

Perceptions and needs of an outpatient palliative care team regarding digital care conferences in palliative care: a mixed-method online survey

Andreas S. Ebnetter^a, Maud Maessen^a, Thomas C. Sauter^b, Georgette Jenelten^c, Steffen Eychmueller^a

^a University Centre for Palliative Care, Inselspital, University Hospital Bern, Bern, Switzerland

^b Department of Emergency Medicine, Inselspital, University Hospital Bern, Switzerland

^c Mobile Palliative Care Service Bern-Aare, Spitex Bern, Bern, Switzerland

Summary

BACKGROUND: Telemedicine in palliative care (PC) is increasingly being used, especially in outpatient settings with large geographic distances. Its proven benefits include improved communication, coordination quality and time savings. However, the effect on symptom control is less evident. Whether these benefits apply to the Swiss setting and the needs of healthcare professionals (HCPs) is unknown.

OBJECTIVES: To identify the perceptions and needs of healthcare professionals (nurses and physicians) regarding telemedicine (generally and specifically for care conferences) in a Swiss outpatient palliative care network.

METHODS: We conducted a cross-sectional, mixed-method online survey with purposefully sampled healthcare professionals from an outpatient palliative care team as baseline data during the planning phase of a quality improvement project (digital care conferences).

FINDINGS/RESULTS: Of the 251 HCPs approached, 66 responded, including nurses (n = 37) and physicians (n = 29), with an overall response rate of 26.6%. These were distributed into two groups: general palliative care HCPs (n = 48, return rate 21.3%) and specialised palliative care HCPs (n = 18, return rate 69.2%). Generally, telemedicine was perceived as useful. Potential easy access to other HCPs and hence improved communication and coordination were perceived as advantages. Barriers included a lack of acceptance and physical contact, unsolved questions about potential data breaches and technical obstacles. Regarding digital care conferences, the perceived acceptance and feasibility were good; preferred participants were the specialised palliative care HCPs (nurses and physicians), primary physicians and home care nurses, as well as the leadership of a nurse. The needs of the HCPs were as follows: (a) clear and efficient planning, (b) usability and security and (c) visual contact with the patient.

CONCLUSION: Digital care conferences are perceived as a feasible and useful tool by healthcare professionals in a local palliative care network in Switzerland. A pilot phase

will be the next step towards systematic integration of this telemedicine modality into outpatient palliative care.

Introduction

Telemedicine has a strong focus on communication. Therefore, it is not surprising that telemedicine has been applied and well described in palliative care settings [1, 2]. Telemedicine, the use of digital communication tools in medicine, belongs to the broad field of digital health interventions, as defined by the World Health Organization [3]. Four applications exist: consultations between healthcare providers and clients (i.e., virtual visits), remote monitoring, the transmission of medical data (i.e., sending vitals via a smartphone) and case management by healthcare providers (i.e., via a digital care conference) [3].

The three main goals of palliative care are (a) to optimise symptom relief, (b) to optimise functioning and (c) to prolong survival with an optimal balance of disease-modifying treatment and quality of life [4]. The successful implementation of these goals requires good knowledge of the needs and objectives of patients and their caregivers and excellent interprofessional coordination. The basis of these two important elements is communication.

In palliative care, the proven benefits of telemedicine, mainly in countries with large geographical distances, are closely related to good communication and coordination between patients, caregivers and healthcare professionals (HCPs) [5]. The reduction of symptom severity, especially for psychological symptoms, has been described as a benefit of telemedicine. However, this is less well proven [2]. Although the effect on functioning has been described as non-inferior to physical rehabilitation in other fields, such as post-stroke rehabilitation, this effect has not been proven in palliative care [6]. Additionally, cost reductions can occur, mainly due to reduced travel expenses [7].

Few studies have addressed the needs of patients, caregivers and healthcare professionals regarding telemedicine tools. In our scoping review, we concluded that needs are, in general, poorly investigated before the implementation of such tools [5]. An analysis of the literature showed that most patients value the following three features highly:

Andreas Samuel Ebnetter
Inselspital, University Hospital Bern
CH-3010 Bern
andreasamuel.ebnetter
[at]insel.ch

(a) good communication, (b) good coordination, and (c) technical reliability [5]. Therefore, this can be a starting point for a structured needs assessment with a well-conceptualised tool, such as the framework of AlDossary et al. [8]. This publicly available framework describes a structured two-phase approach to developing telemedicine tools based on the needs of patients/clients. First, mixed methods evaluate availability, needs, accessibility and perceptions. Second, potential telemedicine solutions are defined by balancing the needs and priorities of the community with resources [9].

On a local level, the preliminary work of our group for the epall.ch quality improvement project [5, 10] concluded that, for our local setting, the most useful applications seem to be virtual visits and digital care conferences [11]. The lifting of COVID-19 restrictions further highlighted digital care conferences as the most promising tool for increasing the quality of care. Digital care conferences allow professional coordination and case management via a video conference in the presence of the patient and her/his family [12].

The perceptions and needs of patients, caregivers and health professionals in a local palliative care network concerning these digital care conferences are unknown. Additionally, the internationally available literature can only be partially applied to the local setting of a palliative care network in a canton in Switzerland. The uncertainty of whether these tools are accepted and needed in the local palliative care setting makes a study of perceptions and needs logical. Therefore, we designed a survey for palliative outpatient care that focused on healthcare professionals (nurses and physicians) while they initiated and led these care conferences.

The objective of this survey was to identify the perceptions and needs of healthcare professionals (nurses and physicians) regarding telemedicine (digital care conferences) in our local palliative care outpatient network.

This survey is part of the planning phase of a larger quality improvement project informed by the Plan–Do–Check–Act cycle, which targets effectiveness, patient-centredness and efficiency [13].

Methods

Study design

A cross-sectional online survey was conducted using purposive typical-case sampling and a purpose-built questionnaire on the secure online platform LamaPoll.de™. The analysis comprised mixed methods: a quantitative analysis of multiple-choice questions and an analysis of free-text answers with content analysis.

Data collection methods

No validated questionnaire exists to assess telemedicine tools in palliative care [14, 15]. Therefore, a purposeful questionnaire was developed according to the framework of Boynton et al. [16–18]. The survey's content was partially informed by phase one of the framework proposed by AlDossary [9] and used modified elements of the telecare perception questionnaire from Demiris et al. [19]. The

questions about needs were deduced from the results of our scoping review [5].

The survey comprised three sections: three introductory questions (profession, gender and age); six general questions about digital conferences (including usefulness and risk); and eight questions about digital care conferences (including acceptance, feasibility and needs). The questionnaire was developed following a pilot test conducted with 12 healthcare professionals. The details of the participants and the main changes to the questionnaire during the pilot phase are explained in the appendix. The supplementary file available for download at <https://doi.org/10.57187/smw.2023.40123> contains the draft and the post-pilot, final version of the survey.

The questions about digital care conferences focused on perceptions and included questions about perceived acceptance and feasibility (including free-text answers) and advantages. Furthermore, the participants' opinions about who should attend and who should lead the discussions were recorded. Finally, the subjects were asked about their feelings and needs regarding digital care conferences, with the themes of communication, coordination and technical aspects, including free-text answers.

A descending-order 5-point Likert scale was used, with 1 being very favourable (“fully agree” or “very useful”) and 5 being most unfavourable (“do not agree at all” or “not useful at all”) towards the statement in the question.

Sample characteristics

The population was a purposeful sample of physicians (primary care, specialist, palliative care) and nurses (home care, home care with training in palliative care, specialised palliative care) associated with the local palliative care service/network Mobile Palliative Care Service Bern Area (rural and urban). This specialised mobile palliative care (PC) care team serves a population of 390,000, 15 acute-care hospitals (one university hospital) [20] and all the nursing homes of the region. It is the specialist palliative care nursing reference service for 11 home care nurse teams (Spitex), providing the second-line service to about 300 new patients per year (the primary home care teams, some with palliative care training, provide the first-line service). With a full-time equivalent of 7 nurses and 1.3 physicians, specialised palliative care support is offered, with a 24/7 on-call service.

Purposeful sampling is well suited for the purpose of this quality improvement study because it addresses a specific group of healthcare professionals within a network in a non-random and non-probabilistic manner.

The main inclusion criteria were (a) being a palliative care specialist actively working in the local care network (specialised palliative care healthcare professionals [specialised PC HCPs]) or (b) being a healthcare professional (primary care physician, specialist physician [oncologist] or home care nurse) with recent (less than 12 months) active clinical cooperation with the service (general palliative care healthcare professionals [general PC HCPs]). No exclusion criteria were applied. No preliminary sample size was calculated due to the exploratory nature of the survey.

Survey administration

Following a pre-information email to the participants, the survey was administered on 6 July 2022, via email using the serial letter function of Microsoft Word™ and Microsoft Outlook™. The tools used for the survey (LamaPoll.de) comply with European data protection laws and provide anonymisation by default. The one-time cryptolink concealed in the individual raw data also protected against multiple participation. The survey's duration was 40 days, from 6 July 2022 to 15 August 2022; a single reminder was issued on 22 July 2022.

Ethical considerations

The design complied with Swiss ethics for quality improvement projects [21]. The survey was entirely anonymous and did not include health-related data from the participants or patients. The local ethics committee waived full ethical approval (Req-2022-0745). Nonetheless, general GCP rules were followed, the modified project plan and major steps were documented in an audit trail and the data were stored on a secure server.

Open science

The study followed an internal review study protocol that was not published due to its local character. The key achievements and deviations from the protocol (none) were traced in an audit trail. Due to the local character of the study, the raw data, especially the qualitative data, are not publicly available. Nonetheless, the appendix includes all aggregated quantitative data.

Statistical analysis

All data were analysed descriptively, providing the median, interquartile range (IQR) and range for skewed distributed data. For between-group comparisons, a non-parametric test (Mann–Whitney U) was conducted using SPSS™ Version 29.0. Normally distributed data are presented with the mean/standard deviation (SD) and the t-test for comparing groups. There was a chi-square goodness-of-fit test for binomial variables. Significance was defined by a p-value <0.05; detailed p-values were provided when the results were significant. The following groups were compared: nurses vs physicians and general PC HCP vs specialised PC HCP. The number of missing values per item was variable and very low (n = 0–3, less than 5%). The number of participants is mentioned in figure captions, and details can be consulted in the tables S1–S7 in the appendix.

The free-text answers were analysed with MAXQDA2022 using a directed content analysis technique with mixed manifest/latent coding of the data. In this method of qualitative research, the data are analysed in their original wording when clear and unequivocal statements are given. The content (latent interpretation) is interpreted when the statements clearly allow interpretation, that is, analogies or description of examples. Codes were generated with a directed/deductive approach based on preliminary categories and codes informed by the authors' previous work [5, 11, 12]. In general, content analysis suits the analysis of free-text responses well, because the data (answering text) are usually short and summative, leaving only a moderate margin

for interpretation, and content analysis allows quantification of the codes. The analysis followed the standard procedure of content analysis by (a) immersion in the data, (b) the identification and labeling of codes and (c) the grouping of the codes into categories. For a detailed explanation of the content analysis methods, we refer readers to Kleinheksel et al. [22] and Hisieh and Shannon [23]. One coder (ASE), who has experience in qualitative research, performed the initial qualitative data analysis. MM, who is highly experienced in qualitative research, checked the codebook for consistency, and diverging opinions were solved by discussion. SE served as a second code reviewer in unclear situations. The frequency of the codes was analysed to rank their importance. The entire sample was analysed without applying sufficiency or saturation criteria.

Results

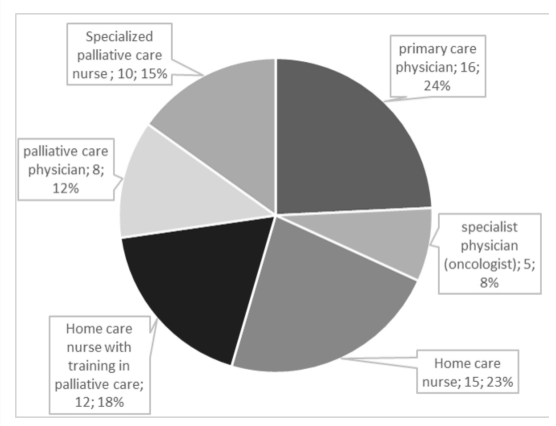
Respondent characteristics

A total of 251 eligible healthcare professionals were invited to participate in the survey, including 26 (HCPs) in the Mobile Palliative Care Service (specialised PC HCPs, including 10 nurses and 16 physicians) and 225 HCPs as associated professionals (169 general practitioners [GPs], 19 oncologists and 37 home care nurses [with and without palliative care training]). Of the 251 healthcare professionals invited, 183 did not respond and 2 declined to participate. This resulted in 66 analysable responses and an overall response rate of 26.5% (n = 249).

