

SYSTEMATIC REVIEW

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The renewed Development Model for Integrated Care: a systematic review and model update

Mirella M. N. Minkman^{1,2*} , Nick Zonneveld^{1,2} , Kirsten Hulsebos³, Marloes van der Spoel³ and Roelof Ettema³

Abstract

Background Organising integrated health services beyond domains in interorganizational networks, can be supported by conceptual models to overview the complexity. The Development Model for Integrated Care (DMIC) is a systematically developed generic model that has been applied to innovate and implement integrated care services in a large range of (international) healthcare settings. After a decade, it is important to incorporate new available literature in the model. Therefore, our aim was to update and further develop the DMIC by incorporating the current body of knowledge.

Methods A systematic literature review and subsequent stepwise systematic update of the DMIC.

Results The review of the literature resulted in 179 included studies and eventually 20 new elements for the development model, which could be positioned in the nine clusters. New elements address the importance of the social system and community of the client, proactive care during the life span, digital (care) services and ethical and value driven collaboration in interorganizational networks that cross domains. The added elements for integrated care build further on the nine thematic clusters and the model as a whole, expanded with new accents.

Conclusion The renewed model emphasizes the connectedness of care within a larger eco-system approach and inter-organizational networks. The model captures current knowledge which can be supportive as a generic conceptual model to develop, implement or innovate integrated services towards health value in societies. Further, it can serve for healthcare services research purposes to reflect on and monitor developments in integrated care settings over time on multiple levels.

Keywords Elements of integrated care, Conceptual model, Inter-organisational networks

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Background

With increasing pressure on changing demographics, resources, and staff capacities worldwide, the need for person-centered and affordable health services that deliver integrated care is evident. The concept of integrated care is often defined and described from different points of view and unraveled in multiple contexts, without leading to one size fits all approaches or definitions [1–3]. This demonstrates that care and welfare are multidimensional in its nature and are also context-related. Integrated health services also have to interact with other domains such as housing, education, work and leisure. As a consequence, the development of these integrated services remains a complex challenge in many societies for policy makers, professionals and researchers [4, 5].

Over time, the vocabulary, definitions and characteristics of integrated care reflect the developments in health care settings over the world. Where in the early 2000s terms like disease management, care pathways and care chains are used, a shift towards integrated services, inter-organisational networks, cross-domain care, integrated pathways and population health management is present. This reflects the development from single disease oriented or process based solutions towards interventions that influence the total health needs of people in communities and societies as a whole. From this perspective, health is a multidimensional concept which only can occur in balance with other domains in life [4, 6–8].

Besides the terminology, developments in healthcare and societies itself set their footprints on the innovation and realization of integrated care. Digital care, artificial intelligence, the availability of knowledge via the internet and the involvement of clients/civilians and communities as partners in care (co-design and co-creation) are a few of these developments. They are related to larger trends and driven by underlying forces like the increased possibilities of digitalization or policy measures, that are widely embedded in societies. Furthermore, the COVID-19 pandemic and follow up pandemic preparedness actions can be seen as a stress test for many healthcare systems. The need to reorganize and rethink whole system approaches on acute care, youth care and elderly care, urges rethinking how adaptiveness can be increased and on what scale (local, (sub)regional, national) integrated services should be organized [9, 10].

We learned that the development of integrated services takes long timespans. They require changes of processes, implementation of innovations, but also urge for different behavior, relations, routines and other power balances. It urges the need for inter-organisational collaboration with its complexity for shared leadership, resolving financial barriers and making inter-organisational networks work [1, 11, 12]. The development of integrated care needs non-traditional governance that combines

a suitable package of leadership, accountability, supervision (both internal and external) as fundamentals to build on. Governance fundamentals often still have single organisations as their entities and lack more horizontal mechanisms, inter-organisational networks and linkages with communities [13, 14]. It takes time to develop new ways of working and other governance arrangements. In this way we find ourselves currently in a timespan of disentangling a governance order “in-the-making” [15].

Conceptual models

Despite changing contexts and developments worldwide, the aim and ambition of integrated care stays rather coherent over time. There is a growing body of knowledge and evidence about integrated care in general. Numerous practice- or evidence based approaches and examples are available, often accompanied by discussions about (needed) system- or policy changes. The purpose is often focused on reducing fragmentation between silos, domains and services by pursuing connectedness and coordination to deliver care and support that contributes to the total needs and quality of life of people. The multidimensionality and complexity of integrated care as a concept, can be supported by conceptual models to guide, evaluate or enhance the development in practice. Conceptual models point out the most important components and ingredients, but are not that concrete or limited to a certain context. They need a translation into a specific context. Conceptual models can in this way be supportive for policy, practice and research purposes to overview and guide the complexity of integrated care. Several conceptual models have been developed with different backgrounds, methods, validity and usage. Some examples are the Innovative Care for Chronic Conditions (ICCC) model, the Framework of WHO, the Prisma model, the Rainbow model and the Development Model for Integrated Care [16–21]. The update of this last model is the object of our study. The DMIC is systematically developed and consists of concrete activities (defined as elements), that come together in thematic clusters. This makes the DMIC useful in practice and is therefore frequently used. However, activities can become obsolete and new activities, due to new developments and knowledge, are not automatically included in the model. That motivated us to update this model in a systematic and thorough way.

