi: http://dx.doi.org/10.1097/NCC.0000000000000743. . PubMed PMID: 31517649; PubMed Central PMCID: PMCPMC7098847.
23. Slavin-Stewart C, Phillips A, Horton R. A Feasibility Study of Home-Based Palliative Care Telemedicine in Rural Nova Scotia. J Palliat Med. 2020 Apr;23(4):548–51. http://dx.doi.org/10.1089/jpm.2019.0173. PubMed. 1557-7740
24. Tieman JJ, Swetenham K, Morgan DD, To TH, Currow DC. Using telehealth to support end of life care in the community: a feasibility study. BMC Palliat Care. 2016;15(1):94. Epub 2016/11/20. doi: http://dx.doi.org/10.1186/s12904-016-0167-7. . PubMed PMID: 27855681; PubMed Central PMCID: PMCPMC5114812.
25. Weck CE, Lex KM, Lorenzl S. Telemedicine in Palliative Care: Implementation of New Technologies to Overcome Structural Challenges in the Care of Neurological Patients. Front Neurol. 2019;10:510. Epub 2019/06/11. doi: http://dx.doi.org/10.3389/fneur.2019.00510. . PubMed PMID: 31178815; PubMed Central PMCID: PMCPMC6542948.
26. Jess M, Timm H, Dieperink KB. Video consultations in palliative care: A systematic integrative review. Palliat Med. 2019 Sep;33(8):942–58. http://dx.doi.org/10.1177/0269216319854938. PubMed. 1477-030X
27. Steindal SA, Nes AAG, Godskesen TE, Dihle A, Lind S, Winger A, et al. Patients' Experiences of Telehealth in Palliative Home Care: Scoping Review. J Med Internet Res. 2020;22(5):e16218. Epub 2020/05/06. doi: http://dx.doi.org/10.2196/16218. . PubMed PMID: 32369037; PubMed Central PMCID: PMCPMC7238080.
28. Sutherland AE, Stickland J, Wee B. Can video consultations replace face-to-face interviews? Palliative medicine and the Covid-19 pandemic: rapid review. BMJ Support Palliat Care. 2020;10(3):271-5. Epub 2020/05/28. doi: http://dx.doi.org/10.1136/bmjspcare-2020-002326. . PubMed PMID: 32457086; PubMed Central PMCID: PMCPMC7295858.
29. Widberg C, Wiklund B, Klarare A. Patients' experiences of eHealth in palliative care: an integrative review. BMC Palliat Care. 2020;19(1):158. Epub 2020/10/16. doi: http://dx.doi.org/10.1186/s12904-020-00667-1. . PubMed PMID: 33054746; PubMed Central PMCID: PMCPMC7560207.
30. Zheng Y, Head BA, Schapmire TJ. A Systematic Review of Telehealth in Palliative Care: caregiver Outcomes. Telemed J E Health. 2016 Apr;22(4):288–94. http://dx.doi.org/10.1089/tmj.2015.0090. PubMed. 1556-3669
31. Funderskov KF, Boe Danbjørg D, Jess M, Munk L, Olsen Zwisler AD, Dieperink KB. Telemedicine in specialised palliative care: healthcare professionals' and their perspectives on video consultations-A qualitative study. J Clin Nurs. 2019 Nov;28(21-22):3966–76. http://dx.doi.org/10.1111/jocn.15004. PubMed. 1365-2702
32. Portz JD, Ford KL, Doyon K, Bekelman DB, Boxer RS, Kutner JS, et al. Using Grounded Theory to Inform the Human-Centered Design of Digital Health in Geriatric Palliative Care. J Pain Symptom Manage. 2020;60(6):1181-92 e1. Epub 2020/07/03. doi: http://dx.doi.org/10.1016/j.jpainsymman.2020.06.027. . PubMed PMID: 32615298; PubMed Central PMCID: PMCPMC7323666.
33. Read Paul L, Salmon C, Sinnarajah A, Spice R. Web-based videoconferencing for rural palliative care consultation with elderly patients at home. Support Care Cancer. 2019 Sep;27(9):3321–30. http://dx.doi.org/10.1007/s00520-018-4580-8. PubMed. 1433-7339
