Sustainment of innovations in palliative care: a survey on lessons learned from a nationwide quality improvement programme

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A B S T R A C T

Context

While much is known about factors influencing short-term implementation, little is known about what factors are relevant for the long-term sustainment of innovations. In the Dutch National Quality Improvement Programme for Palliative Care, innovations were implemented in 76 implementation projects.

Objectives

To give insight into the sustainment strategies used and factors facilitating and hindering sustainment.

Methods

Online questionnaire with pre-structured and open questions sent to the contact persons for 76 implementation projects, 2 to 6.5 years after the start.

Results

Information was gathered on 63 implementation projects (response 83%). The majority of the projects took place in home care, general practices and/or nursing homes. Sustainment was attained in 60% of the implementation projects. Six often applied strategies were statistically significantly related to sustainment: (a) realizing coherence between the innovation and the strategic policy of the organization; (b) arranging to have a specific professional responsible for the use of the innovation; (c) integrating the innovation into the organization's broader palliative care policy; (d) arranging accessibility of the innovation; (e) involving management in the implementation project; and (f) giving regular feedback about the implementation. In three quarters of the

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projects, barriers and facilitators were encountered relating to characteristics of the care organizations, such as employee turnover and ratification of the project by the management.

Conclusion

Applying the six strategies enhances sustainment. The organization plays a decisive role in the sustainment of innovations in palliative care. Engaging the management team in implementation projects from early onset is of utmost importance.

Key message

This article describes strategies and factors contributing to sustainment of innovations in palliative care, based on 363 implementation projects. Six successful strategies aimed at sustaining the innovation were found. Most factors facilitating or hindering sustainment were related to characteristics of the organization in which the innovation had been implemented.

Introduction

The uptake of innovations can be a challenge [1]. Implementation science, defined as the science of methods to promote the systematic uptake of research findings and other evidence based practices in routine practice [2], has resulted in knowledge about the factors and strategies influencing implementation [2-4]. Successful implementation needs strategies that address factors in different domains, i.e. the kind of innovation, the healthcare professionals, the patients, the organisation, and the context.

So far, most research on innovations in health care has focused on factors and strategies affecting short-term implementation [3,5,6]. Less is known about factors associated with long-term sustainable implementation, which may be different from those affecting short-term implementation.

In addition, studies have shown difficulties when implementing palliative care in general healthcare settings where there is not an exclusive focus on patients in the palliative phase, such as home-care and hospital settings [7-11]. This study provides insight into strategies and factors affecting sustainable implementation of innovations in palliative care in a nationwide Dutch Quality Improvement Programme in which palliative care innovations were implemented mainly in general healthcare settings.

[Box 1]

In the Netherlands, the improvement of palliative care was stimulated between 2012 and 2016 through the nationwide National Quality Improvement Programme for Palliative Care (Box 1). In this programme, 76 implementation projects were carried out. In each project, an innovation, i.e. a tool or method for palliative care, was implemented during a project phase of one year [12].

From an evaluation of this improvement programme, we have indications that in most projects the care innovation was indeed implemented after one year [13]. However, such large-scale improvement programmes are a new feature within palliative care and it was unknown whether the short-term implementation would lead to sustainment of the innovation. From a healthcare, societal and financial perspective, healthcare professionals, project leaders, funding organizations and other stakeholders would like to know about the long-term impact of their investments in the innovations [14].

Along with Rogers, we mean by 'innovation' an idea, practice or object that is perceived as new by an individual or other unit of adoption [15]. In our study this refers to the use of practice-based or

evidence-based innovations within palliative care. 'Sustainment', also called 'continuation' or 'maintenance', is used to refer to the extent to which an innovation is maintained or institutionalized within an organization [2, 14,16]. 'Strategies' are defined as planned activities intended to mainstream an innovation within an organization [14,17-19].

Because palliative care is multidisciplinary care, often with multiple healthcare 109 organizations involved, implementing palliative care innovations is particularly challenging [10]. Studies of ways to improve the provision of palliative care are relatively new [11]. A systematic review [7] in the United States identified barriers regarding the education, implementation and organization of the healthcare system. Education-related barriers were the lack of adequate education and training for medical residents, and the perception of palliative care as end-of life care [7]. Implementation-related barriers were the inadequate size of the palliative medicine-trained workforce, the challenge of timely identifying patients for palliative care, and a need for a change of culture regarding palliative care across settings, including settings traditionally focused on cure [7]. Organizational barriers were related to healthcare policy, such as a fragmented healthcare system or a lack of adequate reimbursement for palliative care. Similar barriers were found to be important in palliative care in Europe as well [8,9,11]. Whereas the initial implementation is often challenging, long-term sustainment may be even more so.