The Development Model for Integrated Care

The Development Model for Integrated Care (DMIC) was one of the first generic, nonclient group nor disease or sector specific conceptual models covering integrated care which was also validated in multiple settings [21]. After its inception, the model has been used in (inter) national practice for self-assessment, improvement,

research and educational purposes [22–25]. The DMIC was developed based on an international literature study, a three round Delphi study and validation studies in 84 integrated health care services. It constructed a generic model that captures elements that contribute to the development, implementation or innovation of integrated care. An element is defined as an activity focusing on the development (realization, improvement, innovation or sustainability) of integrated care [26]. Although a large diversity of inter-organisational integrated care networks (in size, client group, location, etc.) participated in the validation studies, they did confirm the model [26–28].

The model consists of 89 elements of integrated care, described as activities that contribute to the realization, implementation or development of integrated care. The elements are grouped in nine thematic clusters which were labelled quality care, performance management, inter-professional teamwork, delivery system, roles and tasks, patient-centeredness, commitment, transparent entrepreneurship and results-focused learning. The DMIC also pays attention to the question how integrated care services can develop over time. For instance, if certain elements are more suitable in earlier phases of development or later in time. The study defined four development phases with different characteristics per phase, called the initiative- and design phase, the experimental and execution phase, the expansion and monitoring phase and the consolidation and transformation phase [28].

The model has been applied in practice through a self-assessment module in the form of a questionnaire or quick scan, to analyze the current state of the integrated care services and define improvement areas or changes over time. It was translated into English, French, German and Mandarin. Leaders and coordinators of inter-organisational networks like networks for people with dementia, youth care, palliative care, diabetes care or stroke care formulated their improvement plans based on the DMIC. Over 600 professionals and inter-organisational networks in the Netherlands used the DMIC model and related tools. The National Stroke Service Network of the Netherlands adapted the model into their quality assessment and auditing of stroke services. Based on three rounds of assessment over multiple years, a unique benchmark study was published [22–25]. Recently the fourth round was executed. In Canada and Germany networks also used the DMIC as their reference and improvement framework. A Norwegian research project analyzed the applicability and possibilities of the model in social care [29]. Although the DMIC is being used, new developments and knowledge have emerged since the inception of the model. Therefore our research question is: what changes or improvements have to be incorporated

into the conceptual model suiting the current body of knowledge?

Methods

The purpose of this study is twofold (1) assessing to what extent the 89 elements of the DMIC are still in line with the current literature and, (2) identifying what additional elements are needed. First, a systematic review of the integrated care literature of the past 15 years was conducted, drawing on the principles of the PRISMA framework [30]. Second, we followed a systematic approach to update the DMIC to current insights. The review and update of the DMIC was performed in five phases.

Phase 1: establishment of inclusion criteria and systematic search

First, the scope of the systematic search was defined, by formulating a set of inclusion criteria. The first version of the DMIC was based on a systematic review that ran until 2007. We therefore started the review of the literature for this update in 2007. Publications were included in the study if they:

- described activities or elements promoting integrated care;
- presented results of review research or empirical findings;
- were published between January 1st 2007 and May 15th 2023; and,
- were written in the English language.

The broad version of the Integrated Care Search string developed by the International Foundation of Integrated Care (IFIC) was used for the formulation of search terms ([31, 32], Appendix 1).

After establishing the scope of the study, a systematic search was executed in the PubMed database. Additionally, the snowball technique was used by specifically searching for references with terminology related to integrated care elements, such as integrated care ‘needs’, ‘activities’, ‘elements’, ‘preconditions’ and ‘models’. Additional articles from multiple sources and databases were found using the snowballing technique by searching through the references of identified articles.

Phase 2: assessment of publications

Assessment of the literature identified in the systematic search took place in three steps. First, titles of the publications were screened independently by two researchers, assessing whether articles met the inclusion criteria established. Second, the abstracts of the articles selected in step 1 were independently assessed for eligibility by two researchers. Third, the full-texts of the articles included in step 2 were independently assessed by two

researchers. In all three steps, discussion took place if two researchers assessed a publication differently. For reasons of increasing inter-rater reliability and spreading the workload, in total, eight researchers in different duos participated in phase 2 (RE, NZ, KH, MvdS, PvB, IG, SP, MS).