34. Tasneem S, Kim A, Bagheri A, Lebret J. Telemedicine Video Visits for patients receiving palliative care: A qualitative study. Am J Hosp Palliat Care. 2019 Sep;36(9):789–94. http://dx.doi.org/10.1177/1049909119846843. PubMed. 1938-2715
35. Calton BA, Rabow MW, Branagan L, Dionne-Odom JN, Parker Oliver D, Bakitas MA, et al. Top Ten Tips Palliative Care Clinicians Should Know About Telepalliative Care. J Palliat Med. 2019 Aug;22(8):981–5. http://dx.doi.org/10.1089/jpm.2019.0278. PubMed. 1557-7740
36. Chavarri-Guerra Y, Ramos-Lopez WA, Covarrubias-Gomez A, Sanchez-Roman S, Quiroz-Friedman P, Alcocer-Castillejos N, et al. Providing Supportive and Palliative Care Using Telemedicine for Patients with Advanced Cancer During the COVID-19 Pandemic in Mexico. Oncologist. 2021;26(3):e512-e5. Epub 2020/10/24. doi: http://dx.doi.org/10.1002/onco.13568. . PubMed PMID: 33094533; PubMed Central PMCID: PMCPMC7930406.
37. Cheung KL, Tamura MK, Stapleton RD, Rabinowitz T, LaMantia MA, Gramling R. Feasibility and Acceptability of Telemedicine-Facilitated Palliative Care Consultations in Rural Dialysis Units. J Palliat Med. 2021;24(9):1307-13. Epub 2021/01/21. doi: http://dx.doi.org/10.1089/jpm.2020.0647. . PubMed PMID: 33470899; PubMed Central PMCID: PMCPMC8392074.
38. Hawkins JP, Gannon C, Palfrey J. Virtual visits in palliative care: about time or against the grain? BMJ Support Palliat Care. 2020;10(3):331-6. Epub 2020/07/19. doi: http://dx.doi.org/10.1136/bmjspcare-2020-002498. . PubMed PMID: 32680889; PubMed Central PMCID: PMCPMC7456669.
39. Jiang B, Bills M, Poon P. Integrated telehealth-assisted home-based specialist palliative care in rural Australia: A feasibility study. J Telemed Telecare. 2020:1357633X20966466. Epub 2020/10/21. doi: http://dx.doi.org/10.1177/1357633X20966466. . PubMed PMID: 33079611.
40. Nkhoma KB, Ebenso B, Akeju D, Adejoh S, Bennett M, Chirenje M, et al. Stakeholder perspectives and requirements to guide the development of digital technology for palliative cancer services: a multi-country, cross-sectional, qualitative study in Nigeria, Uganda and Zimbabwe. BMC Palliat Care. 2021;20(1):4. Epub 2021/01/06. doi: http://dx.doi.org/10.1186/s12904-020-00694-y. . PubMed PMID: 33397321; PubMed Central PMCID: PMCPMC7784352.
41. Phongtankuel V, Shalev A, Adelman RD, Dewald R, Dignam R, Baughn R, et al. Mobile Health Technology Is Here-But Are Hospice Informal Caregivers Receptive? Am J Hosp Palliat Care. 2018;35(12):1547-52. Epub 2018/06/05. doi: http://dx.doi.org/10.1177/1049909118779018. . PubMed PMID: 29862851; PubMed Central PMCID: PMCPMC6185794.
42. Hoek PD, Schers HJ, Bronkhorst EM, Vissers KCP, Hasselaar JGJ. The effect of weekly specialist palliative care teleconsultations in patients with advanced cancer -a randomized clinical trial. BMC Med. 2017;15(1):119. Epub 2017/06/20. doi: http://dx.doi.org/10.1186/s12916-017-0866-9. . PubMed PMID: 28625164; PubMed Central PMCID: PMCPMC5474887.
43. National-Cancer-Institute. Levels of Evidence for Supportive and Palliative Care Studies (PDQ®)–Health Professional Version - National Cancer Institute 2010 [updated 01/04/2010 - 07:00]. Available from: https://www.cancer.gov/publications/pdq/levels-evidence/supportive-care#_3
44. Steindal SA, Nes AA, Godskesen TE, Lind S, Dhle A, Winger A, et al. Advantages and Challenges in Using Telehealth for Home-Based Pal-

