From reactive to proactive: implementing palliative care for patients with COPD

Broese, J.M.C.

Citation

Broese, J. M. C. (2023, October 17). *From reactive to proactive: implementing palliative care for patients with COPD*. Retrieved from https://hdl.handle.net/1887/3643947

Chapter 8

General discussion

Patients with COPD may benefit from palliative care including advance care planning (ACP), because of their severe symptom burden and high mortality rates.[1,2] However, when I started my PhD trajectory, there was little evidence for the effectiveness of palliative care interventions for this patient group specifically.[3,4] Furthermore, it was unclear how palliative care could be organized for this patient group and which requirements could facilitate successful implementation.[5] Therefore, this thesis aimed to study how palliative care for patients with COPD and their informal caregivers could be effectively improved and organized. Several studies with various methodologies were conducted to broaden the knowledge of the effectiveness and process of palliative care integration into COPD care.

In this final chapter of this thesis, I will answer the research questions and critically discuss the methodologies used and implications of the main research findings. Finally, recommendations for clinical practice, education, policy and future research are provided.

Main findings

1. To what degree is palliative care for patients with COPD currently implemented and formalized in primary and secondary care in the Netherlands?
In a survey study (chapter 2), many pulmonologists and general practitioners stated that they frequently talk with patients about topics related to palliative care. They tend to prescribe opioids to treat dyspnea and involve palliative care specialists probably more often than a decade ago, indicating a growing recognition of the importance of palliative care for patients with COPD. Nonetheless, palliative care for patients with COPD and their informal caregivers is not well-structured or formalized, and ACP discussions often just happen in the context of acute care.

2. Have palliative care interventions been developed for patients with COPD and what evidence is available on the effectiveness and implementation outcomes?
The systematic review as described in chapter 3 identified twenty interventions, spanning both short-term and longitudinal approaches in diverse care settings, designed to improve the delivery of palliative care to individuals with COPD. Only four interventions (20%) were evaluated in sufficiently vigorous controlled trials, and findings on efficacy were found to be inconclusive and inconsistent. However, qualitative data indicated that having someone to call for support and education about breathlessness were most valued characteristics to patients. Most frequently named barriers were uncertainty about the timing of referral due to the unpredictable disease trajectory (referrers), time availability (providers) and accessibility (patients).

3. What is the effect of the implementation of integrated palliative care on patient, informal caregiver and healthcare provider outcomes?
In the COMPASSION study, a cluster randomized controlled trial in which eight hospital regions participated (chapter 5), we found no evidence that palliative care integrated into regular COPD care improves patient's quality of life or other well-being outcomes. However, our findings suggest that it can potentially reduce ICU admissions. We aimed to assess the effect on informal caregiver burden, but the response rates to questionnaires was insufficient to conduct analyses. Regarding healthcare providers, self-efficacy for delivering palliative care increased (chapter 6).

4. What is the effect of a multifaceted implementation strategy on implementation outcomes and what barriers hamper the implementation of integrated palliative care in routine COPD care?
With a combination of quantitative and qualitative data (chapter 6), we found that approximately half of the screened patients received an outpatient palliative care conversation, on average six weeks post-inclusion, primarily conducted by a pulmonologist and COPD nurse together. However, care continuity and coordination, and aftercare remained limited. Key barriers to implementation included time constraints, the COVID-19 pandemic, and barriers related to interdisciplinary and transmural collaboration. Implementation facilitators encompassed systematic screening of palliative patients, adapting to the patient's readiness, conducting joint palliative care conversations with a pulmonologist and COPD nurse, and regular meetings with a small team under the leadership of a dedicated implementation leader.

5. What is the accuracy of the ProPal-COPD tool in predicting 1-year mortality, and what are user-experiences of healthcare providers?
In a prospective validation cohort, the ProPal-COPD tool's ability to predict all-cause mortality within one year did not appear to be substantially better than previously established prediction models and the Surprise Question (chapter 7). However, the tool appeared user-friendly and found valuable by healthcare providers, as its indicators enhance their comprehension of the palliative phase and foster a shared understanding of the prognosis.

Combining clinical effectiveness and implementation research

From the first two studies conducted within this PhD project (the survey study and the systematic review as described in chapters 2 and 3), it became clear that there were gaps in practice and knowledge regarding structurally integrating palliative care into COPD care. Moreover, robust evidence on the clinical effectiveness in patients with COPD was lacking. Therefore, we set up a trial with a hybrid effectiveness-implementation design (described in chapter 4) in which we were able to simultaneously study the clinical effectiveness and the implementation process.[6] Doing so, we were able to address various research objectives and make efficient use of the limited time in this 4-year project to guarantee sufficient time needed for the inclusion and follow-up of patients.

Despite the benefits, designing a hybrid type 2 effectiveness-implementation study led to methodological challenges. It demands a complex balance between internal validity to assess clinical effectiveness on the one hand and factors facilitating implementation on the other. Various concessions had to be made, as already discussed in chapters 4 and 6. For instance, to facilitate implementation, the intervention was heterogenous across regions because intervention components were allowed to be tailored to regional needs. However, this limited the internal validity and thus, optimal effectiveness evaluation. On the other hand, healthcare providers had to focus on enrolling sufficient patients and informal caregivers for the effectiveness trial. This limited their time to implement intervention components. Given these drawbacks, combining the two objectives in one study should be done thoughtfully. By focusing on either clinical effectiveness or implementation, choices on methodologies may be easier to make, and a study can potentially become more robust and produce clearer study results. For future research, I would recommend to choose a hybrid type 1 design, combining a clinical effectiveness study with a process evaluation, or a type 3 design, testing one or more implementation strategies combined with collecting some relevant clinical outcomes.

