The Development Model for Integrated Care: a validated tool for evaluation and development

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Abstract

Purpose – Integrating health, social and informal care and seeking for new effective collaborations is a major topic in many countries, and requires innovation and improvement in current practices. Conceptual quality management models can facilitate practice improvement. However, a generic quality management model for integrated care was lacking. The purpose of this paper is to describe the results of multiple studies that resulted in a validated generic quality management model for integrated care. The Development Model for Integrated Care (DMIC) is the basis for a digital tool for self-evaluation and is being used in multiple ways in a large number of integrated care settings.

Design/methodology/approach – A literature review, a Delphi study and concept mapping study were executed to identify the essential ingredients of integrated care. A next step was an expert study on the development process of integrated care over time. Lastly, a survey study in 84 integrated care networks was performed to empirically validate the model. Based on the model, a digital self-assessment tool was created to apply the model in practice.

Findings – The studies showed that integrated care is a complex and multi-component concept but generic elements can be assessed. The literature and expert study resulted in a set of 89 elements of integrated care. The elements were grouped in nine clusters; "quality care", "performance management", "inter-professional teamwork", "delivery system", "roles and tasks", "patient-centredness", "commitment", "transparent entrepreneurship" and "result-focused learning". Four developmental phases named "the initiative and design phase", "the experimental and execution phase", "the expansion and monitoring phase" and "the consolidation and transformation phase" were found. The findings showed that the model is applicable for multiple integrated care settings.

Research limitations/implications – The DMIC has the potential to serve as a research framework for integrated care, and the use as an evaluation tool on multiple levels. Further research is suggested about more explicitly involving the perspectives of clients, research on the involvement of multiple stakeholders and their professional backgrounds and the use of the model in other countries.

Practical implications – The DMIC is the basis of a digital web-based assessment tool, which is being used in the Netherlands in multiple integrated care settings. Applying the tool helps in assessing the current state of integrated care practice and defining suggestions for further improvement and development. It is also being used to benchmark multiple settings and is adopted in guidelines or care standards for integrated care.

Originality/value – A generic conceptual and validated model that can be supportive for integrated care practices, policy and research was lacking. The results of the summarized studies in this paper present such a conceptual model for integrated care and gives suggestions for further use in an international audience. Results in a Canadian study showed that the model can also be used in other settings and countries. This contributes to the opportunities for use of the model in integrated care practice, policy and research also in other countries.

Keywords Integrated care, Development model, Integrated care development, Integrated care improvement, Quality management mode, Digital tool, Digital self-assessment

Paper type Research paper

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Introduction

In the Netherlands substantial changes in legislation and new policies introduce major reforms in health care and long-term care since 2015. The new policy focuses on decentralization, a decline of the role of the state in providing health and social care and increases the focus on taking own responsibilities, informal care and self-management. The most vulnerable people like frail elderly or handicapped people with a need for support 24 hours a day, are still covered for care. The reforms change the responsibilities and roles of multiple stakeholders in care like health care providers, health insurers, municipalities and also of clients and informal carers. For instance, municipalities will have a bigger responsibility in purchasing and arranging social care and welfare for vulnerable people. These changes ask for new collaborations between regional stakeholders, the development of (new) networks and redefining the results that can be reached. The increased need for adjustment and collaboration between partners stresses the importance of knowledge about the development of integrated care and the creation of dynamic but sustainable networks at the same time. This paper contributes to this knowledge and builds forward on a previous paper in this journal about the development and implementation of integrated care (Minkman, 2012a).

The aim of integrating services is often to better serve client's needs and reduce fragmentation to achieve better outcomes in well-being, health status, quality of care or life and costs. Integrated care is executed in a variety of ways and generates a substantial enthusiasm and belief in its impact by involved health care providers and policy makers all over the world. The evidence of the effects of integrated care is mixed (Nolte *et al.*, 2014; WHO Service Delivery and Safety, 2015b). Often a set of combined interventions, different evolving contexts and influencing factors are present, which makes evaluating the effects of integrated care not easy. Robust and "classic-controlled research designs" do often not match the dynamic character of integrated care practices and intensive long-term studies who evaluate developments over time are scarce. But besides knowing what integrated care can deliver, a comprehensive understanding of what relevant activities are when implementing integrated care and how the development process of integrated care over time can take place is also necessary (Goodwin, 2013; Minkman, 2012b; Kodner and Spreeuwenberg, 2002).

