

## Explorative Study on the Utilization of Patient Pathways in Finnish Public Healthcare

MSc Madeleine Eklund  
Aalto University,  
Department of Industrial  
Engineering and Management  
madeleine eklund@aalto.fi

MSc Märt Vesinurm  
Aalto University,  
Department of Industrial  
Engineering and Management  
mart.vesinurm@aalto.fi

PhD Paulus Torkki  
University of Helsinki,  
Department of Public Health  
paulus.torkki@helsinki.fi

### Abstract

*In this study, we explore the perception and usage of patient pathways among professionals in the Finnish public healthcare system, which is currently coping with the need for increased efficiency and productivity. Twenty-three healthcare professionals participated in a survey that combined open-ended and standardized questions. The findings reveal a positive view of patient pathways, with over 90% reporting usage in their work due to the structure and coordination among professionals that the pathways offer. However, some difficulties are highlighted, such as locating updated pathways and experiencing inflexibility in their usage. We recommend focusing on enhancing the accessibility of patient pathways and ensuring that they remain updated for their utilization. Further monitoring of pathway usage is required, and a cooperative approach could help overcome barriers to the pathways' implementation. Centralizing patient pathway information in a single digital environment could prevent the accumulation of underutilized tacit knowledge.*

**Keywords:** patient pathway, public healthcare, survey study, care coordination, integration

### 1. Introduction

The healthcare sector in Finland is characterized by extensive public services, with the growth rate of healthcare spending anticipated to outpace the GDP growth rate (Terveyden ja hyvinvoinnin laitos, 2023). To sustain the existing welfare structure, there is a pressing need for enhanced efficiency in the healthcare sector. Many countries have experienced a surge in per capita healthcare spending, yet this has not corresponded to a proportionate increase in the number of healthy life years (OECD, 2021). In Finland, there are indications of a decline in healthcare quality (Ronkainen, 2022). This points to a potential

decrease in healthcare productivity, positioning healthcare as the least efficient service sector in the country (Lillrank & Heiskala, 2022). This context highlights the potential of patient pathways as a solution for improving effectiveness (Asmiranjati et al., 2018). Patient pathways should be grounded in current clinical evidence and support health systems in evaluating the impacts of various interventions, allocating resources efficiently and identifying outcome metrics integral to the delivery of optimal care.

The healthcare system strives to enhance the quality and efficiency of care delivery, leading to a shift from opinion-based to evidence-based practice (Degu et al., 2022). Patient pathways constitute one such evidence-based tool that has gained traction in the healthcare operations management realm due to its potential to optimize patient outcomes and clinical efficiency (Rotter et al., 2019). Over the last 10 years, there has been a growing interest in exploring patient pathways in both research and practice. The pathway has different definitions, and various terms, such as care plan, clinical path, care map or care pathway, have been used to describe the same phenomenon (Nuutinen, 2000). Nonetheless, essentially, the definitions have similar components: strategy, standard, diagnosis and procedure for patient care. It is a standard by which care is provided, and it instructs healthcare professionals (HCPs) on how treatment should be continued in each different situation (Asmirajanti et al., 2018). It entails detailed information about clinical treatment based on each patient's condition (Asmirajanti et al., 2018). In the context of operations management, a patient pathway can be perceived as a production plan geared towards quality enhancement. By introducing greater control and reducing unwanted variability, patient pathways contribute to the enhancement of healthcare delivery and patient outcomes (MacKay & Steiner, 1997).

Previous studies also investigated patient pathways, focusing on the patient's perspective and highlighting the importance of patient-centred care and tailored interventions (Sather et al., 2019; Metsälä et al., 2022). For instance, Metsälä et al. (2022) emphasized the role of individualized patient pathways and targeted interventions for improving health outcomes. Similarly, Sather et al. (2019) explored the impact of patient engagement and shared decision-making on the effectiveness of patient pathways, demonstrating that active patient involvement contributed to better treatment adherence and health outcomes.

