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Experiences of the development and use of a Paediatric Oncology Trigger Tool

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ABSTRACT

Background Trigger tools are widely used for detecting adverse events. Within the multicentre study Patient Safety in Paediatric Oncology, a trigger tool was created to address the unique needs of paediatric oncology. Although trigger tools are highly valued for detecting adverse events, concerns about their usability and reliability persist. Understanding the perspectives of medical record reviewers using these tools may provide valuable insights for improving their usability and reliability. This study aimed to explore the experiences of medical record reviewers involved in the development and use of a Paediatric Oncology Trigger Tool.

Methods A descriptive qualitative case study was conducted to investigate the experiences of medical record reviewers participating in the development and use of the Paediatric Oncology Trigger Tool. Data were collected through a semi-structured focus group interview conducted via Zoom, involving six reviewers with varying levels of experience in paediatric oncology and trigger tool methodology. The interview was audio-recorded and transcribed verbatim. The written text was analysed in its entirety using reflexive thematic analysis.

Results The analysis revealed an overarching theme of *knowledge building* with three themes: *competencies*, *resources* and *usefulness*. The findings highlight the importance of collaborative learning, expert support and adequate resources, while also noting challenges such as time consumption and the emotional impact of reviewing medical records of critically ill children.

Conclusions This study offers a comprehensive examination and clarity regarding the development and use of a patient safety instrument, a process marked by both challenges and facilitators from the perspective of medical record reviewers. The study underscores the need for resources, training and support during the review process to ensure the reliability and usefulness of the trigger tool.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Trigger tools are highly valued for detecting adverse events, but concerns about their usability and reliability persist.
⇒ There is limited knowledge about the experiences of reviewers involved in the development of trigger tools.

WHAT THIS STUDY ADDS

⇒ Detailed insights into the practical challenges, facilitators and benefits of participating in the development and use of a specific trigger tool from the perspective of the medical record reviewers.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ These findings suggest that adequate resources, training and support during the review process are crucial to ensure the reliability and usefulness of the trigger tool.
⇒ The findings can inform future development and use of trigger tools.

INTRODUCTION

Paediatric oncology has the potential to lead in healthcare quality and safety due to its tradition of developing detailed treatment protocols and guidelines.[1] Healthcare professionals in this field are acutely aware of the gravity of their work, as they treat children who are suffering from life-threatening illnesses requiring life-saving treatments.[2] The meticulous regulation of these treatments is imperative, given the potential for severe and fatal complications.[3]

Despite the critical nature of this field, there is a need for enhanced knowledge regarding harm in paediatric oncology beyond treatment-related toxicity.[1] Adverse events, defined as events resulting in harm to the patient,[4] and also no-harm incidents, defined as incidents reaching a patient but not resulting in discernible harm,[4] need to be identified and can be identified through medical record review methodology.

One widely used method for medical record reviews is the Global Trigger Tool, developed by the Institute for Healthcare Improvement.[5] The Global Trigger Tool involves screening medical records for triggers—specific terms or events that could indicate adverse events—followed by an investigation of whether an adverse event occurred and an assessment of that event if it happened. To adapt the Global Trigger Tool to various healthcare settings, several customised trigger tools (TTs) have been developed.[6–11] There has not previously existed an instrument that maps the area of

paediatric oncology. Within the national multicentre study, Patient Safety in Paediatric Oncology, a specific Paediatric Oncology Trigger Tool (POTT) was created to meet the requirements for patient safety within this specialty.[1]

Although TTs are valued for detecting adverse events,[12] concerns about their usability and reliability persist.[13–15] To enhance these aspects, several research groups have conducted implementation and feasibility studies.[16–19] The experiences of implementation from the perspective of medical record reviewers have been studied.[18 20] However, little is known about the experiences of medical record reviewers involved in the development of a TT. Understanding their perspectives can provide valuable insights for the future development of reliable and useful TTs. In addition, learning arising from the development and review process can be useful in practice, and in the long run may benefit patients. Therefore, this study aimed to explore the experiences of medical record reviewers involved in the development and use of a specific patient safety instrument—the POTT.

