# BETTER TOGETHER: CONDITIONS FOR IMPLEMENTING INNOVATIONS TO IMPROVE QUALITY OF CARE IN HEALTH DELIVERY ORGANIZATIONS

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The necessary resilience of healthcare delivery organizations to cope with a changing and ever challenging socio-economic environment depends on continuous, effective innovation, based on the adoption of proven interventions. It is aimed at increasing output quality of care, thus better responding to demands of patients, staff and stakeholders. Although expectations of (digital) innovation in healthcare are generally high, the outcomes often do not meet these expectations. In a scoping review of 46 research papers on innovation, we analyzed which factors were reported as barriers and facilitators for success or failure of innovation initiatives. The mayority of papers reported a variety of conditions and a limited use of available implementation frameworks. Furthermore, the underlying model of quality of care was often incomplete, thereby compromising the outcome of the initiative, hampering effective dissemination and implementation of interventions and the means for valid outcome research of innovation projects.

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#### 1 Introduction

Healthcare delivery organizations are under an increasing amount of pressure to keep delivering the necessary quality of care in an environment, where the demand for healthcare services continues to grow, while the availability of staff to deliver them continues to decrease. Continuous innovation is a crucial condition for the resilience of organizations, proving vitality in such a changing and ever challenging socio-economic environment, complying with regulation and imposed standards and responding to varying demands of clients, staff and external stakeholders (Garrido-Moreno et al., 2024).

The authoritative Oslo Manual (OECD, 2018, p. 46) defines innovation as: "The implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations". For the healthcare sector, a teleological dimension is added where innovation is "A new or improved solution with the transformative ability to accelerate positive health impact" (WHO, 2024, p. 2). Digital innovations in particular "are poised to significantly alter the healthcare environment offering a more sustainable, efficient and accessible healthcare ecosystem for future generations" (Thacharodi et al., 2024, p. 1).

Innovation in healthcare attains this positive health impact through proven interventions. They aim to improve quality of care, which can be defined by six interacting dimensions: effectiveness, efficiency, safety, equity, timeliness and patient-centeredness (Ayanian & Markel, 2016; Berwick & Fox, 2016; Busse et al., 2019). The World Heathcare Organization (WHO) and national healthcare agencies have embraced these dimensions in practice.

However, the outcomes of such innovation initiatives often fail to meet expectations (Hügle & Grek, 2023; Sony et al., 2023). Although innovation is vital for organizational continuity and healthcare improvement, dissemination and implementation (D&I) of even the most proven interventions often remains a challenge with uncertain outcome (Nilsen & Birken, 2020; Peden et al., 2019; Philp & Pitt, 2019). An obvious tension exists between the need to improve quality on the one hand and knowing how to do so on the other – a gap which cannot be closed by applying standard stage-gate models (Auerbach et al., 2007; Cooper, 1990).

Our research interest is to identify the conditions for successful dissemination and implementation of interventions aimed at innovations that lead to quality improvement. We pose our research question as follows: Which factors are reported as determinants for implementation effectiveness and its outcome in terms of improved quality of care?

This study aims to determine, to what extent frameworks are in fact used in implementation projects for healthcare innovation. Given our aim to determine the scope of coverage of a body of literature on this topic, we will use a scoping review design in this research (Munn et al., 2018). Our study follows a five steps methodological framework. In the next section we explore the theoretical background and formulate a set of expectations (Step 1). Section 3 will discuss how studies were identified (Step 2) and selected (Step 3). Section 4 presents the mapping and interpretation of the data (Step 4). We conclude with the final step (5) of summarizing and reporting the results in Section 5.

## 2 Theoretical Background

In this section we explore the theoretical background on implementation frameworks and on quality in healthcare delivery organizations, leading to expectations on the role they play in innovation dissemination and implementation.