Although our study provided valuable insights in implementation processes, the effectiveness evaluation of our intervention was hampered by implementation failure due to several implementation barriers including significant external factors like the COVID-19 pandemic. However, in hindsight, part of the implementation failure could possibly been prevented by testing the feasibility and study procedures before the trial, and providing a longer implementation period. Indeed, as good palliative care encompasses various aspects,[7] we had developed an intervention comprising different components: 1) identification using the ProPal-COPD tool, 2) one or more palliative care conversations including ACP, multidimensional assessment, and symptom management, 3) coordination and continuity of care, and 4) aftercare when a patient had died. However, during the trial it became clear that regions had difficulties implementing all components simultaneously (chapter 6). Screening with the ProPal-COPD tool went well, but with a significant proportion of patients no palliative care conversation had taken place, and transmural collaboration and aftercare remained inadequate. Furthermore, the inclusion of patients had already started while intervention components were still being implemented, resulting in patients filling out questionnaires without receiving the intervention. Future research should consider testing the feasibility of the complex intervention before the formal evaluation takes place, as is recommended by the Medical Research Council Framework,[8] or testing the different intervention components separately and implementing them consecutively, each with its matching outcome.[9] The question is though, whether this would have been attainable in a project funded for four years.

The impact of palliative care on patients with COPD

Unfortunately, we were unable to draw definitive conclusions about the effectiveness of our intervention (chapter 5). Next to implementation failure, factors related to the primary outcome measure played a role. We chose for quality of life as a primary outcome measure, as this is the ultimate aim of palliative care, according to its definition.[10] However, the fact that no previous study to date has found an effect of palliative care on quality of life in patients with COPD[11-19] raises the question whether this outcome measure is appropriate to assess the intervention effect in this patient group. First, quality of life is a broad outcome influenced by many factors. Moreover, it may be difficult to improve in advanced disease. Our intervention mostly consisted of only one outpatient conversation, which may have been insufficient to affect quality of life measurably. Also, as transmural collaboration remained poor, probably treatments were not continued in primary care. Second, the timing of the follow up questionnaires was not related to the occurrence of the palliative care conversations. Also, as COPD is characterized by occurrence of acute exacerbations, the capricious disease course may have influenced our measurements that were defined at fixed time points. Third, in line with previous studies,[13, 20] filling in questionnaires and returning them (despite multiple reminders by phone) appeared to be burdensome and difficult for patients with advanced COPD due to their frequent lack of energy and the fact that half of them have low literacy skills.[21] We chose to use the FACIT-Pal questionnaire as it covers all four palliative care dimensions (physical, psychological, social and spiritual), but some of its 46 items are abstract in nature and may be difficult to interpret.[22] Also, we included too many secondary outcome measures. As a result, we faced a high number of non-returned questionnaires. Either a new and short questionnaire appropriate for this patient group needs to be developed, a research nurse needs to be involved, or data on patient outcomes should be collected qualitatively instead of quantitatively, as was already suggested earlier by Horton et al. and Farquhar et al.[20, 23]

An outcome measure less broad and more specific related to the goal and timing of the intervention may have led to different results.[24] In a systematic review, Fleuren et al. identified five distinctive underlying goals of ACP that may be informative when selecting an outcome measure in future studies: 1) respecting individual patient autonomy, 2) improving quality of care, 3) strengthening relationships, 4) preparing for end-of-life, and 5) reducing overtreatment.[25] Depending on the goal emphasized in a palliative care intervention, future research could choose an appropriate outcome measure. For example, in relation to the goal of respecting patient autonomy, the documentation of care preferences could be studied, as was previously done in a randomized controlled trial involving ACP in patients with dementia.[26] To address the goal of improving quality of care, an outcome measure could focus on coping with COPD or mastery of breathlessness, which was evaluated in a breathlessness support service.[12] Regarding strengthening relationships, this could be qualitatively assessed by using the Content Coding for Contextualization of Care (4C) method.[27] When the goal is preparation for end-of-life, the Quality of end-of-life care Communication questionnaire (QOC) can be considered,[28] as was previously done in a trial testing a nurse-led ACP intervention.[29] Finally, to address the goal of reducing overtreatment, the number of hospital admissions and days could be assessed.

As COPD patients are far from a homogenous group, research is needed on what does work for whom, including studying the needs of patients from different cultural contexts. It is interesting to consider measuring patient tailored goals and assess whether these personalized goals have been reached. Finally, as advanced COPD significantly affects the patient's informal caregivers,[30] it is important to study how informal caregiver support can be integrated into palliative care interventions. We recommend to set up a separate study addressing informal caregivers' needs, as we experienced that their recruitment needs a different approach than the study inclusion of patients.

