

BMJ Open Addressing palliative care and end-of-life issues in patients with advanced cancer: a systematic review of communication interventions for physicians not specialised in palliative care

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ABSTRACT

Objective To identify and summarise evaluated interventions aiming to improve the communication of palliative care (PC) and end-of-life (EoL) issues in physicians caring for cancer patients. Such interventions are needed with regard to the aim of an earlier communication of those issues in oncology daily practice, which is associated with a range of benefits for patients and caregivers but is often impeded by physicians' communication insecurities.

Design Systematic review based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines.

Data sources Relevant publications were systematically searched in MEDLINE, PsycINFO, CINAHL and Web of Science databases in September 2020 with an update in July 2021.

Eligibility criteria We included publications reporting a quantitative evaluation of a communication intervention on one or more PC/EoL issues with a communication-related main outcome. Target group had to be physicians caring for cancer patients non-specialist in PC.

Data extraction and synthesis Two independent raters extracted intervention characteristics, publication characteristics and publication quality. Results were narratively synthesised.

Results 24 publications reporting 22 interventions were included. 13 publications reported randomised controlled trials. A majority of the interventions addressed one specific PC/EoL issue, most often breaking bad news. Teaching strategies mostly involved role-plays. Target group were mainly oncologists. In addition to self-reported outcome measurements for evaluation, most publications also reported the use of external rating data. All but one publication reported significant intervention effects on at least one outcome parameter. Publication quality was overall moderate.

Conclusions The empirically tested communication interventions on PC/EoL issues seem to effectively improve physicians' communication. Future interventions should focus on other issues than breaking bad news, such as preparing for the future. Target group should also be

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This systematic review was built on a comprehensive database search.
- ⇒ Intervention and publication characteristics were narratively summarised and concisely displayed based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines.
- ⇒ We used the Effective Public Health Practice Project Quality Assessment Tool to assess risk of bias of the included publications.
- ⇒ Due to heterogeneity of the publications, a quantitative meta-analysis was not possible.
- ⇒ A publication bias in favour of significant results is possible and some unpublished studies might have been missed.

organ-specific oncologists, as all primary caring physicians are responsible for timely communication. Our risk-of-bias assessment revealed some weaknesses, indicating that more high-quality studies for evaluation are needed.

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INTRODUCTION

Physicians caring for patients with advanced cancer should communicate early about issues related to palliative care (PC) and the end of life (EoL). Important components include, for example, talking about goals of care, advance care planning, eliciting personal values, preparing for the future or involving caregivers.¹

Several studies indicate that an early communication about these issues brings a range of benefits to patients, caregivers and the healthcare system,²⁻⁷ as this is associated with improved symptom control, increased quality of life, better acceptance of their incurable illness leading to premature dying and a decrease of caregivers' burden. Besides, EoL

conversations are associated with less aggressive medical care at the very EoL, less admissions to the intensive care unit as well as earlier hospice referrals.^{6 7}

Also patients themselves often prefer an early and clear communication and consider this as essential for their personal EoL care.⁸ The majority prefers an early and honest conversation about their prognosis and EoL issues.^{9–12} A timely communication enables them to participate more actively in treatment decisions, to avoid inadequate treatments, to set own individual priorities and to prepare themselves for death.¹³ It also enables them access to specialised PC services, which is essential with regard to the high PC needs of oncological patients.¹⁴

Previous studies demonstrated that conversation about PC/EoL issues usually occur too late, that is, when patients are no longer able to decide for themselves or already are in crisis.¹⁵ Although according to different guidelines—such as the ones from the American Society of Clinical Oncology Clinical Practice—the primary caring oncologist is responsible for addressing these issues,^{16 17} they often fail to do so in daily clinical practice.¹⁵

Major barriers to timely discussion of the aspects are communication insecurities of the caring physicians, who seem to avoid these conversations.^{18 19} Indeed, addressing the EoL is considered the most stressful and uncomfortable part of oncological care.²⁰ Physicians report, for example, the fear of causing stress or destroying hope when addressing these issues.^{10 20–22} Additionally, previous personal traumatic experiences might be responsible,¹⁸ as well as own attitudes and fears towards death.^{23 24} Besides those personal and individual reasons, a lack of physicians' knowledge about early communication of PC/EoL issues represents a barrier. A systematic scoping review on advance care planning in practice, for example, found that advance care planning often fails due to the absence of professionals' awareness about initiating it at an early stage.²⁵ Lastly, also a deficiency of physicians' training in EoL communication seems to be crucial for those rare conversations.²⁶

Hence, evidence-based interventions to reduce communication barriers regarding PC/EoL issues are needed. As in cancer care the primary caring (organ-specific) oncologist is supposed to provide primary PC and to communicate these aspects, those interventions should target non-palliative-care specialists.

A range of communication skills trainings in oncological settings already exist and previous reviews have summarised and evaluated their effectiveness.^{27 28} Two existing systematic reviews including studies published up to December 2015 already focused on EoL communication interventions for generalist PC providers, but without restriction to trainings explicitly targeting physicians.^{29 30} In fact, in these reviews only 30% of the interventions were designed for physicians^{29 30} and those and other reviews on such interventions do not focus on the oncological setting.^{29–33}

So far, there is little evidence on PC/EoL communication interventions specifically designed for the oncology

physicians' perspective. With regard to the aim of an earlier communication of PC/EoL issues in oncology daily practice, which is the main responsibility of the primary caring physician, an overview on those interventions is essential. This will enable conclusions for the need, the design and the evaluation of future interventions on strengthening physicians in early communication, which will then in turn lead to a significant improvement of advanced cancer care. Against this background, the objective of this study is to systematically review the evidence on communication interventions for oncologists or organ-specific physicians who are not specialised in PC that focus one or more communication issues relevant to PC and the EoL.

METHODS

In order to provide a complete and transparent reporting, our systematic review was developed based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (online supplemental material S1).^{34 35} The review protocol published in the International Prospective Register of Systematic Reviews (PROSPERO) is presented in online supplemental material S2.

The research questions of this systematic review were developed based on the PICO criteria ('Participants', 'Interventions', 'Comparison', 'Outcome').³⁶ As we included publications independent of the presence or absence of a comparison group, we specified all but the criterion comparison (C). This resulted in the following research questions that this article addresses:

1. Which communication interventions on PC/EoL issues for physicians caring for cancer patients were evaluated and published?
2. What are the aims of the interventions, how are they structured and how is the content conveyed?
3. Which specific PC/EoL issues do they address?
4. Which communication-related outcome measurements are used?
5. What effects of the interventions are reported?

Eligibility criteria

The inclusion criteria regarding the publication characteristics were: (1) German or English language, (2) accessibility of full text, (3) published in a peer-reviewed journal, (4) primary research (eg, no intervention descriptions, study protocols or review articles), (5) studies that provide a (partly) quantitative evaluation of an intervention and (6) studies with a communication-related main outcome.

With regard to the study participants, the following criteria had to be met: (1) physicians caring for cancer patients (oncologists or organ-specific specialists such as gynaecologists or urologists), (2) not more than 20% PC specialists unless specialists and non-specialists were reported separately (defined according to procedures in the systematic reviews of Brighton *et al* and Selman *et al*^{29 30}), (3) no medical students or healthcare professionals other

than physicians unless they were reported separately, (4) no joint interventions for physicians and patients unless the results of the physicians were reported separately. The inclusion in case of a separate reporting of the physicians in the above cases was considered acceptable, as the effect of the intervention on the target group of this review could then be extracted separately.