In the previous paper the concept of integrated care was discussed, together with the relevance, aims, implementation and development (Minkman, 2012a). The paper concluded that a lot of knowledge is already present about integrated care, but to further implement and develop integrated care in practice, next steps are needed. These steps concern answers on three important sets of research questions, and "wrapping up" this knowledge into a practical, but evidence-based tool or model that can serve different stakeholders. The formulated question is "What are the relevant ingredients of integrated care and how are these ingredients related to each other?" A second set of questions arises about the process of the development of integrated care practices (or sometimes called integrated health service delivery) over time. How can the developmental process of integrated care evolve? And what are the characteristics and key issues of the development process over time? The third set of questions concern the extent to which this knowledge can be used as a basis for a generic quality management model for integrated care? And if so, can this model be empirically validated in integrated care practice?

Before answering these questions and starting the development of a model, we analysed if existing quality management models are useable for integrated care. Although numerous models or frameworks are available like the Bellagio model

(Schlette *et al.*, 2009), the Person-centred practice framework (McCormack, 2003), the Rainbow model (Valentijn, 2015) and WHO's Framework for action (WHO Service Delivery and Safety, 2015a) the number of validated, internationally frequently used quality management models in integrated care was limited when we started our study. Only the European Foundation for Quality Management Excellence model and the Malcolm Baldrige Quality Award criteria on the one hand and the Chronic Care Model (CCM) on the other hand met our criteria. The criteria were first that the models consist of multiple "enablers" of good quality care (for instance leadership, decision support systems or delivery system design). Enablers cover the processes, structure and means of an organization. Second, these models focus on multiple performance dimensions for multiple stakeholders (for instance organizational performance, worker satisfaction). Lastly, a criterion was that they assume dynamic relationships between improved performance and implementation of the model enablers. Our systematic literature review on studies with these models included 37 studies. Data were retrieved about the main intervention elements, study design, evidence level, setting, data collection and analysis, principal results and performance dimensions. The main conclusions were that the evidence for improved performance when using these models was mixed and limited, but growing for the (components of) the CCM. However, the studied models do not have a focus on integrated care in general. Therefor the next step in our studies was to develop such a model (Minkman *et al.*, 2007).

In this paper an overview of the results of multiple studies which focused on the above-mentioned research questions are presented. Details of each study are described in Minkman *et al.* (2007, 2009, 2011, 2012, 2013). The studies together resulted in the Development Model for Integrated Care (DMIC). This conceptual model is a generic, not client group specific model, that has been validated and used in the Netherlands and abroad. First the development and validation process of the model is described. Next, our experiences with using the model in integrated care practice in the Netherlands are described. Finally, we discuss the limitations of our studies and other opportunities to use the model in further studies and in an international context.

Methods

Development of the model

To develop a conceptual model for integrated care a combination of three methods was applied. First, a literature study was conducted which identified 101 elements of integrated care. An element of integrated care was defined as an activity focusing on the development (realization, improvement, innovation or sustainability) of integrated care. The Pubmed and Cochrane databases were searched on reviews and other sources like doctoral theses, evaluation reports and frequently used quality management models were also studied. In the second step a three round Delphi study was carried out with 31 experts to improve, complete and restrict the list of elements from the literature study (Linstone and Turoff, 2002; Franklin and Hart, 2007). The experts rated the importance of each element, could suggest new elements and could do suggestions for reformulation of elements. Based on strict cut-off points elements were included or excluded in the final set. This Delphi procedure delivered a final list of 89 elements of integrated care. The elements were used as input for a concept mapping session with the same expert panel. Concept mapping is an exploratory systematic consensus procedure for modelling conceptual frameworks based on specific elements (Trochim and Kane, 2005; Nabitz *et al.*, 2005). First, a point map was

calculated by using multidimensional scaling. Second, the coordinates of the point map where used to conduct hierarchical cluster analyses. The concept map resulted in nine clusters which were labelled by the experts.

Development of integrated care over time

To answer the questions how integrated care services develop over time, we started with a (non-systematic) literature study on organizational development, network organizations and quality improvement models. The results of the literature study were discussed in subgroups by the 31 experts. A question was if, how many and with what characterizing features developmental phases of integrated care could be recognized in practice. Based on the analyses, a concept description of a four-phase model was constructed. To further develop and member-check the four-phase model a digital questionnaire was developed. In the questionnaire the experts could give feedback on the phase descriptions and each expert reviewed the 89 elements of integrated care from the pre-study in relation to the four phases. The experts scored if elements were relevant in each phase or in multiple phases. Descriptive statistics and frequency analyses were further used to analyse the results.