Phase 3: data extraction

In the data-extraction phase, two categories of data were extracted from the publications. This information was systematically included and recorded in an Excel file. First, the characteristics of each article were noted: the author(s), year of publication, study design, care setting and country/region. Second, the elements promoting integrated care were extracted from the articles. Again in alternating duos, the data extraction was conducted by two researchers independently. A third and a fourth researcher were consulted in case of disagreements. As in phase two, the same research team participated in phase 3.

Phase 4: data analysis

Analysis of the data extracted was performed in two main steps:

- 1) Comparing the extracted elements with the existing model: First, the activities and elements identified in the included articles, were compared with the existing elements in the DMIC. The research team assessed whether an activity or element extracted from the articles: (1) overlapped with the existing elements in the DMIC, or (2) formed an addition to the existing model. If applicable, an element was placed in one of the nine existing DMIC clusters, and then compared with the existing elements in the particular cluster. If this was not possible, elements were placed in a new category. Overlapping elements were excluded from the data-set. The assessment of elements took place independently alternating by two researchers (RE, NZ, KH, MvdS). A third and a fourth researcher were consulted in case of disagreements (RE, NZ, MM).
- 2) Thematic analysis of additional elements: Thematic analysis of additional elements was conducted as a secondary step. Secondly, all newly identified elements fitting the model were subjected to thematic analysis. This involved a comprehensive analysis and search for common or overarching themes within these elements, aiming to identify patterns or recurring concepts.

Phase 5: adjustment of the DMIC

Lastly, the DMIC was adjusted based on the data of the systematic review. This took place in four steps.

- 1) Describing the newly found elements: First, new additional elements were formulated based on the thematic analysis. These new formulations were tailored to align with the style, language, and abstraction level of the current DMIC. This was collaboratively done by three researchers (MM, NZ, RE).
- 2) Placing new elements in the clusters: Second, the new elements formulated in step 1 were placed into existing DMIC clusters. Two researchers (MM, NZ) independently categorised the new elements into the existing DMIC clusters. Any potential disagreements were resolved in a consensus session. Subsequently, a third researcher checked all outcomes (RE).
- 3) Refining and updating the language of the existing 89 elements in the model based on the review findings: the language of the initial 89 initial elements were refined and updated by three researchers (MM, NZ, RE). If necessary, minor linguistic adjustments were made for consistency reasons.
- 4) Refining and updating cluster labels: Lastly, based on the newly added elements, the existing cluster labels and descriptions of the DMIC were assessed and, if needed, refined to cover the cluster. This step was executed by three researchers (MM, NZ, RE).

Results

The search process regarding phase 1 of our methods resulted in 2,609 identified publications, of which in phase 2, after screening on title and abstract initially 257 full texts were included in the full-text assessment. The flow chart in Fig. 1 illustrates the screening process, and reasons for exclusion. After assessing the full text publications, eventually, 179 studies were included in our review (Fig. 1, Appendix 2) [33–211]. As a result of the data extraction in phase 3 of our methods, all publications were registered in an Excel database with the core characteristics of each publication: year of publication, sample size, setting, region/country, presence of an element concerning an action with regard to integrated care, and if yes, the relevant element(s).

In phase 4, during data extraction of the included publications, 801 elements were identified. Initially, a large number of elements overlapped with existing ones and could be placed in (one of the) nine existing clusters of the model. Finally, 140 elements were included in the thematic analysis (Fig. 2).

In phase 5 of our methods we adjusted the DMIC, resulting from the thematic analysis, by adding twenty new elements to the DMIC because they did not overlap with existing ones. Most elements (seven) were added to cluster 1. Three elements were each added to clusters 2 and 4, two elements were added to cluster 3 and one