Finally, the inclusion criteria regarding the intervention were: (1) main focus on improving communication, (2) intervention on one or more PC/EoL issues, (3) designed for oncological setting and (4) no paediatric context. Inspired by Back, who summarised central patient-clinician communication issues in PC¹ from different systematic reviews and guidelines such as the ones from the American Society of Clinical Oncology,³⁷ we defined the following PC/EoL issues:

- ▶ Preparing for the future.
- ▶ Talking about death and dying.
- ▶ Talking about transition to PC/introducing PC.
- ▶ Talking about prognosis
- ▶ Discussing goals of care.
- ▶ Supporting or involving family caregivers
- ▶ Preparing for the future.
- ▶ Eliciting values.
- ▶ Dealing with emotions/giving emotional support.
- ▶ Breaking bad news/discussing serious news.
- ▶ Advance care planning.
- ▶ Talking about advance directives.
- ▶ Shared decision making (in an oncological context).

Search

We conducted our search in MEDLINE (via OVID), PsycINFO (via OVID), CINAHL (Cumulative Index to Nursing and Allied Health Literature) and Web of Science up to September 2020. An update of the search was conducted in July 2021. There were no restrictions on year of publication or geographical location. The search strategy is displayed in online supplemental material S3. We conducted additional hand searches in reference lists of relevant papers and earlier reviews to identify further suitable articles.

Study selection

In a first step, the first author (NH) removed duplicates and screened the titles and abstracts identified within the searches. Second, the first author (NH) and another member of the research team (HMR) independently screened the full texts with a screening form according to the predefined inclusion and exclusion criteria. Disagreements were resolved by consensus after discussion. Excluded papers were listed and reasons for exclusion were documented.

Data extraction and quality assessment

Data of the selected publications were independently extracted by two authors (NH and HMR) using a data extraction form. The form included the following information, which was sought from all articles: publication

characteristics (authors, year, title, language, country), methods (study design, sample size, participants, communication-related outcome parameters), the investigated intervention (name of intervention, target group, setting, aim, content/learning activities) as well as the reported effect of the intervention. After a comparison of the two independently completed data extraction forms and a discussion of disagreements, all the above information was tabulated for each publication.

Above that, the two raters (NH and HMR) independently assessed the quality of the included articles by means of the Effective Public Health Practice Project Quality Assessment Tool (EPHPP).^{38,39} The instrument assesses information on six aspects: selection bias, design, confounders, blinding, data collection methods as well as withdrawals and drop-outs. Based on the rating of these components (strong, moderate or weak), the findings were summed up to a final grade (strong, moderate or weak). Disagreements between the raters were resolved by consensus after discussion.

Information regarding study characteristics as well as intervention characteristics was tabulated.

Data synthesis

We conducted a narrative synthesis of the results, as the methodological and statistical heterogeneity of the publications allowed no quantitative synthesis.⁴⁰ In doing so, the recommendations of the Cochrane Consumers and Communication Review Group were respected.⁴¹

Patient and public involvement

No patient involved.

RESULTS

Publication selection

The initial database searches yielded a total of 957 records. An additional 17 publications were identified through handsearch (via reference lists, etc). After removal of duplicates, a total of 462 abstracts and titles were screened. The screening process retrieved 105 potentially relevant papers, which were subsequently full-text assessed for eligibility. This resulted in 22 articles that were initially included in this review. The reasons for exclusion of all full-text screened papers are displayed in [figure 1](#). Five publications appeared to meet the inclusion criteria but were excluded because the reported interventions targeted more general communication skills of physicians working in oncology rather than having a focus on PC/EoL issues.^{42–46}

Two more articles were identified through a rerun of database searches in July 2021. Thus, a total of 24 articles were included in the qualitative synthesis. An overview of the publication selection process is illustrated in the PRISMA flow diagram ([figure 1](#)).

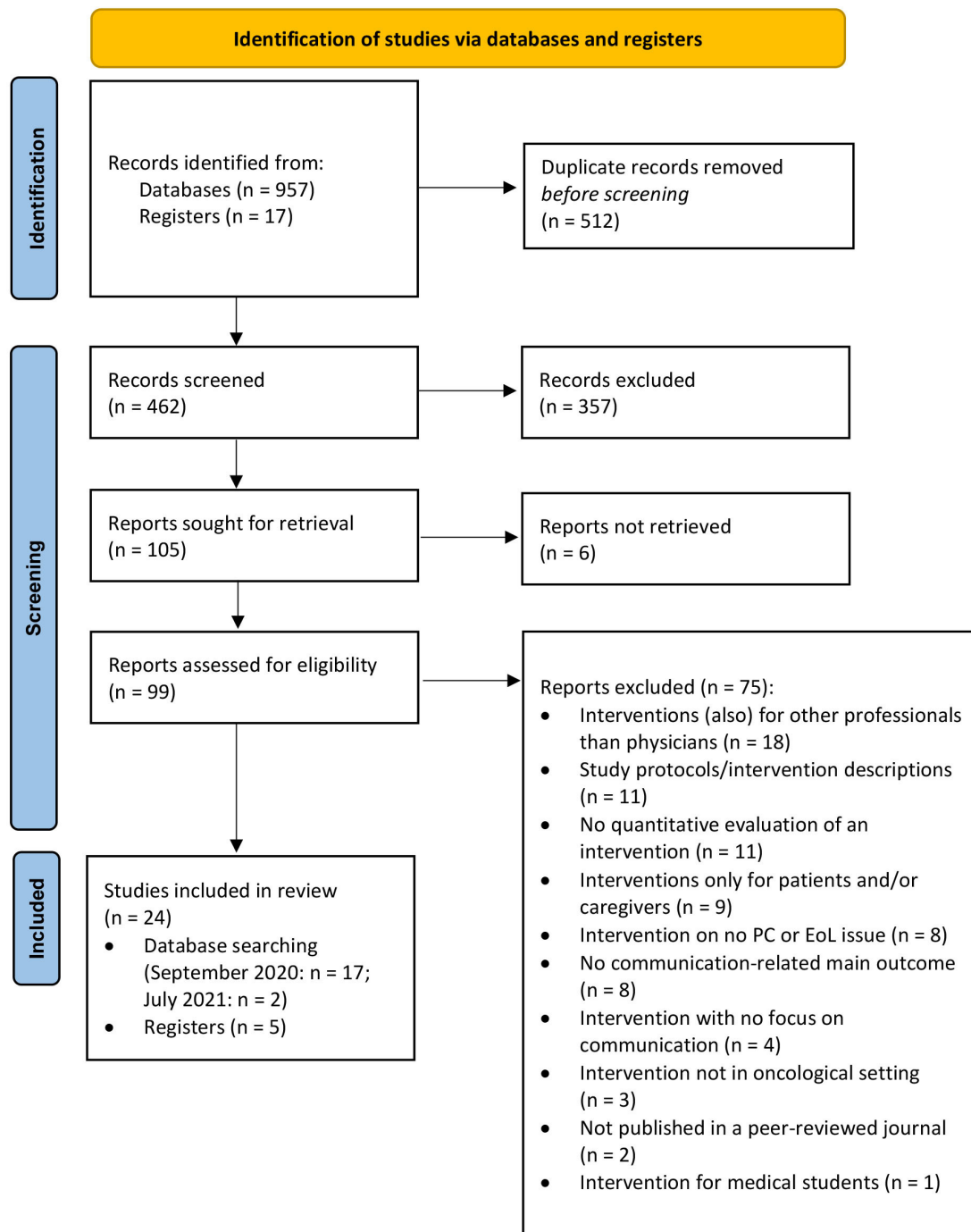


Figure 1 PRISMA 2020 flow diagram of the systematic literature search. EoL, end-of-life; PC, palliative care; PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