Eighteen of the specialised PC HCPs (n = 26) replied, resulting in a return rate of 69.2%. Of the general PC HCPs (n = 225), 48 replied, resulting in a return rate of 21.3%. Figure 1 shows the proportions of the participants' roles. The response rate was lower in the physician group than in the nurse group (78.2 vs 14.2%).

Nurses (n = 27) and physicians (n = 21) were equally represented in the general palliative care group (n = 48; 56.3% vs 43.7%) and the specialised palliative care group (n = 18; 55.6% vs 44.4%). Female HCPs outnumbered their male colleagues in both groups. The mean age was similar in both the general and specialised palliative care HCP groups (46.7 vs 47.1 years; p = 0.289). The youngest participant in the general group was about 10 years younger

Figure 1: Distribution of the roles of participants responding to the survey.



than in the specialised palliative care group (with an age range of 22–68 vs 34–63 years).

More HCPs in the specialised group were already using telemedicine tools (27.9% vs 6.3%, $p = 0.017 [X^2]$). The tools used ($n = 15$) were Zoom® ($n = 6$), Webex® ($n = 4$), Microsoft Teams® ($n = 1$), other ($n = 2$, phone) and HIN® videoconferences ($n = 1$). Table 1 summarises the characteristics of the groups.

Perceived usefulness of telemedicine in general

All telemedicine applications were rated “useful” (median = 2). Digital care conferences, digital data transmission and digital education/training received the highest “very useful” rating (>40%). See figure 2.

Comparing the specialised PC HCP to the general PC HCP group, the palliative care specialists perceived digital care conferences (1 [1; 1–3] vs 2 [1; 1–4], $p = 0.045$) and digital education/training (1 [1; 1–4] vs 2 [1; 1–5], $p = 0.029$) as more useful than their non-specialised peers (see figures S1 and S2 in the appendix).

These differences were less marked between physicians and nurses. The physicians ranked the usefulness of digital education higher than the nurses did (1 [1; 1–3] vs 2 [1;

1–5]). Table S1 in the appendix provides the detailed results.

Perceived risks of telemedicine in general

All the participants agreed (median = 2) that the following risks are relevant: (a) technical problems, (b) a lack of billing, (c) a risk of a data leak, (d) a lack of physical contact and (e) a lack of acceptance (figure 3).

Comparing the general palliative care HCPs with the specialised palliative care HCPs, the specialists tended to be slightly less concerned about the lack of billing (3 [1; 1–4] vs 2 [2; 1–4]), data leaks (2.5 [1; 1–4] vs 2 [1; 1–5]) and the lack of acceptance by patients and caregivers (3 [1; 1–5] vs 2 [1; 1–5]). See figures S3–S5 in the appendix.

More nurses fully agreed that technical problems could be an issue (40.5% vs 17.2%), (2 [1; 1–4] vs 2 [1; 1–4], $p = 0.024$). See figure 4.

The detailed results can be viewed in table S2 in the appendix.

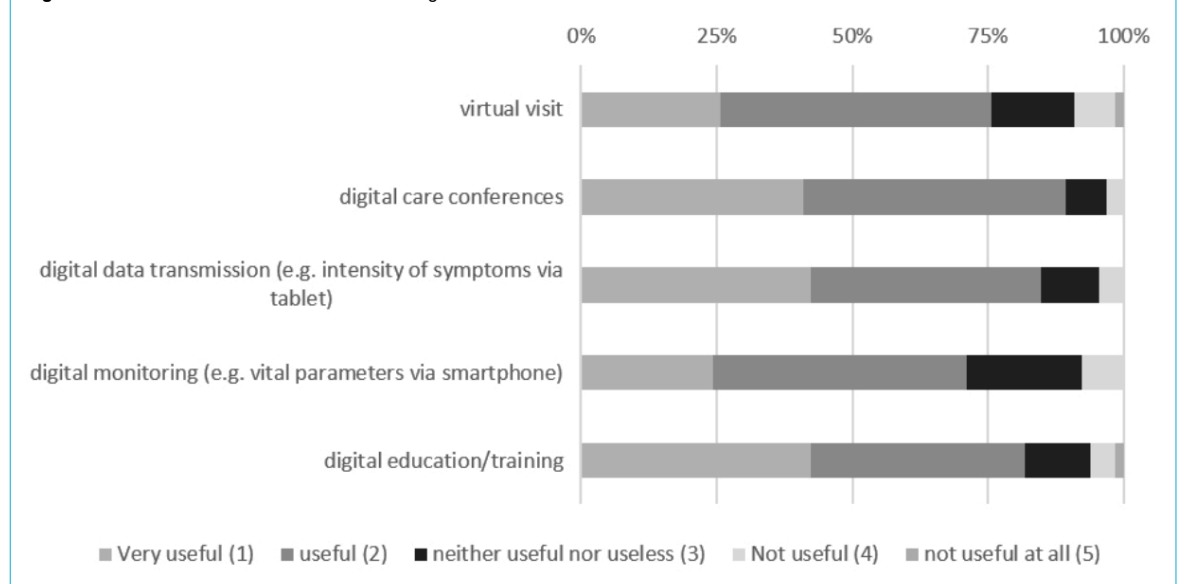
Risk, barriers and opportunities – qualitative analysis

Concerning “Risk, barriers and opportunities of telemedicine in general”, 25 comments (37%) were received. More

Table 1:
Demographics of respondents and preliminary use of telemedicine.

		General palliative care healthcare professionals (n = 48)	Specialised palliative care healthcare professionals (n = 18)
Profession	Nurse	27 (56.3%)	10 (55.6%)
	Physician	21 (43.7%)	8 (44.4%)
Sex	Female	34 (70.8%)	13 (72.2%)
	Male	14 (29.2%)	4 (22.2%)
	Other		1 (5.6%)
Age (y)		46.71 Range 22–68 SD (10.6)	47.06 Range 34–63 SD (9.6)
Has ever used telemedicine		3 (6.3%)	5 (27.9%)
Tools used (n = 15)	HIN.ch®	1 (6.7%)	
	MS Teams®	2 (13.3%)	
	Webex®	4 (26.7%)	
	Zoom®	6 (40.0%)	
	Others	2 (13.3%)	

Figure 2: Perceived usefulness of telemedicine in general.



nurses commented than physicians (16 [43.34%] vs 9 [31%]) and, proportionally, the specialised PC HCPs provided slightly more comments than the general PC HCPs (10 [55.6%] vs 15 [37.5%]).

Two categories were predefined: “Opportunity” and “Risk”. In the “Opportunity” category (figure 5), statements coded for “improved communication” (n = 6) predominated. “Improved coordination”, “improved access” and “tools for exceptional situations” ranked the same (n = 3). “Travel savings” and interestingly “time saving” ranked last.

Typical comments about “improved communication” were as follows:

- “Less loss of information through direct exchange between all professionals...”

- “(I) find the exchange in the group on the topic of palliative care very important.”

Concerning the other codes:

- Improved access: “Faster access to distant patients.”
- “In addition to home visits, a digital visit allows for rapid assessment when change occurs, with the quick adjustment of treatment providing an additional benefit.”
- Time and travel savings: “Patient doesn't need to travel ...”

In the “Risk” category (figure 6), statements about “lack of physical contact” were frequent (n = 11). “Technical barriers” were the next concern (n = 6), followed by “lack of financial compensation” (n = 3), lack of acceptance by patients (n = 2) and risk of technology (n = 2). “Lack of ethi-

Figure 3: Perceived risks of telemedicine (all types included) of 66 healthcare professionals.

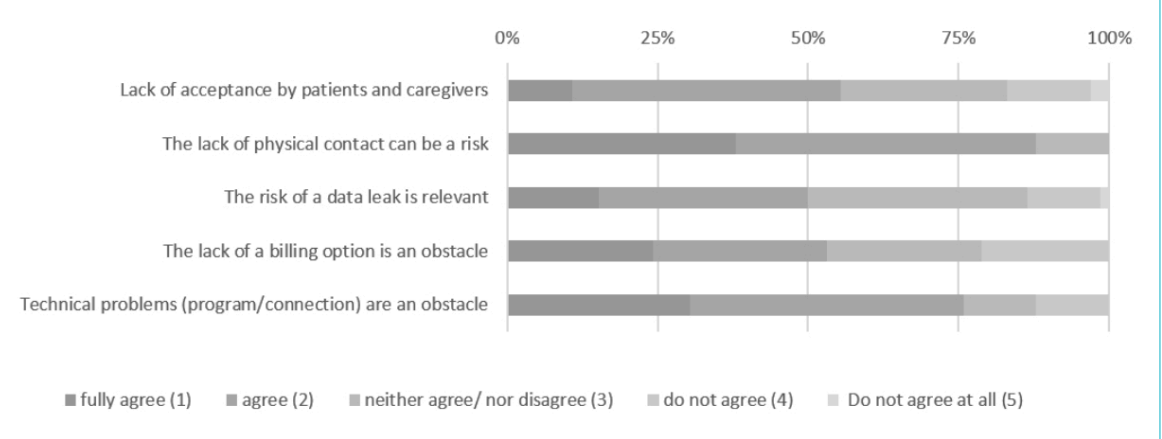


Figure 4: Technical problems as an obstacle to telemedicine, perceptions of physicians (n = 29) and nurses (37).

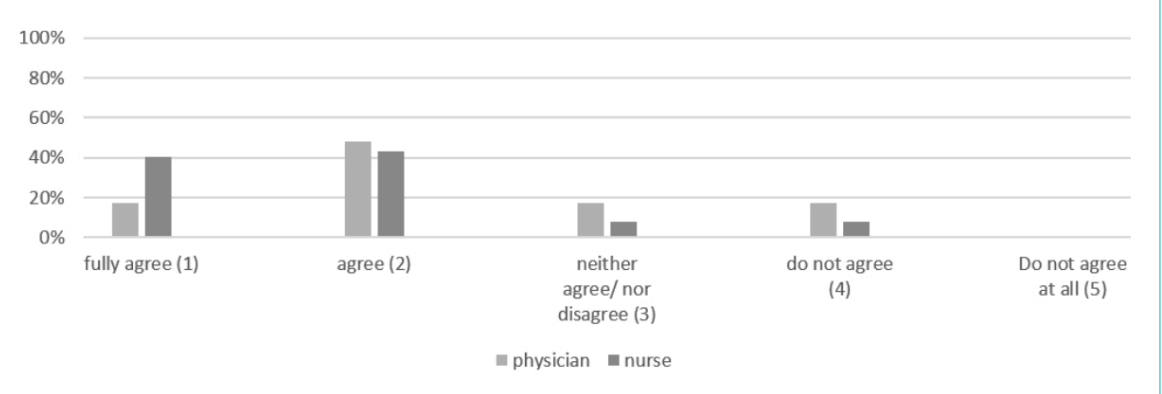
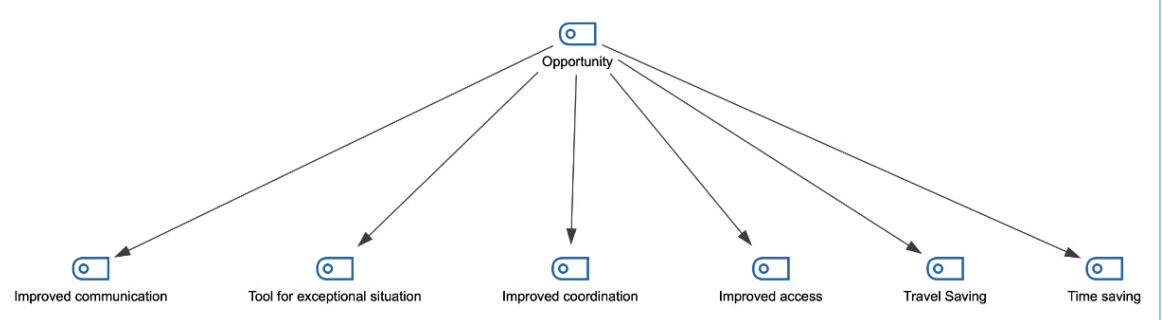


Figure 5: Code-Map of the “Opportunities” category (hierarchical code-subcode Model).



cal standards”, “Relationship with patient” and “IT security” ranked last (n = 1).

Comments on the “lack of physical contact” were typical:

- “Impairment of the doctor–patient relationship due to the lack of direct contact...”
- “However, as soon as it comes to assessments and the evaluation of the individual condition of a person and his/her family/relatives, there is no alternative to the human encounter.”