Read et al. (2021) highlighted the significance of HCPs' perspectives in evaluating the effectiveness and practicality of patient pathways since their insights could inform the design and implementation of such interventions. In their study, Tindall et al. (2023) found that stakeholder engagement and collaboration played a critical role in the successful adoption and sustainability of patient pathways, suggesting the need for further examination of stakeholder perspectives.

The extant literature has also examined the organizational and structural factors that influence the implementation of patient pathways, such as healthcare policies, guideline design and technological advancements (Evans-Lacko et al., 2010; Madsen et al., 2022).

While existing studies have contributed to patient pathway research from these perspectives, there is still a need for a comprehensive understanding of their impact on healthcare operations, particularly from the viewpoint of HCPs. Seys et al. (2017) found that compared to other HCPs, physicians perceived the quality of organized care as the highest. For the development and implementation of care pathways, it is important for teams to be involved in the whole process and support the project. Knowledge-intensive services rely on patient pathways as a set of tools for managing processes and sharing and utilizing knowledge from various professionals.

In this study, we aim to address the abovementioned research gap by examining how HCPs perceive and utilize patient pathways to optimize care delivery and improve clinical efficiency.

We collected information related to patient pathway knowledge and utilization in the form of survey data from different Finnish healthcare districts that actively use patient pathways to address the lack of a theoretical model for knowledge creation by HCPs (Bose & Sugumaran, 2003; Vanhaecht et al., 2007).

The main objective of our study is to explore the perceptions and utilization of patient pathways among HCPs in the Finnish public healthcare system. A

secondary objective is to explore the ways in which patient pathways are documented and how they are used in treatment planning. We address the gaps in the literature regarding the theoretical model for knowledge creation by HCPs (Bose & Sugumaran, 2003; Vanhaecht et al., 2007), as well as explore the role of organizational and structural factors that influence the implementation of patient pathways (Evans-Lacko et al., 2010; Madsen et al., 2022).

We aim to answer the following research questions:

1. How are the quality and efficiency of patient pathways perceived by HCPs in Finnish public healthcare?
2. How are pathways utilized by HCPs in the care planning process?

We aim to answer these questions by means of an explorative survey sent out to Finnish HCPs. This survey that uses a validated set of questions explores how different HCPs perceive the quality and efficiency of their organizations in terms of patient care. The total scores serve as indicators of how well each organization performs across various domains of healthcare delivery from each professional group's perspective, aimed at capturing the perceptions and uses of patient pathways in clinical practice.

This paper is structured as follows: first, we introduce the methods used in our study. Second, we discuss the results obtained from the analysis of the explorative survey. Third, we explain the implications of our study and propose a framework for analyzing the utilization of patient pathways in clinical practice. Finally, we draw conclusions from our study.

## 2. Methods

This explorative survey study (Stebbins, 2001) is cross-sectional and multicentred. Its scope is limited to the public healthcare sector in Finland; privately owned actors are excluded from our research as their incentives differ notably. Our initial data collection involved four semi-structured interviews with HCPs to create an insightful survey.

### 2.1. Data collection

The responses to the survey were obtained through convenience sampling (Saunders et al., 2012), aimed at HCPs with continuous patient contacts. The survey included open-ended questions and the Care Process Self-Evaluation Tool (CPSET), a standardized question set (Vanhaecht et al., 2007), which is

validated and was originally developed at the Catholic University of Leuven in Belgium. In this study, the CPSET questions were translated from English to Finnish. The CPSET consists of 29 questions and five subscales: patient-focused organization, care coordination, communication, collaboration with primary care and follow-up care. The respondents rated the statements on a 10-point scale, ranging from totally disagree (1) to totally agree (10).

First, the survey was distributed to HCPs. The goal was for these professionals to forward it to their colleagues, creating a snowball effect (Johnson, 2014).