Publication and intervention characteristics

Across the 24 included publications, 22 different interventions were evaluated. Two interventions were evaluated in two publications each.^{47–50} Two times, an adapted version in form of one submodule or one workshop of an intervention reported in another publication was investigated.^{51 52}

Publication characteristics

An overview of the relevant publication characteristics is provided in [table 1](#). The included articles were published

between 1999⁵³ and 2021.⁵⁰ Half of them are from North America (n=12), followed by Europe (n=6), Asia (n=5) and Australia (n=1). Thirteen publications reported randomised controlled trials (RCTs).^{47–50 54–62} The remaining 11 papers reported uncontrolled intervention studies with at least two measurement time points (pre and post).^{51–53 63–70} The sample size ranges from n=10^{61 63} to n=383⁷⁰ studied physicians. However, the majority (n=20 articles) reported sample sizes of less than 70 participating physicians. In the majority of the publications

Table 1 Overview of publication characteristics in N=24 publications on N=22 communication interventions for physicians

Name of the intervention	Publication (country)	Study design (groups; measurement time points); sample size	Target group
An Illness-Trajectory Communication Curriculum	Cannone <i>et al</i> 2019 (USA) ⁶⁶	Uncontrolled intervention study (IG; pre, post—2 weeks after the last module); N=22	Multispecialty oncology residents and fellows
Avatar-mediated training in a virtual world	Andrade <i>et al</i> 2010 (USA) ⁶³	Uncontrolled intervention study (IG; pre, post—directly after the intervention); N=10	Geriatric and internal medicine fellows
Belgian Interuniversity Curriculum-communication skills training (BIC-CST)	Liénard <i>et al</i> 2010 (Belgium) ⁶⁰	Randomised controlled trial (IG, CG; pre, post—after 8 months); N=98	Medical residents working with cancer patients
Brief Breaking Bad News (BBN) CST module	Gorniewicz <i>et al</i> 2017 (USA) ⁵⁸	Randomised controlled trial (IG, CG; pre, post—within 1 month after pre); n=38 (plus n=28 separately reported students)	Residents of family medicine and internal medicine and medical, nursing or pharmacy students (reported separately)
CST	Butow <i>et al</i> 2008 (Australia) ⁵⁴	Randomised controlled trial (IG, CG; pre, post—shortly after the intervention, follow-up—12 months after pre); N=30	Medical and radiation oncologists
CST	Baile <i>et al</i> 1999, (USA) ⁵³	Uncontrolled intervention study (IG; pre, post—directly after the workshop); N=29 (thereof n=17 in workshop one and n=12 in workshop 2)	Oncologists and oncology fellows
CST ⁵³ -adapted version (workshop on BBN)	Fujimori <i>et al</i> 2003 (Japan) ⁵¹	Uncontrolled intervention study (IG; pre, post—directly after the workshop, follow-up—3 months later); N=58	Oncologists
CST based on patients preferences	Fujimori <i>et al</i> 2014 (Japan) ⁵⁶	Randomised controlled trial (IG, CG; pre, post—2 weeks after pre); N=30	Oncologists
CST workshop	Yamada <i>et al</i> 2018; (Japan) ⁷⁰	Uncontrolled intervention study (IG; pre, post—directly after the workshop, follow-up—after 3 months); N=383	Oncologists with three or more years of clinical experience in oncology
Communication training in oncology	Lenzi <i>et al</i> 2011 (USA) ⁶⁸	Uncontrolled intervention study (IG; pre, post—directly after the training); N=57	Senior oncologists
COM-ON-p (communication in oncology-transition to palliative care)	Goelz <i>et al</i> 2011 (Germany) ⁵⁷	Randomised controlled trial (IG, CG; pre, post—5 weeks after pre); N=41	Oncologists (haematology, oncology, gynaecology, surgery)
Comskil Training Curriculum	Bylund <i>et al</i> 2010 (USA) ⁶⁵	Uncontrolled intervention study (IG; pre, post—not stated when); N=36	Physicians and surgeons being future facilitators of the training (train-the-trainer)
Comskil Training Curriculum ⁶⁵ —adapted version (module on discussing prognosis)	Brown <i>et al</i> 2010 (USA) ⁵²	Uncontrolled intervention study (IG; pre, post—directly at the end of the intervention); N=142	Multispecialty fellows and physicians working in oncology setting
Goals-of-Care communication skills and coaching intervention (INT)	Annadurai <i>et al</i> 2021 (USA) ⁵⁰	Randomised controlled trial (IG, usual care; pre, post—after 6 months); N=22	Solid tumour oncologists
	Bickell <i>et al</i> 2020 (USA) ⁴⁹	Randomised controlled trial (IG, usual care; pre, post—after 6 months); N=22 physicians, N=265 patients	Solid tumour oncologists and patients with a <2 years life expectancy
Interact-Cancer (computer-assisted instruction programme)	Hulsman <i>et al</i> 2002 (Netherlands) ⁶⁷	Uncontrolled intervention study (IG; participants divided into implementers vs non-implementers based on self-reported motivation; four measurement time points at intervals of 4 weeks: T1 (pre), T2, T3, T4 (intervention between T2 and T3); N=21	Medical oncologists
Integrating simulation model with art-based teaching strategies	Yakhforosha <i>et al</i> 2018 (Iran) ⁶⁹	Uncontrolled intervention study (IG; 3 pre and three post measurements within 2 weeks intervals); N=19	Medical oncology fellows
Oncotalk	Back <i>et al</i> 2007 (USA) ⁶⁴	Uncontrolled intervention study (IG; pre, post—directly after the 4-day intervention); N=115	Oncology fellows

Continued



Table 1 Continued

Name of the intervention	Publication (country)	Study design (groups; measurement time points); sample size	Target group
Patient-Centred Communication Intervention (VOICE)	Epstein <i>et al</i> 2017 (USA) ⁵⁵	Randomised controlled trial (IG, CG; pre, post—not stated when); N=38 physicians, N=265 patients	Medical oncologists and their patients
Posttraining Consolidation Workshops after a basic training programme	Delvaux <i>et al</i> 2005 (Belgium) ⁴⁸	Randomised controlled trial (IG receiving basic programme and consolidation workshop, waitlist CG receiving only basic programme; baseline—before basic programme, post—after consolidation workshops of IG, 5 months after baseline); N=62	Multispecialty physicians working with cancer patients
	Razavi <i>et al</i> 2003 (Belgium) ⁴⁷	Randomised controlled trial (IG receiving basic programme and consolidation workshop, waitlist CG receiving only basic programme; baseline—before basic programme, post—after consolidation workshops of IG, 5 months after baseline); N=62	Multi-specialty physicians working with cancer patients (oncology, radiotherapy, gynaecology, etc)
SCOPE (Studying Communication in Oncologist-Patient Encounters) CD-ROM	Tulsky <i>et al</i> 2011 (USA) ⁶²	Randomised controlled trial (IG, CG; pre, post—within 1 month after the intervention); N=48	Medical, gynecologic and radiation oncologists
Training Oncologists and Empowering Patients in Effective Communication During Medical Consultations in Singapore	Malhotra <i>et al</i> 2019 (Singapore) ⁶¹	Randomised controlled trial (IG, CG; pre, post—not stated when); N=10 physicians, N=60 patients	Oncologists and their patients
Training on Shared Decision-Making About Palliative Chemotherapy	Henselmans <i>et al</i> 2019 (Netherlands) ⁵⁹	Randomised controlled trial (IG, CG; pre, post—after 4 months); N=31	Medical oncologists and oncologists-in-training

CG, control group; IG, intervention group; n. s., not significant; SP, simulated patients.