Typical comments for the other codes concerning the “Risk”category were as follows:

- Technical barriers: “[I]n ‘my’ home care institutions, there would... be no quiet computer workstations available.”
- Lack of financial compensation: “In terms of billing, these consultations should be able to be billed like physical visits or telephone visits.”
- Risk of technology: “[I] think the trend towards more and more digitalisation is not all good. Direct human contact must not be completely lost – especially in holistic palliative care, where it is about so much more than symptoms and medication and vital signs.”

Digital care conferences

Acceptance of digital care conferences

Acceptance by the HCPs was good overall (2 [1; 1–3]). The HCPs judged acceptance by their patients and caregivers to be good (2 [1; 1–4]). Interestingly, the HCPs

judged acceptance more often to be neutral (“neither good/nor bad” or “bad”) in their patients (32.8%, 14.1%, respectively) and their caregivers (26.6%, 7.81%, respectively) than for themselves (“neither good/nor bad”; 21.8%). See figure 7.

There were differences between the general and specialised PC HCP groups concerning patients’ perceived acceptance. Patients’ acceptance was rated higher by the specialised HCP (“good” 2 [2; 1–4]) than by their general peers (“neither good/nor bad” 3 [1; 1–4], p = 0.012) (figure 8). The nurses judged acceptance by their patients higher than the physicians did (2 [1; 1–4] vs 3 [1; 1–4]). See figure 8. Table S3.1 in the appendix details the results.

Feasibility

The participants generally judged the feasibility of digital care conferences in their profession to be good (2 [1; 1–5]). Interestingly, 35% of the HCPs were neutral or critical about feasibility. The physicians perceived the feasibility of digital care conferences as more persistently “good” (2 [0; 1–4]) than did the nurses, whose answer range was larger (2 [1; 1–5]). See figure 9. Table S3.2 in the appendix shows the detailed results.

Feasibility: qualitative analysis

Free-text comments described the reasons for these views on feasibility. Short comments were given by 50 participants (75.8%). Again, slightly more nurses commented than physicians (29 [58%] vs 21 [42%]), and the HCPs in

Figure 6: Code-Map of the “Risk” category (hierarchical code-subcode Model).

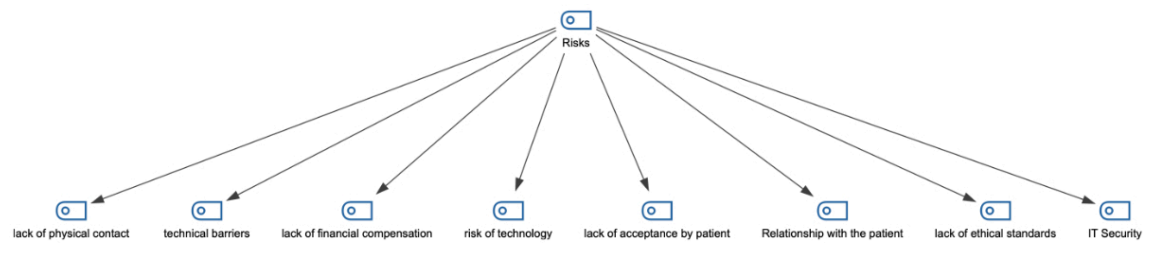
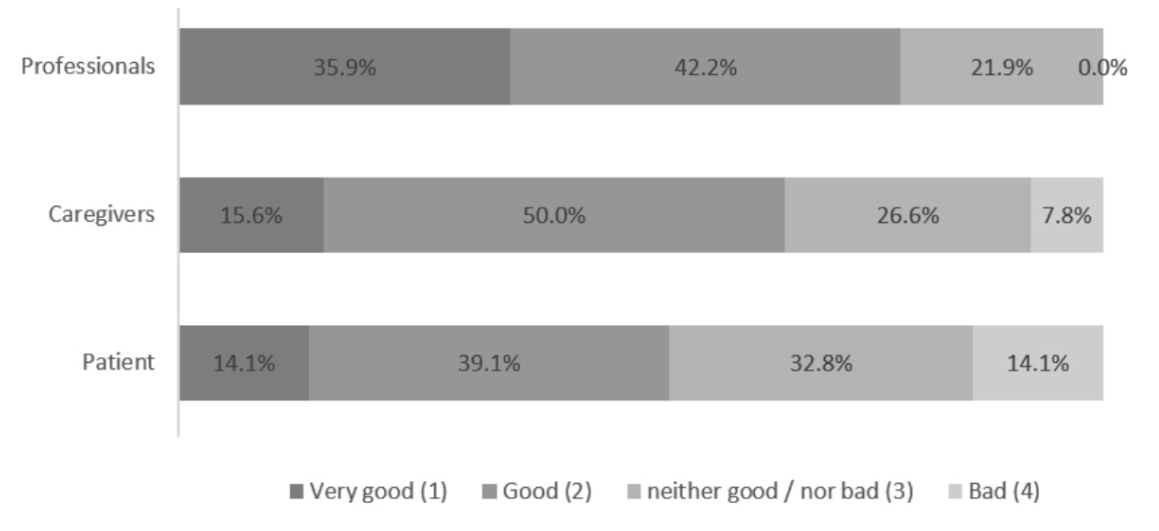


Figure 7: Perceived acceptance of digital care conferences by 64 healthcare professionals (missing = 2).



the general palliative care group left more comments than those of the specialised group (38 [76%] vs 11 [22%]).

Two categories were predefined: “Factors increasing feasibility” and “Threats to feasibility”.

The highest-rated “Factors increasing feasibility” were access to digital tools (n = 14) and good planning (n = 11), followed by ease of use (n = 3), good user experience, clear distribution of responsibility and experience during the COVID-19 pandemic (n = 2). See figure 10.

Typical quotes about “access to digital tools” were as follows:

- “We do a lot of digital work (digital patient documentation for years), so a conference should be feasible.”
- “Most practices are already well digitised and could organise an informatics solution with little conversion.”

Comments about “good planning” critically highlight the importance of good planning to facilitate the conference.

Figure 8: Different perceptions of the acceptance of telemedicine from patients (specialist palliative care healthcare professionals [PC HCPs] [n = 17], general PC HCPs [n = 47], physicians [n = 29] and nurses [n = 35]; missing [n = 2]).

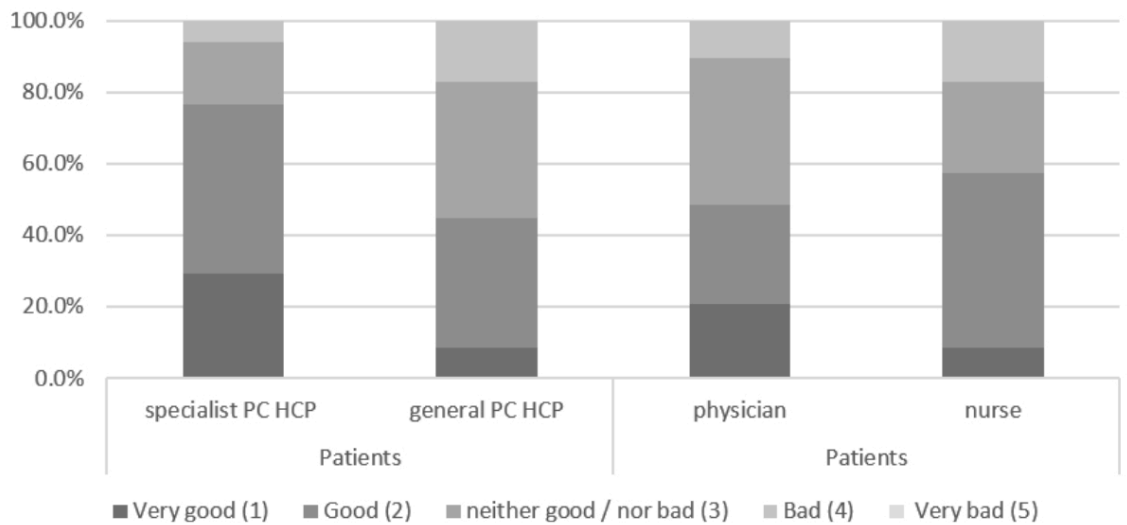


Figure 9: Perceived feasibility of digital care conferences by 63 healthcare professionals (missing n = 3).

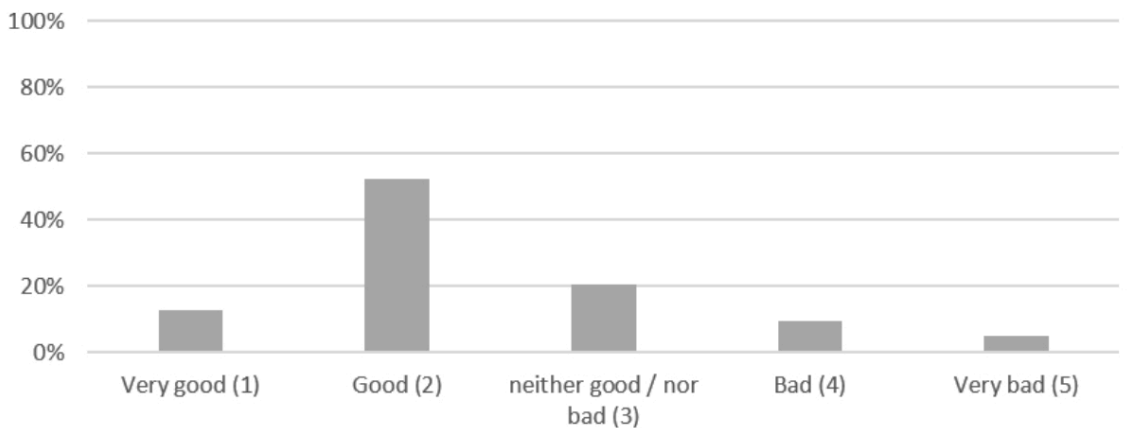
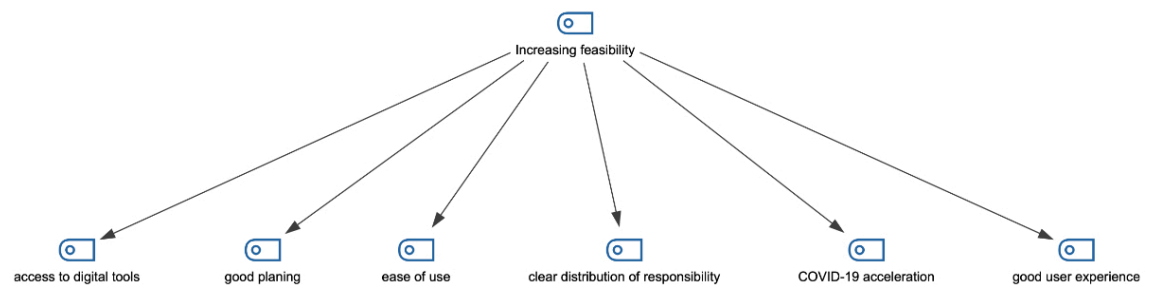


Figure 10: Code-Map of the “Factors increasing feasibility” category (hierarchical code-subcode Model).



- “A pre-planned video conference is usually not difficult to organise in everyday life.”
- “Mostly plannable, (if) time saving, technical requirements given...”

“Threats to feasibility” mentioned were a lack of experience with digital tools (n = 11), technical problems/limitations (n = 7) and a lack of physical contact (n = 7). A few participants mentioned a lack of resources (n = 2), the risk of a security breach (n = 1) and frail patients (n = 1). See figure 11.

Typical quotes highlighting the “lack of experience with digital tools” were as follows:

- “The current patients are often 80 or older, and they very often have no experience with palliative cares, etc. Often, there are no computers on-site at all.”
- “Colleagues are unsure of how to use the application, do not dare to do this...”

Quotes depicting concerns about technical limitations usually addressed a lack of devices or connection:

- “Most of our clients don’t have any technical devices and also no internet, partly [because] they live very remotely without network reception. So, I think in many situations, it is not really feasible.”

The lack of physical contact is also presented as a threat to feasibility. The following two quotes describe this concern:

- “In some situations, direct contact is more ‘human’ and provides a sense of security (regarding the) involvement of the persons concerned and their relatives.”
- “In palliative situations, a physical presence is therefore of enormous advantage compared to a digital presence.”

Advantages of digital care conferences

The HCPs agreed that digital care conferences could increase understanding, save time and money and improve coordination and communication between professionals (median = 2). See figure S6 in the appendix. The “saving money” item was viewed as the least critical. Table S4 in the appendix demonstrates the detailed results.