Second, HCPs were approached by email. Their email addresses were collected manually from a practitioner database. The initial goal was to recruit respondents from all healthcare districts and from diverse areas of specialization. The survey participants were initially contacted via institutional email. The selection was guided by a geographical strategy, using healthcare districts as the separating factor. An effort was made to achieve equitable representation by contacting approximately the same number of participants across all healthcare districts. The target was to recruit respondents with continuous patient contacts. Eventually, the survey was sent directly to 200 HCPs in Finland.

## 2.2. Analysis

Qualitative and quantitative data were analyzed separately due to the different methods required for their respective interpretations. Open-ended responses were coded via the Gioia method (Gioia et al., 2013), with concepts identified and categorized by themes per question to preserve anonymity and highlight contradictions. The results were summarized for inclusion in this paper.

The CPSET data were processed through IBM SPSS for descriptive statistics calculation. Descriptive statistics (minimums, maximums, means and standard deviations) were calculated from the data. After the coding and data analysis, we compiled a framework utilizing 1) the themes from the qualitative analysis and 2) the quantitative CPSET results. Our purpose was to explore broader themes and generalize the findings.

## 3. Results

In total, 23 completed questionnaires (11.5% response rate) were gathered from Finnish HCPs. A total of 15 physicians answered the questionnaire, representing most of the respondents, followed by 6 nurses and 2 other staff members. The snowballing

technique appeared somewhat successful, as evidenced by emails from initial contacts indicating that they forwarded the survey to their colleagues, as well as the receipt of survey responses originating from these referrals.

The respondents had a broad age distribution, ranging from 20s to 60s. Most respondents were women, totalling 18 versus 5 men. The distribution of the years of experience in healthcare was also relative, ranging from under 5 to over 40 years. The respondents' gender, age and occupation distributions are presented in Table 1. Over one-third of the respondents indicated less than 5 years of experience in healthcare. Out of the 21 healthcare districts in Finland, 12 (57.1%) are represented by the respondents, along with Helsinki and Helsinki University Hospital (HUS). The participant demographics had a broad variance, covering HCPs working in different settings – from healthcare districts operating in rural areas and small healthcare centres to those in large university-level hospitals. All participants had a diverse range of specialties, extending from primary to specialized healthcare services.

**Table 1. Demographic characteristics.**

|                                      |                     | N  | (%)      |
|--------------------------------------|---------------------|----|----------|
| Gender                               | Female              | 18 | 78       |
|                                      | Male                | 5  | 22       |
|                                      | No answer           | 0  | 0        |
| Age (years)                          | 20-29               | 7  | 30       |
|                                      | 30-49               | 6  | 26       |
|                                      | 50-69               | 10 | 43       |
| Experience within healthcare (years) | ≤ 5                 | 8  | 35       |
|                                      | 6-20                | 5  | 21       |
|                                      | 21-40               | 9  | 39       |
|                                      | No answer           | 0  | 0        |
| Occupation                           | Physician           | 15 | 65       |
|                                      | Nurse               | 6  | 26       |
|                                      | Other               | 2  | 9        |
| Healthcare provider                  | University hospital | 4  | (4/5) *  |
|                                      | Central hospital    | 8  | (8/16) * |

\* Finnish public healthcare providers consist of 5 university hospitals and 16 central hospitals.

## 3.1. Qualitative results

### Research objective 1: HCPs' perceptions on the utilization of patient pathways

#### Theme 1: Clinical applicability

*Evidence:* Out of the 23 respondents, 21 (91.3%) indicate that patient pathways are predominantly used by HCPs. The pathways are typically presented in text format or as flowcharts and sometimes visualized in

videos. They exist as tacit knowledge of the healthcare system and general professional practices.

*The treatment path tells [HCPs] how to proceed in a certain situation in terms of the patient's diagnosis and treatment. Often, the treatment path progresses with clear yes/no questions from one box to another in the chart.* (Participant 7)

#### Theme 2: Accessibility and usability

*Evidence:* Patient pathways predominantly exist in digital formats. HCPs commonly resort to Intranet services – using *terveysportti.fi* (a web portal maintained by the Finnish Medical Society Duodecim) and *terveyskyla.fi* (a web portal managed by a consortium of university hospitals) – to access these pathways.