(n=14), the target group were oncologists (medical, surgical and radiation oncologists).^{49 50 53–56 59 61 64 66–70}

In eight publications, the study participants were multi-specialty physicians working in oncology (oncologists and organ-specific physicians)^{47 48 51 52 57 60 62 65} and two exclusively targeted physicians other than oncologists.^{58 63} Bylund *et al* reported a train-the-trainer intervention, thus the target group were future facilitators of the training.⁶⁵

Intervention characteristics

The interventions were conducted in very different settings. While four interventions were carried out only virtual,^{58 61 63 67} a majority (n=18) was carried out at least partly in person^{47–57 59 60 62 64–66 68–70} (table 2; detailed description in online supplemental material S4). The length ranged from short and individual computer-assisted trainings or videos^{58 61 63 67} to multiple hour^{51–53} or multiple day workshops.^{56 64 68} Some interventions (n=6) consisted of basic group sessions plus follow-up appointments such as individual coaching sessions, consolidation workshops, video conferences or phone calls.^{47–50 54 55 57 59} Half of the reported interventions (n=10) lasted more than 1 day or consisted of several hours spread over a longer period of time, that is, weeks or months.^{47 48 54 56 57 60 64–66 68 70} Two interventions included also a patients' coaching or a communication aid for them.^{55 61} Delvaux *et al* and Razavi *et al*—reporting on the same study—tested explicitly the efficacy of consolidation workshops following a basic training programme.^{47 48}

The interventions focused on communication about a variety of PC/EoL issues. While 10 interventions targeted more than one PC/EoL issue,^{47 48 53 55 61 64–68 70} 12 interventions focused on just one issue.^{49–52 54 56–60 62 63 69} The most frequently addressed PC/EoL issue was breaking bad news (n=14),^{47 48 51 53 56 58 60 63–70} followed by dealing with emotions (including subtopics such as showing empathy, managing reactions to illness, dealing with denial, anger; n=10).^{47 48 53–55 61 62 65 67 68 70} Talking about prognosis was addressed four times^{52 55 61 65} and other issues, such as goals of care discussions^{49 50 61} or interacting with relatives,^{47 48 66} were targeted in three or less interventions.

The didactic approach and the content of the described interventions vary widely. The largest overlap regarding the theoretical basis of the curriculum represented the SPIKES protocol, a protocol suggesting a six-step approach to deliver bad news.⁷¹ SPIKES stands for (1) 'Setting up the interview', (2) 'assessing the patient's Perception', (3) 'making an Invitation to disclose the news', (4) 'sharing the Knowledge about the news', (5) 'responding to patient's Emotion', (6) 'Summarise the plan'.⁷¹ In six interventions, the communication skills were taught based on this approach.^{49–51 53 63 66 69} With regard to learning activities, the most frequently used training method was the conduction of practical role-plays, which were part of 16 of the reviewed interventions.^{47–54 56 57 59 60 64–66 68–70} Those were carried out with simulated patients in eleven

Table 2 Overview of intervention characteristics (N=22 interventions evaluated in N=24 publications)

Name of the intervention	Setting			Duration			Addressed PC/EoL issue			Learning activities/didactics								
	Virtual	In person	5	Up to 1 day	More than 1 day	Spread over weeks/months	Breaking Bad News (BBN)	Dealing with emotions/managing reaction	Prognosis	Other	9	16	19	Didactic lecture (by staff or computer-based)	Role play	Example videos	Other	
																		18
No of trainings fulfilling the criteria (n)																		
An Illness-Trajectory Communication Curriculum ⁶⁶		x			x	x	x								x	x		x
Avatar-mediated training in a virtual world ⁶³	x			x			x								x			x
Belgian Interuniversity Curriculum-communication skills training (CST) ⁶⁰		x		x	x	x	x								x	x		x
Brief BBN CST module ⁵⁸	x			x			x									x		x
CST ⁵⁴		x			x	x	x								x	x		x
CST ⁵³		x		x			x								x	x		x
CST ⁵³ -adapted version of the workshop on BBN ⁵¹		x		x			x								x	x		x
CST based on patients preferences ⁵⁶		x			x		x								x	x		x
CST workshop ⁷⁰		x			x		x								x	x		x
Communication training in oncology ⁶⁸		x			x		x								x	x		x
COM-ON-p (communication in oncology-transition to palliative care) ⁵⁷		x			x		x								x	x		x
Comskil Training Curriculum ⁶⁵		x			x		x								x	x		x
Comskil Training Curriculum ⁶⁵ – adapted version (module about discussing prognosis) ⁵²		x			x		x								x	x		x
Goals-of-Care communication skills and coaching intervention ^{49,50}		x			x		x								x	x		x
Interact-Cancer (computer-assisted instruction programme) ⁶⁷		x			x		x								x	x		x
Integrating simulation model with art-based teaching strategies ⁶⁹		x			x		x								x	x		x
Oncotalk ⁶⁴		x			x		x								x	x		x
Patient-Centred Communication Intervention (VOICE) ⁵⁵		x			x		x								x	x		x
Posttraining Consolidation Workshops after a basic training programme ^{47,48}		x			x		x								x	x		x
SCOPE (Studying Communication in Oncologist-Patient Encounters) CD-ROM ⁶²		x			x		x								x	x		x
Training Oncologists and Empowering Patients in Effective Communication During Medical Consultations in Singapore ⁶¹		x			N/A		N/A								x	x		x
Training on Shared Decision-Making About Palliative Chemotherapy ⁵⁹		x			x		x								x	x		x
EoL, end-of-life; N/A, not available; PC, palliative care.																		

interventions,^{52 54 56 57 59 64–66 68–70} Fifteen interventions included a lecture held by a facilitator,^{47–54 59–62 64–66 68 69} whereas in four interventions the theoretical input was computer-based.^{56 63 67 70} In about one-third of the interventions (n=7), videos of ‘ideal’ conversations were presented.^{52 54 58 59 61 65 67} In some interventions, the facilitators gave individual feedback on real patient encounters, for example, in form of a coaching or by discussing a taped conversation (n=4).^{49 50 59 61 62} Two times the facilitators conducted face-to-face meetings following the intervention to discuss and transfer individual learning goals into daily routine.^{57 66}

Outcome measurements and intervention effects

Outcome measurements

The reviewed articles reported different communication-related outcome measurements and methods to evaluate the intervention. Those are displayed in [table 3](#). While six of the included publications describe only self-reported data for evaluation,^{51–53 63 68 70} the majority (n=18) also included objective, externally assessed outcome measurements.^{47–50 54–62 64–67 69} With one exception,⁶⁹ all objective outcome measurements were assessed by an external rating of pre and post videotaped or audiotaped clinical encounters of the participating physicians.^{47–50 54–62 64–67} In four articles, the rating was conducted based on transcripts of the audiotapes.^{47 48 60 61} Only Yakhforosha *et al* carried out the rating simultaneously during an outpatient consultation.⁶⁹ Gorniewicz *et al* and Cannone *et al* used videotaped objective structured clinical exams for their ratings, a commonly used evaluation tool for physicians.^{58 66} The clinical encounters were either conducted with simulated patients (n=9),^{24 54 56–58 60 64 66 69} real patients (n=7)^{49 50 55 61 62 65 67} or both (n=2).^{47 48} Rating was mostly conducted through study staff (n=17).^{47–50 54–57 59–62 64–67 69} In six articles, the authors also collected rating data from of the (simulated) patients’ perspective^{47–49 62 66 69} and in one case only the simulated patients represented the raters.⁵⁸