Given the sparseness of empirical research into sustainability and factors and strategies contributing to sustainment in palliative care, our study focuses on the sustainment of palliative innovations 2 to 6.5 years after the start of the implementation projects. The research questions are:
1. To what extent did the implementation of palliative innovations result in sustainable innovations in palliative care?
2. Which strategies were related to the sustainment of palliative innovations?
3. Which factors were perceived as facilitating or hindering the sustainment of palliative innovations?

Methods

Design
Contact persons (a managers or coordinator) of the 76 implementation projects in the National Quality Improvement Programme for Palliative Care were sent an online questionnaire with pre-structured and open-ended questions. The questionnaire was sent 2 to 6.5 years after the start of each implementation project. To increase the response rate, a reminder was e-mailed after two weeks. Contact persons who did not respond were phoned and asked whether they were able to fill in the questionnaire. If not (this was predominantly because their function had changed), they were asked to provide the name of another contact person.
A total of 63 completed questionnaires were received (response rate 83%). Non-response was not related to the chosen innovation in the implementation project. No ethical approval was needed according to the Dutch law on medical research (the 'WMO') because the research subjects were not subjected to procedures and were not required to follow rules of behaviour. Study participation was voluntary and data were stored anonymously.

Questionnaire
Sustainment was measured using two items [20]: 1. "Is the innovation still applied?" ('yes', 'partly', 'no'), 2. "Is the innovation well implemented and sustained?" ('yes', 'I think so', 'I do not think so', 'no').

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Strategies aimed at achieving sustainment were measured by ten items (see table 3). The strategies were derived from a qualitative analysis of 76 in-depth interviews with the contact persons and some healthcare professionals involved in the first year of each implementation project and described elsewhere [13]. In these interviews interviewees told how they intended to sustain the innovation. The statements in the questionnaire described the realization of ten strategies most often mentioned in these interviews. Examples of statements are 'the training is included in the training programme of the organization'; 'professionals regularly receive feedback about the implementation of the innovation'. The question was: 'To what extent do you agree with each statement?' The answer categories were: 'agree', 'agree somewhat', 'partly agree, partly disagree', 'disagree somewhat', 'disagree' and 'don't know'.

Factors facilitating and hindering sustainment were measured in two open-ended questions. The questions were introduced with the text: "Many factors may influence sustainment of an innovation. For instance factors related to the innovation, the chosen strategies, the healthcare professionals, the patients and their family, the participating organizations, or the social political context." The questions were: 1. "Which factors hindered further sustainment after the implementation project of one year?" and 2. "Which factors facilitated further sustainment after the implementation project of one year?"

Coding and analysis
Descriptive statistics were calculated to gain insight into sustainment and the realized strategies. In addition, bivariate relationships were examined using Fisher exact tests. The item indicating sustainment ("Is the innovation well implemented and sustained?") was used for further statistical analyses into strategies and factors related to sustainment. Because of the low number of observations in some answer categories, the answers were dichotomized into '(probably) well implemented and sustained' and '(probably) not well implemented and sustained'. A strategy was considered as a realized if the answers was agree or agree somewhat. The other answers were coded as not being realized. These quantitative data were analysed using the Fisher exact test in STATA 14.0 [28]. A difference was deemed to be statistically significant if $p < .05$.

In addition, the open-ended questionnaire items were analysed. MF and AdV coded the factors mentioned in the open-ended questions using the measurement instrument for determinants of innovations (MIDI) as a guide to structure the factors [6]. MIDI was developed from 50 potentially relevant factors in innovation. It is based on a systematic review, a Delphi panel [29] and empirical studies [6], which resulted in 29 factors. MIDI has been successfully applied in different settings and innovations [30-32]. MIDI briefly describes each code and illustrates the code with examples. The factors can be broken down into four domains or levels: characteristics of the innovation, factors related to the healthcare professionals who are expected to use the innovation, factors related to the organization where healthcare professionals work, and the broader context of the organization. To ensure consistency in coding, MF and AdV each separately coded some of the questionnaires. As a next step the coding authors discussed any disagreements and decided whether a code in the MIDI guide needed further specification. This procedure was repeated cyclically until all answers were coded. A sample of the first ten coded questionnaires was then coded again to control for a possible shift in coding. No shift was found.