Participants in the digital care conference

The patient (1 [1; 1–3]), the specialised palliative care nurse (1 [1;1–3]), the home care nurse with training in palliative care (1 [1;1–4]), the primary care physician (1 [1;1–4]) and the palliative care physician (1 [1:1–4]) were among the first choices as participants in the conference. Home care nurses (without palliative care training) (2 [1; 1–3]), specialist physicians (2 [1; 1–5]) and caregivers (2 [1;1–3]) ranked second, but were still considered important participants (figure 12).

Figure 11: Code-Map of the “Threats to feasibility” category (hierarchical code-subcode Model).

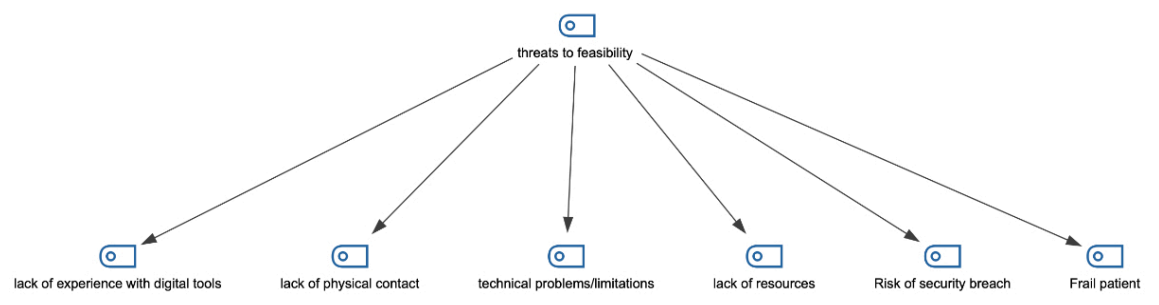
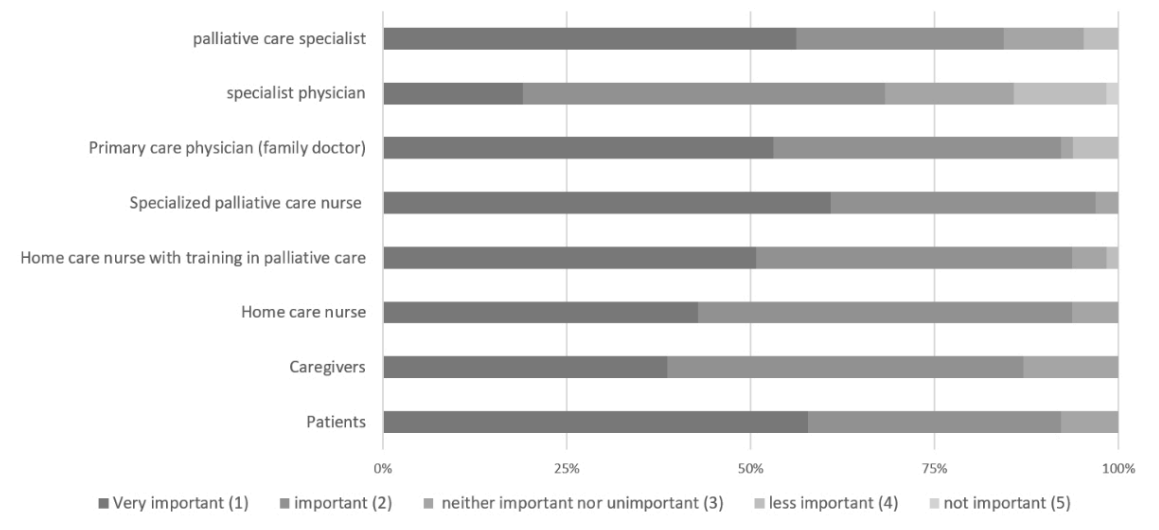


Figure 12: Preferences for participants in the digital care conferences by 64 healthcare professionals (missing per item = 2–4, no exclusions).



Minor, nonrelevant disparities were present between the groups (specialised vs general palliative care providers, physicians vs nurses). See table S5 in the appendix.

Leader of the digital care conference

The specialised palliative care nurse was the main choice of the survey participants to lead the care conference (median 3 [1; 1–6]). See figure 13.

Interestingly, the general palliative care HCPs wanted the specialised nurse to be the leader, while the HCPs working in a specialised palliative care role preferred the primary care physician to lead (3 [0; 1–6 vs 4 [3; 3–6]). See figure S6 in the appendix.

The nurses preferred to have a nurse lead the conference (71.4%). The physicians also revealed a preference for a nurse leader (57.2%), and the main preference (specialised nurse in palliative care) remained the same among all participants (see figure S7 in the appendix). Specialist physicians were not considered for leading the conference (0% of all groups). Table S6 in the appendix depicts the detailed results.

Needs

The HCPs rated being able to see the patient (1 [1; 1–4]), goal setting (1 [1; 1–3]), coordination of care (1 [1; 1–2]), easy access/operation (1 [1; 1–3]) and privacy (1 [1; 1–4]) as very important. A clear timeframe (2 [1; 1–4]) and the possibility of seeing the other professional (2 [2; 1–5]) were ranked second but still considered important (figure 14).

Although the median response was similar between the specialised and general HCPs, the specialised professionals ranked visual communication (76.5% vs 52.2%), a common goal (82.4% vs 54.3%, $p = 0.042$), coordination (76.5% vs 55.3%) and a clear timeframe (47.1% vs 36.2%) as very important more often than important. No obvious differences were found between nurses and physicians. Table S7 in the appendix displays the detailed results.

Needs – qualitative analysis

Within the three predefined categories (Communication, Coordination and Technical usability), most codes ($n = 10$) concerned the “Coordination” category. Figures 15–17 demonstrate the Code-Maps.

In the “Coordination” category (figure 16, statements mostly related to resource planning ($n = 6$), adaptation to the setting ($n = 3$) and interprofessional collaboration ($n = 1$).

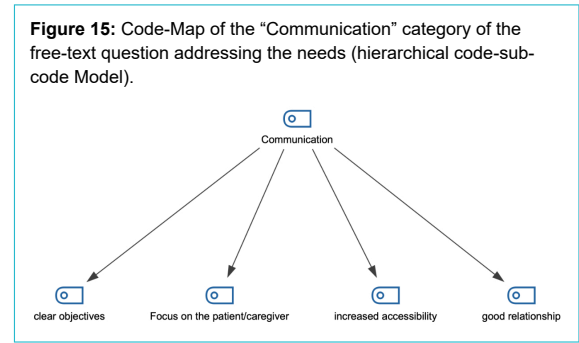


Figure 13: Preferences for leader of the digital care conference by 63 healthcare professionals (missing per item = 3, no exclusions).

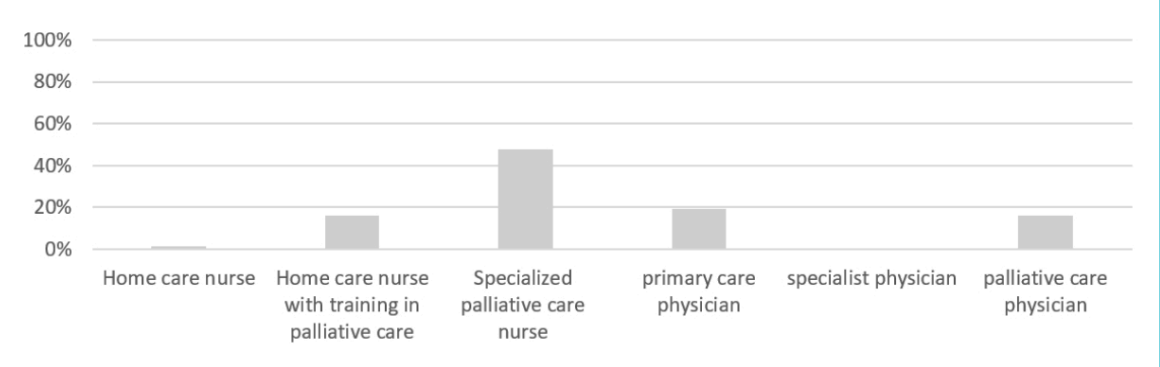
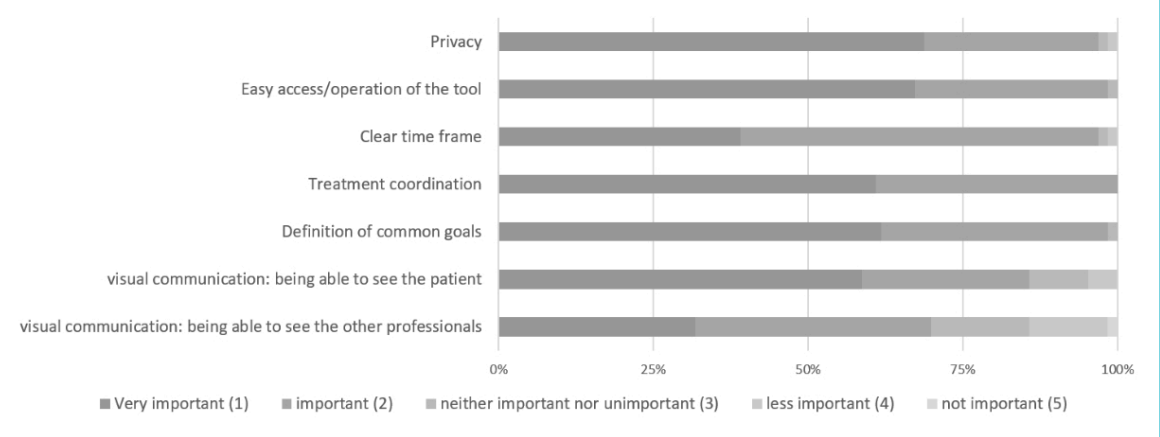


Figure 14: Priority of needs concerning the digital care conference by 64 healthcare professionals (missing = 2).



Quotes especially highlighted the importance of a selection of participants in accordance with the problem/situation, as the two following examples show:

- “ [N]ot all (...) have to be present. This is decided per case, as few as possible, but those affected. One person from primary care home care. If involved, the specialised palliative care team, certainly the GP, ... and one specialist.”
- “Reduce the number of participants in such meetings to a sensible minimum...”
- “The composition of the group depends on the question.”

In the “Communication” category (figure 15), the comments highlighted clear objectives (n = 1), a focus on the patient (n = 1), accessibility (n = 1) and a good relationship with the patient (n = 1), as the following exemplary quote shows:

- “The focus should be on the goals of the patient and his/her relatives.”
- “Goals, issues and timeline clearly defined...”

In the “Technical usability” category (n = 4) (figure 17), statements about the affordability/billing possibility (n = 2) and the security of the tool (n = 1) were highlighted, as well as the necessity of good preparation (n = 1).

- “...Healthcare insurance billing must be possible.”
- “...Common platform for communication with secure transmission (data protection)...”

Interpretation and discussion

The results demonstrated that telemedicine was perceived as useful in a Swiss local palliative care network, although prior exposure to digital communication tools in clinical practice was low (6.3% for the general PC HCPs and

26.9% for the specialist PC HCPs). The participants judged digital care conferences, digital education and data transmission to be very useful and agreed on the common risks (lack of acceptance, lack of physical contact, data breaches and technical obstacles). Improved coordination and communication were the most frequently mentioned opportunities.

Concerning digital care conferences, acceptance and feasibility were good. Priority was given to the presence of the specialised PC HCP (nurse and physician), the primary physician and the home care nurse with training in PC. The survey’s participants thought that the conference should be led by the specialist palliative care nurse or the primary care physician. Important needs for healthcare professionals were a visual connection with the patient, the coordination of care and the correct functioning of the tool.

Telemedicine and digital education in general

The low use of telemedicine tools in general can be explained by Swiss healthcare professionals’ critical views on digitalisation [24]. Significantly more specialised HCPs had ever used telemedicine tools in their daily work than the general HCPs. The reason could be ever-changing situations and the desire of patients to stay at home, leading to the ad hoc use of telemedicine tools. The tools employed were secure, but most were not specifically designed for healthcare use.

Regarding perceived usefulness, all types of telemedicine and digital education received a useful rating, which is surprising, as physicians are usually critical of these tools. Interestingly, the ratings for virtual visits were lower than for digital interprofessional meetings or digital education. One reason could be that peer-to-peer telemedicine and digital education do not entail concerns about the lack of physical contact or the possibility of examining the patient [25].

The risks of and barriers to telemedicine are numerous and well described [26–29] and typically include concerns about acceptance, the lack of physical contact, data security and technical issues, and the lack of billing possibilities. Therefore, it is not unusual that these were also found in this survey. The lack of billing remains a concern because there is no specific billing possibility in the Swiss medical tariff system (TARMED).