With regard to the applied measurement instruments and outcome parameters, the publications varied widely. The most frequently assessed outcome parameter was interpersonal empathy or responsiveness to emotions, which was assessed with at least one scale in 21 articles (88 %).^{47–51 53–62 64–67 69 70} In four papers, the authors rated empathy based on the NURSE-statement,⁷² a commonly used approach to measure empathic expressions (‘Naming’, ‘Understanding’, ‘Respecting’, ‘Supporting’ and ‘Exploring’).^{49 50 62 64} Over one-third of the articles reported an external rating based on the steps of the SPIKES protocol^{49 50 64 66 69} or other protocols on breaking bad news.^{56 58 60 69} In five publications, the authors used self-developed coding systems on specific communication skills such as ‘transition to PC’⁵⁷ or ‘informing about prognosis’.^{54 55 57 65 67} The self-assessment data mostly referred to constructs like perceived confidence or comfort level,^{51–53 56 66} self-efficacy in communicating

the respective topic^{63 68} or a retrospective evaluation of a patient encounter.^{47 48 59}

Taken together, in less than half of the publications (n=10), the authors made use of existing, valid and reliable measurement instruments,^{47–50 58 59 63 67 69 70} which were then in most cases combined with further self-developed items or questionnaires.^{47–50 58 59 67} In eight papers, the authors created a study-specific rating system and reported acceptable inter-rater reliabilities^{54 56 57 64 65 67} or other reliability data.^{55 66}

In seven publications, also outcome parameters non-related to communication were assessed.^{47 49 51 54–56 61} Those were among others patient-related outcomes such as distress, anxiety or quality of life or physician-related outcomes such as stress or burnout levels. Bickell *et al* also assessed the utilisation of aggressive care at the EoL.⁴⁹

Intervention effects

The reported effects of the interventions are displayed in [table 3](#). With regard to the externally assessed outcome measurements, 11 of the 24 articles reported a significant improvement in externally rated empathy or responsiveness to emotions.^{47 55 56 58–62 64 66 70} Eight articles, on the other hand, reported no significant improvement in this regard.^{48–50 54 57 65 67 69} Almost half of the publications (n=11) reported a significant improvement in global communication skills (such as question type, assessment skills or engaging patients in consultations).^{47 48 55 57–60 65–67 69} The externally rated quality of the breaking bad news process according to different protocols improved in five of eight publications in at least some steps.^{56 58 64 66 69}

Also, some papers reported significant effects on specific communication skills related to the PC/EoL issues that the intervention addresses. Two publications on the same intervention, for example, reported a positive impact of their goals-of-care intervention on eliciting patient values.^{49 50} Goelz *et al* found a significant positive effect of their intervention targeting the transition to PC on communicating the transition to PC and involving significant others.⁵⁷ Two articles reported an increase in the discussion of prognosis after the intervention,^{55 61} one of which also reported an increase in discussing treatment choices.⁵⁵ Henselmans *et al* reported a positive impact of their intervention targeting shared decision making about palliative chemotherapy on the emergence and the quality of shared decision making within the consultations.⁵⁹

With regard to self-reported outcome measures, significant improvements were reported on empathy,^{51 53 69} confidence/comfort level in communication^{51 53 56 66} as well as the perceived self-efficacy.⁶³ One publication reported only trends but no significant effects of their intervention.⁵⁴

The effects on the outcome parameters non-related to communication can only be described exemplarily within this review, as we focus on the communication-related outcomes. Here it is worth mentioning that in the articles reporting physician-related outcomes, the interventions did not succeed in reducing burnout or stress level^{51 54} or aggressive care at the EoL.⁴⁹

Table 3 Overview of outcome measurements and intervention effects in N=24 publications

Publication	(1) Communication-related outcome measurements; (2) effects of the intervention
Cannone <i>et al</i> 2019 ⁶⁶	(1) External rating of 6 domains of communication skills in OSCE-scenarios by faculty members and SP via a self-developed instrument based on SPIKES protocol, self-reported perceived readiness and comfort level; (2) Sign. improvement in global communication skills and positive changes in some subcategories rated by faculty members ('emotion and empathy', 'delivering phase of breaking bad news' (BBN), isolated items of other domains), increased comfort level in all areas.
Andrade <i>et al</i> 2010 ⁶³	(1) Self-reported self-efficacy via the self-efficacy Affective Competency Score; ⁸⁶ (2) Sign. improvement of self-efficacy.
Liénard <i>et al</i> 2010 ⁶⁰	(1) Quantitative analyses of physicians' utterances regarding assessment, support and information type in transcripts of audiotaped SP encounters via a communication content analysis software, external rating of 3 phases of the BBN-process; (2) Significantly more open questions, open directive questions and empathy as well as a sign. decrease in the amount of given information in IG; BBN process: IG allocated more time to the predelivery phase and less time to the delivery phase and delivered bad news more precisely.
Gorniewicz <i>et al</i> 2017 ⁵⁸	(1) External rating of 5 domains of BBN skills in videotaped SP-OSCE-sessions via a BBN rating form checklist by SP, external rating of 5 general communication skills via the Common Ground Assessment Summary form ⁸³ by SP; (2) Sign. intervention effect on 3 BBN domains: 'BBN', 'communication related to emotions' and 'after BBN, determines patient readiness to proceed and communication preferences', significant intervention effect on four general communication skills ('active listening', 'addressing feelings with patients', 'closing the interview' and 'global interview performance').
Butow <i>et al</i> 2008 ⁵⁴	(1) External rating of 10 key doctor behaviours and the number of predetermined patient concerns plus the degree to which they were adequately addressed in videotaped SP encounters via a self-developed instrument; (2) Trend of IG to show more creating environment and fewer blocking behaviours than the CG (n.s.).
Baile <i>et al</i> 1999 ⁵³	(1) Self-reported confidence in communication regarding BBN and difficult patient situations via self-developed items; (2) Workshop 1 (BBN): significant improvement of confidence in 18 of 21 items; workshop 2 (managing difficult patient situations): sign. improvement of confidence in 11 of 45 items.
Fujimori <i>et al</i> 2003 ⁵¹	(1) Self-reported confidence in communication with patients regarding BBN via items developed by Baile <i>et al</i> , ⁵³ (2) Sign. improvement of confidence in 20 of 21 items at post and follow-up.
Fujimori <i>et al</i> 2014 ⁵⁶	(1) External rating of 4 communication domains in videotaped SP encounters via a self-developed rating system based on the SHARE protocol on BBN, ⁸⁵ self-reported confidence in communication via items related to SHARE and the confidence questionnaire by Baile <i>et al</i> , ⁵³ self-reported patients' satisfaction with consultation and trust in oncologist via self-developed items; (2) Sign. intervention effect on 'setting up supportive environment for interview', 'considering how to deliver bad news' and 'providing reassurance/addressing patient's emotions with empathic responses', sign. effect on confidence; no change in satisfaction.
Yamada <i>et al</i> 2018 ⁷⁰	(1) Self-reported intrapersonal empathy via the Jefferson Scale of Physician Empathy (JSPE) ⁸⁷ and the Interpersonal Reactivity Index (IRI); ⁸⁸ (2) Sign. improvement of JSPE total empathy-score and all subscale scores ('perspective taking', 'compassionate care', 'standing in the patient's shoes') at post and follow-up, sign. improvement in 2 of 3 IRI subscales ('perspective taking' and 'personal distress') from pre to follow-up.
Lenzi <i>et al</i> 2011 ⁶⁸	(1) Self-reported data on self-efficacy, use of BBN and communication skills, knowledge on communication skills as well as attitudes via not specified questionnaires; (2) Sign. improvement in 14 of 15 items on used BBN-skills, most of the communication skills items, knowledge questions, attitudes and self-efficacy.
Goelz <i>et al</i> 2011 ⁵⁷	(1) External rating of 3 domains of communication behaviour in videotaped SP encounters via a rating system developed for this purpose (COM-ON-Checklist (communication in oncology-transition)); (2) Sign. intervention effect on all domains: transition to palliative care, global communication skills and involvement of sign. others.
Bylund <i>et al</i> 2010 ⁶⁵	(1) External rating of 6 communication domains in videotaped real patient encounters via the self-developed Comskil Coding System; (2) Sign. improvement in two communication domains ('establishing the consultation framework', 'checking skills') and in five individual items; mediated by amount of modules participated in.
Brown <i>et al</i> 2010 ⁵²	(1) Self-reported confidence about discussing prognosis via two self-developed items; (2) Sign. improvement in both items.
Annadurai <i>et al</i> 2021 ⁵⁰	(1) External rating of 7 core communication skills via an assessment tool based on SPIKES ⁷¹ and NURSE ⁷² statements plus some additional skills in pre and post audio recordings of real clinical encounters; (2) Sign. intervention effect on eliciting patient values, no increase in overall and other communication skills.
Bickell <i>et al</i> 2020 ⁴⁹	(1) Perception and quality of Goals-of-Care (GoC) discussions rated by patients via two self-developed items, external rating of 7 core communication skills via an assessment tool based on SPIKES ⁷¹ and NURSE ⁷² statements (detailed description by Annadurai <i>et al</i> ⁵⁰) and some additional skills in pre and post audio recordings of real clinical encounters; (2) Sign. intervention effect on eliciting patient values, prevalence/quality of GoC communication n.s., overall and other communication skills n.s.

