

Benefits, Barriers and Determinants of Clinical Pathway Use in Germany, Austria and Switzerland. A pilot study

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Abstract

Background: Performance-oriented financing of healthcare aims at demand-based and efficient resource allocation. Often, clinical pathways (CPs) are introduced in this context.

Purpose: For CP success (a) the degree of utilization of and divergence, (b) cost effects and (c) health professionals' acceptance rate of and satisfaction are relevant. There are gaps in research regarding these issues in general, and more specifically in the German speaking part of Europe.

Methodology/Approach: Employing a two-stage mixed-methods pilot study, we studied (a) and (b) quantitatively in Germany, Austria, and Switzerland, and (c) qualitatively in Germany and Austria.

Results: Many hospitals already implemented CPs, but the utilization varies. They are expected to yield middle-range savings, but intangible benefits are more important. In general, employees are in favor of CPs, but several conditions need to be met, e.g. adaptability to local requirements.

Conclusion: Linking the results to the Consolidated Framework for Implementation Research showed many criteria are covered, which might lead to the positive evaluations, but also highlights the complexity of the intervention.

Practice Implication: As enhanced acceptance rates are expected to lead to higher benefits and vice versa, management team should safeguard employee participation and perceived benefits in all phases of the CP cycle.

Keywords

Clinical guidelines, Employees, Evaluation, Germany, Europe, Implementation

Introduction

Clinical Pathways (CPs) are one of the main possibilities to combine medical and economic requirements in the clinical practice in an evidence-based way¹ and to concurrently improve quality and outcomes.^{2,3} Critical voices, however, raise concerns regarding an economization of health care⁴ and decisional freedom in treatment.¹ As the implementation of CPs equals an organizational change process,^{5,6} the economic success also depends on its acceptance by users,⁷ which becomes visible in utilization and satisfaction rates.

The use of CPs remains behind its potential quantitatively as well as qualitatively.¹ Why utilization rates are low and which contribution CPs (can) have as instrument for aligning the complex demands in clinical practice thus needs further investigation, particularly regarding barriers and facilitators of their use as in general implementation research.⁸ Moreover, this should be done in a comprehensive way covering

several interrelated levels,¹ for example by using combinations of models like the Consolidated Framework for Implementation Research (CFIR).⁹ The present study focuses on the current status in the German speaking part of Europe (Germany, Austria, Switzerland), where CP utilization is low, or changed, and scientific investigations in the context of CPs are scarce.¹⁰ Using a two-staged mixed-methods pilot study,

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we investigate where CPs are used, which benefits are perceived, and which requirements of adaptations are voiced by different stakeholders.

Background

To date, there is no standard definition of CPs, which is why Lawal et al. (2016: 3) condensed the literature to four criteria: to qualify as CP, an intervention has to (1) be “a structured multidisciplinary care plan”, (2) “be used to channel the translation of guidelines or evidence into local structures”, (3) “detail the steps in a course of treatment or care in a plan” or equivalent, and (4) “aim to standardize care for a specific clinical problem, procedure or episode of care in a specific population”, which means there are pre-defined entry criteria. Most frequently, they are developed within the precise context of a hospital, though there are also expert-developed ones, which then need to be adapted to internal requirements.¹ Moreover, allowing for justified deviations is recommended,¹¹ just as recurrently revising the CPs based on the latest evidence.¹²

Clinical Pathways can have various functions. From the perspective of functional services, they can be checklists, for management an instrument for planning processes and controlling costs, risks, and quality, and for physicians an internal guideline that assists diagnostic and therapeutic decision making^{13,14} reducing cognitive load.¹ In addition, they may be introduced for improving internal fit with healthcare reimbursement systems like DRGs.¹⁵ From the patients’ and their families’ perspective, CPs inform about the sequence of treatment(s)³ and offer the possibility to influence the latter, mainly when Patient Reported Outcome Measures (PROMs) are taken.¹³