## 2.1 Implementation frameworks

To facilitate and support quality improvement through proven interventions, implementation science has developed several frameworks for innovation management and implementation research (Estabrooks et al., 2006; Kitson et al., 2008; Rycroft-Malone & Bucknall, 2010). Frameworks list and classify factors which influence the implementation process and its outcome in several domains to design better innovation projects, reduce the risk of unforeseen side-effects and manage uncertainty (Fagerberg et al., 2005). In total a few dozen frameworks are available, 18 of which were combined by Damschröder et al. into the Consolidated Framework for Implementation Research or CFIR, revised in 2022 based on users' feedback (2009; 2022), leading to one of the most highly cited frameworks (Skolarus et al., 2017).

Considering the need for planning, management and accountability of the necessary investments in quality improvement, it could be expected that these frameworks are widely used as crucial tools in project planning and management. The first focus of this paper's review will be to confirm whether the available resources and experience provided by implementation science are in fact applied and in what way.

# 2.2 Aspects of quality in healthcare delivery organizations

We define "quality in healthcare" as a healthcare delivery organization's performance on one or more of the six dimensions of quality mentioned in Section 1. However, there remain several complications to consider when addressing quality from an innovation perspective.

Firstly, in any model of quality, including the six dimensions model, there is the challenge of reckoning the interaction between dimensions when implementing an intervention in structure, process or outcome (Donabedian, 1980). There is not just the desired effect on the primary dimension to consider, but also the related intended or unintended interacting side effects on other dimensions (Busse et al., 2019).

Then there is the challenge of operationalizing and measuring the quality of care and the effects of the organizations' activities to improve it. Quality is whatever is measured in the interdependent dimensions at any moment. Crucial in this respect are the quality indicators which can be defined as quantitative measures providing information about the status of the six quality dimensions.

Finally, the problem of interacting effects between dimensions can be addressed by developing methods for combining different indicators into composite indicators or scores (Shwartz et al., 2015). These scores allow aggregation of different aspects into one outcome to give a clearer picture of the overall quality of care and changes therein.

Given the utmost importance of quality improvement as primary motive and success determinant for innovation, the expectation is that innovation initiatives would account for the intended primary effects on the six dimensions of quality, consider the interdependency effects and provide concrete outcome measurements. This will be the second focus of our review.

## 3 Identification and Selection of Sources

This section presents the process that was followed to identify and select the articles to be included for the review. Munn (2018) recommends the use of a standardized protocol to report on this process. We have summarized our approach according to the scoping review extension of the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) statement (Page et al., 2021).

## 3.1 Identifying studies

Healthcare is not the only sector of society being confronted by the need for innovation or experiencing success and failure in implementing quality improvement. This research into dissemination and implementation practice will include organizations in all areas of society facing similar challenges in deciding on interventions, selecting appropriate strategies and managing the process.

We executed our initial literature search in February 2024 on four databases:

- Web of Science as a database of peer reviewed journals focusing on social sciences and general management including journals dedicated to innovation.
- PubMed/MEDLINE for biomedical literature, life science journals and publications focusing on healthcare management.
- the Wiley Online Library as an additional source of publications from the areas of health, social sciences and the humanities on the subject of innovation and conditions for success or failure of quality improving interventions.
- the Cochrane Database of systematic research. Findings in the Cochrane database are systematic reviews, and they are primarily used as a possible source for relevant case studies, not included from the other databases.

The search strategy on the four databases consisted of a query with combinations of the search terms "innovation" and "enabler(s)" and/or "facilitator(s)" and/or "barrier(s)". The terms were arranged in a Boolean query as ((Innovation AND (facilitator OR enabler) AND barrier)) over title, key words, abstract and full text of publications ranging from the beginning of database registration till February 1<sup>st</sup>, 2024. The resulting list of research papers was then submitted to the set of inclusion/exclusion criteria to come to a final selection.

#### 3.2 Select: eligibility criteria and study selection

As the literature research is focused on the conditions for success or failure of actual D&I projects and their outcomes, three inclusion criteria were applied. Studies must have appeared in international peer-reviewed journals in English (1). Case studies, reviews or quality evaluation studies, reporting on D&I projects are included, excluding theoretical and positioning papers (2). Innovations in clinical care or medical interventions in diagnostics, treatment and rehabilitation are excluded as they represent a different type of quality (3).