METHODS

Design

A descriptive qualitative case study using a reflexive thematic analysis was conducted. The reporting of the study was guided by the Reflexive Thematic Analysis Reporting Guidelines.[21]

Setting

Paediatric oncology care in Sweden is provided by six geographically dispersed paediatric oncology centres at university hospitals in collaboration with paediatric departments at county hospitals. In this study, four out of six paediatric oncology centres participated along with their associated county hospitals. The experiences explored in this study were based on the reviewers' participation in the Patient Safety in Paediatric Oncology study, where the POTT was developed and used in a manual record review of medical records covering the patient process from university hospitals to home healthcare.

The support to the reviewers in the development and review process included web-based real-time lessons and training opportunities for reviewers as well as individual support from experts in paediatric oncology and TT methodology. A trigger manual including triggers, trigger definitions and decision support information was developed in an iterative process. A manual informing the study was also available. Review meetings were held as part of group support. Monitoring was performed as a quality assurance process.

At the time of the focus group interview, 292 medical records had been reviewed. There was no time limit imposed on the reviewers regarding the timeframe for the review process of each medical record. During the development and review process, changes in the POTT's decision support information were made to increase clarity.

Table 1 Characteristic of the reviewers participating in the focus group interview

Characteristics	Reviewers, n=6
Previous experience*	
Trigger tool methodology	2
Paediatric oncology	3
Profession	
Physician	1
Registered nurse	3
Medical student	2

*One of the reviewers had no previous experience in either paediatric oncology or trigger tool methodology.

Initially, all review data were recorded in Word templates. During the development process, the Castor database was introduced for collecting data and facilitating monitoring and communication between the reviewers and the monitor.

Participants

All medical record reviewers participating in the Patient Safety in Paediatric Oncology study, except the first and second authors of this study, were invited to participate in the focus group. The reviewers had diverse prior experiences, both in using TT methodology and in paediatric oncology (table 1). All reviewers were female. The first author provided information about the focus group at a review meeting and thereafter by email. The participants received oral information at the beginning of the focus group interview, and they consented orally. Reviewers who did not want to participate in the focus group could refuse without explanation or implications. All invited reviewers agreed to participate.

Data collection

Data were collected using a semi-structured focus group interview. The focus group interview was conducted as a digital meeting using the same digital platform Zoom, as other meetings in the Patient Safety in Paediatric Oncology study. A semi-structured interview guide was developed based on data from the development process of the POTT and expert knowledge about TTs. The questions focused on the reviewers' experiences of the development and review process as well as TT methodology. The focus group interview was conducted by the last author, who was experienced in semi-structured focus group methodology, and who guided the interview discussion. The focus group interview lasted 2 hours and 13 min and was audio-recorded.

Data analysis

After verbatim transcription and de-identification of the recorded material, the data were analysed using a reflexive thematic analysis inspired by Braun and Clarke.[22 23] The analysis was initially conducted by the