Although we failed to measure a positive effect on quality of life quantitatively, this does not mean that palliative care is unbeneficial for patients with advanced COPD. In a study where patients with COPD were presented with a standardized description of early palliative care, they were willing to receive this care.[31] In another study, patients with COPD preferred discussions during intervals of good health in contrast to last minute crisis-type decision-making.[32] Moreover, various qualitative studies found positive psychological effects, and no negative reactions have been described.[15, 16, 33, 34] In our interviews, patients and informal caregivers participating in the COMPASSION study stated that the palliative care conversations had given them clarity and peace of mind. (These data have not been published due to insufficient data saturation.) Healthcare providers unanimously described similar reactions of their patients to the conversations in interviews, and they definitely wanted to continue providing palliative care conversations (chapter 6). Therefore, we are still convinced that with optimized implementation patients with COPD and their informal caregivers can benefit from integrated palliative care.

Initiating palliative care in patients with COPD

In the literature, there has yet to be a consensus on *when* it is appropriate to start palliative care in patients with COPD. Various tools have been developed to predict prognosis and facilitate healthcare providers to identify patients needing palliative care.[35-37] The ProPal-COPD tool was previously developed by Duenk et al. in 2017, and with its short completion time and high sensitivity, as measured in an internal validity study, it seemed to be a promising tool.[38] Also, it combined clinical indicators with the Surprise Question, leaving space for 'the clinical view' of pulmonologists, and provided a binary outcome, making it feasible to use it as a clear inclusion criterion in a controlled trial. Therefore, we chose in the COMPASSION project to use the ProPal-COPD tool. In chapter 7, however, we found that the predictive validity to predict death within one year was disappointing.

Due to the failure to predict prognosis in COPD and the ambiguous relation between life expectancy and palliative care needs, it has been advocated to use needs-based tools instead. Recently, the I-HARP for COPD has been developed.[39] Furthermore, as COPD treatments cannot be divided into curative and palliative treatments searching for a transition point might seem superfluous. Ideally, palliative care components such as multidimensional assessment, optimal symptom management, and ACP are fully integrated into regular COPD care from diagnosis, with a gradually shifting focus over time, tailored to the patient's needs. Indeed, by using a two-track approach ('hope for the best, prepare for the worst'), ACP could be initiated in any stage of the disease. However, the reality of daily practice with limited time and financial resources, makes it infeasible to provide a comprehensive person-centered assessment to all COPD patients. Since palliative care discussions rarely take place and many healthcare providers are still reluctant to discuss end-of-life topics proactively, selecting patients most benefiting from a palliative care approach remains essential. Therefore, Waller et al. proposed to divide the identification process in two steps 1) a pragmatic method of identifying patients with palliative care needs and 2) a more comprehensive assessment.[40] Regarding the first step, in our interviews with healthcare providers on user experiences with the ProPal-COPD tool, we found that the systematic screening of patients admitted with an acute exacerbation increased healthcare providers' awareness and encouraged them to initiate palliative care conversations (chapter 7). Providing healthcare providers with better insight into prognosis, may activate them to introduce end-of-life topics in a timely and proactively manner. In a next step, eventually, we can integrate such an approach during the whole disease trajectory.

A possibility is to alter the usual frequency of outpatient visits. Today, patients are scheduled in a fixed scheme with every 3 or 6 months a regular control visit with their pulmonologist or COPD nurse. Bove et al. assessed in Denmark an alternative structure where fixed appointments were replaced with a flexible model tailored to the patient's needs. This new structure included at least one ACP conversation per year and phone contact whenever needed.[41] A similar model worked well in patients with Parkinson's disease.[42] Testing this alternative care structure for patients with COPD in the Netherlands would be interesting. Moreover, it aligns with the Dutch guideline, which recommends that ACP should take place at least once a year.[43] Next to addressing ACP and the four palliative care dimensions, breathlessness services based on the Breathing-Thinking-Functioning model promise to alleviate breathlessness in severe COPD.[44] Such a service has been tested in the Netherlands and appeared feasible.[45] Furthermore, integration of a palliative care approach into pulmonary rehabilitation seems promising because the multidisciplinary nature allows for an integrated approach to all four palliative care dimensions.[46]

Interdisciplinary collaboration

In the Netherlands, palliative care is not considered a distinct specialism, but it is delivered by generalists (e.g., GPs, nurses, pulmonologists, cardiologists), who receive support from palliative care specialists when required.[7] This is even more relevant in organ failure such as COPD, since disease-directed care and palliative care overlap.[47] In our systematic review described in chapter 3, we found that components most valued by COPD patients were: patient and family education on breathlessness management, direct access to a professional for support and an ongoing relationship. These components are not palliative care specific and require expertise in pulmonary medicine. Therefore, in the COMPASSION study we focused on integrating palliative care into regular COPD care rather than creating a separate palliative care service to which patients should be referred. An advantage is that a longitudinal relationship often already exists with the pulmonologist or COPD nurse. Also, they have a higher caseload of patients with severe COPD than general practitioners, allowing to create expertise.

As COPD care involves primary as well as secondary care providers and there are regional differences when palliative care specialists are involved, the roles and responsibilities of healthcare providers involved in the care of patients with severe COPD remain unclear.[48] As long as palliative care is not a standard part of medical training and nurse education, palliative care specialists may play a bigger role first. But conversely, palliative care specialists primarily have experience in oncology and need to be trained in supporting patients with COPD[49]. Patients with COPD need a significantly different approach than patients with cancer. As half of the COPD patients have low literacy,[21] communication should be adapted to the patient's level of understanding. More importantly, end-of-life topics must be gently introduced, as COPD patients do not always associate their disease with death and dying.[50] Also, specific COPD problems such as fear of suffocation need to be addressed.