Validation of the model

In the last phase of the study the empirical validation of the 89 elements, the nine clusters and the four development phases of the DMIC were empirically tested in integrated care practice. Based on the DMIC, a survey was developed for integrated care coordinators of three integrated care service settings in the Netherlands: stroke, acute myocardial infarct (AMI) and dementia. The selection of these three groups was based on the desired variance in client groups, variance in involved care providers and stakeholders and different starting points of the collaborative networks to assess the generalizability of the model. The survey focused on the relevance, implementation and plans of the elements in integrated care practices. In total, 84 integrated care services – 32 stroke, nine AMI and 43 dementia services participated in the study. Data were collected on integrated care site characteristics, relevance, presence and year of implementation of the 89 elements. Regarding the development phases data were collected on self-assessed development phases and factors that influence development. The data analysis was done by means of descriptive statistics, χ^2, ANOVA, Kruskal-Wallis tests, κ tests, Pearson's correlation.

Development of an improvement tool

After the validation phase of the total model a digital web-based self-assessment tool for integrated care settings was developed. Based on the user demands and desired output, an ICT-provider translated these requests into a web-based tool with a database. The aim of the tool was to self-asses the current state of integrated care in a certain practice or network, assess if multiple involved partners have the same perceptions on the integrated care collaboration and to get directions for further improvement. Also another aim was to benchmark multiple sites when comparable settings would use the tool, to learn from each other and from good practices.

Results

Overall results

Our study showed that integrated care development and implementation can be seen as a complex long-term process, in which multiple activities are relevant. The results show

that eventually 89 generic elements of integrated care were defined and found relevant into practice, although practices differed in client group, involved professionals and stakeholders, age, region, size and focus. The elements are clustered in nine-related groups or "clusters". The process of development of integrated care over time seems time consuming and takes multiple years, in which multiple phases can be distinguished. The conceptual representation of the clusters, elements and phases formed together the basis for a quality management model for integrated care, called the DMIC. This model can be used as an (self) assessment tool and serve multiple purposes for practice, policy and research (see Figure 1).