*Not all information is visible; the databases differ from each other.* (Participant 14)

#### Theme 3: Monitoring and updating

*Evidence:* Systematic monitoring of patient pathway utilization seems to be lacking. Some respondents (n = 3) indicate that the topic might be incidentally addressed during meetings, while one respondent asserts that monitoring is entirely absent, given that adherence to the defined pathway is considered standard practice.

### **Research objective 2: HCPs' perspectives on the practicality of patient pathways**

#### Theme 1: Flexibility and individualization

*Evidence:* Some respondents (n = 6) report that one of the main problems with patient pathways is their inflexibility. Many patients require a more tailored treatment plan, but patient pathways are often too general.

*Patients' problems are often individual and complex – the treatment path is not necessarily flexible for all these needs, lack of resources, diseases that would need to be adjusted, monitoring of many different specialties together – not possible.* (Participant 10)

#### Theme 2: Availability and updates

*Evidence:* Another problem reported by some respondents (n = 6) is the difficulty of finding the correct patient pathway from Information and

Communications Technology (ICT) systems as these might be old, and sometimes, patient pathways are updated so frequently that it is difficult to keep up with the updates.

*Sometimes, the treatment paths are updated very often, which is why not all employees necessarily keep up and follow the latest recommendation when they don't know about the changes.* (Participant 3)

The respondents indicate that patient pathways are typically updated on a demand basis. Individual patient pathways typically have a named person responsible. The need for updating might be evaluated regularly, and the general practice is to gather a work group to update the existing patient pathways. Many respondents note that they can influence the frequency of updating the local patient pathways, either by taking part in the work group or by talking with the people responsible for the process.

#### Theme 3: Consistent usage

*Evidence:* The last category of the challenges reported by some respondents (n = 8) describes the difficulties in the consistency of use of patient pathways.

*The lack of consistent usage of patient pathways across our ecosystem of 26 service providers has often led to difficulties in negotiations and discussions.* (Participant 16)

The respondents report problems related to consistent usage, which are divided into three categories. The first category of problems includes the inflexibility of patient pathways, given that many patients require a more tailored treatment plan and patient pathways are often too general. A respondent makes the following claim:

*The problems of the patients are often individual and complex – a patient pathway does not necessarily attend to all these needs.* (Participant 8)

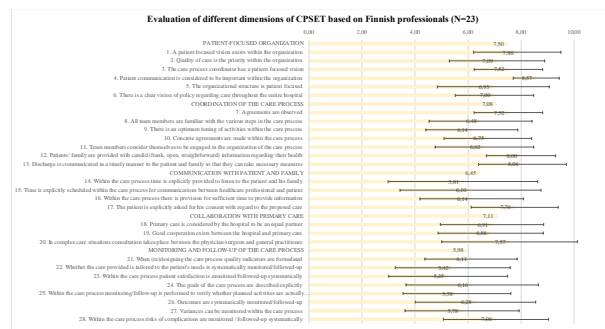
The second category involves the difficulty of finding the correct patient pathway from ICT systems, for the reasons stated in Theme 2. The responses indicate this as a frequent issue, with 8 out of the 23 (34.7%) respondents mentioning the scarcity of patient pathways or the difficulty in finding the correct pathway as one of the problems they have faced.

The last category describes the difficulties in ensuring that all unit members use the pathways. A respondent mentions that until the end of 2022, they

operated in an ecosystem that included 26 service providers, which occasionally made negotiations and discussions difficult. Another respondent synthesizes the problem quite clearly, saying, "patient pathways are not used by all professionals" (Participant 22).