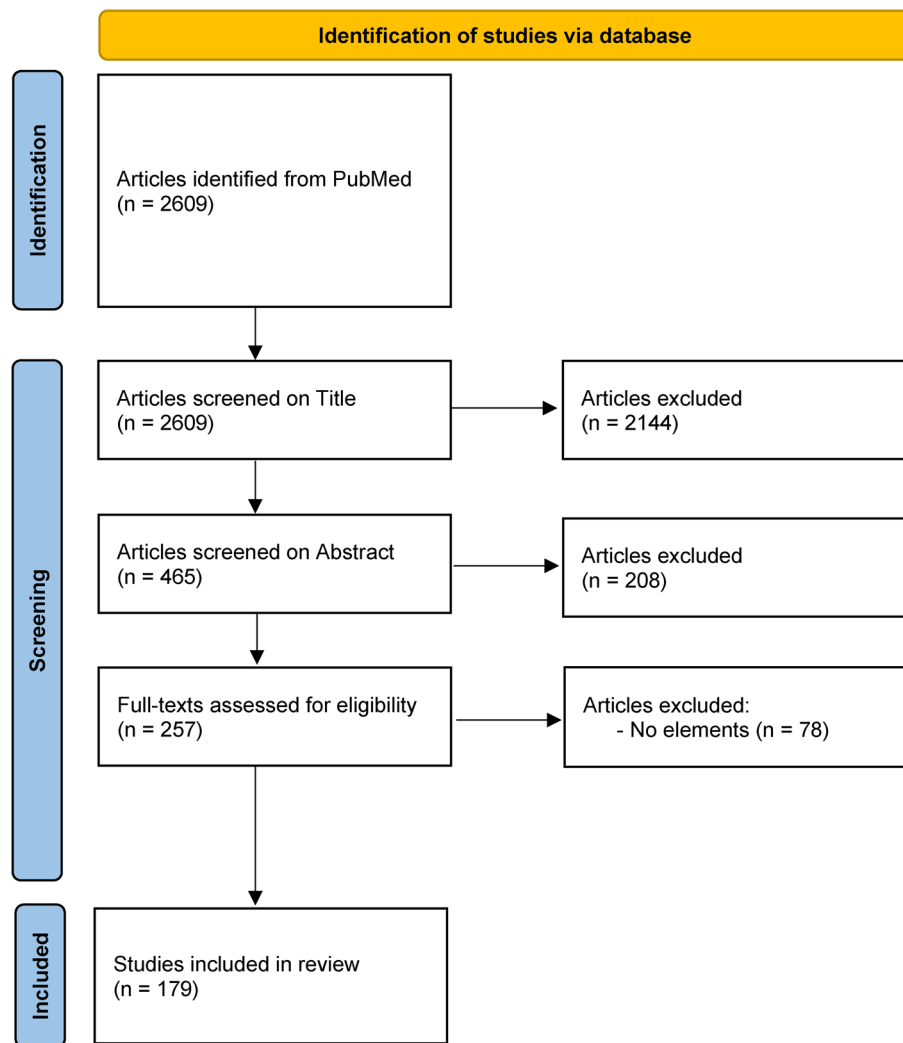


Fig. 1 Flowchart literature review

element each was added to clusters 5, 6 and 8. In cluster 9 three initial elements were combined into two and two elements were added (Fig. 2; Table 1).

The seven new elements in cluster 1 (client centeredness) addressed involving the context of the client, like family, volunteers, informal carers and their role. Concepts like shared decision making were mentioned in the collaborative relationship with professionals. A proactive approach aligned with personal needs and values of people was another added accent. This aligns with the new elements in cluster 3 that focus on the outcomes and experiences of persons in the context of the client. In cluster 2, elements were added related to digital care and digital information services for clients and professionals. In the cluster about quality care, the added accents reflect prevention, being proactive and a match between the care delivered and personal identities. Lastly, the clusters focusing on collaboration and entrepreneurship were expanded with elements that address the larger context

of the collaboration like policy makers, other integrated care services that are present in the area and relational and ethical aspects in the processes of collaboration (Table 1).

In phase 5, the third and fourth step of adjusting the DMIC, we compared the language used in the original DMIC to language used in the new identified elements and studies. Subsequently, we adapted the language of the original elements to this more recent vocabulary. For example, it appeared that 'patients' often were named 'clients or service users'. Since the new elements accentuate topics within the clusters, we consistently added these accents to the cluster descriptions and cluster labels (Appendix 3). Finally, the graphic picture of the model, that finds its origin in the initial study and concept mapping analyses [21] was also updated, including the new labels found in this study (Fig. 3).