liative Care: Protocol for a Systematic Mixed Studies Review. JMIR Res Protoc. 2021 May;10(5):e22626. http://dx.doi.org/10.2196/22626. PubMed. 1929-0748

45. Mirella Longo AA-CMMAN. In light of the COVID-19 pandemic, a realist synthesis of mobile application-enabled communication and care management for patients in end-of-life care. 2021.
46. Rebecca Hutchinson YSLBMK-FAS. How is telehealth being used to increase access to specialty palliative care?
47. University of California SF. Integrative Palliative Care/Psycho-Oncology Telehealth Group Medical Visits for Patients With Advanced Cancer: A Pilot Study. Clinical trial registration. clinicaltrials.gov, 2021 2021/01/27/. Report No.: NCT04697524.
48. Langbecker D, Caffery LJ, Gillespie N, Smith AC. Using survey methods in telehealth research: A practical guide. J Telemed Telecare. 2017 Oct;23(9):770–9. http://dx.doi.org/10.1177/1357633X17721814. PubMed. 1758-1109
49. Disalvo D, Agar M, Caplan G, Murtagh FE, Luckett T, Heneka N, et al. Virtual models of care for people with palliative care needs living in their own home: A systematic meta-review and narrative synthesis. Palliat Med. 2021 Sep;35(8):1385–406. http://dx.doi.org/10.1177/02692163211024451. PubMed. 1477-030X
50. WHO. Research considerations. WHO Guideline. Geneva: World Health Organization, 2019.
51. AlDossary S, Martin-Khan MG, Bradford NK, Armfield NR, Smith AC. The Development of a Telemedicine Planning Framework Based on Needs Assessment. J Med Syst. 2017 May;41(5):74. http://dx.doi.org/10.1007/s10916-017-0709-4. PubMed. 1573-689X
52. Holden RJ, Karsh BT. The technology acceptance model: its past and its future in health care. J Biomed Inform. 2010;43(1):159-72. Epub 2009/07/21. doi: http://dx.doi.org/10.1016/j.jbi.2009.07.002. . PubMed PMID: 19615467; PubMed Central PMCID: PMCPMC2814963.
53. Fereidouni A, Rassouli M, Salesi M, Ashrafizadeh H, Vahedian-Azimi A, Barasteh S. Preferred Place of Death in Adult Cancer Patients: A Systematic Review and Meta-Analysis. Frontiers in psychology. 2021;12:704590. Epub 2021/09/14. doi: http://dx.doi.org/10.3389/fpsyg.2021.704590. . PubMed PMID: 34512460; PubMed Central PMCID: PMCPmc8429937.
54. Pfeiffer V, Sojer R. Digital Trends Survey 2021. Schweiz Arzteztg. 2021;102: 1198–92 http://dx.doi.org/10.4414/saez.2021.20144. 0036-7486
55. Reinhold S. Angebot und Nachfrage von digitalen Gesundheitsangeboten (Teil 1). Schweiz Arzteztg. 2018;99(42):1428–31.
56. Reinhold S. Angebot und Nachfrage von digitalen Gesundheitsangeboten (Teil 2). Schweiz Arzteztg. 2018;99(48):1686–9.
57. Mettler AC, Piazza L, Michel J, Müller M, Exadaktylos AK, Hautz WE, et al. Use of telehealth and outcomes before a visit to the emergency department: a cross-sectional study on walk-in patients in Switzerland. Swiss Med Wkly. 2021 Jul;151:w20543. http://dx.doi.org/10.4414/smw.2021.20543. PubMed. 1424-3997

Appendix 1: PRISMA-ScR checkist

Table S1:
Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist.