As patients with COPD mostly live at home, and outpatient visits can become too burdensome in later stages of the disease, it is important to have a smooth continuity between hospital and primary care. However, during the COMPASSION project, it became clear that collaboration between the hospital and primary care remained challenging, even though we actively tried to involve general practitioners. Due to a lack of time and availability, pulmonologists were not always able contact the patient's general practitioner by phone after a palliative care conversation had taken place. To facilitate transmural collaboration and information exchange, working agreements should be made and safeguarded in a protocol. Furthermore, COPD nurses in primary care may have a pivotal role in the management of patients with severe COPD at home and can function as a linking pin between the hospital and primary care.[51] They have the possibility to support patients at home in their own environment, and usually have more time than general practitioners. However, they are not available in all regions.

Factors for successful implementation

Implementation is a complex process, for which active and appropriate strategies are needed.[52, 53] Although there has been a national guideline on palliative care COPD since 2011 that has been fully revised in 2021,[43] research has shown that simply acquiring knowledge without actively engaging with it has minimal influence on healthcare providers' behavior.[54] The findings of this thesis will contribute to a better understanding of what factors are needed to effectively implement palliative care into regular COPD care.

Healthcare providers need to be trained to gain knowledge and skills to change behavior. Today, medical doctors and nurses in COPD care receive little education on palliative care and related communication.[55] Their training mainly focuses on pharmacological treatments of physical symptoms, denying the possibility that patients eventually die from their disease. Reflection on your own attitude towards death and how you cope with it as a healthcare provider, is not part of their training.[56] In Chapter 6, we showed that the COMPASSION training (comprising of communication training with roleplay, education on the identification of palliative patients, dyspnea management, and transmural care collaboration) increased self-efficacy of healthcare providers and enhanced job satisfaction as they could contribute more meaningfully to the patient's wellbeing. Furthermore, an interesting finding was that doing the conversations jointly with a pulmonologist and COPD nurse was preferred, because they could reinforce each other. Also, sharing experiences with healthcare providers of different intervention regions stimulated to continue implementation. To allow scaling up, we transformed the training into a blended learning program in a follow-up project, which can be freely accessed via www.palliatievezorgcopd.nl. Strategies on a national level may be needed to achieve behavior change across all COPD healthcare providers in the Netherlands, including those who are not motivated to voluntarily participate in a training ('late adopters'). Therefore, it is essential that palliative COPD care training, including non-pharmacological dyspnea management, multidimensional assessment and communication skills to discuss end-of-life topics, is integrated as a standard part of the training to become a nurse, doctor or pulmonologist. Also, knowledge on the management of non-oncological diseases like COPD should be integrated into specialist palliative care training.

To further stimulate behavior change, practical tools are needed, as was emphasized by the field. Throughout the COMPASSION project, alongside the scientific output, we developed many hands-on tools for use in practice, e.g. information leaflets and videos for patients, informal caregivers, and healthcare providers. The tools are offered in the online toolbox www.palliatievezorgcopd.nl and are enthusiastically received by many healthcare providers. The online toolbox has around 100 visitors per week (Google Analytics) and won the national palliative care impact prize in February 2023.

Next to behavior change of individual healthcare providers, it is of equal importance that organizational and financial prerequisites are fulfilled, in order to integrate palliative care in COPD in all regions of the Netherlands.[57] To achieve lasting successful change, a project-based approach with specific goals is important.[58] As became clear during the COMPASSION project where healthcare providers had difficulties to fill out an action plan, this process should preferably led by a dedicated implementation leader, since healthcare providers often lack knowledge and skills to lead a project in a systematic way.[59] The frequency and duration of outpatient visits may require reconsideration, in order to guarantee sufficient time for proactive palliative care conversations. For example by reserving a fixed spot in the weekly schedule, or by planning fewer but lengthier consultations. Transmural collaboration may be improved by a shared medical record and different financing structure and need to be studied further. However, these huge challenges apply to all chronic care and need a national approach. Lastly, a set of quality indicators for monitoring palliative care would serve as a catalyst for implementing high-quality palliative care in practice. In the Netherlands, ongoing efforts are being made to develop and establish such an indicator set.[60-62]

Although healthcare providers never mentioned financial resources as a barrier, time constraints was the second most important barrier to provide palliative care for pulmonologists (chapter 2), as ACP discussions usually take more time than a regular outpatient visit. Therefore, to ensure successful and durable implementation across all regions, the financing structure of palliative care, including ACP, must be properly regulated. Palliative care interventions might easily become cost effective if it prevents intensive care admissions, as our findings in chapter 5 suggest and is shown by the systematic review of Flierman et al.[63] In the USA, healthcare providers may bill for ACP discussions under CPT Code 99497 from 2016.[64] Fortunately, there are ongoing developments in the Netherlands too. Since 2022, medical specialists can declare discussions about treatment options, called 'Time to Talk', on condition that an individual care plan is created and reviewed by a consultant of a specialist palliative care team.[65] Also, the NZa is planning experiments with alternative funding systems in order to stimulate regional transmural collaboration, such as bundle financing. These experiments will start in 2024. Although we will need some more patience before the incentives will be effective, these are hopeful developments.

Recommendations

The discussion of the main findings and methodological considerations yielded multiple recommendations regarding the integration of a proactive palliative care approach into regular COPD care. These recommendations will now be summarized, divided into recommendations for clinical practice, education, policy and future research.