Results

[Table 1]

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Characteristics of the implementation projects

The most frequently implemented innovations (table 1) concerned a road map to identify palliative care needs (n=21), Patz, the Dutch version of the Gold Standards Framework (n=10), STEM, which is a method and training programme to improve communication about dying and care preferences at the end of life (n=7), and a specialist palliative care consultant (n=6).

The projects mostly (76.1%) aimed at improving palliative care for the general population and were spread over a variety of settings, mostly home-care settings, nursing homes and/or general practices. The majority (57.1%) of the projects were performed in multiple settings.

[Table 2]

Sustainment of the innovations (research question 1)

In 60.3% of the implementation projects the innovation was evidently or probably well implemented and sustained (table 2). Most innovations (95.3%) were still being applied, although sometimes only in part (table 2). In an open question the contact persons explained what they meant by 'partly'. They said that some teams or organizations had stopped applying the innovation, whereas other teams or organizations continued and/or they said that the original innovation had been adapted to better fit the needs of the healthcare professionals.

[Table 3]

Realized strategies related to sustainment (research question 2)

Eight strategies aimed at sustainment were realized in more than half of the projects (table 3). The strategy mentioned most frequently was arranging coherence between the innovation and the general strategic policy of the organization (90.0%). Other frequently realized 238 strategies were integrating the innovation into palliative care policy (83.3%), making the innovation easy to access by healthcare professionals (83.3%), arranging for someone to be responsible for its use (71.7%), involving management in the implementation project (63.3%), offering training (63.3%), providing regular feedback about the implementation of the innovation (61.7%), and regularly putting its use on the team agenda (51.7%). Six strategies were much more likely to have been realized in trajectories that resulted in sustainment than trajectories that did not, and therefore seemed to have significantly influenced sustainment: (a) realizing coherence between the innovation and the strategic policy of the organization (97.4%); (b) arranging to have a professional who is responsible for the use (97.4%); (c) integrating the innovation into the organization's palliative care policy (94.7%); (d) making the innovation easy to access by healthcare professionals (92.1%); (e) involving management in the implementation project (84.2%); and (f) providing regular feedback about the implementation of the innovation (84.2%).

Offering training opportunities and an annual allocation of money for continuation were not related to sustainment, whereas integrating the innovation in the electronic patient records although less frequently applied, was.

[Table 4][Table 5]

Factors facilitating or hindering sustainment (research question 3)

Open-ended questions addressed the factors hindering and facilitating sustainment. The factors were broken down into four domains described by the measurement instrument for determinants of innovations (MIDI): characteristics of the innovation, factors related to the healthcare professionals who are expected to use the innovation, factors related to the organization where the healthcare professionals work, and the broader context of the organization. Table 4 shows the percentage of

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projects in which this domain affected the sustainability of the innovation, as perceived by the respondents. The codes or factors within each domain are described in table 5. Factors facilitating and hindering sustainment are experienced in all four domains. Facilitators mentioned most frequently were related to the organizational domain and in the domain of the healthcare professional (in respectively 72.1% and 49.2% of the implementation projects). Organizational factors facilitated sustainment in a variety of ways (table 5): (formal) ratification of the innovation by management (for example by including the use of the innovation in policy documents); stability in the workforce or adequate replacements when employees leave; availability of sufficient financial resources; availability of time to apply the innovation; a coordinator or driving force; and available training facilities. In the domain of the healthcare professional, the facilitators mentioned most often were the personal benefits experienced from the innovation and/or the perceived benefits for patients and their families and the experienced support of colleagues.

Experienced barriers to sustainment were mostly related to the organisation (77.0%) and were generally the counterpart of the above-mentioned facilitating factors.