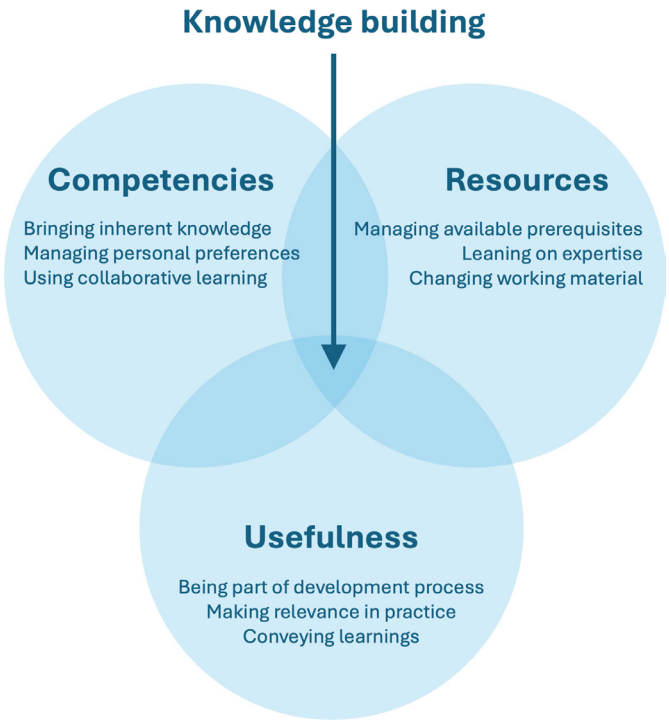

Figure 1 Overarching theme, themes and subthemes.

first and last authors. To become familiar with the data, the transcript was read through several times by each author individually. General ideas and observations were noted to explore patterns of meaning. Subsequently, data segments were marked and transferred into an Excel sheet. The segments were shortened into condensed units, which were then organised to seek consistency. The first and last authors compared and discussed the initial condensed material and began formulating initial codes for each segment or condensed unit. These were then reflected on to clarify the aim and provide an interpretation of the entire data set. Then, initially, both semantic and latent themes were generated. After this stage, all authors reflected on the material and further reflected on it in relation to the aim of gaining a deeper exploration. Subthemes and codes were reframed several times during this process, and themes were developed at a more reflexive conceptual level. These steps were collaborated on several times among all authors. After thoughtful reflexive engagement among all the authors, a consensus about the generated findings was obtained. The themes and subthemes are described as analytic narratives and illustrated by a figure showing relations between themes (figure 1). The themes are exemplified with citations, translated from Swedish by the authors.

Patient and public involvement

Patients or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

RESULTS

The analysis resulted in an overarching theme of *knowledge building*, along with three other themes and nine subthemes (figure 1). The rich data provided a comprehensive description of the experiences related to developing and using the POTT. The themes are interconnected and presented in a roughly chronological order as they appeared in the interview, although the respondents often revisited different topics. The overarching theme, *knowledge building*, reflects the patterns of shared meanings in the data. Building knowledge was emphasised as crucial, both knowledge that the respondents brought with them and the knowledge developed during the study, individually and collectively. Experts and a dedicated monitor were highly valued resources. Time was another significant factor, highlighted in several themes from different perspectives.

Competencies

The participants' inherent knowledge, or lack of it, influenced their work. Support and discussions within the review group were essential for ensuring consistent assessments among the record reviewers. The diverse experiences within the group were an asset, contributing to shared and mutual learning, which participants described as 'one plus one exceeds two'. Despite challenges, realising that others also struggled made it easier to cope.

Bringing inherent knowledge

Skills and competencies were crucial from the start. The individual and collective experiences brought into the project mattered. Previous experiences varied among reviewers; some were experienced in using the national version of the Global Trigger Tool in adult settings, while others were new to the method, but trained and experienced in paediatric oncology.

> … no experience with electronic medical records nor with the method either, so that was a big challenge at the beginning

There were challenges in understanding the concept of adverse events and preventability, which was frequently discussed in the group. The reviewers used the study and trigger manual differently, depending on their inherent understanding and previous experience of medical record reviews.

Managing personal preferences

Participants noted the need to manage their own preferences. Familiarity with working with a TT was beneficial. Those less experienced with TTs particularly took advantage of and appreciated the support functions. Experiences with oncological diagnoses also played a role; knowing how an illness usually manifested or how the care process affected the patient helped in making connections and interpretations. Participants found it challenging to remain objective when assessments were complex.

> … difficult being objective, interpret very much what I read …//… had to struggle a lot with what I read and not interpreting the context.

Individual preferences also encompass the varying adherence to the guidelines informing the study, irrespective of whether one is an experienced reviewer unfamiliar with paediatric oncology, or vice versa.

Using collaborative learning

Being part of a group facilitated shared learning. Regular, scheduled discussions within the review group deepened knowledge and calibration among the record reviewers in the application of the POTT. Sharing experiences and learnings from using the POTT strengthened the common knowledge base within the group. It was also important to see that others faced similar challenges.