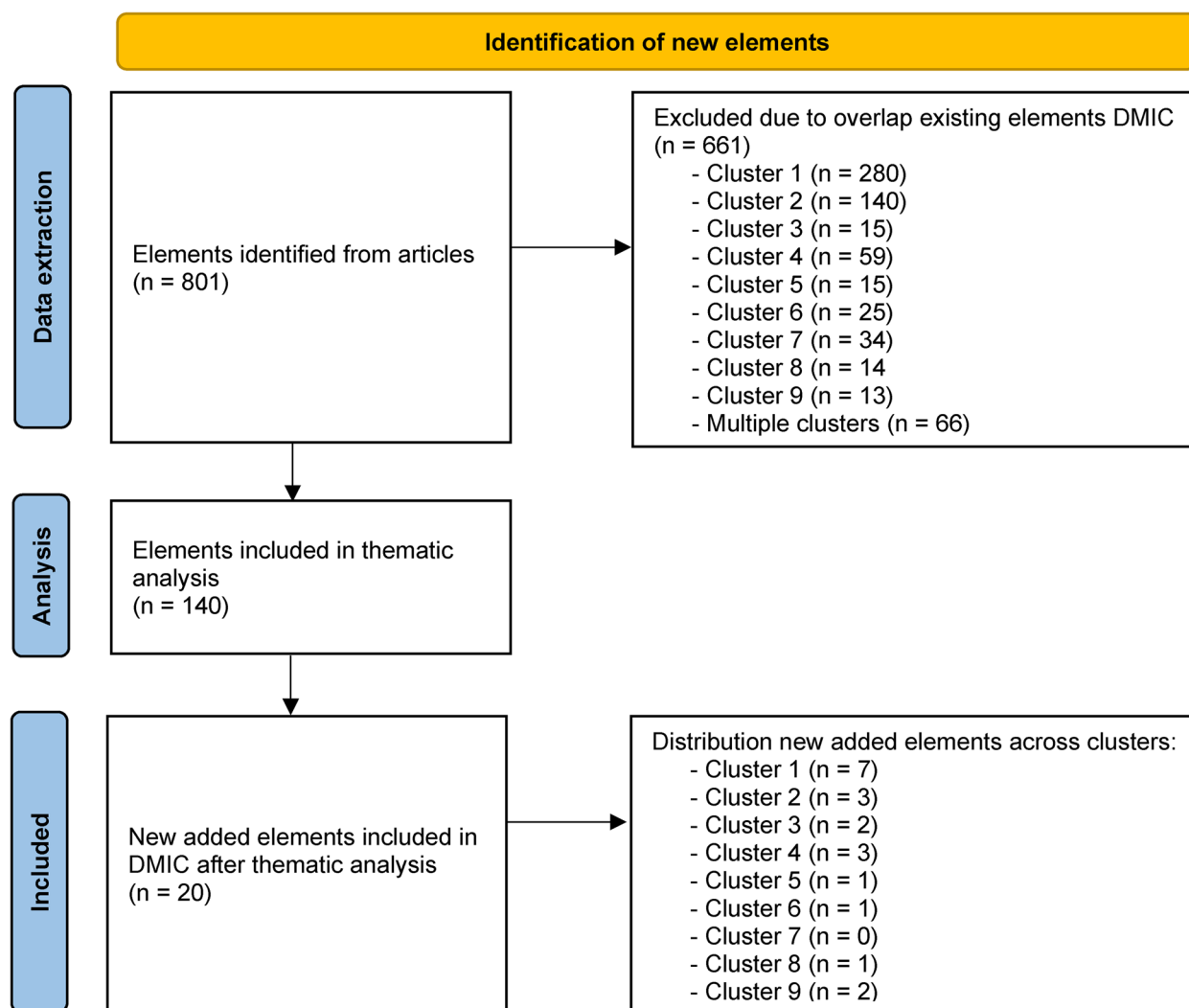


Fig. 2 Flowchart of elements DMIC

Discussion

In this study, we investigated the improvements required for the DMIC to align with the current body of knowledge. This investigation led to a refined and updated conceptual model that reflects recent developments in our societies. The large number of included studies in our review illustrate the relevance of integrated care as both a concept and as a strategy for people that are in need of care and support. The diversity in countries, settings, health care systems and approaches underline the complexity of developing integrated services in a suitable and effective way. While the underlying goals of integrated care, often organized in inter-organisational collaborations, remain more or less the same, the concept of integrated care and its context develops over time [4, 23, 40, 212]. To align with these developments, the purpose of this study was to incorporate the available knowledge into an updated DMIC, by using a systematic approach.

The results show that the organisation of integrated care encompasses activities (in the DMIC: 'elements') across multiple themes (in the DMIC: 'clusters') at various levels such as the client level, the (inter) organisational level and the broader context. This confirms the multidimensionality of integrated care as a concept, and highlights the complexity of implementing integrated care in real life contexts. Although nearly 15 years have elapsed between the previous study [21], the initial elements of the model were confirmed in recent studies and the number of new elements was moderate. New elements were merely related to existing ones and did not add a full other dimension. Therefore, the new elements could be incorporated into the existing nine clusters. We conclude that our review confirmed the solid basis of the conceptual model, while acknowledging that all elements can have different appearances in practice.