### 3.2. Quantitative results

The total CPSET score is 6.74 (Figure 1). The subtopics' scores are as follows: patient-focused organization = 7.50, coordination of the care process = 7.08, communication with patient and family = 6.45, collaboration with primary care = 7.11 and monitoring and follow-up of the care process = 5.98. In a similar study conducted by Biringer and colleagues' (2017) in the Norwegian health care setting, the corresponding CPSET values are 7.6, 7.3, 6.8, 6.7 and 6.3. In both studies, patient-focused organization scores the highest, while monitoring and follow-up of the care process has the lowest score.



**Figure 1. Average scores and standard deviations (68% CI) of the CPSET results.**

The data present a large variation in the CPSET responses (Table 2). The questions with the highest variance are as follows: "14. In the care process, time is explicitly provided to listen to the patient and his/her family" (average = 5.81, standard deviation = 2.82), and "15. Time is explicitly scheduled in the care process for communications between the healthcare professional and the patient" (average = 6.10, standard deviation = 2.66). The question with the lowest variance is "4. Patient communication is considered important within the organization" (average = 8.57, standard deviation = 0.87).

Nurses, with the highest average CPSET score of 7.09, generally have the most favourable view of their organization's effectiveness in patient care and coordination. In contrast, physicians and other healthcare personnel have lower average scores of 6.58 and 6.31, respectively, indicating more room for perceived improvement in organizational performance.

### Patient-focused organization (mean = 7.50)

This category reflects the clinicians' perception of how patient-focused the organization is. The mean scores are relatively high, suggesting clinicians' general agreement that the organization has a patient-focused vision (7.86) and indicating quality of care as a priority (7.09). The importance of patient communication has the highest mean score in this category (8.57).

### Coordination of the care process (mean = 7.08)

In this category, the responses suggest the clinicians' belief that there is a good level of coordination in the care process. However, there is room for improvement in optimizing the timing of activities in the care process (6.14) and engaging team members in the organization of the care process (6.62).

**Table 2. Descriptive statistics of the CPSET results.**

|  | N  | Minimum | Maximum | Mean | Std. Deviation |
|--|----|---------|---------|------|----------------|
| 1. A patient focused vision exists within the organization   | 21 | 2       | 9       | 7.86 | 1.652          |
| 2. Quality of care is the priority within the organization   | 22 | 2       | 9       | 7.09 | 1.797          |
| 3. The care process coordinator has a patient focused vision   | 21 | 4       | 9       | 7.52 | 1.289          |
| 4. Patient communication is considered to be important within the organization   | 21 | 7       | 10      | 8.57 | 0.870          |
| 5. The organizational structure is patient focused   | 21 | 2       | 10      | 6.95 | 2.109          |
| 6. There is a clear vision of policy regarding care throughout the entire hospital   | 21 | 3       | 9       | 7.00 | 1.483          |
| 7. Agreements are observed   | 21 | 4       | 9       | 7.52 | 1.289          |
| 8. All team members are familiar with the various steps in the care process  | 21 | 2       | 9       | 6.48 | 1.940          |
| 9. There is an optimum timing of activities within the care process  | 21 | 3       | 9       | 6.14 | 1.740          |
| 10. Concrete agreements are made within the care process   | 20 | 3       | 9       | 6.75 | 1.650          |
| 11. Team members consider themselves to be engaged in the organization of the care process                                 | 21 | 2       | 9       | 6.62 | 1.857          |
| 12. Patients/ family are provided with candid (frank, open, straightforward) information regarding their health            | 21 | 5       | 9       | 8.00 | 1.304          |
| 13. Discharge is communicated in a timely manner to the patient and family so that they can take necessary measures        | 18 | 5       | 10      | 8.06 | 1.662          |
| 14. Within the care process time is explicitly provided to listen to the patient and his family                            | 21 | 1       | 9       | 5.81 | 2.822          |
| 15. Time is explicitly scheduled within the care process for communications between healthcare professional and patient    | 21 | 1       | 9       | 6.10 | 2.663          |
| 16. Within the care process there is provision for sufficient time to provide information                                  | 22 | 2       | 9       | 6.14 | 1.959          |
| 17. The patient is explicitly asked for his consent with regard to the proposed care                                       | 21 | 5       | 10      | 7.76 | 1.640          |
| 18. Primary care is considered by the hospital to be an equal partner  | 22 | 2       | 10      | 6.91 | 1.950          |
| 19. Good cooperation exists between the hospital and primary care  | 21 | 2       | 10      | 6.86 | 1.982          |
| 20. In complex care situations consultation takes place between the physician/surgeon and general practitioner             | 21 | 1       | 10      | 7.57 | 2.561          |
| 21. When (re)designing the care process quality indicators are formulated  | 18 | 3       | 9       | 6.11 | 1.745          |
| 22. Whether the care provided is tailored to the patient's needs is systematically monitored/ followed-up                  | 19 | 2       | 9       | 5.42 | 2.168          |
| 23. Within the care process patient satisfaction is monitored/ followed-up systematically                                  | 20 | 2       | 9       | 5.25 | 2.245          |
| 24. The goals of the care process are described explicitly   | 19 | 1       | 9       | 6.16 | 2.500          |
| 25. Within the care process monitoring/ follow-up is performed to verify whether planned activities are actually performed | 19 | 2       | 9       | 5.58 | 2.036          |
| 26. Outcomes are systematically monitored/ followed-up   | 18 | 2       | 9       | 6.28 | 2.270          |
| 27. Variances can be monitored within the care process   | 18 | 2       | 9       | 5.78 | 2.157          |
| 28. Within the care process risks of complications are monitored / followed-up systematically                              | 18 | 4       | 10      | 7.06 | 1.984          |
| 29. The progress in the care process is continuously monitored/ followed-up and adjusted                                   | 19 | 2       | 10      | 6.21 | 2.149          |