> … take advantage of each other and each other's skills and opinions and thoughts.

> We had different approaches …// … we have been able to help each other in the discussions and raised different topics during our discussions.

Resources

Available resources enabled the review, while issues with access to medical records posed obstacles. From the start, expert support and monitoring were seen as helpful. The study manual and the trigger manual were also valuable resources. The most significant challenge, according to participants, was the time-consuming nature of the reviews. They also noted that the review group was a good size; more members might have reduced individual effort, but a certain quantity of reviews was necessary to 'get into the mindset'.

Managing available prerequisites

Participants experienced in various types of medical record reviews in other contexts did not expect the review to be so time-consuming. Those without prior experience found it reassuring that even experienced reviewers faced time management challenges. Concerns were raised about the feasibility of using such a comprehensive tool in clinical practice due to its time-consuming nature and organisational challenges.

> It takes time and what is reasonable and what is too long?

> … there will be organisational challenges with time-consumption.

Additionally, participants thought that imposing a time limit, which is common in TT practice, would not be adequate for this patient group, as it might limit the findings. Some participants struggled with access to medical records, whether digital or paper, which sometimes hindered their work. Although the study manual was clear, it underwent changes during the development process, which could be somewhat confusing.

Leaning on expertise

The review group and experts were valuable resources, as was the monitoring process. Support from experts in the research group was crucial for understanding the specific conditions of this patient group, as well as the challenges of the review process. The presence of experts in paediatric oncology helped participants understand how the triggers applied to specific patient groups. Different diagnoses had different challenges, which became clear when using the POTT during the review process. The diverse experience and expertise within the review group were appreciated.

> Even if you can read the manual, there are still those extra questions, so I think that if you are going to work with this type of method, it is very important that the monitor process is available.

All participants agreed that both they and the study benefitted from the presence of a proficient method expert acting as a monitor. This expert facilitated their understanding of the standard use of such instruments and provided valuable support to the reviewers, enhancing their sense of security. Without this resource, participants believed that the quality of the study would have been compromised. They also raised concerns about the practical application of this approach.

To ensure a rigorous research approach, planned education on the use of TT methodology was conducted at the beginning of the study. This training was particularly valued by those with little or no prior experience. Even experienced reviewers found that joint education helped the group calibrate the use of the POTT.

Changing the working material

The structured review process and monitoring were helpful in an ongoing, changing process. Participants who started the review first faced the most challenges, while those who joined later benefited from earlier experiences. The introduction of a research database facilitated the review process, as did feedback from the monitoring process. The triggers evolved as a natural consequence of the development process of the POTT, and the trigger manual changed accordingly, which participants found natural in a development study, but challenging.

> … good to continue to develop and make the review process better, to continuously evaluate is important.

> There was a lot that wasn't really, that we revised at our meetings … //… it was unclear … //… it was difficult to go back and change [when the manual changed].

Usefulness

Participants emphasised the importance of the POTT instrument being useful in practice and contributing to better and safer care for children. They also highlighted the importance of the knowledge created during the

project being useful when using the instrument in practice.

Being part of the development process

Some participants were familiar with TT methodology, but had not previously engaged with TTs in a research context. They found that the study setting differed from typical real-world use. This difference involved being more consistent and conducting reviews in exactly the same way, along with a sense that strictness was essential. The experts and monitoring support were crucial in this regard. However, challenges arose due to the evolving process of changing manuals. Despite these challenges, participants found the study stimulating and something different, providing learning. Some participants mentioned the psychological stress of reading about very sick children, which was exacerbated when working alone, especially for those with children of similar ages, and this needed to be considered. Working in pairs was suggested to mitigate these feelings.

> …. it's really hard, even mentally to dig into in all these cases … // … I need to take a break in between … //…. Now there's enough misery for today …

Making relevance in practice

All participants highlighted the importance of a tool for assessing preventable adverse events. They wanted the study to make a real difference and improve care for children. That was the main driving force behind taking part in a research study. However, there were concerns that the instrument might be too difficult to handle in practice, potentially limiting the impact. One of the benefits was that everyday events, otherwise easily overlooked, were identified, which hopefully would benefit the children.