Our results show five overarching new accents in the model. The first accent is about the role of the client -also

Table 1 New added elements DMIC

Cluster	No.	Element description
1: Needs of the client and his network	1	A (pro)active, co-producing and more equal role of the client in care
	2	Client and professional make decision together (shared decision making) about care and support services
	3	Mapping the social network (family, relatives, friends) of the client
	4	Involving the social network (family, relatives, friends) in the care of the client
	5	Involving volunteers, peers and/or other informal carers in the care of the client
	6	Pro-actively developing preventative care for clients, for example aimed at a healthy lifestyle
	7	Ensuring that care and support align with the personal values and needs of clients
2: Care delivery, coordination and digital system	8	Offering self-care information at one central point
	9	Using supportive eHealth
	10	Integrating (online) web services with clinical information systems for the client
3: Performance management	11	Collecting data on outcomes of relatives and informal caregivers
	12	Collecting data on the feedback and experiences of relatives and informal caregivers
4: Proactive and preventative care	13	Pro-actively screening the target group/population, preventing or delaying the need for care
	14	To fit care activities into the daily lives of clients
	15	Paying attention to cultural identities and diversity of clients
5: Focused learning and reflection	16	Reflecting on the moral and ethical aspects of cases to learn from this
6: Interprofessional Teamwork	17	Investing in psychosocial factors of collaboration, such as a good working atmosphere, communication, and appreciation of each other's expertise within the multidisciplinary team
8: Commitment to collaboration	18	Creating awareness of the role of values and ethics in collaboration
9: Transparent entrepreneurship and governance	19	Connecting with (local) policymakers to let practical experiences inform policy (feedback loop)
	20	Coordinating with other networks on who does what in which area

named service users- and their social network. The added elements accentuate seeing and involving clients as equal partners in care and involving the broader context of a person. This includes family, friends, informal carers or volunteers in the community and impacts the relation between professionals and clients [46, 66, 79, 98, 177]. By including the broader context and the living environment, the experiences and feedback from the social network of people becomes more relevant [213]. Shared decision making, based on preferences and options of both clients and their carers resembles the broader increased attention for shared decision making in health-care settings [214].

The second accent broadens the scope of integrated care, beyond traditional care, cure or organisational boundaries of healthcare organisations. Interventions focus on supporting healthy lifestyles and a proactive, preventive approach before support is needed. For instance, care for persons with obesity should not only take the medical situation into account but also interventions in the physical living environment, cooking or sports. These studies reflect a more holistic perspective and a broad definition of integrated care that goes across domains to prevent sub-optimal solutions [57, 75, 147]. A third accent was visible in the cluster about entrepreneurship, leadership and governance: positioning integrated care services—often organized through inter-organizational networks—within the broader geographical area and context. In this setting, stakeholders such as

local policymakers and various inter-organizational networks interact, presenting new challenges such as multi-network governance [68, 172, 174].

As expected, the further development of digitalization in the time span of our study is reflected in our findings. In the initial model, the role of digitalization was limited to elements on client records, client care plans and the development of connections between databases of partners in the collaborative network. Recent studies included in the review add hybrid and digital care solutions (e-health) and integrating (online) web platforms or services with clinical information systems [33, 121, 132, 156]. As a consequence, the increasing availability of data impacts the dimensions of learning, information exchange and collecting outcome data. Whereas hybrid and digital solutions are rapidly developing, we expect more studies on digital options for integrated care services in the future.

Lastly, next to process, coordinative or governance aspects of integrated care, we found new elements about values and ethics, respecting identities and psychosocial aspects in collaborative processes. These findings relate to normative and relational aspects of effective collaboration [76, 150, 172]. Developing integrated care needs connections and productive interactions on all levels. The initial model already included elements about direct contact, stimulating trust and the awareness of being part of a larger ambition. Recent studies define the importance