Communication with patient and family (mean = 6.45)

While the mean score in this category is slightly lower, it suggests clinicians' positive perception regarding communication with patients and their families. The patients' explicit consent regarding the proposed care is relatively high (7.76), but the time provided to listen to the patients and their families is considered lower (5.81).

Collaboration with primary care (mean = 7.11)

This category assesses how clinicians view the collaboration between the hospital and primary care. The highest score is earned by consultations taking place in complex care situations (7.57), indicating that clinicians perceive a good level of collaboration with primary care.

Monitoring and follow-up of the care process (mean = 5.98)

This category has the lowest mean score among the categories, suggesting that clinicians perceive some room for improvement in the monitoring and follow-up of the care pathway process. Particularly, patient satisfaction monitoring is regarded as an area with more significant room for improvement (5.25).

### 3.3. Framework for evaluating patient pathways

The main themes can be divided into clinician-related, healthcare management-related and ICT-related challenges. These categories emerge from the combination of quantitative and qualitative results. Each aspect influences the pathways' utilization to varying extents; thus, the model enables a more specific identification of the challenges and their effects on the utilization of patient pathways.

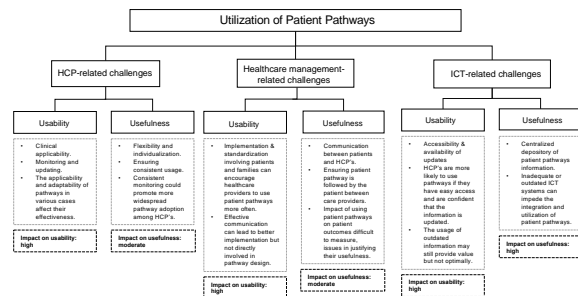


Figure 2. Framework for patient pathway usability and utilization assessment.