Continued

Table 3 Continued

Publication	(1) Communication-related outcome measurements; (2) effects of the intervention
Hulsman <i>et al</i> 2002 ⁶⁷	(1) External rating of 7 domains of communication behaviour in videotaped real patient encounters via the self-developed Communication Rating System, self-reported patients' satisfaction via the Medical Interview Satisfaction Scale; ⁸⁹ (2) Sign. intervention effect on observed general communication behaviour only in the group identified as 'implementers' (no change in non-implementers); no change in patients' satisfaction.
Yakhforoshha <i>et al</i> 2018 ⁶⁹	(1) External rating of 7 domains of BBN performance during SP encounters in real outpatient setting via the modified BBN-checklist ⁹⁰ (Iranian version of the SPIKES-protocol; ⁷¹ (2) Sign. level changes in three domains of BBN checklist: strategy, knowledge and invitation; longitudinal effects n.s.
Back <i>et al</i> 2007 ⁶⁴	(1) External rating of quality of BBN (based on SPIKES model, ⁷¹ quality of discussing transition to palliative care (based on self-developed 6-step-approach) and empathy (five skills based on NURSE model ⁷² in 2 pre-SP and two post-SP encounters; (2) Sign. improvement in 4 SPIKES-steps regarding BBN, 4 steps regarding the transition to palliative care and 4-5 empathic skills
Epstein <i>et al</i> 2017 ⁵⁵	(1) External rating of 4 communication domains in audio recorded real physician visits via a self-developed instrument (a combination of scales from different existing instruments), self-reported patient-physician relationship, healthcare climate and perceived efficacy in patient-physician interactions by patients and physicians via standardised questionnaires; (2) Sign. intervention effect on three domains: 'engaging patients in discussions', 'responding to emotions' and 'discussions of prognosis and treatment choices', self-reported outcomes n. s.
Delvaux <i>et al</i> 2005 ⁴⁸	(1) External rating of form, function and emotional level of each utterance in transcripts of simulated and real audiotaped three-person-interviews (with patient and relative) via the adapted Cancer Research Campaign Workshop Evaluation Manual with a new scale to identify the addressee of utterances, self-reported retrospective perception of the interview by patient, relative and physician via the Perception of the Interview Questionnaire (unpublished dissertation); (2) Sign. intervention effect on 2 of 16 communication skills ('openness toward patient's and relative's concerns and needs' and 'open assessment skills'; changes toward relatives more modest in actual than in simulated interviews), difference in the number of utterance-addressees n. s., sign. intervention effect on patients' (but not in relatives') perception of the physician's performance.
Razavi <i>et al</i> 2003 ⁴⁷	(1) External rating of form, function and emotional level of each utterance in transcripts of simulated and real audiotaped patient encounters via the adapted Cancer Research Campaign Workshop Evaluation Manual, retrospective perception of the interview via the Perception of the Interview Questionnaire (unpublished dissertation); (2) Basic training effect mainly observable in simulated interviews; consolidation workshops: sign. intervention effect on 3 of 22 communication skills in simulated interviews ('open and open directive questions', 'utterances alerting patients to reality', decrease in 'premature reassurance') and in 4 of 22 skills in actual interviews ('acknowledgments', 'empathic statements', 'educated guesses', 'negotiations'); patients view: physicians' of IG showed significantly better understanding of disease.
Tulsky <i>et al</i> 2011 ⁶²	(1) External rating of number of empathic statements in audiotaped real clinic visits via NURSE statement ⁷² and responses to empathic opportunities via a model by Suchman <i>et al</i> , ⁹¹ postmeasurement of patients' trust and perceptions of their oncologist; (2) IG shows significantly more empathic statements and better responding to empathic opportunities; greater trust of patients whose oncologists were in IG.
Malhotra <i>et al</i> 2019 ⁶¹	(1) External rating of the number of negative emotion expressions via the model of empathic communication by Suchmann <i>et al</i> ⁹¹ and number of empathic responses via self-developed items in pre and post transcripts of real patient encounters, proportion of consultations discussing prognosis and goals of care; (2) Sign. more empathic responses and more discussions about prognosis in IG.
Henselmans <i>et al</i> 2019 ⁵⁹	(1) External rating of shared decision making (SDM) in videotaped SP encounters via the Observing Patient Involvement Scale 12, ⁸⁴ external rating of SDM per stage via a self-developed instrument, external rating of 2 communication skills via self-developed items, self-reported oncologists' satisfaction with communication via oncologist-version of the 5-item Patient Satisfaction Questionnaire; (2) Sign. intervention effect on amount of SDM, improvement in all SDM stages and improvement in both communication skills ('responsiveness to emotions' and 'information provision skills'), no effect on satisfaction with the consultation.

CG, control group; IG, intervention group; n.s., not significant; OSCE, objective structured clinical exams; sign., significant; SP, simulated patients.