> … the study itself that we are involved in will definitely be able to show useful results …//… how to look at certain side effects, are they preventable or influenceable.

The communication challenge regarding some concepts also bothered the participants; if they had differences in their interpretation, how could that be handled in practice?

Conveying learnings

Participants stressed the importance of sharing learnings from the research to benefit practical use. At the same time, how this could be done was one of the issues. Just writing a manual and the instrument itself would probably not be enough. All the issues that the participants encountered during the reviews could be hard to convey. The participants agreed that some experience was needed to use the POTT, but that it could be useful to identify areas to improve.

> … could be very useful, of course, for carrying out improvement work locally.

The participants suggested that the importance of education, pilot testing and thorough planning and preparation were crucial before applying the instrument in practice. Using the instrument for one diagnosis at a time and working in pairs were highlighted. The importance of support by experts, both in the diagnosis groups and the methodology, should not be overlooked. All participants were convinced that the period of care that was reviewed should not be shortened; that would imply that important events could be missed that were relevant in practice.

DISCUSSION

This study presents data on the perspectives of medical record reviewers involved in the development and use of a specific instrument—the POTT—in the national multicentre study, Patient Safety in Paediatric Oncology. Data were gathered through a focus group interview and analysed using reflexive thematic analysis. We identified an overarching theme; *knowledge building* and three themes: *competencies*, *resources* and *usefulness*. Knowledge building occurred both individually and within the group of reviewers. They also expressed a need for the emerging knowledge to be passed on to others, benefitting patients in practice where TTs are used, as well as others developing TTs.

This study contributes to the research field by focusing on the reviewers' experiences during the development phase of a TT, which is sparsely documented in existing literature. While other studies have raised concerns about the usability and reliability of TTs,[13–15] this study provides detailed insights into the practical challenges and benefits encountered by the reviewers in the development and review process of the POTT.

The importance of building knowledge to become a knowledge-based individual is consistent with previous research, where paediatric oncologists have cited being knowledge-based as one of their strongest strategies for coping with working with critically ill children.[2] Beyond individual learning, the reviewers also noted that the POTT could contribute valuable insights for improving paediatric oncology care. This aligns with the cycles of continuous improvement in learning health systems, where the power of data is harnessed to learn from every patient, and the knowledge is fed back to healthcare professionals and patients in iterative cycles.[24]

The reviewers had different attitudes towards guidelines and agreements in the review process, based on their inherent knowledge and personal preferences. There were sometimes gaps between the desired ways of working described in the guidelines and how they actually conducted medical record reviews. In the literature, this is illustrated by highlighting the difference between work-as-imagined and work-as-done.[25] These gaps can be difficult to catch, although important to consider when methods, instruments and guidelines for patient safety work are developed and used. Data from the group of

reviewers who, in a safe setting in this study, dared to share information about their concerns about their own shortcomings and workarounds in the review process constitutes an important contribution to other developers of TTs. These findings are consistent with the result of a focus group study exploring the implementation phase of the Global Trigger Tool.[20]

Participating in a development process was both challenging and stimulating. Reviewers not experienced in paediatric oncology, and not included in a paediatric oncology team, found it psychologically stressful to review the medical records of critically ill children while alone. This finding aligns with previous research which claims that seeking support from the team is one of the paediatric oncologist's strongest strategies for coping with the challenges of working with critically ill children.[2] The method expert, who provided feedback on the monitoring process as well as group and individual support, was seen as a valuable resource to ensure the quality of the study, especially regarding the challenging assessments in the second step of the review process. The use of monitoring and support during the review process is not commonly reported in record review studies.[26] The reviewers' experiences of participating in the development of the POTT highlighted the importance of making a difference for the best for patients in practice, which corresponds to what is known about intrinsic motivation and undertaking actions benefitting others.[27] The insights included the value of collaborative learning in the group of reviewers who supported each other, trained together and calibrated their ways of working, and their assessments, against each other.[16 28 29] The importance of guidance in a structured review process through written guidelines as well as access to experts and monitors was another finding in line with previous research,[16 28] as were the findings about the importance of time and allocated resources.[18]