Recommendations for clinical practice

- Patients with COPD should be systematically screened on palliative care needs, by using an easy, quick method. Although a perfect tool does not yet exist, the indicators of the ProPal-COPD tool including the Surprise Question could be used.

- All healthcare providers are encouraged to have a look at the online toolbox www.palliatievezorgcopd.nl, where they can freely select from a wide range of readily available tools that best suit their needs and preferences.
- In COPD, using a two-track approach in palliative care conversations ('hope for the best, prepare for the worst') helps to initiate end-of-life topics in an earlier stage of the disease.
- Respiratory care should be organized in such a way that it ensures sufficient time for palliative care conversations, e.g. by reserving a fixed spot in the weekly schedule.
- Establish working agreements about interdisciplinary and transmural collaboration and reach consensus when to involve specialist palliative care and how all involved healthcare providers will be informed.
- COPD nurses in primary care can play a pivotal role in palliative care in COPD as care coordinator and linking pin between primary and secondary care, and should become available across all regions in the Netherlands.
- To guarantee successful and sustainable implementation, install a small implementation team that works with clearly defined goals, meets regularly, and is led by an engaged implementation leader. A blended learning program have been developed and provides guidance and practical tips.

Recommendations for education

- Non-pharmacological dyspnea management, multidimensional assessment, and communication skills to discuss end-of-life topics should be integrated as a standard part of the training to become a nurse, medical doctor, or pulmonologist.
- Part of the training should be to understand the healthcare provider's own barriers, biases, and attitude towards death and dying, as the difficulty in talking about death often reflects one's discomfort.
- Next to the management of oncological diseases, palliative care specialists should be trained in COPD management and learn how to communicate appropriately with patients with COPD.

Recommendations for policy

- Define a set of quality indicators that are easy to extract from the medical records to monitor the quality of palliative care.
- Make regulations for an appropriate financial structure of palliative care, allowing interdisciplinary and transmural collaboration.
- For the development and nationwide implementation of complex interventions, funding should be available for implementation projects over a period exceeding four years, considering the comprehensive nature of the process and to guarantee continuity of expertise.

Future research

- Our study emphasized the importance to test the intervention's and study procedures' feasibility and incorporate an implementation period, before formal evaluation of the clinical effectiveness takes place.
- When preparing an effectiveness study, define the focus of the intervention based on the five goals of Fleuren et al.[25] and select an outcome measure appropriate for the intervention, while considering the low literacy and energy levels of patients with COPD.
- To reach consensus on when specialist palliative care should be involved in patients with severe COPD, a study using a Delphi design should be conducted.
- Future research is needed on how informal caregiver needs can be addressed.
- Assess the feasibility of an alternative care structure that replaces fixed control visits with a flexible model tailored to patient needs, including an annual ACP ("Look Back and Ahead") conversation and access to phone contact.

Final conclusion

Patients with advanced COPD and their informal caregivers suffer from a high symptom burden that has been insufficiently addressed in the past. Healthcare providers and policymakers are becoming increasingly aware that palliative care for this patient group genuinely needs to be proactively and structurally provided. The findings of this thesis contribute to the understanding what is needed to integrate a palliative care approach into COPD care. The tools and blended learning program developed during and after the PhD-project directly support healthcare providers in their day-to-day clinical practice. However, we are not there yet. Future research is needed to create evidence on the clinical effectiveness to support guidelines, and to explore how informal caregiver needs can be addressed. Furthermore, prerequisites need to be met, such as changes in the care organization providing more time for palliative care conversations, and financial structures that allow interdisciplinary and transmural collaboration.

References

1. Habraken JM, van der Wal WM, Ter Riet G, et al. Health-related quality of life and functional status in end-stage COPD: a longitudinal study. *Eur Respir J* 2011; 37: 280-288. 2010/06/10. DOI: 10.1183/09031936.00149309.
2. Lozano R, Naghavi M, Foreman K, et al. Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet* 2012; 380: 2095-2128. 2012/12/19. DOI: 10.1016/s0140-6736(12)61728-0.
3. Kavalieratos D, Corbelli J, Zhang D, et al. Association Between Palliative Care and Patient and Caregiver Outcomes: A Systematic Review and Meta-analysis. *Jama* 2016; 316: 2104-2114. 2016/11/29. DOI: 10.1001/jama.2016.16840.
4. Siouta N, van Beek K, Preston N, et al. Towards integration of palliative care in patients with chronic heart failure and chronic obstructive pulmonary disease: a systematic literature review of European guidelines and pathways. *BMC Palliat Care* 2016; 15: 18. 2016/02/14. DOI: 10.1186/s12904-016-0089-4.
5. Dalgaard KM, Bergenholtz H, Nielsen ME, et al. Early integration of palliative care in hospitals: A systematic review on methods, barriers, and outcome. *Palliat Support Care* 2014; 12: 495-513. DOI: S1478951513001338 [pii];10.1017/S1478951513001338 [doi].
6. Curran GM, Bauer M, Mittman B, et al. Effectiveness-implementation hybrid designs: combining elements of clinical effectiveness and implementation research to enhance public health impact. *Med Care* 2012; 50: 217-226. 2012/02/09. DOI: 10.1097/MLR.0b013e3182408812.
7. IKNL/Palliactief. Netherlands Quality Framework for Palliative Care. 2017.
8. Moore GF, Audrey S, Barker M, et al. Process evaluation of complex interventions: Medical Research Council guidance. *BMJ (Clinical research ed)* 2015; 350: h1258. 2015/03/21. DOI: 10.1136/bmj.h1258.
9. Levati S, Campbell P, Frost R, et al. Optimisation of complex health interventions prior to a randomised controlled trial: a scoping review of strategies used. *Pilot and Feasibility Studies* 2016; 2: 17. DOI: 10.1186/s40814-016-0058-y.
10. Sepúlveda C, Marlin A, Yoshida T, et al. Palliative Care: the World Health Organization's global perspective. *J Pain Symptom Manage* 2002; 24: 91-96. DOI: 10.1016/s0885-3924(02)00440-2.
11. Aiken LS, Butner J, Lockhart CA, et al. Outcome evaluation of a randomized trial of the PhoenixCare intervention: program of case management and coordinated care for the seriously chronically ill. *J Palliat Med* 2006; 9: 111-126. DOI: 10.1089/jpm.2006.9.111 [doi].
12. Higginson IJ, Bausewein C, Reilly CC, et al. An integrated palliative and respiratory care service for patients with advanced disease and refractory breathlessness: a randomised controlled trial. *Lancet Respir Med* 2014; 2: 979-987. DOI: S2213-2600(14)70226-7 [pii];10.1016/S2213-2600(14)70226-7 [doi].