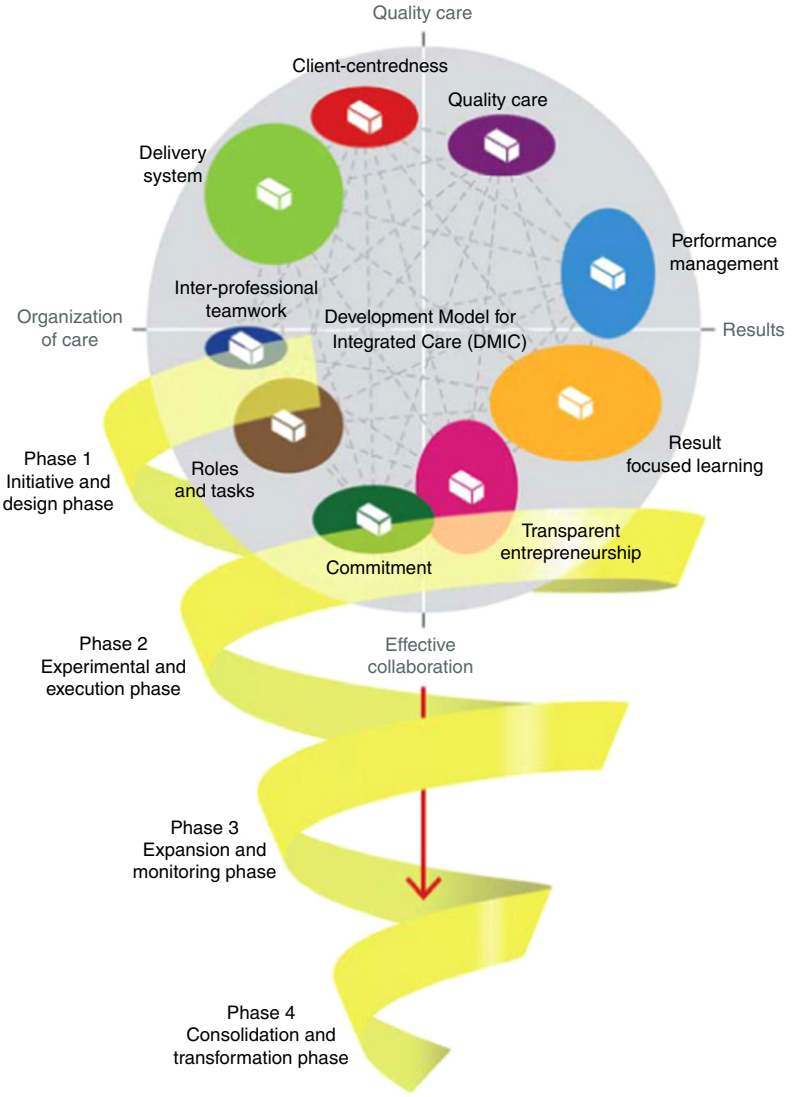

Figure 1.
Development Model of Integrated Care

Development of the model

The 89 elements of integrated care who were the result of the Delphi study are described in the Appendix. During the Delphi study no experts were lost resulting in a response rate of 100 per cent in every round. The included elements had a priority score that ranged between 1.79 and 2.94 (maximum score of 3). The elements cover a wide range of activities who are relevant for integrated care from more procedural or logistic activities (like "reaching agreements on referrals and transfers of clients" or "using shared care and treatment plans") to more collaborative or people centred activities (like "stimulating a learning culture and continuous improvement" or "realizing direct contact among professionals").

As a result of the concept mapping procedure the elements were clustered into nine groups on the cluster map. The labels of the clusters were "quality care" (nine elements), "performance management" (16 elements), "inter-professional teamwork" (three elements), "delivery system" (18 elements), "roles and tasks" (eight elements), "patient-centredness" (nine elements), "commitment" (11 elements), "transparent entrepreneurship" (seven elements) and "result-focused learning" (12 elements). The description of each cluster is presented in the Appendix.

Development of integrated care over time

The study showed that four developmental phases of integrated care development could be defined. These phases were labelled the initiative and design phase; the experimental and execution phase; the expansion and monitoring phase; and the consolidation and transformation phase. The questionnaire results showed a high percentage of confirmation of the phases (range 86.2 per cent phase 3 till 69 per cent phase 2). The results did not show contradictory suggestions of the experts and consensus on all remarks could be reached in the research team. Further systematic analyses of the expert input resulted in the phase description and key words which are presented in the paragraph below. In the next research step analysis of the questionnaire results in which elements were being linked to phases of development, showed that in each of the phases different elements of integrated care were identified as the most important ones. This showed that phases do have different accents over time. In Minkman *et al.* (2009a, b) for each of the four phases, the top 10 (of the 89) elements that are most related to that specific phase are described.

Description of development phases are as follows.

Phase 1. Initiative and design phase: the collaboration between health care providers has been intensified or started up. The starting point is a common problem or chance occurrence, or builds on current cooperation among care professionals. There is a sense of urgency and there are possibilities for working on these challenges in collaboration. The targeted patient group, the care chain and care process have been defined, as also the needs of patients and stakeholders. The level of ambitions, motivation and leadership determine the progress achieved. A multidisciplinary team designs an experiment or project to execute the current ideas. The collaboration can be signed up to in an agreement among care partners.

Key words: exploring possibilities/impossibilities, ambitions and chances, (project) design and collaboration agreements.

Phase 2. Experimental and execution phase: new initiatives or projects are being executed in the care chain. The aims, content, roles and tasks in the care chain have been clarified and written down in care pathways and protocols. There is coordination

at the level of the care chain by for instance installing coordinators or setting up meetings. Information about patient groups, working procedures or professional knowledge is exchanged. There are experiments within the collaboration, results are evaluated to learn from and reflect on. Preconditions for projects have been considered and boundary conditions have been solved by collaborative means or agreements among care providers.

Key words: writing down aims and content of the collaboration, coordination at care chain level, experimenting and reflecting.

Phase 3. Expansion and monitoring phase: projects have been expanded or integrated in integrated care programmes. Agreements on the content, tasks and roles within the care chain are clear and signed up. Collaboration is no longer on an informal basis. Results are systematically monitored and improvement areas identified. The targeted population has been surveyed. More collaborative initiatives emerge such as mutual education programmes. There is a continuous commitment to the ambition of the integrated care programme. Interorganizational barriers and fragmented financial structures are on the agenda of the care partners.

Key words: further development and maturity, monitoring and improving results, new questions and innovation.

Phase 4. Consolidation and transformation phase: the integrated care programme is the regular way of working and providing care. Coordination at care chain level is operational; information is shared, transferred and fed back. A monitoring system periodically shows if results are being sustained, what specific improvement possibilities have been identified and to what extent patient needs have been met. The programme builds further on successful results. Organizational structures transform or are newly designed around the integrated care programme. Financial agreements are arranged with financers by means of integral contracts covering the care chain as a whole. Partners in the care chain explore new options for collaboration in the external environment with other partners.