The highlighted opportunities (coordination and communication) corroborate the literature [5, 25]. Interestingly, some participants highlighted the potential for telemedicine and virtual visits as a backup solution for regular care in exceptional care situations, which could be interpreted as telemedicine tools serving only as backups when regular care is not possible. This contradicts a recent *NEJM Catalyst* survey describing the potential of telemedicine for many standard situations [30].

Digital care conferences

HCP acceptance (80%) was good, which is consistent with the results of the actual use of these tools. Interestingly, the participants, especially the physicians and the general PC HCPs, perceived acceptance by their patients and respective caregivers to be lower than their own. With the limitation that a direct survey with patients/caregivers was not administered, our interpretation is that this reflects a

Figure 16: Code-Map of the “Coordination” category of the free-text question addressing the needs (hierarchical code-subcode Model).

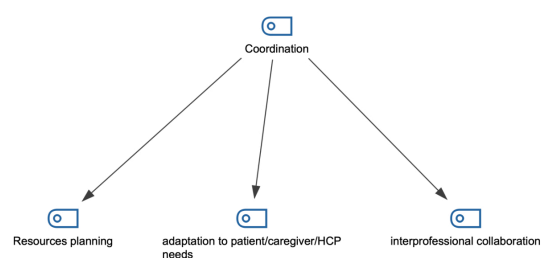
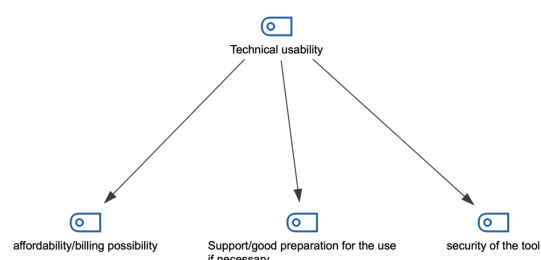


Figure 17: Code-Map of the “Technical usability” category of the free-text question addressing the needs (hierarchical code-subcode Model).



certain prudence and uncertainty concerning acceptance by patients/caregivers.

Judgements about feasibility and advantages were good, and the facilitators and barriers were congruent with examples in the literature [29, 31]. Interestingly, one statement, the lack of experience with digital tools, emerged as a sign that HCPs recognised the necessity of good planning and education before use.

No clear preference for the necessary participants in a digital care conference emerged from this survey. Only the presence of the specialist physician (i.e., the oncologist) was rated as less important. We believe that this reflects the usual composition of the home care team, i.e., the patient, caregiver, home care nurse, nurse specialist (palliative care), primary care physician and, if needed, palliative care physician. A notable result from the survey is the many nurses in basic home care with training in palliative care. We included them in the general PC HCP group; however, the role of these HCPs should certainly be explored in more detail.

As an important element of real-world implementation, the choice of the leader of the conference fell clearly on the specialist nurse (palliative care), which well reflects the usual coordination role of the specialist nurse (including 24-hour availability). The specialist PC HCP subgroup often considered the primary care physician the chair of the conference, which indicates the GP's high importance in this setting.

The survey's participants confirmed the normative needs usually present in the literature [5, 32]. The need to see other peers was the most controversial. From a practical perspective, statements about the need for clear planning and a clear timeframe are very understandable and important: time is a major resource, especially in the outpatient setting. This is especially true because digital care conferences run the risk of taking considerable time to plan, thereby reducing the resource efficacy (time and money) of telemedicine [7, 33].

Strengths and limitations

Our survey has several strengths. First, it explores clinically relevant topics in a well-defined local setting. Second, it is based on existing theories about telemedicine. Third, the mixed-methods strategy helps capture the individual needs of healthcare professionals. Online surveys are inherently challenging to generalise [34]. Generalisability was not a goal of this survey, as it was clearly intended as the planning phase of a local QI project. Correspondingly, we do not believe that this is a significant limitation. Nonetheless, care was taken to define the purposive sample as close to reality (palliative care network) as possible.

The overall return rate was small for the general HCP population but adequate for the specialised team. The return rate of the general practitioners was low, potentially reducing the validity of the results for this specific healthcare professional group. Possible reasons for this could be (a) the differing patient population of individual general practitioners (high vs low rate of palliative care patients), (b) lack of time and (c) the general practitioner's lack of interest in research or telemedicine, representing a possible confounder. Another limitation of this study is that

only a few participants had ever used telemedicine tools. Hence, we surveyed the perceptions of digital conferences but did not proceed to a subgroup analysis (previous users of telemedicine) due to the small sample size.

Conclusion and implementation for practice

The results of this survey reveal a good perception of the feasibility and acceptance of telemedicine and digital care conferences of HCPs in our local palliative care outpatient network. The participants also had positive perceptions of facilitators and needs. The constructive views of barriers and risk show that the pilot phase of a digital care conference can be addressed with confidence.

In addition, we suggest that a nurse lead the pilot phase of a digital care conference. According to this survey, the following main aspects will be considered: (a) a clear and simple framework/template for the conference, (b) simple-to-use and data protection-compliant videoconference tools accessible to all participants and (c) clear and transparent documentation of the decisions.

Acknowledgments

The authors would like to thank Dr. AlDossary for sharing her insight into the development process of the needs-based implementation of telemedicine.

Financial disclosure

This research received no specific grant from any funding agency.

Potential competing interests

All authors have completed and submitted the International Committee of Medical Journal Editors form for disclosure of potential conflicts of interest. No potential conflict of interest related to the content of this manuscript was disclosed.

References

- 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 Feb;44(1):226–37. <http://dx.doi.org/10.1002/nur.22105>. PubMed. 1098-240X
- 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 Apr;4(1):64. <http://dx.doi.org/10.1038/s41746-021-00430-7>. PubMed. 2398-6352
- WHO. WHO | Classification of digital health interventions v1.0. WHO.
- Cherny N, Portenoy RK. Core concepts in palliative care. In: Cherny N, Fallon M, Kaasa S, editors. *Oxford Textbook of Palliative Medicine*. Oxford university press; 2021. <http://dx.doi.org/10.1093/med/9780198821328.003.0006>.
- Ebneter AS, Sauter TC, Christen A, Eychmueller S. Feasibility, acceptability and needs in telemedicine for palliative care. *Swiss Med Wkly*. 2022 Mar;152(9-10):Swiss Med Wkly. 2022;152:w30148. <http://dx.doi.org/10.4414/SMW.2022.w30148>. PubMed. 1424-3997
- Laver KE, Adey-Wakeling Z, Crotty M, Lannin NA, George S, Sherrington C. Telerehabilitation services for stroke. *Cochrane Database Syst Rev*. 2020 Jan;1(1):CD010255. PubMed. 1469-493X
- Lomenick AF, Kuhlman SJ, Barnes JL, Gurley-Calvez T, Spaulding AO, Krebill HM, et al. Economics of Using Telemedicine to Supplement Hospice Care in Rural Areas. *J Palliat Med*. 2021 Sep;24(10):1461–6. <http://dx.doi.org/10.1089/jpm.2020.0117>. PubMed. 1557-7740
- 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
- AlDossary S, Armfield NR, Smith AC, Martin-Khan MG. A Needs-based Planning Framework for Telemedicine Services: A Practical Guide. Faculty of Medicine The University of Queensland, Australia.: National Health and Medical Research Council (NHMRC) Centre of Research Excellence in Telehealth; 2019.
- Ebneter AS, Flidner M, Trapp D, Ramseier F, Sauter TC, Eychmueller S. [Telemedicine in Palliative Care: Digital Communication in a

- Relationship-Based Speciality - Does It Make Sense?]. *Prax Bern* 1994. 2021 Nov;110(15):845–50.
11. Ebnetter AS, Sauter T, Achter A, Eychmüller S. Einsatz von Telemedizin in der Palliative Care. *Schweiz Arzteztg*. 2022. <http://dx.doi.org/10.4414/saez.2022.20419>. 0036-7486
 12. Ebnetter AS, Eychmüller S. Digital Hilfsmittel in der Palliative Care: Quo vadis? *Infoonco-Suisse*. 2022 Aug;12(5).
 13. Institute of Medicine Committee on Quality of Health Care in A. In. *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington (DC): National Academies Press (US) Copyright 2001 by the National Academy of Sciences. All rights reserved.; 2001.
 14. 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
 15. Weaver MS, Neumann ML, Navaneethan H, Robinson JE, Hinds PS. Human Touch via Touchscreen: Rural Nurses' Experiential Perspectives on Telehealth Use in Pediatric Hospice Care. *J Pain Symptom Manage*. 2020 Nov;60(5):1027–33. <http://dx.doi.org/10.1016/j.jpainsymman.2020.06.003>. *PubMed*. 1873-6513
 16. Boynton PM. Administering, analysing, and reporting your questionnaire. *BMJ*. 2004 Jun;328(7452):1372–5. <http://dx.doi.org/10.1136/bmj.328.7452.1372>. *PubMed*. 1756-1833
 17. Boynton PM, Wood GW, Greenhalgh T, Clinic Q. Reaching beyond the white middle classes. *BMJ*. 2004 Jun;328(7453):1433–6. <http://dx.doi.org/10.1136/bmj.328.7453.1433>. *PubMed*. 1756-1833
 18. Boynton PM, Greenhalgh T. Selecting, designing, and developing your questionnaire. *BMJ*. 2004 May;328(7451):1312–5. <http://dx.doi.org/10.1136/bmj.328.7451.1312>. *PubMed*. 1756-1833
 19. Demiris G, Speedie S, Finkelstein S. A questionnaire for the assessment of patients' impressions of the risks and benefits of home telecare. *J Telemed Telecare*. 2000;6(5):278–84. <http://dx.doi.org/10.1258/1357633001935914>. *PubMed*. 1357-633X
 20. Spitalisten [Internet]. Kanton Bern. [cited 2023 Apr 2]. Available from: [https://www.gsi.be.ch/de/start/themen/gesundheitsversorger/spitaeler-psychotherapie-rehabilitation/spitalisten.html](https://www.gsi.be.ch/de/start/themen/gesundheit/gesundheitsversorger/spitaeler-psychotherapie-rehabilitation/spitalisten.html)
 21. Basec. Qualitätssicherung oder bewilligungspflichtige. *Forschung*. 2020.0172-1518
 22. Kleinheksel AJ, Rockich-Winston N, Tawfik H, Wyatt TR. Demystifying Content Analysis. *Am J Pharm Educ*. 2020 Jan;84(1):7113. <http://dx.doi.org/10.5688/ajpe7113>. *PubMed*. 1553-6467
 23. Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res*. 2005 Nov;15(9):1277–88. <http://dx.doi.org/10.1177/1049732305276687>. *PubMed*. 1049-7323
 24. InfoSocietyDays. *STUDIENERGEBNISSE 2021 – Swiss eHealth Forum*. Gfs.bern; 2021.
 25. 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
 26. Hammerton M, Benson T, Sibley A. Readiness for five digital technologies in general practice: perceptions of staff in one part of southern England. *BMJ Open Qual*. 2022 Jun;11(2):e001865. <http://dx.doi.org/10.1136/bmjopen-2022-001865>. *PubMed*. 2399-6641
 27. Silva MD, Schack EE. Outpatient Palliative Care Practice for Cancer Patients During COVID-19 Pandemic: Benefits and Barriers of Using Telemedicine. *Am J Hosp Palliat Care*. 2021 Jul;38(7):842–4. <http://dx.doi.org/10.1177/1049909121997358>. *PubMed*. 1938-2715
 28. Kalicki AV, Moody KA, Franzosa E, Gliatto PM, Ornstein KA. Barriers to telehealth access among homebound older adults. *J Am Geriatr Soc*. 2021 Sep;69(9):2404–11. <http://dx.doi.org/10.1111/jgs.17163>. *PubMed*. 1532-5415
 29. Tang M, Reddy A. Telemedicine and Its Past, Present, and Future Roles in Providing Palliative Care to Advanced Cancer Patients. *Cancers (Basel)*. 2022 Apr;14(8):1884. <http://dx.doi.org/10.3390/cancers14081884>. *PubMed*. 2072-6694
 30. Hollander J, Sharma R. Telemedicine Is Mainstream Care Delivery. *NEJM Catal*. 2022;3(7):CAT.22.0176. <http://dx.doi.org/10.1056/CAT.22.0176>. 2642-0007
 31. 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 Nov;15(1):94. <http://dx.doi.org/10.1186/s12904-016-0167-7>. *PubMed*. 1472-684X
 32. Salvador Vergés À, Cusi Sánchez MV, Bossio Grigera P, Fàbrega Aguiló C, Gomes da Costa F, Serra Trullas A, et al. Determinants in Stakeholder Opinions About Telemedicine in Palliative Care: A Scoping Review. *Telemed J E Health*. 2022 Jul;28(7):932–41. <http://dx.doi.org/10.1089/tmj.2021.0441>. *PubMed*. 1556-3669
 33. Snoswell CL, Smith AC, Page M, Scuffham P, Caffery LJ. Quantifying the Societal Benefits From Telehealth: Productivity and Reduced Travel. *Value Health Reg Issues*. 2022 Mar;28:61–6. <http://dx.doi.org/10.1016/j.vhri.2021.07.007>. *PubMed*. 2212-1102
 34. Andrade C. The Limitations of Online Surveys. *Indian J Psychol Med*. 2020 Oct;42(6):575–6. <http://dx.doi.org/10.1177/0253717620957496>. *PubMed*. 0253-7176

Appendix

Details of the survey pilot phase

Initial survey

Demographics of the pilot phase participants

- First-consultation phase (15.6.2022-22.6.2022): main authors (n = 3)
- Pilot-Phase (24.6.2022-1.7.2022): health care professional outside of the local network (overall response rate 11/14 (78%): specialised palliative care: n = 2 (response rate 2/2 100%); home care nurse: n = 3 (response rate 2/3 (66%); general practitioners: n = 3 (response rate 2/3 (66%); palliative care physicians: n = 3 (response rate 3/3 100%); specialised physicians: n = 3 (response rate 2/3 66%)

Major changes, based on the comments of the pilot phase participants (n = 11)

- Improving the clarity of the introduction
- Improve the clarity of the professionals' roles
- Decoupling the questions about the importance of participation different people and adding a question about which person should have the lead.
- Improving the structuring of the questions regarding needs

Table S1:

Perceived usefulness of telemedicine in general.