13. Duenk RG, Verhagen C, Bronkhorst EM, et al. Proactive palliative care for patients with COPD (PROLONG): a pragmatic cluster controlled trial. *Int J Chron Obstruct Pulmon Dis* 2017; 12: 2795-2806. DOI: 10.2147/COPD.S141974 [doi];copd-12-2795 [pii].
14. Rabow MW, Dibble SL, Pantilat SZ, et al. The comprehensive care team: a controlled trial of outpatient palliative medicine consultation. *Arch Intern Med* 2004; 164: 83-91. DOI: 10.1001/archinte.164.1.83 [doi];164/1/83 [pii].
15. Rocker GM and Verma JY. 'INSPIRED' COPD Outreach Program: doing the right things right. *Clinical and investigative medicine Medecine clinique et experimentale* 2014; 37: E311-319. 2014/10/06.
16. Long MB, Bekelman DB and Make B. Improving Quality of Life in Chronic Obstructive Pulmonary Disease by Integrating Palliative Approaches to Dyspnea, Anxiety, and Depression. *Journal of Hospice & Palliative Nursing* 2014; 16: 514-520.
17. Scheerens C, Pype P, Van Cauwenberg J, et al. Early Integrated Palliative Home Care and Standard Care for End-Stage COPD (EPIC): A Phase II Pilot RCT Testing Feasibility, Acceptability, and Effectiveness. *J Pain Symptom Manage* 2020; 59: 206-224.e207. 2019/10/13. DOI: 10.1016/j.jpainsymman.2019.09.012.
18. Vitacca M, Comini L, Tabaglio E, et al. Tele-Assisted Palliative Homecare for Advanced Chronic Obstructive Pulmonary Disease: A Feasibility Study. *J Palliat Med* 2019; 22: 173-178. 2018/09/27. DOI: 10.1089/jpm.2018.0321.
19. Janssens JP, Weber C, Herrmann FR, et al. Can Early Introduction of Palliative Care Limit Intensive Care, Emergency and Hospital Admissions in Patients with Severe Chronic Obstructive Pulmonary Disease? A Pilot Randomized Study. *Respiration* 2019; 97: 406-415. DOI: 10.1159/000495312.
20. Horton R, Rocker G, Dale A, et al. Implementing a palliative care trial in advanced COPD: a feasibility assessment (the COPD IMPACT study). *J Palliat Med* 2013; 16: 67-73. DOI: 10.1089/jpm.2012.0285 [doi].
21. Heijmans M, Brabers A and Rademakers J. *Hoe gezondheidsvaardig is Nederland? Factsheet Gezondheidsvaardigheden–Cijfers 2019*. 2019. Utrecht: Nivel.
22. Lyons KD, Bakitas M, Hegel MT, et al. Reliability and validity of the Functional Assessment of Chronic Illness Therapy-Palliative care (FACIT-Pal) scale. *J Pain Symptom Manage* 2009; 37: 23-32. 2008/05/28. DOI: 10.1016/j.jpainsymman.2007.12.015.
23. Farquhar MC, Prevost AT, McCrone P, et al. The clinical and cost effectiveness of a Breathlessness Intervention Service for patients with advanced non-malignant disease and their informal carers: mixed findings of a mixed method randomised controlled trial. *Trials* 2016; 17: 185. DOI: 10.1186/s13063-016-1304-6 [doi];10.1186/s13063-016-1304-6 [pii].
24. Dodd SR, Payne SA, Preston NJ, et al. Understanding the Outcomes of Supplementary Support Services in Palliative Care for Older People. A Scoping Review and Mapping Exercise. *J Pain Symptom Manage* 2020 2020/03/24. DOI: 10.1016/j.jpainsymman.2020.03.010.