Key words: continuous improvement, new ambitions, structures fitting the integrated care programme (organizational structures, integral financing).

Validation of the model: integrated care elements

The elements and phases were validated in 84 integrated care practices for people with dementia, stroke and AMI. The characteristics of the involved integrated care practices are described in Minkman *et al.* (2013). For each practice the integrated care coordinator or programme leader rated all elements of the model in relevance for their setting and scored if elements were implemented already or being planned to work on. The results showed that the elements of the DMIC were rated as highly relevant in all three care settings (see Figure 2). Although the dementia networks did not go back nearly as far (i.e. they are younger), the numbers of implemented elements were comparable to those in the other services, indicating a large amount of activity in recent years. For the total group, the mean percentages of implemented elements were the highest in the clusters "inter-professional teamwork" and "roles and tasks", while the lowest percentages were found in the "quality care" and "performance management" clusters. Timeline analyses showed that the older integrated care services had fewer plans for further implementation of elements in the near future than the younger ones, as was presumed by the model. The number of planned elements differed significantly between the three groups of services (respectively 8, 4 and 21, $p < 0.001$) but told us that the

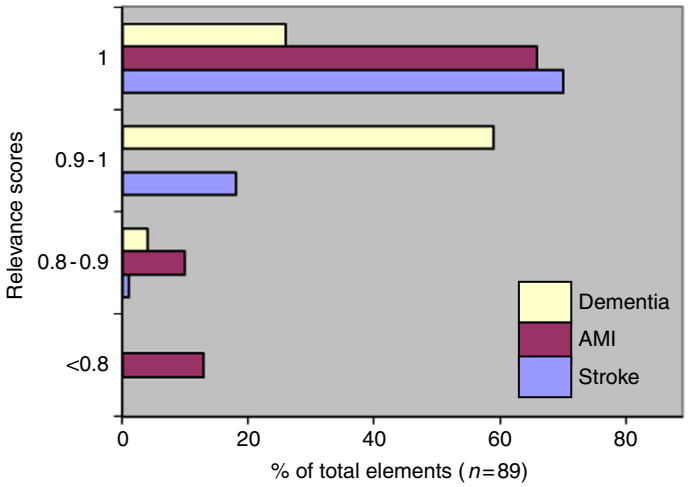

Figure 2.
Relevance scores

integrated care services are still developing, although the intensity differs. Although the client groups and the characteristics of the 84 participating integrated care services differed considerably, the results confirm that the clusters and the vast majority of DMIC elements are relevant to all three groups.

Validation of the model: phases of development

For the validation of the development phases, data were collected by self-assessed development phases and factors that influence the development of the integrated care services. All 84 participating integrated care services positioned themselves in one of the four phases and confirmed the phase descriptions. Of these 93 per cent confirmed that they recognized earlier phases and had gone through the previous phase. The study provided support for a presumption of the four-phase model that the number of implemented elements would increase between each of the phases (and decrease for planned elements). The correlation between implemented relevant elements and the self-assessed phase was substantially lower than the correlation with phases as calculated on the basis of the DMIC. This indicates that the self-assessment of development phases would appear to be complex, while the DMIC can be supportive in calculating the development phase of integrated care services. The results also showed that elements corresponding to the earlier phases of the model were on average older in age, which indicates a certain pattern in development over time. Although the integrated care services were all very different, the DMIC development phases were confirmed.

Self-assessment tool for integrated care

The 84 integrated care practices who worked with the DMIC in the validation studies, stressed that using the model as a reflection model on their own situation was helpful. Therefor the idea was realized to build an internet-based assessment tool based on the DMIC. The tool consists of three parts. In part A generic information about an integrated care service is collected (like involved partners, number of clients, role of the coordinator), in part B the 89 elements are to be scored (self-assessed by the service) and in part C the development phases are presented and self-assessed. The tool can be used in two ways. One possibility is that one person on behalf of the total service or

network scores all questions, another option is that multiple persons from a network or service all fill in the questions in the tool. Based on consensus scores, the total scores for the integrated care service can be calculated and differences and overlap between persons can be shown. Together the results give an overview of the current situation of an integrated care practice and the view of multiple involved stakeholders of the integrated care service. Based on the previous research (Minkman, 2012b) the tool can also define if the self-assessed scores (i.e. developmental phases) match the scores as calculated by the DMIC.