All participants	Very useful		Useful		Neither useful nor useless		Not useful		Not useful at all		n	Median (IQR; range)	
Virtual visit/consultation	25.76%		50%		15.15%		7.58%		1.52%		66	2 (1; 1–5)	
Digital interprofessional meetings (round table discussions)	40.91%		48.48%		7.58%		3.03%		0%		66	2 (1; 1–4)	
Digital data transmission (e.g., intensity of symptoms via tablet)	42.42%		42.42%		10.61%		4.55%		0%		66	2 (1; 1–4)	
Digital monitoring (e.g., vital parameters via smartphone)	24.24%		46.97%		21.21%		7.58%		0%		66	2 (1; 1–4)	
Digitally supported continuing education/training	42.42%		39.39%		12.12%		4.55%		1.52%		66	2 (1; 1–5)	
Specialised HCP (n = 18) vs general HCP (n = 48)	Very useful		Useful		Neither useful nor useless		Not useful		Not useful at all		Mann-Whitney	Median (IQR; range)	
	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.		Spec.	Gen.
Virtual visit	33.3%	22.9%	50.0%	50.0%	16.7%	14.6%	0.0%	10.4%	0.0%	2.1%	n.s	2 (1; 1–3)	2 (1; 1–5)
Digital care conferences	61.1%	33.3%	33.3%	54.2%	5.6%	8.3%	0.0%	4.2%	0.0%	0.0%	0.045	1 (1; 1–3)	2(1; 1–4)
Digital data transmission (e.g., intensity of symptoms via tablet)	27.8%	47.9%	33.3%	45.8%	27.8%	4.2%	11.1%	2.1%	0.0%	0.0%	0.016	2 (2; 1–4)	2 (1; 1–4)
Digital monitoring (e.g., vital parameters via smartphone)	16.7%	27.1%	38.9%	50.0%	33.3%	16.7%	11.1%	6.3%	0.0%	0.0%	n.s.	2 (1; 1–4)	2 (1; 1–4)
Digitally supported continuing education/training	66.7%	33.3%	22.2%	45.8%	5.6%	14.6%	5.6%	4.2%	0.0%	2.1%	0.029	1 (13; 1–4)	2 (1; 1–5)
Physicians (n = 29) vs. nurses (n = 37)	Very useful		Useful		Neither useful nor useless		Not useful		Not useful at all		Mann-Whitney	Median (IQR; range)	
	Phys.	Nurs.	Phys.	Nurs.	Phys.	Nurs.	Phys.	Nurs.	Phys.	Nurs.		Phys.	Nurs.
Virtual visit	17.2%	32.4%	51.7%	48.6%	17.2%	13.5%	13.8%	2.7%	0.0%	2.7%	n.s	2 (1; 1–4)	2 (1; 1–5)
Digital care conferences	41.4%	40.5%	48.3%	48.6%	10.3%	5.4%	0.0%	5.4%	0.0%		n.s	2 (1; 1–3)	2 (1; 1–4)
Digital data transmission (e.g., intensity of symptoms via tablet)	45.9%	37.9%	37.9%	45.9%	20.7%	2.7%	3.4%	5.4%	0.0%	0.0%	n.s	2 (2; 1–4)	2 (1; 1–4)
Digital monitoring (e.g., vital parameters via smartphone)	27.6%	21.6%	37.9%	54.1%	27.6%	16.2%	6.9%	8.1%	0.0%	0.0%	n.s	2 (2; 1–4)	2 (1; 1–4)
Digitally supported continuing education/training	55.2%	32.4%	31.0%	45.9%	13.8%	10.8%	0.0%	8.1%	0.0%	2.7%	n.s (0.066)	1 (1; 1–3)	2 (1; 1–5)

Table S2:
Perceived risks of telemedicine in general.

All participants	Fully agree		Agree		Neither agree nor disagree		Do not agree		Do not agree at all		n	Median (95% CI; range)	
Technical problems (program/connection) are an obstacle	30.30%		45.45%		12.12%		12.12%		0%		66	2 (2; 1-4)	
Lack of a billing option is an obstacle	24.24%		28.79%		25.76%		21.21%		0%		66	2 (2; 1-4)	
Risk of a data leak is relevant	15.15%		34.85%		36.36%		12.12%		1.52%		66	2 (1; 1-5)	
Lack of physical contact can be a risk	37.88%		50%		12.12%		0%		0%		66	2 (1; 1-3)	
Lack of acceptance by patients and caregivers	10.77%		44.62%		27.69%		13.85%		3.08%		65	2 (1; 1-5)	
Specialised HCP (n = 18), general HCP (n = 48)	Fully agree		Agree		Neither agree nor disagree		Do not agree		Do not agree at all		Mann-Whitney	Median (IQR; range)	
	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.		Spec.	Gen.
Technical problems (program/connection) are an obstacle	38.9%	27.1%	44.4%	45.8%	16.7%	10.4%	0.0%	16.7%	0.0%	0.0%	n.s	2 (1; 1-3)	2 (2; 1-4)
Lack of a billing option is an obstacle	16.7%	27.1%	22.2%	31.3%	38.9%	20.8%	22.2%	20.8%	0.0%	0.0%	n.s	3(1; 1-4)	2 (2; 1-4)
Risk of a data leak is relevant	11.1%	16.7%	38.9%	33.3%	44.4%	33.3%	5.6%	14.6%	0.0%	2.1%	n.s	2.5 (1; 1-4)	2 (1; 1-5)
Lack of physical contact can be a risk	22.2%	43.8%	61.1%	45.8%	16.7%	10.4%	0.0%	0.0%	0.0%	0.0%	n.s	2 (0; 1-3)	2 (1; 1-3)
Lack of acceptance by patients and caregivers	11.1%	10.6%	33.3%	48.9%	33.3%	25.5%	16.7%	12.8%	5.6%	2.1%	n.s	3 (1; 1-5)	2 (1; 1-5)
Physicians (n = 29) vs. nurses (n = 37)	Fully agree		Agree		Neither agree nor disagree		Do not agree		Do not agree at all		Mann-Whitney	Median (95% CI; range)	
	Phys.	Nurs.	Phys.	Nurs.	Phys.	Nurs.	Phys.	Nurs.	Phys.	Nurs.		Phys.	Nurs.
Technical problems (program/connection) are an obstacle	17.2%	40.5%	48.3%	43.2%	17.2%	8.1%	17.2%	8.1%	0.0%	0.0%	0.024	2 (1; 1-4)	2 (1; 1-4)
Lack of a billing option is an obstacle	27.8%	21.6%	24.1%	32.4%	24.1%	27.0%	24.1%	18.9%	0.0%	0.0%	n.s.	2 (3; 1-4)	2 (1; 1-4)
Risk of a data leak is relevant	10.3%	18.9%	34.5%	35.1%	34.5%	37.8%	17.2%	8.1%	3.4%	0.0%	n.s.	3 (1; 1-5)	2 (1; 1-4)
Lack of physical contact can be a risk	43.2%	31.0%	55.2%	45.9%	13.8%	10.8%	0.0%	0.0%	0.0%	0.0%	n.s	2 (1; 1-3)	2 (1; 1-3)
Lack of acceptance by patients and caregivers	3.4%	16.7%	48.3%	41.7%	31.0%	25.0%	10.3%	16.7%	6.9%	0.0%	n.s	2 (1; 1-4)	2 (1; 1-5)

Table S3.1:
Acceptance of digital care conferences.

All participants	Very good		Good		Neither good nor bad		Bad		Very bad		n	Median (IQR; range)	
Patient (perceived by HCP)	14.06%		39.06%		32.81%		14.06%		0%		64*	2 (1; 1-4)	
Caregivers	15.62%		50%		26.56%		7.81%		0%		64*	2 (1; 1-4)	
Professionals	35.94%		42.19%		21.88%		0%		0%		64*	2 (1; 1-3)	
Specialised HCP (n = 17) vs Gen. HCP (n = 47)	Very good		Good		Neither good nor bad		Bad		Very bad		Mann-Whitney	Median (95% CI; range)	
	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.		Spec.	Gen.
Patient (perceived by HCP)	29.4%	8.5%	47.1%	36.2%	17.6%	38.3%	5.9%	17.0%	0.0%	0.0%	0.012	2 (2; 1-4)	3 (1; 1-4)
Caregivers	23.5%	12.8%	64.7%	44.7%	11.8%	31.9%	0.0%	10.6%	0.0%	0.0%	0.024	2 (1; 1-3)	2 (1; 1-4)
Professionals	47.1%	31.9%	23.5%	48.9%	29.4%	19.1%	0.0%	0.0%	0.0%	0.0%	n.s	2 (2; 1-3)	2 (1; 1-3)
Physicians (n = 29) vs. nurses (n = 35)	Very good		Good		Neither good nor bad		Bad		Very bad		Mann-Whitney	Median (IQR; range)	
	Phys.	Nurs.	Phys.	Nurs.	Phys.	Nurs.	Phys.	Nurs.	Phys.	Nurs.		Nurs..	Nurs.
Patient (perceived by HCP)	20.7%	8.6%	27.6%	48.6%	41.4%	25.7%	10.3%	17.1%	0.0%	0.0%	n.s	3 (1; 1-4)	2 (1; 1-4)
Caregivers	20.7%	11.4%	41.4%	57.1%	31.0%	22.9%	6.9%	8.6%	0.0%	0.0%	n.s	2 (1; 1-4)	2 (1; 1-4)
Professionals	31.0%	40.0%	37.9%	45.7%	31.0%	14.3%	0.0%	0.0%	0.0%	0.0%	n.s	2 (2; 1-3)	2 (1; 1-3)

Table S3.2:
Feasibility of digital care conferences.

	Very good		Good		neither good / nor bad		Bad		Very bad		Mann Whit-ney	Median (95%CI; range)	
	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.		Spec.	Gen.
All participants (n = 63)	12.70%		52.38%		20.63%		9.52%		5%			2 (1; 1-5)	
Specialised HCP (n = 16) vs. general. HCP (n = 47)	12.5%	12.8%	56.3%	51.1%	31.3%	17.0%	0.0%	12.8%	0.0%	6.4%	0.514	2 (1; 1-3)	2 (1; 1-5)
Physicians (n = 29) vs. nurses (n = 34)	17.2%	8.8%	62.1%	44.1%	17.2%	23.5%	3.4%	14.7%	0.0%	8.8%	0.018	2 (0; 1-4)	2 (1; 1-5)

Table S4:
Advantage of digital care conferences.