25. Fleuren N, Depla M, Janssen DJA, et al. Underlying goals of advance care planning (ACP): a qualitative analysis of the literature. *BMC Palliat Care* 2020; 19: 27. 2020/03/08. DOI: 10.1186/s12904-020-0535-1.
26. Tilburgs B, Koopmans R, Vernooij-Dassen M, et al. Educating Dutch General Practitioners in Dementia Advance Care Planning: A Cluster Randomized Controlled Trial. *J Am Med Dir Assoc* 2020; 21: 837-842.e834. 2019/11/25. DOI: 10.1016/j.jamda.2019.09.010.
27. Weiner SJ, Kelly B, Ashley N, et al. Content coding for contextualization of care: evaluating physician performance at patient-centered decision making. *Med Decis Making* 2014; 34: 97-106. 20130619. DOI: 10.1177/0272989x13493146.
28. Engelberg R, Downey L and Curtis JR. Psychometric characteristics of a quality of communication questionnaire assessing communication about end-of-life care. *J Palliat Med* 2006; 9: 1086-1098. DOI: 10.1089/jpm.2006.9.1086.
29. Houben CHM, Spruit MA, Luyten H, et al. Cluster-randomised trial of a nurse-led advance care planning session in patients with COPD and their loved ones. *Thorax* 2019; 74: 328-336. 20190119. DOI: 10.1136/thoraxjnl-2018-211943.
30. Nakken N, Janssen DJ, van den Bogaart EH, et al. Informal caregivers of patients with COPD: Home Sweet Home? *European respiratory review : an official journal of the European Respiratory Society* 2015; 24: 498-504. 2015/09/02. DOI: 10.1183/16000617.00010114.
31. Iyer AS, Dionne-Odom JN, Ford SM, et al. A Formative Evaluation of Patient and Family Caregiver Perspectives on Early Palliative Care in Chronic Obstructive Pulmonary Disease across Disease Severity. *Annals of the American Thoracic Society* 2019; 16: 1024-1033. DOI: 10.1513/AnnalsATS.201902-112OC.
32. Reinke LF, Engelberg RA, Shannon SE, et al. Transitions regarding palliative and end-of-life care in severe chronic obstructive pulmonary disease or advanced cancer: themes identified by patients, families, and clinicians. *J Palliat Med* 2008; 11: 601-609. 2008/05/06. DOI: 10.1089/jpm.2007.0236.
33. Rabow MW, Schanche K, Petersen J, et al. Patient perceptions of an outpatient palliative care intervention: “It had been on my mind before, but I did not know how to start talking about death…”. *Journal of Pain and Symptom Management* 2003; 26: 1010-1015.
34. Buckingham S, Kendall M, Ferguson S, et al. HELPing older people with very severe chronic obstructive pulmonary disease (HELP-COPD): mixed-method feasibility pilot randomised controlled trial of a novel intervention. *NPJ Prim Care Respir Med* 2015; 25: 15020. DOI: npjpcrm201520 [pii];10.1038/npjpcrm.2015.20 [doi].
35. Casale G, Magnani C, Fanelli R, et al. Supportive and palliative care indicators tool (SPICT™): content validity, feasibility and pre-test of the Italian version. *BMC Palliative Care* 2020; 19: 79. DOI: 10.1186/s12904-020-00584-3.
36. Thoonsen B, Engels Y, van RE, et al. Early identification of palliative care patients in general practice: development of RADboud indicators for PAlliative Care Needs (RADPAC). *Br J Gen Pract* 2012; 62: e625-e631. DOI: 10.3399/bjgp12X654597 [doi].

37. Bellou V, Belbasis L, Konstantinidis AK, et al. Prognostic models for outcome prediction in patients with chronic obstructive pulmonary disease: systematic review and critical appraisal. *BMJ (Clinical research ed)* 2019; 367: l5358. 20191004. DOI: 10.1136/bmj.l5358.
38. Duenk RG, Verhagen C, Bronkhorst EM, et al. Development of the ProPal-COPD tool to identify patients with COPD for proactive palliative care. *Int J Chron Obstruct Pulmon Dis* 2017; 12: 2121-2128. DOI: 10.2147/COPD.S140037 [doi];copd-12-2121 [pii].
39. Janssen DJ, Ament SM, Boyne J, et al. Characteristics for a tool for timely identification of palliative needs in heart failure: The views of Dutch patients, their families and healthcare professionals. *European journal of cardiovascular nursing : journal of the Working Group on Cardiovascular Nursing of the European Society of Cardiology* 2020: 1474515120918962. 2020/05/07. DOI: 10.1177/1474515120918962.
40. Waller A, Hobden B, Fakes K, et al. A Systematic Review of the Development and Implementation of Needs-Based Palliative Care Tools in Heart Failure and Chronic Respiratory Disease. *Front Cardiovasc Med* 2022; 9: 878428. 20220413. DOI: 10.3389/fcvm.2022.878428.
41. Bove DG, Jellington MO, Lavesen M, et al. Assigned nurses and a professional relationship: a qualitative study of COPD patients’ perspective on a new palliative outpatient structure named CAPTAIN. *BMC Palliat Care* 2019; 18: 24. 2019/03/04. DOI: 10.1186/s12904-019-0410-0.
42. Bloem BR, Darweesh SKL and Meinders MJ. Palliative Programs for Persons With Parkinsonism-The Next Frontier. *JAMA Neurol* 2020; 77: 548-550. DOI: 10.1001/jamaneurol.2019.4697.
43. IKNL/LAN. *National guideline Palliative care in COPD, version 2.0*. 2021. Utrecht, The Netherlands.
44. Spathis A, Booth S, Moffat C, et al. The Breathing, Thinking, Functioning clinical model: a proposal to facilitate evidence-based breathlessness management in chronic respiratory disease. *NPJ Prim Care Respir Med* 2017; 27: 27. 2017/04/23. DOI: 10.1038/s41533-017-0024-z.
45. Mooren K, Wester D, Kerstjens H, et al. Filling the Gap: A Feasibility Study of a COPD-Specific Breathlessness Service. *Copd* 2022; 19: 324-329. DOI: 10.1080/15412555.2022.2099821.
46. van Dam van Isselt EF, Spruit M, Groenewegen-Sipkema KH, et al. Geriatric rehabilitation for patients with advanced chronic obstructive pulmonary disease: a naturalistic prospective cohort study on feasibility and course of health status. *Chronic respiratory disease* 2014; 11: 111-119. 2014/04/15. DOI: 10.1177/1479972314529674.
47. Harrington SE, Rogers E and Davis M. Palliative care and chronic obstructive pulmonary disease: where the lines meet. *Curr Opin Pulm Med* 2017; 23: 154-160. DOI: 10.1097/mcp.0000000000000358.
48. Oishi A and Murtagh FE. The challenges of uncertainty and interprofessional collaboration in palliative care for non-cancer patients in the community: a systematic review of views from patients, carers and health-care professionals. *Palliat Med* 2014; 28: 1081-1098. DOI: 0269216314531999 [pii];10.1177/0269216314531999 [doi].
49. PZNL. *Palliatieve zorg in Nederlandse ziekenhuizen 2022. (available from www.palliaweb.nl).*