For clinician-related challenges, the focus is on clinical applicability, monitoring and updating. These aspects have a high impact on usability and a moderate impact on usefulness, suggesting that clinicians are more likely to adopt pathways if they find these directly applicable to various clinical scenarios and if these are consistently updated. Healthcare management-related challenges revolve around the implementation and standardization of patient pathways. The analysis suggests that outdated information still provides some value but is not ideal, making it difficult to quantify outcomes, thus affecting both usability and usefulness. Finally, ICT-related

challenges highlight the importance of accessibility and availability of updated systems. Inadequate or outdated ICT systems significantly impede the utilization of patient pathways, affecting both usability and usefulness.

## 4. Discussion

Our research has presented some insights into the perceptions, practicality and utilization of patient pathways in Finnish public healthcare. The findings mainly confirm those reported in existing literature, while also offering new perspectives, thereby contributing to the ongoing dialogue surrounding this topic.

Our research contributes to the patient pathway literature by providing a framework for the analysis of how patient pathways are utilized in practice. The potential challenges identified can be used to focus efforts on both research and development (practice) of patient pathways. We have also found several points of confirmatory evidence in relation to previous literature.

First, our findings indicate that Finnish HCPs' understanding of patient pathways is generally aligned with the definitions provided in the literature. Most of the respondents define patient pathways as standardized tools that streamline diagnosis and support care planning, similar to the descriptions of production plans in the literature (Kinsman et al., 2010). However, we have also observed some unique perspectives. A few respondents describe patient pathways as divisions of labour among HCPs or as paths that patients follow through healthcare without a pre-determined plan. These interpretations differ significantly from the conventional understanding and highlight the diversity in perceptions even among HCPs. The findings are further evidenced by Madsen and colleagues' (2022) perceived barriers and facilitators toward adoption and implementation of patient pathways. These aspects reflect the importance of achieving a shared understanding of patient pathways to facilitate their effective implementation in everyday operations.

Second, our research cautiously indicates that the utilization of patient pathways appears to be well-established within the scope of the examined Finnish public healthcare, with 21 out of the 23 (91%) respondents utilizing patient pathways in their work. These findings resonate with Vanhaecht and colleagues' (2007) earlier observations of HCPs' widespread adoption of clinical pathways in Belgium and the Netherlands. However, given the small sample size, these insights should not be generalized to

represent the perspectives of all HCPs across Finnish healthcare districts.

Third, our study suggests that patient and family involvement is insufficiently incorporated in patient pathways. This indicates a gap in the alignment with patient perspectives, which previous studies have also highlighted as critical (Del Vecchio et al., 2015; Faber et al., 2014; Wind et al., 2022). Emphasizing co-creation and monitoring of patient pathways could enhance communication and engagement with patients and their families.

Despite these strengths, we have identified several limitations in the current use of patient pathways. Our study reveals potential areas for improvement, particularly in monitoring and follow-up of patient pathway utilization, aligning with the concerns raised by Kennedy et al. (2022). Without thorough insights into the outcomes associated with a specific patient pathway, assessing its effectiveness becomes a challenge. This observation further emphasizes the need for improvements in monitoring and follow-up of patient pathway usage across areas of Finnish wellbeing. The ability to apply guidelines or pathways in diverse clinical scenarios is imperative for their successful implementation (Jabbour et al., 2018). Simultaneously, the necessity of regular monitoring and updating of clinical pathways has been highlighted, given the rapidly evolving nature of medical knowledge (Rotter et al., 2019).

Our research results align with the notion that patient pathways streamline the diagnosis process and support care planning, accentuating their role as valuable tools for healthcare delivery (Rotter et al., 2019). Furthermore, we extend prior research by investigating the barriers to and facilitators of the implementation of patient pathways. Similarly, to Evans-Lacko and colleagues' (2010), we have found that information accessibility and the need for better patient involvement represent key areas for improvement in facilitators and barriers to implementing clinical care pathways. The importance of ensuring the continuous availability of digital tools, such as patient pathways, and their regular updates to maintain their relevance and effectiveness, is also established (Richter & Schlieter, 2019). Centralizing patient pathways on a single platform has been advocated in studies, suggesting that it can enhance the pathways' utilization and effectiveness (e.g., Cardoen et al., 2010). Here, our proposed framework contributes to a broader understanding of the adoption and practical use of patient pathways.