Section	**Item**	**PRISMA-ScR Checklist item**	**Reported on page # in the PDF version of the article**
Title			
Title	1	Identify the report as a scoping review.	1
Abstract			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	1
Introduction			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	1
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	2
Methods			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	2
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	2
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	2
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	5
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	2
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	2
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	2
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	n/a
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	2
Results			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	2
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	2
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	n/a
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	4
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	4
Discussion			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	5
Limitations	20	Discuss the limitations of the scoping review process.	6
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	6
Funding			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	6

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley and Levac and colleagues and the JBI guidance refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMAScR): Checklist and Explanation. Ann Intern Med. 2018;169:467–473 [18]

Appendix 2: Details of search strategy

Search strategy – Academic publications Key concepts: (Telemedicine OR Telehealth OR Digital health interventions) AND (Palliative Care) AND (Feasibility OR Acceptability OR needs)

Filters: Date: from 2010/1/1 – 2021/4/28

Pubmed-Medline:
(("telemedicine"[MeSH Terms] OR "telemedicine"[All Fields] OR "telemedicine s"[All Fields] OR ("telehealth s"[All Fields] OR "telemedicine"[MeSH Terms] OR "telemedicine"[All Fields] OR "telehealth"[All Fields]) OR (("lancet digit health"[Journal] OR "digit health"[Journal] OR ("digital"[All Fields] AND "health"[All Fields]) OR "digital health"[All Fields]) AND ("intervention s"[All Fields] OR "interventions"[All Fields] OR "interventive"[All Fields] OR "methods"[MeSH Terms] OR "methods"[All Fields] OR "intervention"[All Fields] OR "interventional"[All Fields]))) AND ("palliative care"[MeSH Terms] OR ("palliative"[All Fields] AND "care"[All Fields]) OR "palliative care"[All Fields]) AND ("feasibilities"[All Fields] OR "feasibility"[All Fields] OR "feasible"[All Fields] OR "feasiblity"[All Fields] OR ("accept"[All Fields] OR "acceptabilities"[All Fields] OR "acceptability"[All Fields] OR "acceptable"[All Fields] OR "acceptably"[All Fields] OR "acceptance"[All Fields] OR "acceptances"[All Fields] OR "acceptation"[All Fields] OR "accepted"[All Fields] OR "accepter"[All Fields] OR "accepters"[All Fields] OR "accepting"[All Fields] OR "accepts"[All Fields]) OR ("health services needs and demand"[MeSH Terms] OR ("health"[All Fields] AND "services"[All Fields] AND "needs"[All Fields] AND "demand"[All Fields]) OR "health services needs and demand"[All Fields] OR "needed"[All Fields] OR "needs"[All Fields] OR "needing"[All Fields]))) AND (2010/1/1:2021/4/28[pdat])

Search terms (free text and controlled vocabulary):
Telemedicine: "telemedicine"[MeSH Terms] OR "telemedicine"[All Fields] OR "telemedicine's"[All Fields]

Telehealth: "telehealth's"[All Fields] OR "telemedicine"[MeSH Terms] OR "telemedicine"[All Fields] OR "telehealth"[All Fields]

Digital health: "Lancet Digit Health"[Journal:__jid101751302] OR "Digit Health"[Journal:__jid101690863] OR ("digital"[All Fields] AND "health"[All Fields]) OR "digital health"[All Fields]

interventions: "intervention's"[All Fields] OR "interventions"[All Fields] OR "interventive"[All Fields] OR "methods"[MeSH Terms] OR "methods"[All Fields] OR "intervention"[All Fields] OR "interventional"[All Fields]

Palliative Care: "palliative care"[MeSH Terms] OR ("palliative"[All Fields] AND "care"[All Fields]) OR "palliative care"[All Fields]

Feasibility: "feasibilities"[All Fields] OR "feasibility"[All Fields] OR "feasible"[All Fields] OR "feasiblity"[All Fields]

Acceptability: "accept"[All Fields] OR "acceptabilities"[All Fields] OR "acceptability"[All Fields] OR "acceptable"[All Fields] OR "acceptably"[All Fields] OR "acceptance"[All Fields] OR "acceptances"[All Fields] OR "acceptation"[All Fields] OR "accepted"[All Fields] OR "accepter"[All Fields] OR "accepters"[All Fields] OR "accepting"[All Fields] OR "accepts"[All Fields]

needs: "health services needs and demand"[MeSH Terms] OR ("health"[All Fields] AND "services"[All Fields] AND "needs"[All Fields] AND "demand"[All Fields]) OR "health services needs and demand"[All Fields] OR "needed"[All Fields] OR "needs"[All Fields] OR "needing"[All Fields]