50. Knauft E, Nielsen EL, Engelberg RA, et al. Barriers and facilitators to end-of-life care communication for patients with COPD. *Chest* 2005; 127: 2188-2196. 2005/06/11. DOI: 10.1378/chest.127.6.2188.
51. Disler R, Cui Y, Luckett T, et al. Respiratory Nurses Have Positive Attitudes But Lack Confidence in Advance Care Planning for Chronic Obstructive Pulmonary Disease: Online Survey. *J Hosp Palliat Nurs* 2021; 23: 442-454. DOI: 10.1097/njh.0000000000000778.
52. Cabana MD, Rand Cs Fau - Powe NR, Powe Nr Fau - Wu AW, et al. Why don't physicians follow clinical practice guidelines? A framework for improvement. *JAMA* 1999; 282.
53. Powell BJ, Beidas RS, Lewis CC, et al. Methods to Improve the Selection and Tailoring of Implementation Strategies. *The journal of behavioral health services & research* 2017; 44: 177-194. 2015/08/21. DOI: 10.1007/s11414-015-9475-6.
54. Davis DA, Thomson MA, Oxman AD, et al. Changing physician performance. A systematic review of the effect of continuing medical education strategies. *Jama* 1995; 274: 700-705. DOI: 10.1001/jama.274.9.700.
55. de Bruin J, Verhoef MJ, Slaets JPJ, et al. End-of-life care in the Dutch medical curricula.
56. Galiana L, Oliver A, De Simone G, et al. A Brief Measure for the Assessment of Competence in Coping With Death: The Coping With Death Scale Short Version. *J Pain Symptom Manage* 2019; 57: 209-215. 20181115. DOI: 10.1016/j.jpainsymman.2018.11.003.
57. Wensing M and Grol R. Knowledge translation in health: how implementation science could contribute more. *BMC Medicine* 2019; 17: 88. DOI: 10.1186/s12916-019-1322-9.
58. Hagger MS and Luszczynska A. Implementation intention and action planning interventions in health contexts: state of the research and proposals for the way forward. *Applied psychology Health and well-being* 2014; 6: 1-47. 2014/03/05. DOI: 10.1111/aphw.12017.
59. Solberg LI, Brekke Ml Fau - Kottke TE, Kottke Te Fau - Steel RP, et al. Continuous quality improvement in primary care: what's happening?
60. Pasman HR, Brandt HE, Deliens L, et al. Quality indicators for palliative care: a systematic review. *J Pain Symptom Manage* 2009; 38: 145-156. DOI: 10.1016/j.jpainsymman.2008.07.008.
61. Brandt HE, Francke AL, Pasman HRW, et al. *Indicatoren voor Palliatieve Zorg. Ontwikkeling en toetsing van een set kwaliteitsindicatoren voor de palliatieve zorgverlening*. 2009. NIVEL.
62. Van Schoten S, Schouten B, de Jong L, et al. *Kwaliteitsindicatoren en zorggerelateerde schade aan het levenseinde Een retrospectief dossieronderzoek bij patiënten overleden in Nederlandse ziekenhuizen*. 2023. NIVEL.
63. Flierman I, Gieteling E, Van Rijn M, et al. Effectiveness of transmural team-based palliative care in prevention of hospitalizations in patients at the end of life: A systematic review and meta-analysis. *Palliat Med* 2023; 37: 75-87. 20221221. DOI: 10.1177/02692163221135616.
64. Center for Medicare and Medicaid Services. Frequently Asked Questions about Billing the Physician Fee Schedule for Advance Care Planning Services, https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/PhysicianFeeSched/Downloads/FAQ-Advance-Care-Planning.pdf (July 2016).

65. Nederlandse zorgautoriteit. Prestatiebeschrijvingbeschikking facultatieve prestatie Time to talk: bespreken wensen en grenzen in de palliatieve fase - TB/REG-21685-01, https://puc.overheid.nl/nza/doc/PUC_660378_22/1/ (2021).