All participants	Fully agree		Agree		Neither agree nor disagree		Do not agree		Do not agree at all		n	Median (IQR; range)	
...gives me a good understanding of the medical problem	15.62%		56.25%		20.31%		7.81%		0%		64	2 (1; 1–4)	
...can save time	42.19%		50%		4.69%		3.12%		0%		64	2 (1; 1–4)	
...can save money	31.25%		35.94%		25%		7.81%		0%		64	2 (2; 1–4)	
...improve coordination within the team	29.69%		48.44%		12.50%		7.81%		1.56%		64	2 (1; 1–5)	
...improve communication between the treating professionals	30.16%		39.68%		22.22%		6.35%		1.59%		63	2 (2; 1–5)	
Physicians (n = 29) vs. nurses (n = 35)	Fully agree		Agree		Neither agree nor disagree		Do not agree		Do not agree at all		Mann-Whitney	Median (IQR; range)	
	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.		Spec.	Gen.
...give me a good understanding of the medical problem	17.60%	14.90%	58.80%	55.30%	17.60%	21.30%	5.90%	8.50%	0.00%	0.00%	n.s	2 (1; 1–4)	2 (1; 1–4)
...can save time	47.10%	40.40%	35.30%	55.30%	17.60%	0.00%	0.00%	4.30%	0.00%	0.00%	n.s	2 (1; 1–3)	2 (1; 1.4)
...can save money	35.30%	29.80%	29.40%	38.30%	35.30%	21.30%	0.00%	10.60%	0.00%	0.00%	n.s	2 (2; 1–3)	2 (2; 1–4)
...improve coordination within the team	41.20%	25.50%	47.10%	48.90%	11.80%	12.80%	0.00%	10.60%	0.00%	2.10%	n.s	2 (1; 1–3)	2 (2; 1–5)
...improve communication between the treating professionals	31.30%	29.80%	43.80%	38.30%	25.00%	21.30%	0.00%	8.50%	0.00%	2.10%	n.s	2 (2; 1–3)	2 (2; 1–5)
Specialised HCP (n = 17) vs. general HCP (n = 47)	Fully agree		Agree		Neither agree nor disagree		Do not agree		Do not agree at all		Mann-Whitney	Median (95% CI; range)	
	Physicians	Nurse	Physicians	Nurse	Physicians	Nurse	Physicians	Nurse	Physicians	Nurse		Physicians	Nurses
...give me a good understanding of the medical problem	10.30%	20.00%	48.30%	62.90%	34.50%	8.60%	6.90%	8.60%	0.00%	0.00%	n.s	2 (1; 1–4)	2 (0; 1–4)
...can save time	48.30%	37.10%	37.90%	60.00%	10.30%	0.00%	3.40%	2.90%	0.00%	0.00%	n.s	2 (1; 1–4)	2 (1; 1–4)
...can save money	34.50%	28.60%	24.10%	45.70%	31.00%	20.00%	10.30%	5.70%	0.00%	0.00%	n.s	2 (2; 1–4)	2 (2; 1–4)
...improve coordination within the team	34.50%	25.70%	51.70%	45.70%	10.30%	14.30%	3.40%	11.40%	0.00%	2.90%	n.s	2 (1; 1–4)	2 (2; 1–5)
...improve communication between the treating professionals	31.00%	29.40%	37.90%	41.20%	27.60%	17.60%	3.40%	8.80%	0.00%	2.90%	n.s	2 (2; 1–4)	2 (2; 1–5)

Table S5:
Participants in the digital care conference.

All participants	Very important		Important		Neither important nor unimportant		Less important		Not important		n	Median (CI; range)	
Patients	57.81%		34.38%		7.81%		0%		0%		64	1 (1; 1-3)	
Caregivers	38.71%		48.39%		12.90%		0%		0%		62	2 (1; 1-3)	
Home care nurse	42.86%		50.79%		6.35%		0%		0%		63	2 (1; 1-3)	
Home care nurse with training in palliative care	50.79%		42.86%		4.76%		1.59%		0%		63	1 (1; 1-4)	
Specialised palliative care nurse	60.94%		35.94%		3.12%		0%		0%		64	1 (1; 1-3)	
Primary care physician	53.12%		39.06%		1.56%		6.25%		0%		64	1 (1; 1-4)	
Specialist physician	19.05%		49.21%		17.46%		12.70%		1.59%		63	2 (1; 1-5)	
Palliative care physician	56.25%		28.12%		10.94%		4.69%		0%		64	1(1:1-4)	
Specialised HCP (n = 17), Gen. HCP (n = 47)	Very important		Important		Neither important nor unimportant		Not important		Not important at all		Mann-Whitney	Median (IQR; range)	
	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.		Spec.	Gen.
Patients	76.50%	51.10%	17.60%	40.40%	5.90%	8.50%	0.00%	0.00%	0.00%	0.00%	n.s.	1 (0; 1-3)	1 (1; 1-3)
Caregivers	56.30%	32.60%	31.30%	54.30%	12.50%	13.00%	0.00%	0.00%	0.00%	0.00%	n.s.	1 (1; 1-3)	2 (1; 1.3)
Home care nurse	47.10%	41.30%	35.30%	56.50%	17.60%	2.20%	0.00%	0.00%	0.00%	0.00%	n.s.	1.5 (1; 1-3)	2 (1; 1-3)
Home care nurse with training in palliative care	47.10%	52.20%	47.10%	41.30%	5.90%	4.30%	0.00%	2.20%	0.00%	0.00%	n.s.	1.5 (1; 1-3)	1 (1; 1-4)
Specialised palliative care nurse	82.40%	53.20%	17.60%	42.60%	0.00%	4.30%	0.00%	0.00%	0.00%	0.00%	0.033	1 (0; 1-2)	1 (1; 1-3)
Primary care physician (family physicians)	76.50%	44.70%	17.60%	46.80%	5.90%	0.00%	0.00%	8.50%	0.00%	0.00%	0.034	1 (1; 1-3)	2 (1; 1-4)
Specialist physician	23.50%	17.40%	58.80%	45.70%	17.60%	17.40%	0.00%	17.40%	0.00%	2.20%	n.s.	2 (1; 1-3)	2 (1; 1-5)
Palliative care specialist	82.40%	46.80%	11.80%	34.00%	5.90%	12.80%	0.00%	6.40%	0.00%	0.00%	0.14	1 (1; 1-3)	2 (1; 1-4)
Physicians (n = 29) vs. nurses (n = 35)	Very important		Important		Neither important nor unimportant		Not important		Not important at all		Mann-Whitney	Median (IQR; range)	
	Phys.	Nurs.	Phys.	Nurs.	Phys.	Nurs.	Phys.	Nurs.	Phys.	Nurs.		Phys.	Nurs.
Patients	58.60%	57.10%	34.50%	34.30%	6.90%	8.60%	0.00%	0.00%	0.00%	0.00%	n.s.	1 (1; 1-3)	1 (1; 1-3)
Caregivers	31.00%	45.40%	55.20%	42.40%	13.80%	12.10%	0.00%	0.00%	0.00%	0.00%	n.s.	2 (1; 1-3)	2 (1; 1-3)
Home care nurse	27.60%	55.90%	62.10%	41.20%	10.30%	2.90%	0.00%	0.00%	0.00%	0.00%	0.019	2 (1; 1-3)	1 (1; 1-3)
Home care nurse with training in palliative care	37.90%	61.80%	55.20%	32.40%	6.90%	2.90%	0.00%	2.90%	0.00%	0.00%	n.s.	2 (1; 1-3)	1 (1; 1-4)
Specialised palliative care nurse	55.20%	65.70%	44.80%	28.60%	0.00%	5.70%	0.00%	0.00%	0.00%	0.00%	n.s.	1 (1; 1-2)	1 (1; 1-3)
Primary care physician (family physicians)	44.80%	60.00%	44.80%	34.40%	3.40%	0.00%	6.90%	5.70%	0.00%	0.00%	n.s.	2 (1; 1-4)	1 (2; 1-4)
Specialist physician	10.30%	26.50%	51.70%	47.10%	24.10%	11.80%	10.30%	14.70%	3.40%	0.00%	n.s.	2 (1; 1-5)	2 (2; 1-4)
Physician specialised in palliative care	51.70%	60.00%	27.60%	28.60%	13.80%	8.60%	6.90%	2.90%	0.00%	0.00%	n.s.	1 (1; 1-4)	1 (1; 1-4)

Table S6:

Proposed leader of the conference.

All participants (n = 63)		
Home care nurse	1 (1.59%)	
Home care nurse with training in palliative care	10 (15.87%)	
Specialised palliative care nurse	30 (47.62%)	
Primary care physician	12 (19.05%)	
Specialist physician	0	
Palliative care physician	1 (015.87%)	
Specialised HCP (n = 16), Gen. HCP (n = 47)	Spec.	Gen.
Home care nurse	0.00%	1.60%
Home care nurse with training in palliative care	0.00%	21.30%
Specialised palliative care nurse	25.00%	55.30%
Primary care physician	37.50%	12.80%
Specialist physician	0.00%	0.00%
palliative care physician	37.50%	8.50%
Physicians (n = 29) vs. nurses (n = 34)	Physician	Nurse
Home care nurse	3.60%	0.00%
Home care nurse with training in palliative care	17.90%	14.30%
Specialised palliative care nurse	35.70%	57.10%
Primary care physician	17.90%	20.00%
Specialist physician	0.00%	0.00%
palliative care physician	25.00%	8.60%

Table S7:
Needs.

All participants	Very important		Important		Neither important nor unimportant		Less important		Not important		n	Median (IQR; range)	
	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.			
Visual communication: being able to see the other professionals	31.75%		38.10%		15.87%		12.70%		1.59%		63	2 (2; 1-5)	
Visual communication: being able to see the patient	58.73%		26.98%		9.52%		4.76%		0%		63	1 (1; 1-4)	
Definition of common goals	61.90%		36.51%		1.59%		0%		0%		63	1 (1; 1-3)	
Treatment coordination	60.94%		39.06%		0%		0%		0%		64	1 (1; 1-2)	
Clear time frame	39.06%		57.81%		1.56%		1.56%		0%		64	2 (1; 1-4)	
Easy access/operation of the tool	67.19%		31.25%		1.56%		0%		0%		64	1 (1; 1-3)	
Privacy	68.75%		28.12%		1.56%		1.56%		0%		64	1 (1; 1-4)	
Specialised HCP (n = 17) vs general HCP (n = 47)	Very important		Important		Neither important nor unimportant		Not important		Not important at all		Mann-Whitney	Median (IQR; range)	
	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.	Spec.	Gen.		Spec.	Gen.
Visual communication: being able to see the other professionals	35.30%	30.40%	41.20%	37.00%	11.80%	17.40%	5.90%	15.20%	5.90%	0.00%	n.s	2 (2; 1-5)	2 (2; 1-4)
Visual communication: being able to see the patient	76.50%	52.20%	11.80%	32.60%	11.80%	8.70%	6.50%	0.00%	0.00%	0.00%	n.s	1 (1; 1-3)	1 (1; 1-4)
Definition of common goals	82.40%	54.30%	17.60%	43.50%	0.00%	2.20%	0.00%	0.00%	0.00%	0.00%	0.042	1 (0; 1-2)	1 (1; 1-3)
Treatment coordination	76.50%	55.30%	23.50%	44.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	n.s	1 (1; 1-2)	1 (1; 1-2)
Clear time frame	47.10%	36.20%	52.90%	59.60%	0.00%	2.10%	0.00%	2.10%	0.00%	0.00%	n.s	2 (1; 1-2)	2 (1; 1-4)
Easy access/operation of the tool	64.70%	68.10%	35.30%	29.80%	0.00%	2.10%	0.00%	0.00%	0.00%	0.00%	n.s	1 (1; 1-2)	1 (1; 1-3)
Privacy	64.70%	70.20%	35.30%	25.50%	0.00%	2.10%	0.00%	2.10%	0.00%	0.00%	n.s	1 (1; 1-2)	1 (1; 1-4)
Physicians (n = 29) vs. nurses (n = 35)	Very important		Important		Neither important nor unimportant		Not important		Not important at all		Mann-Whitney	Median (IQR; range)	
	Phys.	Nurs.	Phys.	Nurs.	Phys.	Nurs.	Phys.	Nurs.	Phys.	Nurs.		Phys.	Nurs.
Visual communication: being able to see the other professionals	31.00%	32.40%	44.80%	32.40%	10.30%	20.60%	10.30%	14.70%	3.40%	0.00%	n.s	2 (2; 1-5)	2 (2; 1-4)
Visual communication: being able to see the patient	58.60%	58.80%	24.10%	29.40%	13.80%	5.90%	3.40%	5.90%	0.00%	0.00%	n.s	1 (1; 1-4)	1 (1; 1-4)
Definition of common goals	69.00%	55.90%	31.00%	41.20%	0.00%	2.90%	0.00%	0.00%	0.00%	0.00%	n.s	1 (1; 1-2)	1 (1; 1-3)
Treatment coordination	62.10%	60.00%	37.90%	40.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	n.s	1(1; 1-2)	1 (1; 1-2)
Clear time frame	41.40%	37.10%	55.20%	60.00%	3.40%	0.00%	0.00%	2.90%	0.00%	0.00%	n.s	2 (1; 1-3)	2(1; 1-4)
Easy access/operation of the tool	51.70%	80.00%	44.80%	20.00%	3.40%	0.00%	0.00%	0.00%	0.00%	0.00%	0.015	1 (1; 1-3)	1 (0; 1-2)
Privacy	55.20%	80.00%	37.90%	20.00%	3.40%	0.00%	3.40%	0.00%	0.00%	0.00%	0.026	1(1; 1-4)	1 (0; 1-2)

Figure S1: Rated usefulness of digital care conferences by specialist PC HCP (n = 18) and general PC HCP (n = 48).