Use in practice

Another founding was that the integrated care coordinators in the validation studies found that the DMIC helped them to assess their integrated care and supported them in obtaining ideas for expanding their integrated care activities. It showed that the model can be used as an instrument to reflect on current practices and to identify areas for improvement fitting their phase of development. To apply the model and to bridge the gap between research and practice, the web-based tool was build and tested in practice. During the last years already 136 networks and 519 individuals used the web-based tool to assess their practice and the generalizability and relevance of the model was further tested. Besides stroke, dementia and AMI services as in the validation studies, respondents from other types of integrated care practices for diabetes, youth care, elderly care, palliative care and care for people with autism and brain damage used the model. First results of these practices showed that in all networks it was applicable. Filling in the digital tool based on the model helped them to assess their integrated care more objectively and helped to define areas for improvement. Also, by involving multiple partners per integrated care service when filling in the digital tool, differences in perceptions about development phases and present or to prioritize elements became visible. Another recent application of the model is using the digital tool as a benchmark tool in 36 integrated diabetes networks. Also, the National Dutch Stroke Service Network adopted the DMIC as a quality management tool and benchmarks all their members (about 60 stroke services) every two years. Because of this wide spread use in the Netherlands, it is interesting to question if the DMIC is also relevant and applicable in other countries. The results of a Canadian study are promising in this perspective. In Quebec the DMIC was applied in four different care pathways: chronic obstructive pulmonary disease, autonomy support for the elderly, palliative oncology care and mental health. The instrument and model was translated into French. The internal consistency analyses (Cronbach's α used for dichotomous variables) showed significant consistency across the 89 elements, the nine clusters and the four phases of development. The involved nurses in this study confirmed that 98 per cent of the integrative activities or elements of the model were relevant to their practice. The study showed that the model was useful and revealed a gap between the evolution of nursing practice and the introduction of changes aimed at increasing service integration.

Conclusion and discussion

Our study showed that integrated care is a polymorphous concept with a number of underlying concepts, aims, possible interventions and variation in practice. Despite differences in client groups, size of the geographical area, focus and providers, there are common and generic components which are important for the improvement and development of integrated care services. Support for the conclusion was found that the

DMIC's elements and clusters can serve as a basis for a generic quality management tool for integrated care.

These generic components are described as 89 elements or activities that focus on the realization, improvement, innovation or sustainability of integrated care. The elements are grouped in nine-related clusters (see the Appendix). When we compare the clusters with existing frequently used quality management models like the CCM there is a resemblance in for instance the "delivery system design" and "clinical information system" clusters (Minkman *et al.*, 2009a, b). The DMIC, however, has a larger focus on collaboration, commitment, learning, roles and tasks and entrepreneurship. When we compare the DMIC with the taxonomy of the recently developed Rainbow model which focuses on primary care, ingredients like for instance centrality of client needs, case management, inter-professional education and collaboration do overlap. Differences are for instance that the scope of the RMIC is more on population needs related to primary care, it is clustered around types of integration and value creation is more included (Valentijn, 2015). However, if we overview the DMIC studies, it can be concluded that it captures in an integrated way the essential ingredients for integrated care. The validation studies in 84 integrated care practices, pointed out that the DMIC components are not only a theoretical exercise, but are recognized and relevant in practice. The empirical validation of the DMIC in 84 practices confirmed the model; the elements are widely recognized in practice, the cluster relevance scores are all very high.

An interesting finding which differs with other (quality management) models is the attention to four phases of development in our model. In the literature about organizational development phases or life-cycle thinking is more common (Phelps *et al.*, 2007). The four phases of the DMIC do have their different accents; they show that integrated care development is characterized by a changing focus over time in each phase, often starting with the drawing up of numerous plans for the near term. The developmental phases were recognized and experienced in practice although integrated care development is sometimes seen as chaotic, always dynamic and influenced by a lot of contextual factors. The self-assessment of development phases appears to be complex; about one-third of the scores overlapped with the development phase as calculated by the DMIC (Minkman *et al.*, 2013). New (unpublished) analyses show that the background of the person (professional, managerial, coordinator) who executes the self-assessment on behalf of the integrated services could be an important factor in the scoring. Persons who have a coordinative role seem to score more elements as present, resulting in higher development phases. This was also found in the Canadian study (Longpre and Dubois, 2015).