Discussion

Main findings

Our first main finding is that 60 per cent of the implementation projects led to sustained change. Hence, sustainment of palliative care innovations is possible. The literature also shows that at least 60% of implemented innovative health programmes reported sustainment of at least one programme component [33]. Sustainment figures were higher when respondents were asked whether healthcare professionals still applied the innovation (95%). However, when asked directly about sustainment, in the sense of the innovation being integrated in mainstream care processes, the percentage dropped.

Secondly, our study shows support for six main strategies influencing sustainment. These strategies focus on: (a) the coherence between the innovation and the strategic policy of the organization; (b) having a professional responsible for the use; (c) the fit between the innovation and the organization's palliative care policy; (d) the accessibility of the innovation by healthcare professionals; (e) the involvement of management in the implementation project; and (f) regular feedback about the implementation of the innovation. The main strategies are also found to be relevant in other health care settings [17,19], implying that professionals in palliative care can benefit from the already existing body of knowledge about sustainment strategies.

Thirdly, in line with models of factors influencing implementations [2-4], and studies on implementation in palliative care across countries [11], barriers and facilitators were found in different domains: the domain of the innovation itself, the healthcare professional as the person working according to the innovation, the organization in which the innovation is implemented, and the context of the innovation. We tentatively conclude that sustainment is mainly determined by the strategies chosen to deal with barriers and make use of facilitators. This is in accordance with implementation frameworks that promote starting with an analysis of possible factors influencing successful implementation and choosing implementation strategies in alignment with the outcomes of this analysis [4,6,34].

Our fourth main finding is that organizational factors play a major role for sustainable innovations. In three quarters of the projects, barriers and facilitators were mentioned that related to the organisation in which the innovation was implemented. In previous early implementation research, other factors were predominant, such as the characteristics of the innovation and the motivation of professionals to work with the innovation. Therefore, we hypothesize that organisational factors, such as ratification of the innovation by management, financial and training facilities and organisational stability, are particularly important for the *sustainment* of palliative care innovation.

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This study shows that sustainment of innovations in palliative care can be realized by choosing the right strategies and organizational support. Successful projects seem to face the same kinds of barriers and facilitators as unsuccessful strategies, implying that it might be the interplay between barriers and facilitators on the one hand and the chosen 325 implementation strategies on the other that enhances sustainment. For palliative care practice, this implies that factors facilitating and hindering implementations should be monitored during the implementation process and implementation strategies should be continuously aligned with these factors.

The concept of sustainment, or sustainability, needs to be studied further as different ways of measuring it give different results. The question what exactly is to be sustained in an innovation is addressed in the literature. It is not clear if sustainability of only some elements of an innovation (e.g. part of a tool or method) constitutes a reasonable sustainment outcome [14,35,36]. This is further complicated by the fact that there are both core components (i.e. indispensable elements necessary for the intended effects) and customizable components of innovations [18,37]. It may also be deemed sustainable if the content of the innovation is continuously adapted to suit the context or replaced by a new innovation [14,38].

Strengths and limitations

To our knowledge, this study is one of the first empirical studies on the sustainability of a large-scale improvement across settings within palliative care, offering insight into the sustainment of innovations, the strategies used, and the factors facilitating and hindering sustainment. The study adds to current knowledge in that we integrated experiences regarding 63 implementation projects for different innovations, and considered projects in a variety of settings. This rich variety contributes to robust and comprehensive results that can be generalized to a broad range of health care organisations and innovations. In addition to these generally useful strategies, specific strategies that are fine-tuned to the innovation and health care setting will contribute to further sustainment.

A limitation was that we relied on self-reports. Furthermore, we did not measure whether individual healthcare professionals actually used the innovation, nor the long-term effects on patients and their families.

Conclusion

Sustainment of palliative care innovations in home care, nursing homes, general practices or healthcare settings not exclusively focusing on patients in the palliative stage is possible. Designing an implementation and sustainment plan incorporating the six strategies that are related to sustainment enhances the chance of long-term improvements in palliative care. Factors within care organizations play a decisive role in the implementation process leading to sustainment. Engaging the management team in implementation projects from early onset is of utmost importance for sustainment in the long term.

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Competing interests

The authors declare that they have no competing interests.

AdV conducted the study and drafted the manuscript. AF participated in 368 the design of the study and the drafting of the questionnaire. HV assisted the data collection. AdV and MF analysed the qualitative data and AdV did the statistical analyses. All authors gave comments on drafts of the manuscript and approved the final manuscript.