Figure 1: PRISMA Flow Diagram of the selection process Source: adapted from Page et al., 2021

The retrieval of studies yielded a total of 3348 results. Figure 1 shows how the inclusion criteria reduced the original set to 46 studies for further review. In the end, 11 of the 46 included studies are systematic reviews (reporting on 10-110 primary studies), 9 were scoping reviews (16-81 primary studies) and 26 studies reported the outcome of qualitative (evaluative) case study research into innovation projects and programs. 36 out of 46 studies pertained to innovation in health care, the other 10 addressed conditions for innovation in other areas of society.

#### 4 **Results**

We coded the 46 review papers for type of implementation frameworks applied, including the type of barriers and facilitators reported, and for quality enhancing interventions and measurements of quality dimensions. The open coding was executed independently by three researchers (the first author and two external reviewers) and combined into detailed tables listing the results per review paper. The remainder of this section presents the results in both areas.

#### 4.1 Application of implementation frameworks

The review papers apply or infer implementation frameworks to identify, summarize and classify the barriers and facilitators. 30 of the 46 papers apply a validated general framework to subsume the barriers and facilitators reported in their primary studies or resulting from data collecting. Seven review papers applied CFIR, three papers used the PARiHS and 20 papers applied a different but validated framework, suited to either the intervention or the implementation environment. Eleven papers developed a specific framework from the primary research they reported on. Five papers analyzed the underlying projects by interpreting the outcome of interviews or focus groups with focus groups by means of discourse analysis or semantic classification, without developing a framework.

This means that most of the authors use or create a wide variety of frameworks, even the ones that do focus on healthcare innovations. Unclear is, whether this is because these authors are following other research paradigms or whether this means that there are relevant categories of barriers and facilitators not yet captured in the most used frameworks in healthcare innovation. However, looking at the dominant domains of the frameworks used or developed in the 41 papers, it seems to be possible to semantically map the domains on the five established domains from the CFIR framework (characteristics of the intervention, internal context, external context, adopter skills and quality of the implementation project). The exception to this is the focus on end-users, patient outcome or related aspects, which is addressed in several review papers but, notably, not in CFIR or PARiHS.

Regarding the use of frameworks in the underlying primary studies, eleven of the 46 papers comment explicitly on the application of frameworks in the primary studies and cases, reporting only limited deployment. For instance, Allen et al. (2017, p. 1) state that "more than half (55%) of the studies did not articulate an organizational theory or conceptual framework guiding the inquiry". Kelm et al. (2014, p. 1) go even further and conclude that "the 64 included studies were characterized by relatively poor research designs (and) insufficient reporting of intervention procedures". Yeboah concludes that in only 38 papers out of 110 included in his review, some form of management theory was applied (Yeboah, 2023).

Reference	Framework	Dominant	Condition:	Condition:
	Applied	Domains	Barriers	Facilitators
Abu-Odah (2022)	Innovative Care for Chronic Conditions (ICCC) model (WHO 2006)	Five domains: medical condition, internal context, external context, adopters and end-users.	Micro level: insufficient skills, lack of motivation, mistrust of value of research, inability to interpret findings. Meso level: poor dissemination, lack of resources, lack of time and staff, miscommunication between academy and health, lack of access to research. Macro level: policy makers' distrust of research value, lack of training and skills, gap between research and policy considerations.	Micro level: motivation of professionals. Meso level: dissemination findings, capacity building workshops, budget for research activities. Macro level: collaboration and connection, identifying right stakeholders, developing trust between policy makers and researchers.

 Table 1: Excerpt from data coding table – implementation framework

 Source: https://github.com/rogerbons/Bled2025Kievit-Bons-Roijakkers

This limited use of frameworks in the primary studies does not imply that these organizations do not recognize barriers and facilitators for their implementations. The 46 review papers and quality studies classify large numbers of barriers and facilitators from the primary studies, spanning a substantial number of domains and influencing the outcome of the quality improving initiatives they report. For instance, Abell at al. find 227 individual barriers and 130 individual facilitators (2023), while Consolo et al. (2023, p. 1) reports that "... a total of 245 codes or factors was generated".