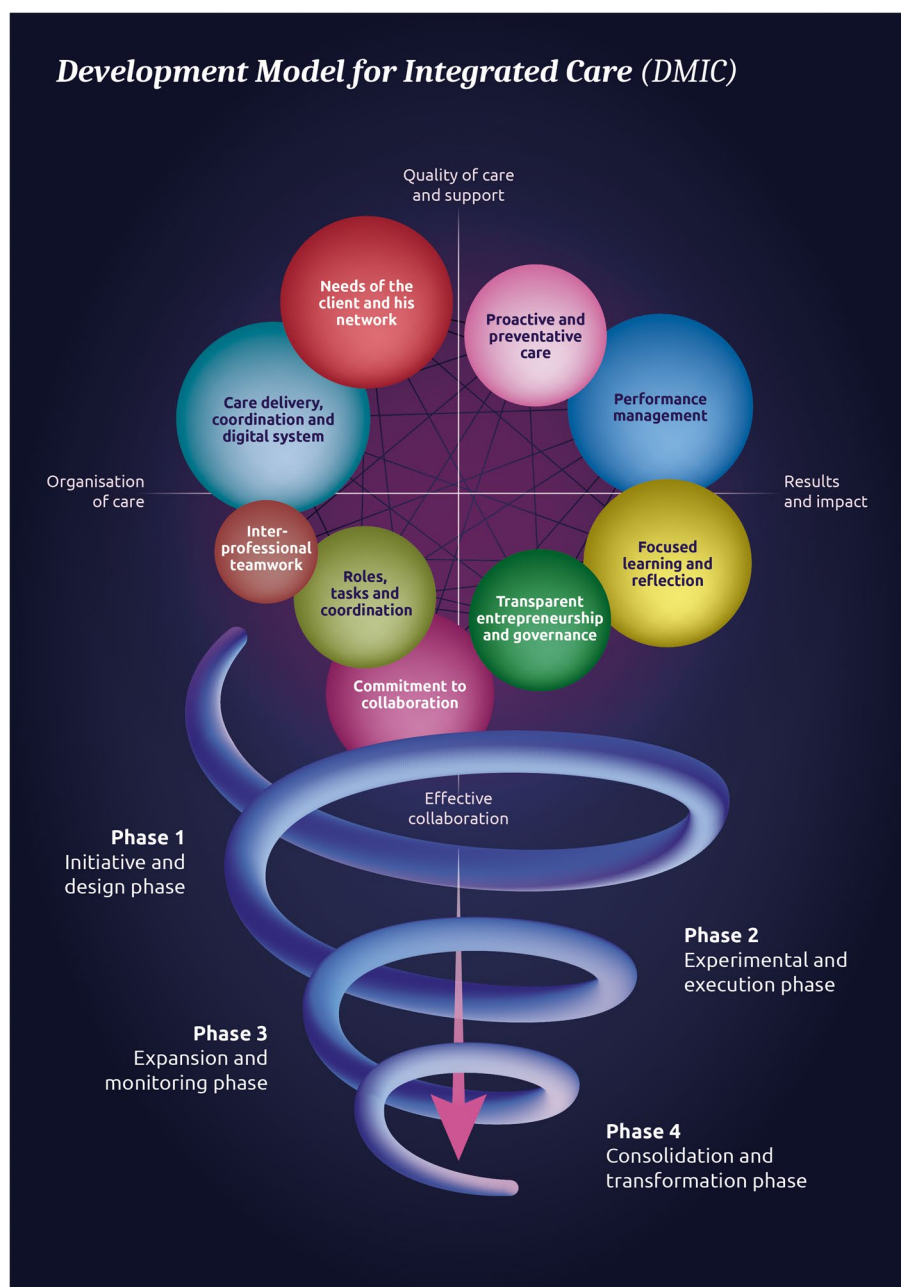


Fig. 3 Development Model for Integrated Care

of balancing values, faith and trust in relationships to support the commitment to a collaboration [215–217].

Overall we, see a shift towards a more contextually and community-oriented, or ‘ecosystem,’ approach. This approach extends beyond connecting and coordination care providers and their organisations as such. The shortages of staff and resources and the need for innovative approaches within the possibilities of the local or regional area could be of influence in this larger movement of personalization and contextualization.

Further, as visualized in Fig. 3, the model balances on the axes of the dimensions organisation, results and impact, quality of care and support and effective collaboration. The left side of the model reflects the large amount of elements that address ‘organisational challenges’ (clusters 2, 6, 7), which also overlap with the findings of a review about determinants of the effectiveness of purpose-oriented networks in healthcare [218]. Challenges occur in a healthcare context where division of labor and specialization creates increasing interdependencies between people, teams and organisations.

Organizational complexity increases when collaborations are needed and form webs of inter-organizational dependencies. These dependencies and how to manage them are reflected in the 'effective collaboration' dimension at the bottom of the model. Increasing organisational complexity and dependencies require a lot of time, resources, relationship building and pose a formidable managerial challenge [219]. This is where the academic disciplines of integrated care and organisational science could strengthen further knowledge development and research. Most intractable problems in our society's -like effective integrated (health) services, reducing violence or sustainable cities - cannot be solved by individual organisations or just by clear professional guidelines. The interaction between these academic disciplines, towards organisational modes that re-integrate highly differentiated organisational systems, could support the further development of our 'societies of networks' [220, 221].

Finally, as reflected in the right part of the model, the outcomes and impact of integrated care services is what eventually counts and adds value. Although the model consists of multiple elements, we agree with Hughes and colleagues [222] in their hermeneutic review that integrated care should not be seen as a (set of) single interventions to achieve predetermined outcomes. It should rather be seen as a set of emerging practices shaped both intrinsically and by contextual features. Leaders, professionals and policy makers should identify and take into account the contexts in which integrated care is introduced, which is in line with our findings and the new accents on involving clients and communities as reflected in the upper part of the model (Fig. 3). However, information about the specific context and what influenced development and implementation processes in that specific context is often limited described.