Implementation

The main aims of CP implementation are ensuring high quality services for patients,¹⁶ reduce costs¹⁷ and minimize risks.¹³ To ensure a smooth integration into daily practice, literature suggests providing employees with detailed information about the benefits of planned CPs, connected processes, and interface management.¹⁸ Should CPs be implemented without participation of the future users, subsequent acceptance rates might be low.⁵ A lot depends on how leadership acts in an implementation process.^{19,20} Apart from co-creational requirements, acceptance can depend on how generated data is used or expected to be used, i.e. in case employees see CPs as pure control interventions or expect sanctions for deviations. Following general change management principles is thus advised,⁵ particularly regarding an analysis of change promoting and endangering factors.

Barriers and determinants of CP use

Behavior and behavioral changes in organizations are determined by capabilities, motivation, and opportunity,²¹

which can be split up in much more detail in and for change management initiatives.⁵ CP specific, organizational and contextual factors can be differentiated regarding promoting and inhibiting aspects.¹⁰ Jabbour and colleagues (2018) highlight that all have to be considered, if possible theory-driven. A range of models combine behavioral science concepts, allowing for a structured analysis of determinants and barriers of CP use.^{9,22} For this study, we draw on the Consolidated Framework for Implementation Research (CFIR), as this encompasses all dimensions relevant for interventions.

On the individual level, hospital staff emphasizes that CP users need high CP related competences and/or be trained in these.²³ In general and CP related, the cost–benefit ratio needs to be in favor of the latter to ensure sustainable integration of CPs in daily practices.¹⁰ Within the organization, the complexity of the change and the will to comply, the internal capacity to do so and the amount of external support are helpful or hindrances. A contextual determinant or promoting factor is integrating CPs in existing overarching institutional structures.¹⁰ When distinguishing determinants and barriers regarding the phases of the intervention implementation,² participation of future users²³ or a high acceptance of expert designed CPs is required.¹ While CPs should be approved by all user groups, goal and expectation alignment of all management levels is of prior importance, plus congruence of objectives between management and the project or pilot team.⁶ Management levels play complementary roles in reaching these favorable conditions,^{6,20} as resources for and legitimization of an intervention need alignment on the hierarchical, clinical, and methodological level.⁶

Method

The explanatory design (also: explanatory sequential design) was chosen for this study, where the qualitative part follows the quantitative one. This is suggested when the research questions mainly necessitate quantitative data, which, however, require qualitative addition to allow for in-depth interpretation.²⁴ In the first part of the study, the economic aspects which can lead to acceptance and satisfaction on the management level were quantitatively investigated. The second, qualitative part focused on group- and individual level acceptance, which has an effect on economic output via behavior. No part of the study required a vote of an ethical board; Institutional Review Board approval was received. For the questionnaire and the topics of the qualitative interviews please refer to the appendix.

Quantitative Part

A sample of 10% of all hospitals in Germany, Austria, and Switzerland was asked to participate in a quantitative online survey. Selection criteria were comparable size (number of beds) and experience with CPs based on having been

mentioned in relevant literature. This was to ensure high likelihood of higher data quality based on experience and expertise, since Germany as representative of the region had been reported to use only very few CPs (prevalence of use between 1-5%),²⁵ so safeguarding organizational proficiency had been built was necessary. In addition, the national online platforms listing all hospitals were used.

For Germany, 195 hospitals were selected, for Austria and Switzerland 30 each. In a first step, 356 persons in these hospitals were contacted with a standard email and informed about the study. Due to a very low response rate (4), this number was reduced to 69, mainly to not contact holdings in multiple ways. In addition, a focus was put on those organizations already mentioned in the literature in the context of CPs. The response rate to the now personalized emails was 27% (19 questionnaires), with a balanced regional dispersion and regarding respondents covering various positions in either implementing of designing or using CPs.

Apart from (socio-)demographic questions on the respondent and regional aspects, the focus of the questionnaire was on items on perceived benefits, cost-benefit ratio, length of experience in the hospital with CPs, departments using them, and CP entry criteria.