Figure 2 contains an excerpt of the findings, the full list of 46 entries has been made available in a github repository. Summarizing, we find that less than half the projects and programs in the primary studies make use of a validated and well-established framework to plan, manage and evaluate the innovation initiative. Furthermore, if a framework is used, in most cases only a limited number of domains and constructs are applied. In that way, interaction and mutual influence go unnoticed. Also, barriers and facilitators often do not match the factors in which the domains of a framework are operationalized. In these cases, authors of review papers design their own dedicated framework with factors to match the reported barriers and facilitators. In many of those cases, it seems it would have been possible to conform to CFIR, with the exception of the patient-oriented domain.

#### 4.2 Aspects of quality

Each of the 46 papers included in the selection addresses conditions for dissemination and implementation of interventions aimed at quality improvement. However, the concepts of quality they used vary. Of the 36 papers dealing with innovation in healthcare specifically, 20 apply to dimensions of quality that fit within the six dimensions model mentioned in Section 2, the other 16 do not refer to any specific quality dimension, but to quality improvement in general. Eight of these 20 concentrate on initiatives to improve patient centeredness. Six papers report on efficiency. Four report on initiatives to increase safety and equity is main concern of two papers. Interestingly, the dimensions of effectiveness and timeliness of healthcare do not appear as leading in any of the 36 papers with a healthcare focus. Figure 3 shows an excerpt of the quality dimensions in our coding table.

#### Table 2: Excerpt from data coding table – quality dimensions.

Source: https://github.com/rogerbons/Bled2025Kievit-Bons-Roijakkers

Reference	Intervention	Quality Dimension
Abell (2023)	Implementation and utilization of Computerized Clinical Decision Support Systems (CDSS)	CDSS have the potential to improve various aspects of healthcare delivery, such as patient safety, clinical management, diagnostic support, cost management and administrative efficiency

Although all papers report on initiatives to improve quality of care through interventions on one (or more) of the quality dimensions, none of the reported cases used quantifiable outcome measures. The reported effects of implementing quality improving interventions are thus of a qualitative nature which leaves them open to debates about relevance, applicability and validity. A few examples across the set of included papers may illustrate this (Table 3).

#### Table 3: Examples of outcome measures on dimensions of quality

Patient Centeredness	"low readmission rates and better patient satisfaction" (Fakha et al., 2021, p. 19)
	"patient autonomy, patient participation" (Vogel et al., 2023, p. 2)
	"patient benefit" (Baines et al., 2020, p. 7)
Efficiency	"more value from resources allocation" (Ahumada-Canale et al., 2023, p. 1)
	"administrative efficiency, cost effectiveness, or users experience" (Barnett et
	al., 2011, p. 2)
	"patient health, care processes, use of resources and economic variables"
	(Niezen & Mathijssen, 2014, p. 152)
Safety	"knowledge of and adherence to routines as fundamental to maintain patient
	safety" (Dugstad et al., 2020, p. 10)
	"the quality, safety, patient-centeredness and cost-effectiveness of care" (Laukka
	et al., 2020, p. 1)
Equity	"health policies for vulnerable populations" (Daniels et al., 2022, p. 1)
	"efficient care" (Ghabour et al., 2023, p. 157)

The only readily quantifiable outcome measure occasionally mentioned in both the reviews and the underlying papers is the clinical patient outcome. This is defined by and results from medical treatment based on the "diagnosis and treatment combination" (DTC). DTCs specify the entirety of all steps required to treat a medical condition or illness, from the first consultation up to the final check-up, and they are standardized and reported on, for instance from healthcare delivery organizations to health insurers. As such, clinical patient outcomes depend on the

relevance and quality of medical interventions and though they reflect the quality of a health delivery system, they are not included in the six quality dimensions.