Risk of bias

The quality of the studies reported in the 24 publications was assessed using the EPHPP Quality Assessment Tool.^{38 39}

Table 4 provides an overview of the ratings according to the seven categories as well as the global ratings. A great majority of the articles achieved the final grade moderate (n=20) and the remaining four articles achieved the final grade weak. The category with the most frequent weak ratings was the selection bias, which is determined by

the representativeness and the participation rate of the reported study. With the exception of one strong rating,⁷⁰ all articles were rated weak in this regard. In most of those papers, it was the small sample size that was crucial to the poor representability. More than half of the publications received moderate or weak ratings regarding the applied measurement instruments. In eight articles, this was due to unstandardised, self-developed questionnaires or rating systems without evidence on reliability and/or

Table 4 Methodological quality of the included publications (N=24) via the effective public health practice project quality assessment tool

Publication	Selection bias	Design	Confounders*	Blinding*	Data collection methods	Withdrawals and drop-outs†	Global rating
Andrade <i>et al</i> 2010 ⁶³	WEAK	MODERATE	N/A	N/A	STRONG	N/A‡	MODERATE
Annadurai <i>et al</i> 2021 ⁵⁰	WEAK	STRONG	STRONG	MODERATE	STRONG	STRONG	MODERATE
Back <i>et al</i> 2007 ⁶⁴	WEAK	MODERATE	N/A	N/A	STRONG	STRONG	MODERATE
Baile <i>et al</i> 1999 ⁵³	WEAK	MODERATE	N/A	N/A	WEAK	STRONG	WEAK
Bickell <i>et al</i> 2020 ⁴⁹	WEAK	STRONG	STRONG	MODERATE	STRONG	STRONG	MODERATE
Brown <i>et al</i> 2010 ⁵²	WEAK	MODERATE	N/A	N/A	WEAK	N/A‡	WEAK
Butow <i>et al</i> 2008 ⁵⁴	WEAK	STRONG	STRONG	WEAK	MODERATE	STRONG	MODERATE
Bylund <i>et al</i> 2009 ⁶⁵	WEAK	MODERATE	N/A	N/A	STRONG	MODERATE	MODERATE
Cannone <i>et al</i> 2019 ⁶⁶	WEAK	MODERATE	N/A	N/A	MODERATE	STRONG	MODERATE
Delvaux <i>et al</i> 2005 ⁴⁸	WEAK	STRONG	STRONG	MODERATE	MODERATE	STRONG	MODERATE
Epstein <i>et al</i> 2017 ⁵⁵	WEAK	STRONG	STRONG	MODERATE	STRONG	STRONG	MODERATE
Fujimori <i>et al</i> 2003 ⁵¹	WEAK	MODERATE	N/A	N/A	WEAK	STRONG	MODERATE
Fujimori <i>et al</i> 2014 ⁵⁶	WEAK	STRONG	STRONG	MODERATE	MODERATE	STRONG	MODERATE
Goelz <i>et al</i> 2011 ⁵⁷	WEAK	STRONG	STRONG	MODERATE	MODERATE	STRONG	MODERATE
Gorniewicz <i>et al</i> 2017 ⁵⁸	WEAK	STRONG	STRONG	MODERATE	MODERATE	STRONG	MODERATE
Henselmans <i>et al</i> 2019 ⁵⁹	WEAK	STRONG	STRONG	MODERATE	STRONG	STRONG	MODERATE
Hulsman <i>et al</i> 2002 ⁶⁷	WEAK	MODERATE	N/A	N/A	STRONG	MODERATE	MODERATE
Lenzi <i>et al</i> 2011 ⁶⁸	WEAK	MODERATE	N/A	N/A	WEAK	STRONG	WEAK
Liénard <i>et al</i> 2010 ⁶⁰	WEAK	STRONG	STRONG	MODERATE	MODERATE	STRONG	MODERATE
Malhotra <i>et al</i> 2019 ⁶¹	WEAK	STRONG	STRONG	MODERATE	WEAK	STRONG	WEAK
Razavi <i>et al</i> 2003 ⁴⁷	WEAK	STRONG	STRONG	MODERATE	MODERATE	STRONG	MODERATE
Tulsky <i>et al</i> 2011 ⁶²	WEAK	STRONG	STRONG	MODERATE	STRONG	STRONG	MODERATE
Yakhforoshha <i>et al</i> 2018 ⁶⁹	WEAK	MODERATE	N/A	N/A	STRONG	STRONG	MODERATE
Yamada <i>et al</i> 2018 ⁷⁰	STRONG	MODERATE	N/A	N/A	STRONG	MODERATE	MODERATE

*For studies with only one group confounders and blinding was set N/A.

†For studies with only one measurement time point withdrawals and drop-outs was set N/A.

‡No drop-outs possible, as the second measurement point was at the end of the intervention and at the same day as the first measurement point.

N/A, not available; RCT, randomised controlled trial.

validity. In other publications, the authors used existing instruments or items with insufficient information on quality criteria (n=5). None of the papers was rated weak in the category study design, as all of the reported studies were either RCTs (n=11; receiving the rating strong) or cohort studies/interrupted time series (n=11; receiving the rating medium).

The most frequent strong ratings (n=19) were given for withdrawals and drop-outs, a category determined by the follow-up rate. For two articles this rating was set 'N/A', as in their reported study second measurement time point was conducted directly after the intervention on the same day as the first measurement time point, so that a dropout in this case was unlikely.

DISCUSSION

To our knowledge, this is the first systematic review of evaluated communication interventions on PC/EoL

issues for physicians caring for cancer patients. We identified the relevant publications and conducted a narrative synthesis with regard to publication characteristics, setting and didactics of the interventions, the addressed PC/EoL issues, the communication-related outcome measurements as well as the reported effectiveness. Further, the methodological quality of the studies was systematically assessed. We focused on interventions explicitly designed for physicians, as there is profound evidence that a timely and adequate communication of PC/EoL issues via the primary caring (organ-specific) oncologist is of great importance.^{2-7 13 16 17}

We identified 24 publications evaluating 22 different communication interventions. The results revealed a great variety, but also similarities between the publications regarding the reported interventions and the evaluation methods. We found that in a majority of the articles the target group were oncologists, while only one-third of

the studies included both oncologists and organ-specific specialists. We consider this to be too few, as the primary caring physicians of cancer patients in many cases are not specialised oncologists but physicians with other specialisations. Goulart *et al*, for example, found that in 55% of 28,977 studied lung cancer patients in the USA the primary caring physician was specialised in internal or family medicine.⁷³

The most frequently addressed PC/EoL issue in communication interventions is breaking bad news. As guidelines demand for the use of predefined, published frameworks when discussing serious news,³⁷ the high number of existing interventions teaching those is a positive result. Further, it is favourable that dealing with patients' emotions has also been addressed in several interventions, as dealing with emotions represents an important communication deficiency of physicians and at the same time is considered to be one of the most central components of communication in PC.^{1 37} Other crucial PC/EoL communication issues, such as goals of care discussions, eliciting values, involving family caregivers or preparing for the future (including talking about death and dying)¹ have received little attention so far. Notably, none of the evaluated interventions for oncologists addressed the topic of discussing advanced directives. Since important communication guidelines in oncology, such as the consensus guideline from the American Society of Clinical Oncology, strongly recommend to timely discuss those,³⁷ this lack of training is a clinically relevant finding. Further, a majority of the interventions focused on just one specific topic, while only a few covered a wider range of communication issues in the field of PC. Moreover, the intervention setting as well as the length of the interventions differed considerably. A majority of the interventions was time intensive and lasted more than 1 day and one-third of the studies the training included follow-up sessions or individual coaching for consolidation. There is no consistent evidence on the optimal length of communication interventions in oncology.²⁷ Nonetheless, Moore *et al* demand to take into account the high time pressure in healthcare professionals and therefore to conduct communication skills trainings in less on-site time.²⁷

Despite large differences with regard to the setting, the didactics and learning activities used within the interventions were similar. A very commonly used technique were role-plays, often performed with simulated patients. This is in concordance with guidelines and strong empirical evidence confirming the effectiveness of role-plays as a teaching strategy in communication skills trainings.⁷⁴⁻⁷⁶ Another commonly applied teaching method was to present example videos of ideal communication behaviour.

