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Early warning tools and clinician 'agency' for strengthening safety culture: An integrative review

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Abstract

Aim: Identify and analyse literature investigating nurses' and midwives' use of early warning tools during the care of adult inpatients.

Design: An integrative literature review.

Methods: Whittemore and Knafl's (2005) framework guided this integrative review. PubMed, CINAHL, EMCARE and Google Scholar were systematically searched. The authors assessed the methodological quality of 21 papers meeting inclusion criteria and thematically analysed key data.

Results: Three main themes were identified, each with further sub-themes.

Conclusion: Early warning tools operate within various systems and cultural contexts. However, their potential for improved patient safety may be hindered. Protocols influencing tool usage may make nurses and midwives distanced from patients and their expertise. For early warning tools to enhance patient safety, assessing their integration into practice is crucial to maximizing effectiveness.

Impact: This review emphasizes the importance of integrating human relationships with early warning tools for patient safety.

Patient or Public Contribution: This integrative literature review does not include patient or public input.

Implications for Practice/Policy: Adapting early warning tools to balance standardization for safety and efficiency and promoting nurses' and midwives' expertise and autonomy is required to optimize delivery of quality care and uphold patient safety.

Reporting Method: The Preferred Reporting Items for Systematic Reviews and Meta-analyses guidelines were used.

KEYWORDS
health risk management, maternity nursing, medical nursing, nurse–patient relationships, work organization

1 | INTRODUCTION

The hallmark of hospital-based care is high-quality surveillance of a patient's clinical status, relying on nurses and midwives using clinical decision-making to optimize patient outcomes. Clinical decision-making is clinical judgement of observations and patient preferences to determine the best treatment plan. (Nibbelink & Brewer, 2018; Tanner, 2006). Clinical decisions impact patient wellness through enacting practice, that is, the ability to assess, interpret information and respond. Enacting practice arising from one's judgement provides learning experiences that develop expertise. Human factors play a role in analysing and responding to deterioration, which impacts safety and patient outcomes (Treacy & Stayt, 2019).

Hospital governance organizes workspaces and coordinates care through clinical protocols, structured procedures and established communication channels within and across multidisciplinary teams. Timely detection of deterioration coupled with rapid and competent responses is the foundation of optimal clinical outcomes, hence implementing early warning tools (EWT) (Royal College of Physicians, 2012). The early warning tool, utilized by nurses and midwives, is designed to prompt early detection of deterioration (Credland et al., 2021). These tools systematically collate vital signs against physiological parameters to provide a deterioration score, thus enabling risk stratification and prioritized care (Credland et al., 2021; Lee et al., 2020). They are designed to enhance monitoring, evaluation and responses to altered patient status (Behling & Renaud, 2015).

EWTs are designed for simplicity. An elevated score triggers escalation of care to a senior clinician for further assessment, investigation and management. (Doyle, 2018). EWTs facilitate swift communication with healthcare teams to ensure prompt treatment and prevent mortality and morbidity. Despite adherence to best practices, clinical protocols and guidelines, missed deterioration remains a persistent challenge (Burke et al., 2022). Several studies (De Vries et al., 2008; Lee et al., 2020; Vlayen et al., 2012) have estimated that in Australia, Europe, the United States and Canada between 3% and 18% of hospitalized patients experience poor outcomes despite the implementation of EWTs. Additionally, prompt detection of deterioration is not limited to the very ill or those with complex co-morbidities, for example, maternity patients.

Pregnancy and the perinatal period are generally viewed in a wellness model. However, the wellness approach does not exclude being alert for deterioration and there are multiple models of care that focus providing quality maternity care (Batinelli et al., 2022; Sandall et al., 2010; Sandall et al., 2016). Maternal mortality could be reduced by maternity EWTs, which have demonstrated an ability to predict death, but there is limited evidence of their effectiveness in early detection of deterioration (Umar et al., 2019). Implementation of EWTs does not automatically lead to a decrease in maternal morbidity (Blumenthal

et al., 2020). Contributing factors to departure from vigilant monitoring include subtle early signs, high workloads, insufficient resources, communication challenges and complacency from routine and past experiences (Wood et al., 2019). Improper usage of EWTs due to a lack of training or awareness is also a contributing factor (Treacy & Stayt, 2019).

1.1 | Background

Healthcare providers, across disciplines, constantly seek to achieve better outcomes for patients, extending to scrutiny of current practice and the development of new ways of maintaining patient wellness. One relatively recent strategy is the early warning scoring systems, introduced in the United Kingdom., in 1997 (Gerry et al., 2017). Several countries, including the United Kingdom, the United States of America, Canada, Australia, and the Netherlands have implemented EWTs and mandated their use through national governance bodies, such as the National Institute for Health and Care Excellence and the Australian Commission on Safety and Quality in Healthcare (Australian Commission on Safety and Quality in Health Care, 2017; Gerry et al., 2017).