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Tables and figures

Box 1. Characteristics of the Dutch National Quality Improvement Programme for Palliative Care

Objectives	To promote a situation in which: (1) Patients die in their preferred place, (2) Patients and relatives feel they are in control regarding palliative care, (3) Patients and relatives see palliative care as being coordinated, (4)Patients and relatives feel care to be concordant with their needs, preferences and values, (5) Patients and relatives receive care for their needs in the physical, psychosocial and spiritual domains.
Setting	Diversity of healthcare settings.
The palliative care innovations	Participating organizations chose the innovation from pre-selected list of options. The following were chosen: 1. Dutch version of the Liverpool Care Pathway (LCP) for the Dying Patient [21-23]. 2. Roadmap to identify and analyse palliative care needs [24]. 3. Specialist palliative care consultant. The introduction of a professional with specific expertise in palliative care who can be consulted by other professionals for coaching, support and advice. 4. PaTz; the Dutch version of the Gold Standards Framework. In PaTz general practitioners and district nurses meet on a regular basis to identify patients with palliative care needs and to discuss care for these patients [25]. 5. STEM or 'Dying your own way'. A method and training programme to facilitate communication about dying and care preferences at the end of life [26]. 6. Informal care support, education and training of professionals to discuss the care with informal caregivers. 7. Informare. Information package for patients and their loved ones that helps them get more control over the palliative care. 8. Palliative care for people with dementia. Linking regional dementia care networks with palliative care networks at the organizational and executive levels.

	9. Advance care planning. Training and tools for general practitioners to realize proactive care planning. 10. Decision making in the palliative phase. Training for professionals to support the decision-making process. 11. Guideline on palliative sedation. Focuses on the use of the guideline when the patient lives at home. 12. GEPLUSD. Method to apply the Utrecht Symptom Diary, a translated and adapted version of the Edmonton Symptom Assessment System to monitor the symptom burden [27].
Duration of the programme	2012–2016, with an annual call for proposals. The grant applications were assessed by an independent quality working group. The criteria for granting this support include the requirement that the applicant must be a representative of the regional palliative care networks, the care organizations involved must have a substantial number of patients with palliative care needs and the innovation chosen must be implemented within one year.
Number of projects	76 implementation projects spread across the country were carried out. Participating organizations in an implementation project worked together in a regional palliative care network, facilitated by a coordinator.
Duration of each project	1 year.
Grant	ZonMw, the Netherlands Organization for Health Research and Development.

Table 1. Characteristics of the implementation projects

Description of characteristic	n	%
Innovation (n=63)		
- Road map to identify and analyse palliative care needs	21	33.3%
- PaTz, the Dutch version of the Gold Standards Framework	10	15.9%
- STEM or 'Dying your own way'	7	11.1%
- Specialist palliative care consultant	6	9.5%
- Informare	4	6.3%
- Combination of innovations	4	6.3%
- Palliative care for people with dementia	3	4.8%
- Dutch version of the Liverpool Care Pathway (LCP) for the Dying Patient	3	4.8%
- Other innovation	5	7.9%
Patient group (multiple answers possible) (n=63)		
- general population	48	76.1%
- people with intellectual disability	12	19.1%
- people with dementia	8	12.7%
- people with a psychiatric diagnosis	3	4.8%
Healthcare setting (multiple answers possible) (n=63)[1]		
- home care	41	65.1%
- nursing home	28	44.4%
- general practice	17	27.0%
- hospice	13	20.6%
- organization for people with intellectual disabilities	12	19.1%
- hospital	8	12.7%
- organization for mental health care	2	3.2%

[1] n=36 implementation projects (57.1%) were performed in multiple settings

Table 2. The perceived sustainability of the innovations

Item	%
1. Is the innovation still being applied? (n=63)	
- yes	66.7%
- partly	28.6%
- no	4.7%
2. Is the innovation well implemented and sustained? (n=63)	
- yes	36.5%
- I think so	23.8%
- I do not think so	22.2%
- no	17.5%

Table 2. The perceived sustainability of the innovations

Table 3. Applied strategies in the implementation projects, related to the perceived sustainment of the innovations