As always, our study had some limitations which also give inspiration for further research. First, the perspectives of clients were only indirectly included. These people are the eventually group to target, so further research to incorporate this perspective more explicit would be worthwhile. Another suggestion for further research is studying the relation with the background and position of the respondents. In multiple studies we have seen that people who are more involved in integrated care initiatives (for instance in a role as coordinator), tend to score more present elements and further phases of development. The web-based tool supports further research with multiple respondents per site. Another aspiration of the model is expanding its use in other countries and in changing contexts. Integrated care is an issue in many countries and in multiple countries new policies and legislation aiming at integrated care are being implemented. Also concepts of care make a shift to more welfare and service orientation approaches. These new concepts about health like "positive health" (Huber, 2011) might

bring changes to what is expected of multiple players in inter-professional collaboration and also new players emerge. An example of this is the upcoming civilian initiatives who arrange care and support in communities for themselves. These collaborations are interesting new players in integrated care settings (Nies, 2014). Lastly, the governance of integrated care asks for further research. How to guide, supervise and organize accountability for integrated care asks for new solutions in times were responsibilities, power and values about care and the relation between professional and client are changing in our dynamic world.

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Appendix. Clusters and elements of the model

Cluster 1. Patient-centredness, nine elements: this cluster is about developing integrated care and information flows tailored to specific (sub)groups of patients. Elements focus on integrated patient and care process supporting information such as front offices, self-management support or information systems, and delivering care adjusted to individual needs (e.g. multi-morbidity).

Element description:

Providing understandable and client-centred information.
Collaboratively offering client information of the care partners.
Designing care for clients with multi- or co-morbidities.
Using self-management support methods as a part of integrated care.
Implementing care process-supporting clinical information systems.
Flexible adjustment of integrated care corresponding to individual clients' needs.
Developing a front office: single entry point for client information.
Using a protocol for the systematic follow-up of clients.
Developing care programmes for relevant client subgroups.

Cluster 2. Delivery system, 18 elements: chain and client logistics, coordination mechanisms and procedures for streamlining the care process for the whole care chain is the main focus of this cluster. The reaching of all agreements (e.g. logistics, sharing expertise), procedures (e.g. information exchange) or tools (e.g. care plans) in the care chain that are necessary from the client's initial entry into the care chain until the final contact are reflected in this cluster.

Element description:
Reaching agreements on referrals and transfer of clients through the care chain.
Reaching agreements on procedures for information exchange.
Using a single client-monitoring record accessible for all care partners.
Reaching agreements on procedures for the exchange of client information.
Developing connections between databases of partners in the care chain.
Offering case management for clients with complex needs.
Reaching agreements on chain logistics (e.g. waiting periods and throughput times).
Using shared client treatment and care plans.
Using uniform client-identification numbers within the care chain.
Reaching agreements among care partners on the consultation of experts and professionals.
Reaching agreements among care partners on managing client preferences.
Reaching agreements among care partners on scheduling client examinations and treatment.
Reaching agreements among care partners on discharge planning.
Developing criteria for the inclusion and throughput of clients in the care chain.
Reaching agreements among care partners on providing care to waiting-list clients.
Bringing specialized nurses into action through the care chain.
Reaching agreements on linking clients to outside resources or community care partners.
Developing criteria for assessing clients' urgency.

Cluster 3. Performance management, 16 elements: measurement and analyses of the results of the care delivered in the care chain is the central theme of this cluster. Elements address performance targets at all levels, monitored by the standardized use of indicators. Indicators address client outcomes, client judgements, organizational outcomes and financial performance data. (Near) mistake analysis, feedback mechanisms and improvement teams are used to improve and manage the level of performance.

Element description:
Defining performance indicators to evaluate the results of the integrated care delivered.
Providing feedback to care partners on transfers.
Gathering client-related performance data (health status, quality of life).
Gathering data on client logistics (e.g. volumes, waiting periods and throughput times) in the care chain.
Using feedback and reminders by professionals for improving care.
Reaching agreements about the uniform use of performance indicators in the care chain.
Monitoring successes and results during the development of the integrated care chain.
Establishing quality targets for the performance of the whole care chain.
Monitoring and analysing mistakes/near mistakes in the care chain.
Using a systematic procedure for the evaluation of agreements, approaches and results.
Monitoring client judgements and satisfaction for the whole care chain.
Gathering financial performance data for the care chain.
Making transparent the effects of the collaboration on the production of the care partners.
Monitoring whether the care delivered corresponds with evidence-based guidelines.
Establishing quality targets for the performance of care partners.
Installing improvement teams at care-chain level.

Cluster 4. Quality care, five elements: this cluster contains elements that focus on the design of a multidisciplinary care pathway throughout the care chain, based on evidence-based guidelines and standards and clients' needs and preferences. A needs assessment of the specific client group

is required for this purpose, combined with the involvement of client representatives in designing, improving and monitoring the integrated care.