Scopus
(TITLE-ABS-KEY (telemedicine) OR TITLE-ABS-KEY (telehealth) OR TITLE-ABS-KEY (digital AND health AND interventions) AND TITLE-ABS-KEY (palliative AND care) AND TITLE-ABS-KEY (feasibility) OR TITLE-ABS-KEY (acceptability) OR TITLE-ABS-KEY (needs)) AND (LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2017) OR LIMIT-TO (PUBYEAR , 2016) OR LIMIT-TO (PUBYEAR , 2015) OR LIMIT-TO (PUBYEAR , 2014) OR LIMIT-TO (PUBYEAR , 2013) OR LIMIT-TO (PUBYEAR , 2012) OR LIMIT-TO (PUBYEAR , 2011) OR LIMIT-TO (PUBYEAR , 2010))

Ovid
https://ovidsp.ovid.com/ovidweb.cgi?T=JS&NEWS=N&PAGE=main&SHAREDSEARCHID=1a2fppTzuUTStqdpYi3i7CcmWMLDgDCcyajqK2bgQwnARsACw4iaO7igHH9frJg1M

Search strategy - Registries
Prospero:

(Telemedicine OR Digital Health intervention OR Telehealth) AND Palliative Care

Clinical Trial.gov:

Telemedicine AND Palliative Care

Cochrane:

Digital OR Telemedicine

Appendix 3: Chart summary of users

Table S2:
Chart summary of users, independence of use, and the three outcome (feasibility, acceptability, and needs)

Author(s) / Year of publication	Client	Provider	Independent use	Feasibility	Acceptability	Needs
Chávarri-Guerra et al. (2021)	Patient and caregiver	Physician, nurse	Yes	No barriers to initiation of intervention (58%)	n/a	n/a
Cheung et al. (2021)	Patient	Physician	No	Technical success rate 94%	Overall rating (patient) 81% at least as good as/ 42% better that physical consultation, relevance 84% Technical communication quality (1-5) 1.2–1.3, connection (approachable) 1.1, relevance 1.7 Overall rating (physician): 60% equal to physical visits, 36% better than physical visit	n/a
Finucane et al. (2021)	Mixed	Mixed	n/a	Good	Good (qualitative statement)	n/a
Nkhoma et al. (2021)	Mixed	Mixed	Yes	n/a	Positive attitude (bridging distance) Concerns regarding privacy	Patients and caregivers: facilitated contact with HCP, access to care/disease information and after hours support, care coordination / HCP: Follow up, remote care delivery, improvement of efficiency / Policymakers: planning of care services, collaboration, improving value of care Service Resources requirements**:** Privacy, confidentiality, network stability, financial capacity, accessible technology, support for non-users
Bentley et al. (2020)	Patient	Physician	Yes	Good (qualitative statement)	4.33/5 recommend online consultation	n/a
Elk et al. (2020)	Phase 1: community and caregiver / Phase 2: community and professional / Phase 3: patient and caregiver	Physician	No	Indirect: few referrals from hospitals	On the selected items: all satisfied or very satisfied (4-5/5)	Phase 1: Experience in various treatment centres (indirect): lack of trust in the health care system; not comfortable with telehealth;*family and culture centred care*; clarity about opiate dosage; advanced care planning; need for service / Phase 2 (Discomfort with telemedicine and other concerns):Wear white coat, acknowledge that not the same as 1:1, continuity, family presence
Hawkins et al. (2020)	Mixed	Physician, nurse	n/a	n/a	n/a	Facilitating factors: preference of patient, convenience for patient (distance), establish rapport
Jiang et al. (2020)	Patient	Physician	No	Duration slightly shorter that analogue; comfortable with equipment (95%)	Patient: overall satisfaction: 100%, patient-clinician rapport: 100%, superior to physical: 77%; caregiver convenience and reduced travel time: 100%	n/a
Kuntz et al. (2020)	Caregiver	Physician	No	Overall quality (physicians): 3.18 (Likert Scale 1-5)	General: good response, good usability, acceptable, comfortable with tool / Communication: understanding 90%, understanding thoughts and wishes 50%, help to trust team: 90%	n/a
Moore et al. (2020)	Patient	Physician, nurse	No	Good audio connection 91.6% good visual connection 84%	Satisfied 88.6% / would use it again 91.7%	n/a
Portz et al. (2020)	Mixed	n/a	n/a	n/a	n/a	**Indirect**: connection with the family, communication and information need / **Direct**: Symptom monitoring: patient portal, interoperability, medication reminders, goal setting features / Psychosocial support: photos of loved ones, encouraging SMSs, music / Decision support: checklists for specific situations / Family support: Syncing to family organisation apps, resources / Spiritual care: Connection with spiritual social media / Goal setting: in-app goal setting / Educational resources: credible links / Algorithm features: communication features patient – family, video visits, in-app games
Schoppee et al. (2020)	Patient caregiver	Nurse	Yes	n/a	Patients 87%, caregivers 70%; age slightly negative, gen-	n/a