EWTs are now used across various contexts and patient categories. They consist of several significant observations and associated parameters, including respiratory rate, oxygen saturation, temperature, systolic and diastolic blood pressure, heart rate, level of consciousness and include the AVPU (alert, voice, pain, unresponsive) scale (Behling & Renaud, 2015; Doyle, 2018; Royal College of Physicians, 2012). EWTs are set to specific limits for vital signs. When these limits are surpassed, a predetermined set of actions is initiated to escalate the patient's care to senior staff. These limits, calculate a score designed to detect early signs of patient deterioration. Vital sign intervention tools fall into three categories: (a) single/multiple parameter systems that trigger intervention at a set threshold, (b) aggregated weighted scoring systems, which assign weight to vital sign scores and (c) a combination of the two. (Le Lagadec & Dwyer, 2017).

Following the 2003–2005 report on Confidential Enquiries into Maternal Deaths in the United Kingdom, a recommendation was made to implement modified early warning scores for obstetric contexts. Subsequently, a modified version of the EWT was created for use in maternity units and emergency departments (Carle et al., 2013), and implemented across all National Health Service (NHS) hospitals in 2013 (Day & Oxton, 2014).

2 | THE REVIEW

Understanding the experiences of clinicians when they work with EWTs helps an appreciation of how EWTs impact practice, knowledge, and safety of clinical work. Increased discernment of how

EWTs are used provides insights that can inform strengthening of the safety culture. This integrative review seeks to explore this knowledge.

3 | AIM

This integrative review explores published literature regarding nurses' and midwives' experiences of the use of EWTs during care of adult inpatients including maternity.

4 | METHODS

4.1 | Design

Whittemore and Knafl's six-step framework guided the integrative review process (Whittemore & Knafl, 2005). The process involved six steps: First, clear identification of the problem to be reviewed; second, a well-defined search strategy; third, identification of relevant literature; fourth, evaluation of data for relevance and rigour and fifth, analysis of data into codes and categories. Finally, conceptualization of data (Whittemore & Knafl, 2005). Adherence to this process ensures transparency and rigour. Findings were analysed and presented using thematic analysis guided by Clarke and Braun's

framework (2017), adhering to the Preferred Reporting Items for Systematic Reviews (see Figure 1).

4.2 | Search methods

An initial exploration of topical literature was conducted to identify commonly used terms to inform the final search strategy. The first author engaged with academic librarian services to devise an initial search strategy that was shared with the team. After consensus was reached, these terms were employed in the final search, see Table 1. Literature published from January 2013 to October 2023 was identified by applying the search terms outlined in Table 1 to databases PubMed, CINAHL, EMCARE and Google Scholar. Phenomena of interest included EWTs within hospital settings in use for inpatients of adult medical-surgical wards, emergency departments, intensive care units and maternity units. Methodological, theoretical and empirical research and grey literature were included [Refer Table 2 for inclusion and exclusion criteria].