Another outcome of our investigation is the missing aspect of interacting effects of interventions on more than one quality dimensions. Several reviews conceive of quality as a combination of dimensions. The consequences of interacting effects of interventions on more than one dimension are not acknowledged, although there are sets of composite indicators available to recon and account for these effects, thus providing a comprehensive assessment of quality (Busse et al., 2019).

Although quantifying the effects of interventions on dimensions of quality is complicated and, in case of combined dimensions, requires application of complexity theory (Storkholm et al., 2019; Turner & Baker, 2019), quality improvement is hard to substantiate without such indicators.

#### 5 Discussion and Conclusions

This literature review was motivated by an interest in the conditions for successful implementation of healthcare innovation. Our focus was to assess if frameworks from implementation science are used in (healthcare) practice and to determine to what extent the six standardized quality of healthcare dimensions are used and operationalized. We selected 46 review papers (36 focusing on healthcare) that analyzed a total of over a thousand underlying primary studies.

There is consensus that the primary studies made very limited use of the available frameworks. This could be due to insufficient local expertise or to a lack of access to these instruments. This complicates comparing projects and establishing quality requirements for design and management of initiatives. It hampers development and application of implementation research and development in practice.

Based on the interpretation of findings reported by 46 review papers and qualitative evaluation studies, the conjectures of Moullin et al. are confirmed, that frameworks "…are not used optimally to substantiate or advance implementation science and practice", thereby "…slowing the translation of research evidence into practice and limiting public health impact" (Moullin et al., 2020, p. 2). We suggest to conduct further research on how the knowledge from the implementation science domain

can be better disseminated to the teams that are responsible for the necessary innovations in the healthcare delivery organizations.

Furthermore, we noticed a diversity in frameworks used by the authors of the review papers, with only 10 of them applying the CFIR and PARiHS frameworks. We believe that it would have been possible for the others to map their framework domains to the five commonly used by CFIR, thus improving comparability and further validation of this framework. The one exception was the patient domain, which is not covered by CFIR, but is considered important in several of the review studies. While we obviously recognize patients as important stakeholders in healthcare innovations, we believe further investigation is needed to assess, if this warrants the extension of the CFIR framework with a patient oriented domain.

The standard model of healthcare quality was partially applied. Concentrating on one or two dimensions, ignoring side effects through interaction between dimensions and insufficient use of quantitative outcome measures may lead to compromising the effectiveness of the innovation and the rationale for future investments in the field. The fact that this seems to be ignored poses interesting research questions we hope to address in the future.

This also applies to the lack of quantified operationalizations of quality dimensions. Investing in quality improvement requires a business case where funding, commitment of people and organizational creativity is outweighed by projected return and anticipated improvements. This business case needs a comprehensive and accurate definition of quality and hard outcome measures to weigh necessary resources against expected yields in terms of improved indicators on relevant dimensions, taking into account their interaction towards better outcomes.

These findings also lead us to some practical recommendations to healthcare delivery organizations. Firstly, involving innovation specialists in their projects and programs should increase the quality of the decisional practice in the dissemination and implementation of innovation. We believe this is especially relevant for digital innovations, where the knowledge on technology and its integration into healthcare practices is even more scarce. Furthermore, we recommend that standard frameworks and quality measurements are used to encourage benchmarking by implementation teams. We encourage these findings to be shared with researchers,

so that the implementation science field can benefit and its knowledge on D&I processes can be further validated and grown.

Finally, as with any study there are some limitations to be mentioned. Our findings are limited by the fact that they are based on the evaluation of 46 reviews and quality evaluations and not on the actual field studies. We plan to investigate the application of artificial intelligence based reviewing techniques to the underlying 1000+ studies, but also to set up action research based research projects in which we actively participate in innovation projects. Another possible limitation in the generalizability of our findings lies in the localized focus of healthcare. Even though the standards we suggest to use are internationally recognized, healthcare is typically organized at the national, regional or local level, making it more challenging to transfer knowledge across borders.

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