Qualitative Part

The qualitative part focused on Germany and Austria as only few quantitative data could be collected from Switzerland. In total, five semi-structured interviews²⁶ with experts and 11 with employees using CPs were done, with location (see Table 1) also equaling the geographic expertise of the

respondents. The experts are or were responsible for implementing paths, often in combination with process and risk management. While the aim of both interview types was investigating acceptance of and satisfaction with CPs, the questions were posed in partly different ways. The details are presented in Table 1 below, the topics and questions outlined in the appendix.

All respondents explicitly agreed to being surveyed. We did qualitative content analysis based on Mayring,²⁷ focusing on thematic and problem centered analysis²⁸ regarding aims, benefits, and critique of CPs and their use, plus suggestions for improvements.

Results

Below, we first present the quantitative and second the qualitative results.

Quantitative Results

In this section, we describe the sample, results regarding CP use and benefits, and the hypothesis testing.

Sample description. As the work areas of the respondents reveal, about half of the sample is responsible for structural, the other half for practical implementation of CPs. For specifics concerning the respondents, please see Table 2 below.

Clinical Pathway use and benefits. Regarding path entry criteria, diagnoses (about 37% stated these relevant for all, about 63% for some CPs) and manifestation of the disease (about a quarter stated these relevant for all, about three quarters for some CPs) were rated as most important, while comorbidities (about 66% stated these relevant for some CPs, about 34% for none) and age (about 43% stated these relevant for some CPs, the rest for none) play a minor role. In our sample, German hospitals used paths longer, whilst experiences in Austria tended to be more recent, and too little data was available from Switzerland.

Global cost-benefit effects are mainly seen in medical aspects. Half of the respondents report middle range savings, about a quarter high and none respectively. As for nursing services, 20% report no and high savings respectively, 60% middle range savings. Regarding pharmaceuticals, half report high and middle range savings, respectively. Only one hospital uses CPs in functional services, the respondent there estimated this to lead to middle range savings.

Concerning cost-benefit effects for medical aspects, 55% stated their responses were valid for all CPs of the hospital, 27% for many, and 18% for only a few. Regarding nursing services, 33% believe their rating holds true for all CPs in the hospital, about half for many, and 17% for a few. For pharmaceuticals, 33% think that their estimation was fitting for

Table 1. Interview details.

Form of Interview	<ul style="list-style-type: none"> • Expert interviews <ul style="list-style-type: none"> ○ 4 via telephone ○ 1 face to face • Employee interviews <ul style="list-style-type: none"> ○ 6 via telephone ○ 1 face to face ○ 4 in written form
Location of interviewee	<ul style="list-style-type: none"> • Expert interviews (5 different hospitals) <ul style="list-style-type: none"> ○ 2 Germany ○ 3 Austria • Employee interviews (3 different hospitals) <ul style="list-style-type: none"> ○ 5 Germany ○ 6 Austria
Form of documentation	<ul style="list-style-type: none"> • Expert interviews: Protocols were checked for content and anonymization requirements by the experts • Employee interviews <ul style="list-style-type: none"> ○ 4 available in writing ○ 6 transcripts ○ 1 protocol
Duration	<ul style="list-style-type: none"> • Expert interviews: up to 120 min • Employee interviews: 25–30 min

Table 2. Respondent demographics.

Gender	51% female
Location/Region	<ul style="list-style-type: none"> • 50% work in German, 44% in Austrian, 6% in Swiss hospitals • Based on the names of the hospitals, the dispersion represents the hospital sector concerning region
Personal work area	<ul style="list-style-type: none"> • 42.9% administration/management • 28.6% physicians • 21.4% care workers • 7.1% diagnostics
Tenure at current employer	<ul style="list-style-type: none"> • 14.3% shorter than 1 year • 35.7% between one and up to 5 years • ~ 7% between 5 and 10 years • 35.7% over 10 years
Personal work experience with CPs	<ul style="list-style-type: none"> • 35.7% between one and up to 5 years • 14.3% between 5 and 10 years • 21.4% over 10 years • 14.3% report not working with CPs
Employer usage of CPs	<ul style="list-style-type: none"> • 18.8% shorter than 1 year • 31.3% between one and up to 5 years • 12.5% between 5 and 10 years • 18.8% longer than 10 years • 12.5% no use of CPs

all CPs, 67% for many. The respondent replying to the question of functional services believes middle-range savings to occur in all CPs in use at the hospital.