Limitations and further research

This study's limitation mainly stem from the multiple labels and definitions used related to integrated care as a concept and integrated care services in general. We used a comprehensive search string of the International Foundation of Integrated Care, which is a powerful search string for integrated care literature studies [31, 32]. With this search string we limited our search to the PubMed database. This could be seen as a limitation, however from a validation study of the search string it was found that PubMed contributes the largest proportion of unique citations covering citations in other databases [31]. We enriched these findings by the snowballing technique including studies from other sources. However, the absence of a common language might not prevent to miss a study or element.

A further limitation is the dominance of studies from western countries in the literature. Resources available

for health and social care, research traditions and policy developments do vary per country which could have consequences for the degree of development of integrated care and our findings. We encourage studies in less presented countries to expand the diversity of studies and further strengthen the model. Finally, we thoroughly followed the method to be as systematic, careful and complete as possible in the review process and in the adjustment of the DMIC. We have gone through all the steps with at least two independent researchers and often with more, composed different combinations of researchers, solved conflicting insights through discussion. Despite this process, we may have missed a study or element.

Our suggestions for further research focus on follow up studies like executed with the initial model. Options could be validation studies with the new set of elements (108 elements instead of 89 elements) with a diversity of integrated care practices that are organized in purpose-oriented networks. Empirical and conceptual work in management and public administration literature could be used more in follow up studies because inter-organizational networks become increasingly important to solve health care's wicked problems. The relationship between the dimensions of the model, characteristics of purpose-oriented networks and achieving goals, results and impact is an important area for further research. Eventually, integrated care is a mean to its end whereas addressing on what level (client, inter-organisation, broader context) impact is realized is crucial.

Further, we recommend a regular update of the DMIC (for instance every 5 years) to capture recent knowledge. This should or cannot lead to keeping expanding elements, so a further (Delphi) study on most relevant elements or developing a short validated version of the model can be recommended. A comprehensive but validated short version, could enhance further application of the model in practice for a diverse user group (professionals, leaders, researchers, funders, policy). Lastly, the DMIC consist of elements, clusters and phases. This study could not include also researching the four development phases, but based on our new findings this is now an option for further research.

Conclusions

The concept of integrated care is subject to change, driven by developments in health systems and societies worldwide like changing demographics, workforces, changing values and digitalization. Subsequently, integrated care knowledge, tools and models should also develop over time. Although the DMIC has been developed more than ten years ago, it is still used as a relevant model for the realization and development of integrated care services. This legitimizes the goal of our study to update the DMIC

to current knowledge. In this study we bridged this gap by performing a systematic review, identifying elements in the current literature to be incorporated in the DMIC. 179 included publications revealed twenty new elements, confirming the relevance and importance of the initial 89 elements and clusters in the DMIC. Also the language and terms used in the DMIC were updated to the current vocabulary and new accents found. The twenty new elements add five accents. Namely seeing and involving service users, relatives and communities more as equal partners in care, with attention to their experiences and feedback. Also the new elements emphasize a broader scope in integrated care, beyond traditional care and cure boundaries focusing on fitting into the daily lives of people, healthy lifestyles and a proactive and preventive approach before support is needed. A third accent is the development of digital care and connected (web-based) digital data services. Further, new accents are found about values and ethics, psychosocial aspects in collaborative processes and respecting identities. Lastly, elements on crossing the boundaries of the (own) collaborative inter-organisational network, implications for policy or other collaborative networks were found. With this we present an updated version of the DMIC that can serve as a model for integrated care development in practice, research or evaluation purposes in the coming years.

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12913-025-12610-2>.

Supplementary Material 1: Appendix 1. Search string.

Supplementary Material 2: Appendix 2. Table of included studies.

Supplementary Material 3: Appendix 3. DMIC full elements 2024.

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Institutional review board statement

The study did not require ethical approval.

Authors' contributions

Conceptualization, M.M., N.Z. and R.E.; methodology, M.M., N.Z. and R.E.; data collection, N.Z., K.H., M.S. and R.E.; formal analysis, M.M., N.Z., K.H., M.S. and R.E.; writing—original draft preparation, M.M., N.Z. and R.E.; writing—review and editing, M.M., N.Z., K.H., M.S. and R.E. All authors have read and agreed the final version of the manuscript, including figures, table and appendixes.

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Data availability

Data is provided within the manuscript, table, figures and supplementary files. We followed the data policies of Vilans, National Knowledge Center for Care and support, Utrecht, The Netherlands.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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