With regard to the outcome measurements, 75% of the publications did not only rely on self-reported data, but also used externally assessed, objective outcome measurements for evaluation. This is commendable, since using different sources of data is an important quality criterion

of evaluating complex interventions.⁷⁷ The objective data were usually assessed by external ratings of the physicians' communication behaviour in videotaped or audiotaped clinical conversations either with simulated or real patients. The most frequently rated parameter was intrapersonal empathy, which seems reasonable, as this is important for all communication issues due to the high level of emotionality in these consultations.¹

All but one article reported significant positive effects of the intervention on at least one outcome parameter, which indicates that the reviewed interventions in general seem to be effective, even though the areas of improvement differ. While almost half of the papers reported a positive impact of the intervention on the competence of empathy, eight of them reported no effect in this regard. A possible explanation for these contradictory results is the great variance in the measurement instruments and the lack of standardised instruments reported within the publications. Several articles reported further improvements in general communication behaviour not directly connected to the PC/EoL issue, such as asking open questions or establishing a framework for the consultation. With regard to more specific aspects of communication, the most frequently reported effects referred to the application of a stepwise approach to deliver bad news, such as the SPIKES protocol.⁷¹ This might be due to the high predefined structure of those protocols and thus an easier operationalisation of the outcome measurements. Numerous further specific changes in subscales were reported. Overall, outcomes assessed by self-reported data improved in almost all of the publications, whereas the effects of externally assessed outcomes were not that unequivocal. In most cases, the improvement was only observed in some of the communication domains or subscales. In about one-third of the articles, less than half of the assessed outcomes revealed a significant change. It can be concluded that the interventions may more easily have a positive impact on self-reported outcomes such as confidence or self-efficacy than on externally rated communication behaviour. This finding is in concordance with other systematic reviews.^{32 78} However, previous findings indicate that self-assessed confidence data are no reliable indicator for competence.⁷⁹ Tulskey *et al* reported a large gap between the self-assessed confidence and the real ability in EoL discussions.^{80 81} Hence, self-report questionnaires seem to be a limited outcome measurement.

The methodological quality of the publications was overall moderate. A majority of the included articles reported RCTs, which reflects a high quality and represents the most robust method to evaluate interventions.⁷⁷ Due to mostly very small sample sizes and low response rates, a frequent methodological weakness was the representability. This indicates a selection bias, probably in favour of physicians that are already more interested in communication. Another frequent methodological limitation was the quality of the assessment tools. Instead of standardised and validated instruments, many

publications reported the use of self-developed items or rating instruments. These findings are consistent with previous reviews claiming methodological weaknesses of the studies and demanding more RCTs and more valid and reliable instruments when evaluating communication interventions in the setting of EoL care.^{27 29–32 78}

Implications

Characteristics and design of future interventions

This systematic review reveals several implications for future communication interventions on PC/EoL issues for physicians. Content wise, those should focus on other aspects than breaking bad news, such as discussing goals of care, preparing for the future or introducing advance directives, because breaking bad news is already sufficiently covered by existing interventions. In addition, interventions need to focus more on strengthening physicians' awareness for the adequate time to communicate the topics. In order to address all primary caring physicians of cancer patients, the target group should be oncologists as well as physicians with other specialisations caring for patients with cancer. Due to the time pressure physicians face, there as well is a need of shorter interventions that are easier to integrate into daily work. Those might include booster sessions for consolidation, as proposed by guidelines on effective communication training strategies in oncology.⁷⁶ Also, Razavi *et al* and Delvaux *et al* found consolidation workshops to be effective^{47 48} and Niglio de Figueiredo *et al* indicate that a higher amount of individual coaching sessions after a communication workshop positively affects the effectiveness of the intervention.⁸²

Characteristics of future studies

Future studies to evaluate the interventions should be designed as methodologically high-quality RCTs. Authors should make use of different sources of data to assess outcomes, but set their focus on the external rating data. Rating data should be assessed via valid, reliable and standardised rating instruments, such as the Common Ground Assessment Summary form⁸³ for general communication skills or the Observing Patient Involvement scale 12⁸⁴ for shared decision making. BBN should be rated via standardised protocols on breaking bad news like SPIKES⁷¹ or SHARE.⁸⁵ However, since the observed communication challenges are often very specific, where appropriate, additional study-specific rating systems should be created. Ideally, those should incorporate or adapt existing rating scales or items, like the developed systems of Fujimori *et al*⁵⁶ or Back *et al*⁶⁴ do. To enhance validity, the study-specific rating systems should be built on an extensive literature research and the development should be presented transparently. An acceptable interrater-reliability can be established through double ratings. Additional self-report questionnaires should be valid, reliable and standardised, such as the self-efficacy Affective Competency Score⁸⁶ to assess changes in self-efficacy through the intervention.

Strengths and limitations

Our systematic review has strengths and some limitations. By publishing a review protocol in advance, we provided transparency of the review process. Also, we conducted and reported our review based on the PRISMA guidelines. To increase objectivity, two independent raters carried out the assessment of full texts for eligibility, the data extraction as well as the quality assessments of the included papers.

Since the methodology of the included publications was too heterogeneous, an important limitation is that we could not conduct a quantitative meta-analysis. Further, we conducted our search in four relevant databases and added a few articles via hand searches in reference lists. Thus, it is possible that we might have missed some publications that were not covered by these databases and which we did not find by additional searches. As we restricted our search to articles published in English or German, we might as well have missed studies published in other languages. Besides, a publication bias in favour of significant results is possible. Lastly, by excluding publications with no communication-related main outcome, it might be that some relevant evaluated interventions in this field were not included. However, setting this focus enabled a more detailed view on how existing interventions actually affect the physicians' communication behaviour. Future systematic reviews should separately report communication-related and non-communication-related outcome measurements.

CONCLUSION

This systematic review provides a detailed overview of existing communication interventions on PC/EoL issues for physicians working in oncology. We found several interventions that seem to effectively improve physicians' communication behaviour. Our results are an important resource for researchers and clinicians planning to develop and evaluate further interventions in this area. An important future focus should be to develop feasible interventions on other PC/EoL issues than breaking bad news, such as goals-of-care discussions or preparing for the future. Due to the benefits of an early communication of PC/EoL issues in oncological care, interventions should also emphasise the adequate timing of communicating these aspects. Target group should be oncologists and organ-specific specialists, as all primary caring physicians are responsible for earlier communication and the latter have not been sufficiently considered in existing interventions. It is important that the effectiveness of the interventions is empirically evaluated within high-quality RCTs using validated instruments and different sources of data.

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HMR, KO and CB. All authors were involved in revising the manuscript substantively, and read and approved the final manuscript.

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