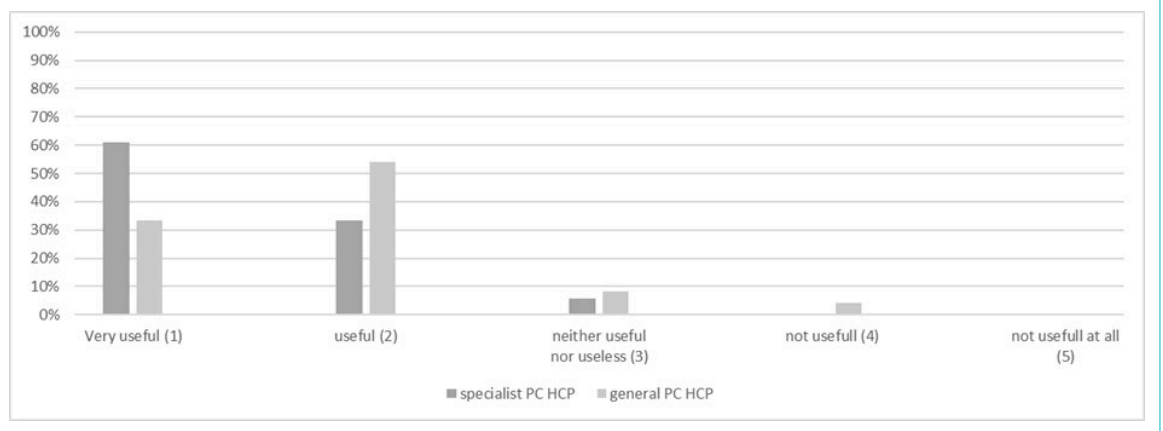


Figure S2: Rated usefulness of digitally supported continuing education/training by specialist PC HCP (n = 18) and general PC HCP (n = 48).

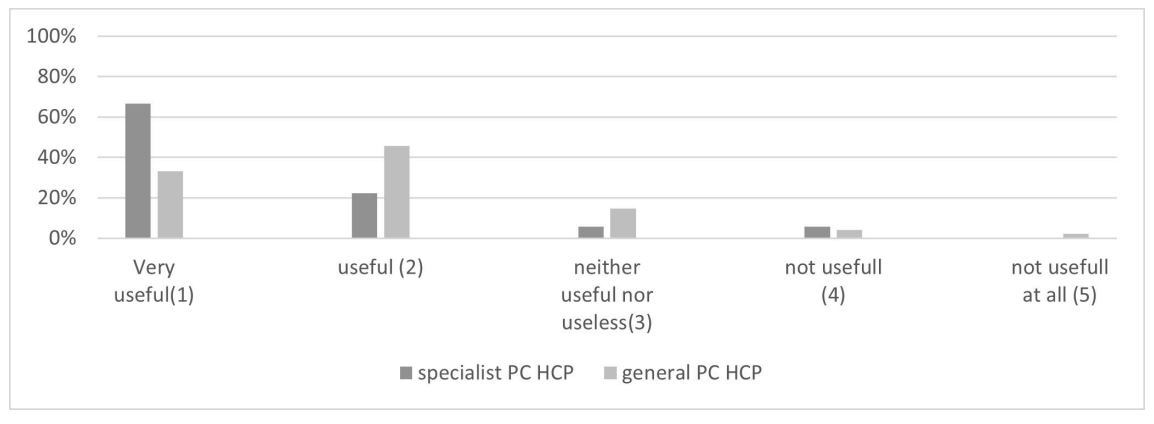


Figure S3: Lack of billing as an obstacle for telemedicine, by specialist PC HCP (n = 18) and general PC HCP (n = 48).

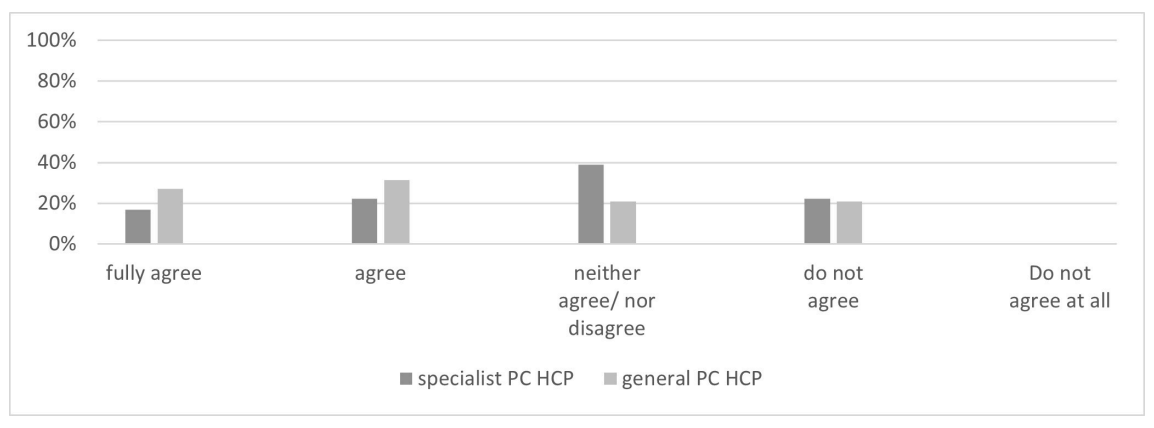


Figure S4: Risk of a data leak as an obstacle for telemedicine by specialist PC HCP (n = 18) and general PC HCP (n = 48).

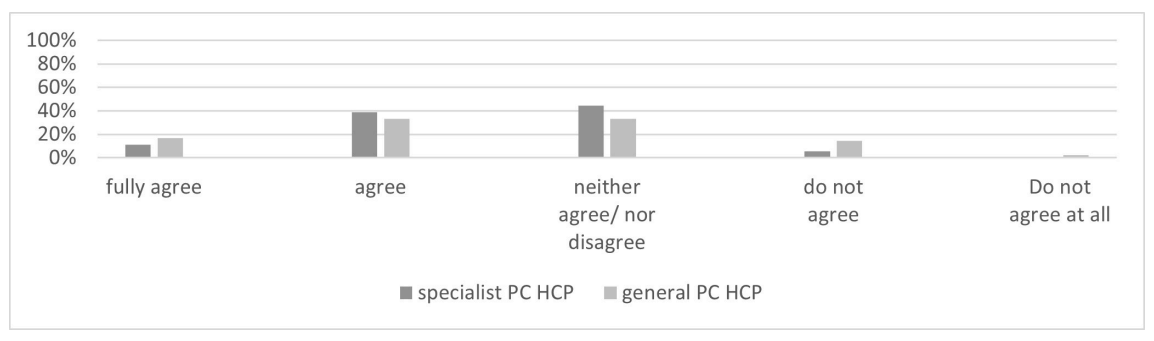


Figure S5: Risk of non-acceptance of patient and caregiver as an obstacle to telemedicine by specialist PC HCP (n = 18) and general PC HCP (n = 48).

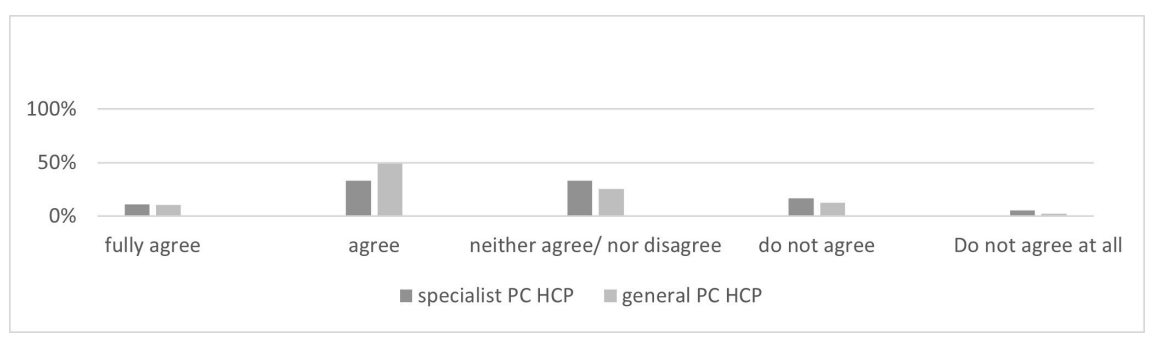


Figure S6: Perceptions of the advantages of digital care conferences from 64 healthcare professionals, two missing.

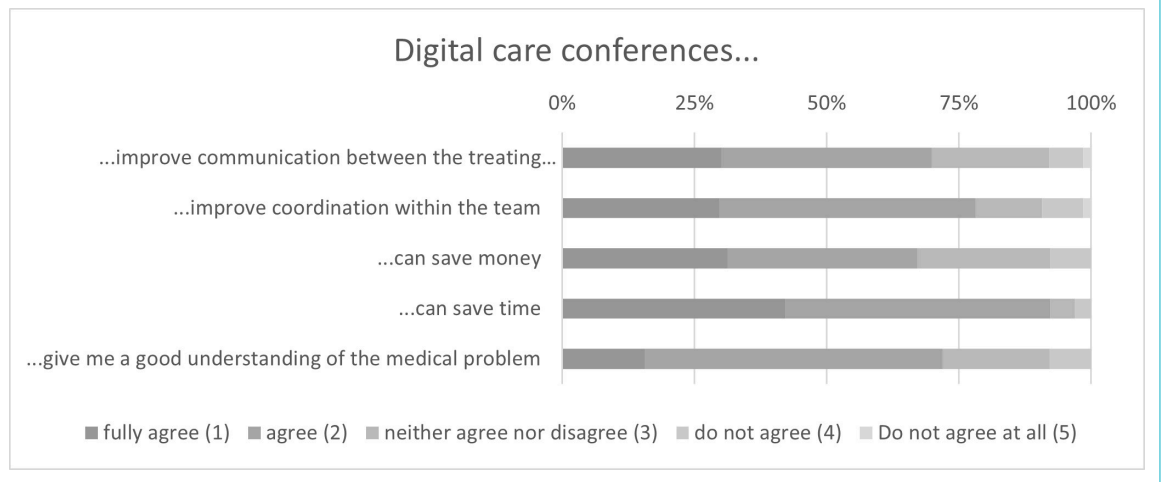


Figure S7: Preference for leadership of the digital care conference by specialist PC HCP (n = 47, one missing) vs. general PC HCP (n = 16, two missing).

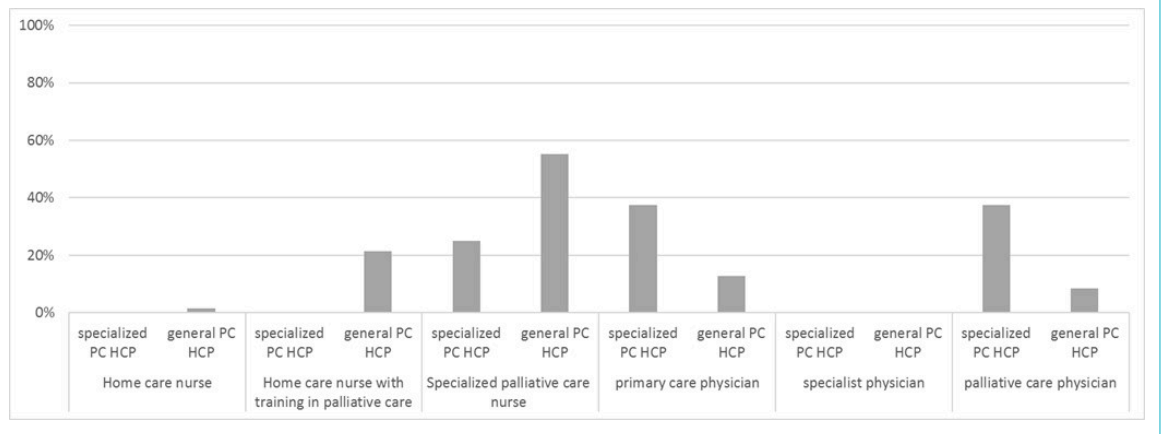


Figure S8: Preference for leadership of the digital care conference by nurses vs physicians.