User benefits are manifold. Respondents were asked to rate whether statements regarding benefits applied. Improvements for onboarding of new employees (67% completely agree, 33% rather agree that this statement applies), in risk management (60% completely agree, 40% rather agree), help in not forgetting anything relevant for treatment (half completely and rather agree, respectively) and optimal patient care notwithstanding shorter length of stay rank highly and reach approval rates of 100% (completely agree and rather agree combined). Though 92% completely and partly agree that CPs improve cooperation between nursing and physician staff, 8% entirely disagree. For 70%, there are improvements in communication with patients while 20% rather and 10% completely disagree. Concerning easier internal communication and improved internal processes, all agree or partly agree. While 90% agree and partly agree that documentation became easier, 10% rather disagree. The same holds true regarding specifications of quality management.

Qualitative Results

We defined four main categories with subcategories. These are described below using exemplary quotes (translated by the authors) from the interviews, which were all done in German. For clarity reasons, we substituted “CP” for all mentions of “path/pathway”).

Acceptance. From the staff’s perspective, CPs are introduced due to ambitions towards standardization and structural improvements, plus financial reasons. Experts add innovation oriented leadership as causal element. The CP design team is always multidisciplinary and has a chief physician as team leader. Before the implementation, most hospitals organize information sessions, in some there are pilots. There is little training, even though according to the experts this would be very important.

Employees and experts reported that CPs “are used in daily practice as they are put on the fever curve, so using them is quasi mandatory” (Interview 10, p. 1). In general, they are accepted – in single cases only after hierarchical intervention, and further developed in an institutionalized way plus when necessary. Thus, as what a CP is seen can change. One expert reported that in a specific hospital CPs were regarded more as reference scheme that had already been surpassed by other procedures (Interview 13, p. 1–2).

Satisfaction and perceived improvements. Employees and experts alike mention improved collaboration as central: “we totally had an improvement in working together. The issue is transparency, the issue is clarity, being aligned, that’s to say knowing the process together” (Interview 10, p. 3). For some, communication and “interface problems (...) absolutely declined” (Interview 6, p. 4), leading to less effort (Interview 8, p. 4).

There is more documentation to do, but in a more structured, clearer, and unified way, which may result in economic benefits and higher patient safety. “More quality and transparency” (Interview 4, p. 2) is ascribed to the whole treatment process. In addition, new staff members or part time

employees may find onboarding easier, which can even lead to higher retention rates (Interview 1, p. 2).

Moreover, information can be shared with patients in an optimized way. Whether they should know about the CPs in particular is conversely discussed as some think “the effort would be too high” (Interview 14, p. 4) and confusion possible as there are cases that deviate from the CPs for specific reasons. General CP adherence is checked for and “deviations are also discussed” (Interview 3, p. 3) with management. In some hospitals “[t]he CPs are defined in a way that allows for individualization within it. Therefore in reality one cannot speak of deviation from the CP. I would not call it a deviation from the CP, but there are various options within the CP” (Interview 16, p. 5).

Problems and Critique. Employees as well as experts highlight that the potential benefits of CPs should not be stressed too much. In particular, over-standardization and over-emphasis of cost-reductions should be avoided. Adding to the problem of increased time requirements due to more documentation necessities, the respondents mention time needed for revising and updating CPs: “checking once, twice a year, is all still correct, this is simply an enormous time investment” (Interview 7, p. 5). CPs also do not simplify everything: they are not useful for complex diagnoses (Interview 10, p. 4), and complex CPs are rather rejected. Moreover, different departments, areas, but also (hospital) locations of the same provider can face very diverging conditions, thus making it impossible to standardize CPs. Thus, “CPs are [not] the ultimate remedy” (Interview 14, p. 1), and e.g. “communication problems are (...) still there” (Interview 1, p. 3).