					der and race, no influence	
Slavin-Stewart et al. (2020)	Patient	Physician, nurse	No	Video/audio quality 100%, > 4/5; connection stability 100%, > 4/5	Patient/caregiver satisfaction, overall 4.29, concerns addressed 4.71, use again 4.64	n/a
Steindal et al. (2020)	Patient	Physician	n/a	If app simple: good usability, comfort / barriers to use; poor health, physical limitations / technical: small font, equipment not portable	Video useful for communication	n/a
Sutherland et al. (2020)	Patient and caregiver	Physician, nurse	n/a	Good	n/a	n/a
Widberg et al. (2020)	Patient	Physician, nurse	n/a	User-friendly and feasible	highly satisfactory, eventually preferred to 1:1	n/a
Calton et al. (2019)	Mixed	Mixed	n/a	Feasible for a wide range of patients (incl. vulnerable populations)	No difference between physical and virtual visits > 50%	Patient: convenience, access, quality HCP: not well studied
Funderskov et al. (2019)	Mixed	Physician, nurse	No	Ease of use in daily practice	Device did not negatively influence daily practice	n/a
Jess et al. (2019)	Mixed	Mixed	n/a	Patient/caregiver: good / HCP: good – reluctant Technology: user-friendliness and reliability	Patients/caregiver/ HCP: positive user perception	n/a
Read Paul et al. (2019)	Patient	Physician	No	Effective communication: patients 90%, HCPs 100% / Technical stability: patients 65%, HCPs 72% / Critique: Poor quality of video, extra time required to set up the equipment	Comfortable discussing concerns: patients 90%, / HCPs 100% / Addressed needs as well as in person: patients 80%, HCPs 90% / Would use again: patients and HCPs 90%	N/A
Tasneem et al. (2019)	Patient	Physician	n/a	Access to device 90%, but desired training; age or racial background, no influence	No concern about privacy (internal), some concern about "external" IT threats / 10/12 no concern about changes in relationship with physician	Indirect: 10/13 enthusiastic about "having a visit without leaving home"
Weck et al. (2019)	Patient	Physician, nurse	No	Good (convenient, access to care)	Positive impact, high acceptance, significance of the visual component	n/a
Bonsignore et al. (2018)	Patient	Physician	Yes	Good	Yes	n/a
Phongtankuel et al. (2018)	Caregiver	n/a	Yes	Concerns: security (35%), usability (42%)	Receptive: 78% (< 65y, 85%, > 65y 62%)	Features: Communication (video 70%, chat 52%, SMS 16%, sharing video/image 11%) / Access to care information (48%; medication information 32%, symptom information 31%, hospice contact information 6%) / Education (39%; EoL Information 11%, caregiving 10%) / Update and schedules (16%; scheduling 10%, patient update 6%)
Hoek et al. (2017)	Patient	Physician, nurse	Yes (after first visit)	n/a	High satisfaction (patients 90.4%, health care providers, 87%)	n/a
Tieman et al. (2016)	Patient and caregiver	Physician, nurse	Yes	Good	Video consultation: similar/better 22.3%/65.2% than phone calls, similar/ better 27.1%/63.1% than face-to-face	n/a
Zheng et al. (2016)	Caregiver	Physician, nurse	n/a	Feasibility good (44% of all studies)	(All studies) 55%	n/a

Appendix 4: Scopus™ territory analysis

Figure S1: Scopus™ territory analysis (28 April 2021). Documents by country or territory. Compare the document counts for up to 15 countries/territories.