Our proposed framework for evaluating patient pathways (Figure 2) integrates HCP-related, healthcare management-related and ICT-related challenges. These challenges have direct implications

for the utilization of patient pathways. Each aspect influences the pathways' usability and usefulness to varying extents, and a better understanding of these challenges could significantly enhance their effectiveness in healthcare delivery. The framework can be used to identify the different underlying causes and their effects on patient pathway utilization.

Our study has focused primarily on the perspectives of physicians and nurses. However, patient care is often multidisciplinary, involving other professionals, such as social workers, physiotherapists, dietitians and more. These professionals also play a crucial role in following patient pathways, particularly in comprehensive or chronic care. Future research could provide a more holistic understanding of the challenges and benefits of using patient pathways by incorporating these additional perspectives. Moreover, our proposed framework could guide future research efforts in the right direction, where we have identified potential challenges in the utilization of patient pathways.

Our study has several limitations. First, our sample size is small, with only 23 HCPs participating in the study, limiting the generalizability of our findings. Second, the gender and professional role distributions are somewhat uneven, with the majority of the respondents being female physicians. This could potentially skew our findings. It is also possible that the study attracted the respondents who were particularly interested or engaged in patient pathways, introducing selection bias. This implies that these professionals have a higher motivation for understanding evidence and improving organizational structures compared with their colleagues who chose not to participate. Our research also utilized convenience sampling (Saunders et al., 2012), which might have limited the diversity and representativeness of the sample. Similarly, variability in the accessibility and visibility of HCPs' contact information across different institutional webpages might have resulted in missed opportunities to include a more diverse set of respondents from various healthcare districts. Third, despite their broad age range, most respondents had less than five years of experience in healthcare, possibly biasing the results towards the views of less experienced professionals. Finally, due to the cross-sectional nature of the study, it can only offer a snapshot of perceptions at a particular point in time. A longitudinal approach might provide more accurate findings, especially concerning the effects of changes and improvements in patient pathways.

Considering these limitations, this study's findings should be interpreted cautiously, and further studies with larger, more diverse samples are

recommended. Future research could also explore different aspects not fully covered in this research, such as the role of patient involvement in developing and implementing patient pathways. This could help address some of the identified gaps and enhance the effectiveness of patient pathways in Finnish public healthcare.

## 5. Conclusions

In conclusion, our study offers insights into the current usage and perception of patient pathways in Finnish public healthcare and proposes a new framework for the evaluation of patient pathways. We find that the central areas for improvement in patient pathways relate to ensuring information sharing, knowledge access and availability, as well as leveraging digital platforms. Our findings generally align with the results reported in existing literature but also highlight varying perspectives and challenges in a practical clinical setting. Providing HCPs with access to relevant patient pathway information is crucial for such pathways' effective use. Furthermore, it is essential to determine HCPs' levels of knowledge and which professionals have access to specific information. Based on our findings, the limited availability of information, particularly when difficult to access, may hinder HCPs from utilizing it, adversely impacting patient care.

Future research should explore these areas in more depth, particularly the involvement of patients and their families in the creation and implementation of patient pathways and the improvement of monitoring and follow-up methods for pathway utilization. Furthermore, this study's participants indicate that digital platforms hosting multiple patient pathways in specific locations have been beneficial but cumbersome to simultaneously follow from diverse sources. Thus, centralizing all patient pathways on a specific location could further enhance their utilization.

## 6. Authors' contributions

**Madeleine Eklund:** Methodology, Investigation, Data curation, Formal analysis, Writing – Original Draft, Writing – Review & Editing, Visualization, Project administration. **Märt Vesinurm:** Conceptualization, Methodology, Writing – original draft, Writing – review & Editing, Supervision.

**Paulus Torkki:** Writing – Review & Editing, Supervision.

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