Element description:

Systematically assessing the needs of the clients in the care chain.

Developing a multidisciplinary care pathway.

Involving client representatives in improvement projects in the care chain.

Using evidence-based guidelines and standards.

Involving client representatives by monitoring the performance of the care chain.

Cluster 5. Result-focused learning, 12 elements: a learning climate of striving towards continuously improved results in the care chain is this clusters central theme. The elements address essential ingredients for improvement: defining goals for collaboration, identifying bottlenecks and gaps in care, and ways of learning and exchanging knowledge in an open atmosphere. Incentives are used to reward improved performance.

Element description:

Stimulating a learning culture and continuous improvement in the care chain.

Defining and assessing the characteristics of the collaboratively delivered care.

Making transparent the benefits of the collaboration for each care-chain partner.

Collaboratively assessing bottlenecks and gaps in care.

Sharing knowledge among care partners about effectively organizing sustainable integrated care.

Striving towards an open culture for discussing possible improvements for care partners.

Learning by the exchange of information among professionals about the care process.

Integrating incentives for rewarding the achievement of quality targets.

Using knowledge and information for directing and coordinating the care chain.

Using collaborative education programmes and learning environments for the professionals of care partners.

Linking consequences to the achievement of agreed goals.

Collaborative learning in the care chain in order to innovate integrated care.

Cluster 6. Inter-professional teamwork, three elements: this cluster represents inter-professional teamwork for a well-described client group. The defined client group is the target to be reached by collaborating professionals, working in well-organized multidisciplinary teams in the care chain.

Element description:

Defining the targeted client group.

Working in multidisciplinary teams.

Reaching agreements on the availability and accessibility of professionals.

Cluster 7. Roles and tasks, eight elements: the need for clarity about each other's expertise, roles and tasks in the care chain is reflected in this cluster. Effective collaboration at all levels, with new partners and by allocating coordinating roles are the main components.

Element description:

Reaching agreements among care partners on tasks, responsibilities and authorizations.

Achieving adjustments among care partners by means of direct contact.

Ensuring that professionals in the care chain are informed of each other's expertise and tasks.

Installing a coordinator working at chain-care level.

Establishing the roles and tasks of multidisciplinary team members.

Realizing direct contact among professionals in the care chain.

Reaching agreements on introducing and integrating new partners in the care chain.

Directing the care chain by appointing a limited number of persons with coordinating tasks.

Cluster 8. Commitment, 11 elements: this cluster's focus is on collaborative commitment and ambition in the care chain. Commitment towards clearly defined goals and a collaborative

ambition, apart from awareness of dependencies and domains. The commitment of leaders to the care chain and the awareness of working in a care chain are also components.

Element description:

Defining the ambitions and aims of the collaboration in the care chain.
Signing collaboration agreements among care partners.
Assuring the leadership commitment of the partners involved to the care chain.
Describing the tasks and authorities of leaders, coordinators and advisory boards in the care chain.
Establishing dependencies among care partners.
Guiding the care chain by emphasizing a collaborative commitment.
Structural meetings of leaders of care-chain organizations.
Reaching agreements about letting go care partner domains.
Stimulating trust among care partners.
Stimulating the awareness of working in a care chain.
Structural meetings with external parties such as insurers, local governments and inspectorates.

Cluster 9. Transparent entrepreneurship, seven elements: this cluster concentrates on space for innovation (experiments), leadership responsibilities for performance achievement and joint financial agreements covering the integrated care. Preconditions for entrepreneurship, including financial preconditions, are represented in the collection of elements.

Element description:

Making commitment to a joint responsibility for the final goals and results to be achieved.
Using a uniform language in the care chain.
Reaching agreements on the financial budget for integrated care.
Allocating financial budgets for the implementation and maintenance of integrated care.
Involving leaders in improvement efforts in the care chain.
Creating an open environment that encourages experiments and pilot projects.
Offering a single collaborative financial contract to financing parties by the collective of care partners.

About the author

Dr Mirella Minkman is the Head of the Innovation and Research Department at Vilans, the Center of Expertise in long-term care in the Netherlands. Her current research focuses on the innovation and improvement of the organization of long-term care (elderly care, care for the disabled and home care) to optimize quality of life and quality of care. Professor Minkman focused her PhD on the development and implementation of integrated care. Besides her work at the Vilans, Mirella is a Distinguished Professor at the Tilburg University and TIAS the University's Business School. There she holds the Chair called "Innovation of organization and governance of integrated long term care". Dr Mirella Minkman can be contacted at: m.minkman@vilans.nl