Strengths and limitations

To our knowledge, there has not been much qualitative research exploring a tool development process, from the perspective of serving as a reviewer in the process. Therefore, this study adds some valuable insights. The reflexive thematic analysis approach offers a deliberative and thoughtful engagement with the data material when generating patterns of shared meaning,[22] and conducted carefully, promotes transparency and auditability.[23] At the same time, a pragmatic approach can be helpful in relevant practice-driven research,[30] although applied with rigour. Subjectivity is always an issue in qualitative research and needs to be considered. In the reflexive approach, researchers take an active role in the construction of knowledge and the interpretation of data, but at the same time need to be aware of their assumptions and positioning to enable credibility and trustworthiness.[23] In this study, the researchers were involved in the Patient Safety in Paediatric Oncology study, and highly engaged in the development of the POTT. In the focus group interview, the reviewers were actively engaged in the discussions and wanted to contribute their point of view. They had diverse backgrounds and experiences, which contributed to rich data. The researcher performing the interview had not performed medical record reviews or participated in the review meetings. However, this researcher had extensive experience in conducting focus group interviews and performing qualitative thematic analysis. These experiences can be regarded as significant when conducting focus group interviews and in the subsequent analysis. The first author possessed substantial knowledge in the field of paediatric oncology but had no prior experience with TTs before participating in the Patient Safety in Paediatric Oncology study.

All authors actively collaborated in the analysis process on joint occasions. This collaboration contributes to a richer and more nuanced reading of the data that goes beyond simply seeking consensus, as thematic analysis allows for more multi-dimensional themes,[22] which might contribute to broader confirmability and transferability.[31] The results will be readily accessible, based on pragmatic assumptions of usefulness. The participants were few, and only one focus group interview was performed, but all possible participants took part, except the first and second authors of this study. This needs to be taken into consideration when it comes to the transferability of the results.

Implications

In previous research, it has been found that attempts to explain the variation in detected adverse events in studies using TTs are seriously hampered by low transparency regarding methodology. The need for specific reporting guidelines to strengthen the evidence base is emphasised.[32] Our study contributes to this effort by providing detailed insights into the development and use of the POTT, which can inform the future development of TTs in research.

The insights provided by the study can also inform future practices in patient safety work. Specific recommendations based on the insights that were generated from this study include:

- Establish training programmes where the reviewers are trained together, fostering a collaborative learning team.
- Allocate sufficient resources, including time and easy access to medical records.
- Pilot test the review process.
- Use detailed manuals to support reliability and a structured review process.
- For data management, use a database with individual pseudonymised patient data to allow easy quality assurance and monitoring.
- Enable continual support, iterative monitoring and feedback during the review process.
- Offer psychological support to reviewers.

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Contributors All authors were involved in conceptualising the study. CE was recruiting and informing the participants. A-CA undertook the focus group interview. All authors were involved in the data analysis and interpretation. CE and A-CA led the writing of the manuscript. The manuscript's spelling and grammar were improved using an AI language model (Microsoft Copilot) and subsequently proofread by a native English-speaking professional. All authors were involved in the critical revision of the manuscript and contributed to the final version of the manuscript. All authors approved the final version of the manuscript to be published. CE is responsible for the overall content as guarantor.

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Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval This study involves human participants. The experiences explored in this study were based on the reviewers' participation in the national multicentre study PaSPO, which was approved by the national Ethical Review Authority (2020-00116, 2021-03512). Participation in the focus group interview, based on verbal consent and presence, was regarded as informed consent. In accordance with national legislation, ethics authority approval was not needed for this case study based on an interview with reviewers. Participants gave informed consent to participate in the study before taking part.

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Data availability statement Data are available upon reasonable request. The dataset generated and analysed during the current study are available from the corresponding author upon reasonable request.

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