Suggestions and Wishes. Where CPs are available in written form, respondents wish for an electronic version, though digitalization is feared by some. While a more comprehensive adherence to CPs is requested, having them include more is also suggested: “Maybe CPs should also cover guidelines of discharge management and hygiene” (Interview 4, p. 3). For checking the documentation and adherence to CPs as well as (moderating) multi-professional meetings, more personnel might be useful.

Some ask for less documentation and more participation in general plus in specific aspects. Ensuring a high degree of participation is one of the main recommendations in the introductory phase of CPs: “It is very important that nursing staff and physicians are convinced - they are the main players regarding in-patient treatments” (Interview 9, p. 5). Due to the crucial role of leadership, respondent 6 (p. 6) suggests “starting in a department where the leader is convinced and backing this up, and then, step by step, the roll out. And if this goes well, the employees are soon convinced.” Moreover, the aims have to be clearly defined and prioritized: “It should be manageable, not too many demands, manageable, and one should leave some latitude. When everything is covered with

writing, it’s not easy to grasp any more. When a house [hospital, added by the authors] is introducing CPs, I really would do a training, at least for the person responsible for documentation, to have them trained and share it with the team” (Interview 5, p. 4).

Discussion

Various reform approaches are used in the health care sector to reduce (the rate of) cost increases, among them CPs. Not much is known regarding their utilization in the German speaking part of Europe,²⁵ which is why we did a two-staged multi-method pilot study. In the quantitative part, the aim was investigating the utilization and dissemination of CPs to get a broad understanding of factors influencing their implementation and maintenance. In the qualitative part, we studied the perspective of employees and experts on CPs.

Main results

To structure the findings, the [Table 3](#) below shows them according to the Consolidated Framework for Implementation Research (CFIR),^{9,29} whose five dimensions cover the constructs relevant for (successful) intervention implementation. All those mentioned in the study are highlighted in bold. After this, we discuss the results referring to the current literature (5.2).

Contextualisation

The study showed that many hospitals already implemented CPs, mainly in Germany. However, the utilization varies, as they are mostly used for medical and care related procedures, but less frequently for function service or pharmaceutical aspects. In addition, the path entry criteria are divergent. Most refer to diagnoses or the degree of the illness; comorbidities or age are seldom included. Nevertheless, due to their standardized nature CPs are most helpful when defined in a narrow fashion. CPs not necessarily lead to higher efficiency; they are not useful for more complex treatments and difficult to evaluate due to their specificity and scope.¹⁰

Regarding cost-benefit-effects, CPs are expected to yield middle-range savings. In addition to financial benefits, the respondents highlight improvements regarding risk management, an aspect also raised in literature.¹³ In general, the benefit for the personnel is thought to be very high – also in comparison to positive financial effects. Many respondents stated there were no financial benefits to be observed, but referred to the creation of intangible values like patient safety and staff satisfaction as has already been suggested.³⁰ Thus, we assume that the immaterial gains, especially for staff and patients, outweigh the material ones and/or are used as additional (mainly post-hoc) legitimization for CPs. The long term use of CPs seems to be connected to the benefits they

Table 3. Results structure regarding Consolidated Framework for Implementation Research.**Characteristics of the intervention**

- **Intervention source** should be the subsequent team of users, i.e. CPs should be developed bottom-up
- Having a multi-professional CP development team and recurrently evaluating the CPs is necessary to ensure **evidence strenght and quality and adaptability**
- The **relative advantage** of CPs is high, according to the respondents and more important than costs
- **Design quality and packaging** play no major role, only clarity of documentation is relevant

Outer setting

- Only implicit in the requirement of adapting the CPs to **patient needs and resources**