Strategy	total (n=60)	innovation (probably) well sustained (n=38)	innovation (probably) not well sustained (n=22)[2]	p-value[1]
- arranging coherence between the innovation and the strategic policy of the organization	90.0%	**97.4%**	77.3%	.021
- integrating the innovation into the broader palliative care policy of the organization	83.3%	**94.7%**	63.6%	.003
- arranging the accessibility of the innovation for professionals	83.3%	**92.1%**	68.2%	.029
- arranging to have a specific person who is responsible for the use of the innovation	71.7%	**97.4%**	27.3%	<.001
- involving management in the implementation project	63.3%	**84.2%**	27.3%	<.001
- including training in the innovation in the training programme of the organization	63.3%	**68.4%**	54.6%	.405
- giving regular feedback to professionals about the implementation of the innovation	61.7%	**84.2%**	22.7%	<.001
- regularly putting the use on the agenda of the team meetings	51.7%	73.7%	13.6%	<.001
- annually allocating money for continuation of the use of the innovation	50.0%	55.3%	40.9%	.422
- integrating the innovation in electronic patient records	41.7%	55.3%	18.2%	.007

[1] Two-sided Fisher exact tests

[2] Questions not asked in n=3 implementation projects in which the innovation was not being used anymore

Bold: most frequently applied strategies in projects having the innovation well implemented and sustained.

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Table 4. Percentage (and number) of projects in which each domain of MIDI 536 was perceived as facilitator or barrier for sustainability of innovations in palliative care as mentioned in the open ended questions (n=61)1

Domains of MIDI	Facilitator	Barrier
- characteristics of the innovation	19.7% (n=12)	21.3% (n=13)
- factors related to the healthcare professionals	49.2% (n=30)	14.8% (n=9)
- factors related to the organization	72.1% (n=44)	77.0% (n=47)
- factors related to the broader context of the organization	11.5% (n=7)	9.8% (n=6)

[1] n=2 missing answers

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Table 5. Factors mentioned in the open ended questions most frequently within each 541 domain of MIDI, facilitating (+) and hindering (-) sustainability of innovations in palliative care

Domain	Factor	Examples
Innovation	Complexity	+ "It easily fits into our routines, what we are used to doing."
	Adaptability	- "We did not manage to integrate the innovation into the ICT environment the healthcare professionals work with. Therefore professionals had to use a paper version of the innovation."
	Other factors	References to procedural clarity, correctness of the innovation or method, observability, relevance for patients.
Healthcare professionals	Personal benefits and/or patient outcome expectations	+ "Healthcare professionals saw that they benefit from applying this innovation" - "Healthcare professionals don't have a sense of urgency. They think that the possible gains of using the innovation cannot compensate for the invested time."
	Social support	+ "We address each other about the use of the instrument."
	Other factors	Perceived professional obligation to work with the innovation or method, perceived self-efficacy because the professional is able to work with the innovation.
Organization	Ratification by management	+ "Continuity and embedding in policy and strategy of the organisation." - "There is also no coherent policy on palliative care provision in the organization."
	Employee turnover and replacement	-+ "The biggest obstacles are staff turnover and transfer of responsibilities. Sustainability is better in the organizations where the responsibilities for further implementation are clear." - "Big change in the workforce, as a result of which there is a decline in specific knowledge and its application."
	Financial resources	- "We regularly run into a budget deficit, which means we have few resources to have extra brochures and such printed."

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	Time available	- "Lack of time and work pressure means that priority is given to direct care."
	Coordinator or driving force	+ "There are some ambassadors who persist and also know the routes within the organization, are enthusiastic about the innovation, believe in it". + "We have a steering group of experts in oncology and palliative care. These experts continuously draw the attention of healthcare professionals to the innovation and give them feedback about the application of the innovation."
	Training facilities	+- "Training in the method is included in the basic training for new colleagues. The training should also be included as standard in 'refresher' courses. This has not been put into practice yet."
	Other factors	Regularly providing feedback to professionals about the use and the experienced benefits for the professionals, possible combinations with other activities in the organisation aimed at improving palliative care, other changes (organizational or otherwise) in the organization affecting the implementation of the innovation.
Context	Factors	A regional network of palliative care that offers regular training courses, innovation as part of the curriculum of nursing schools, a professional association that stimulates working with the innovation.