Inner setting

- **Structural characteristics** are mentioned as limits for CPs
- Providers should not assume identical CPs to function in all their facilities if these differ
- **Communication** has improved
- **Networks** are important in the context of stakeholders' **goal congruence** and to ensure **feedback**
- For a favorable inner setting, **leadership engagement** is imperative, mainly by placing high **relative priority** on CPs, facilitating **access to knowledge and information** plus creating a **learning climate**

Individuals involved

- **Knowledge and beliefs about the intervention** are positive
- Interviewees are certain that they can follow CPs under normal circumstances (**Self-efficacy**) and are ready to do so (**Individual stage of change**)

Process

- **Opinion leaders** and **champions** are very important during the implementation phase of CPs. Important roles: Chief physicians, management, but also nurses: a critical mass should be in favor of the innovation
- Engaging committed employees for the CP design team seems just as vital as nominating **formally appointed internal implementation leaders** to guarantee **execution** of the initiative
- A CP cycle is called for to integrate **reflecting and evaluating** if the CPs still fit the requirements

Table 4. Practice implications.**Recommendations for CP use**

Use for shorter in-patient stays that are easy to standardize and well-structured
Include options in the CPs

Crucial issues for implementation success

Internal promotors
Approval on all levels of leadership
Adaptation to local requirements
Recurring checks for update necessity and benefit generation
Following implementation guidelines from behavioral sciences/change management
Establish CP design team with high success probability (multidisciplinary, familiar with internal requirements and treatment, high commitment)
Safeguarding perception of benefits and participation in all phases of the CP cycle
Ensuring and communicating CP benefits → makes use of interrelationship between benefits and length of use

CP results

Financial: Rather limited potential savings (but lack of assessment) → improving cost transparency is needed to allow for calculation and communication of benefits
Immaterial: Improved risk management and patient safety, higher employee satisfaction, better onboarding of new staff members
If low: considering abandoning the CPs concerned is suggested

yield for staff, which were investigated in detail in the qualitative part.

Overall, employees accept CPs, are satisfied with their design and content, and report improvements in their daily tasks. Knowing why CPs are implemented is vital,³¹ just as being part of its creation,²³ though highly accepted expert-created CPs can also be successful.¹ Nevertheless, adaptations to the local context are recommended,² specifically in case of very divergent situations, even of the same provider.

According to the respondents, CPs can not only improve patient safety and satisfaction, but also serve as information source for them.^{1,32} However, any development towards more impersonal treatment and/or a dehumanization of work due to CP utilization has to be avoided.¹⁰ CPs might even counteract these dangers as patients need to be closely monitored regarding maintenance of path entry and progression criteria, and since CPs at least in some phases require more multi-professional interaction and recurrent reflection. As expected, internal improvements like better teamwork, a reduction of communication problems and superior interface management are realized or become likelier. It is imperative that all professions working along the CPs are in favor of these to ensure reciprocal impulses towards the desired behavior (or behavioral changes).¹ Moreover, they must be aware of the fact that the time related costs of CPs during their creation and implementation will amortize, but not immediately.²³

Missing resources or doubtful reasons for implementing CPs are mentioned as risk factors by the interviewees and literature.¹ In case process management is already in place and/or full internal transparency and/or knowledge transfer are not the goals, this hampers CP implementation¹⁰ due to goal-expectation-incongruence.⁶ Critical factors are organizational and external support,¹⁰ e.g. via easy integration¹⁰ and doing so stepwise. This becomes more relevant when paths massively change current structures and prevalent logics of action⁶ or are embedded in more comprehensive, overarching structures.^{10,23} As results of a pilot study have to be interpreted with caution, further studies should investigate which aspects of the CFIR are the most important regarding CP acceptance and utilization when measured quantitatively, and whether those not mentioned by the interviewees in this study are of less relevance or constitute leverage points not considered so far. In addition to the limitation of being a pilot study, there is a need for further investigations in Switzerland, both quantitatively and qualitatively.

Practice Implication

Clinical Pathways can better yield their full potential when the condensed findings are observed as presented in the table (Table 4) below:

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Supplemental Material

Supplemental material for this article is available online.

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