The search strategy was tailored through truncation symbols and Boolean operators that combined key terms. Subsequently, a supplementary search on Google Scholar was conducted using the same search terms to locate grey literature, reports and other relevant materials. Finally, we conducted a manual search of prominent journals, including scrutinizing reference lists, to
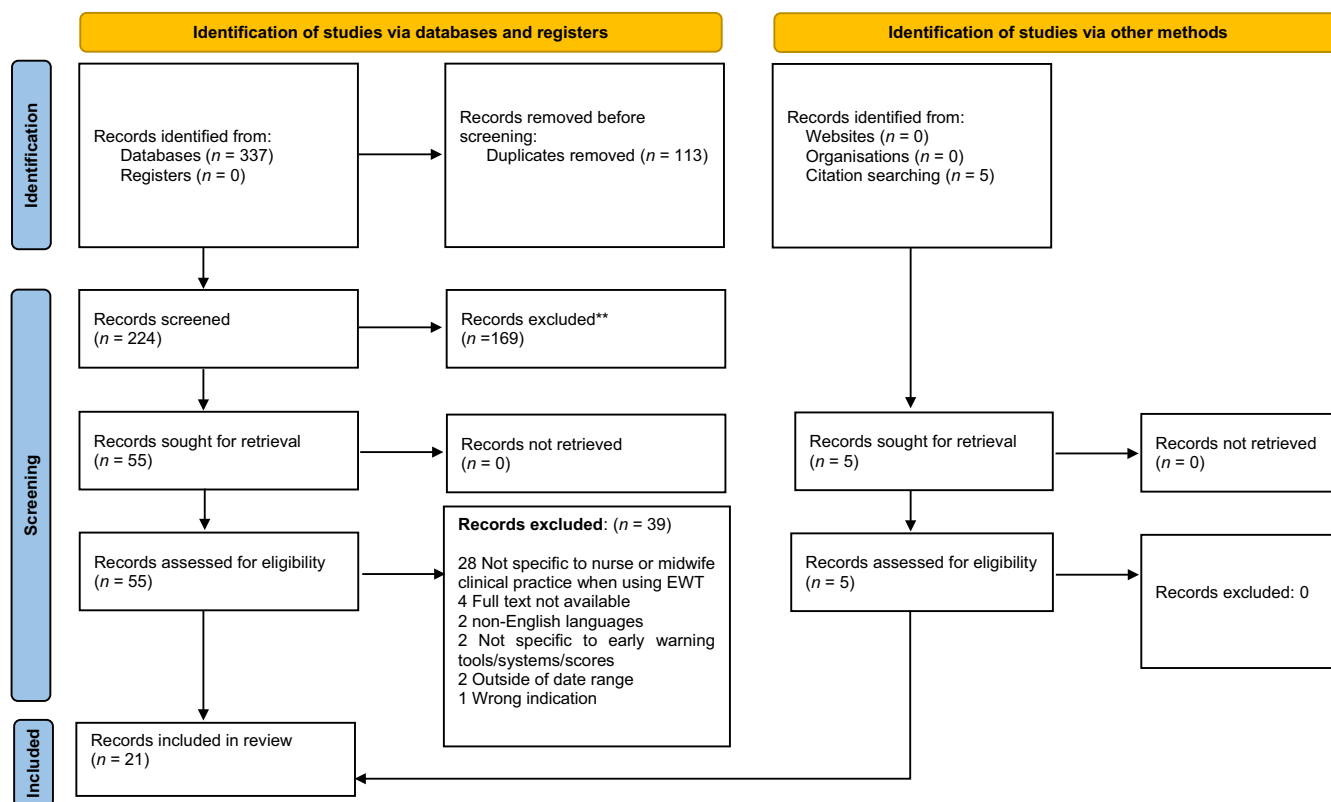

Identification of studies via databases and registers

Records identified from:
Databases (*n* = 337)
Registers (*n* = 0)

→ Records removed before screening:
Duplicates removed (*n* = 113)

Records screened (*n* = 224) → Records excluded** (*n* = 169)

Records sought for retrieval (*n* = 55) → Records not retrieved (*n* = 0)

Records assessed for eligibility (*n* = 55) → Records excluded: (*n* = 39)

28 Not specific to nurse or midwife clinical practice when using EWT
4 Full text not available
2 non-English languages
2 Not specific to early warning tools/systems/scores
2 Outside of date range
1 Wrong indication

Identification of studies via other methods

Records identified from:
Websites (*n* = 0)
Organisations (*n* = 0)
Citation searching (*n* = 5)

Records sought for retrieval (*n* = 5) → Records not retrieved (*n* = 0)

Records assessed for eligibility (*n* = 5) → Records excluded: 0

Records included in review (*n* = 21)

Identification | Screening | Included

FIGURE 1 PRISMA Flowchart. *From*: Page, McKenzie, Bossuyt, Boutron, Hoffmann, Mulrow, et al. (2021). For more information, visit: https://www.prisma-statement.org/.

locate relevant documents not already captured in the database searches.

4.3 | Study selection

The search period, spanning from 2013 to 2023, was specifically selected as we were seeking contemporary literature. Early warning tools are a relatively recent initiative that are under constant review and refinement, hence the priority to review current literature. Completion of both database and manual searches located a total of 337 documents. Among these, 113 were identified as duplicates and subsequently eliminated. A title and abstract screening process conducted on the remaining 224 documents excluded an additional 169. The final set of 55 documents underwent a thorough full-text assessment, being meticulously evaluated against inclusion and exclusion criteria outlined in Table 2. Following this assessment, a further 39 documents were excluded. The rationales for these exclusions after the full-text evaluation are presented in Figure 1. The PRISMA flow diagram (Page, McKenzie, Bossuyt, Boutron, Hoffmann, Mulrow, Shamseer, et al., 2021).

4.4 | Evaluate and extract the data

Selected papers were evaluated using the MMAT criteria. The MMAT uses two initial screening questions and a further five criteria to assess attrition, performance and selection bias, crucial for integrative reviews. No articles were excluded based on low methodology quality: Despite a limited number of studies from an inclusive search, avoiding elimination based on quality preserved data integrity. A standardized tool was used to extract essential information from 21 documents [refer Table 3].

4.5 | Data abstraction & synthesis

Data analysis followed Braun and Clarke's six-stage framework for thematic analysis, beginning with all authors reading the full text of the included literature independently. Team meetings allowed for discussion and clarification to reach consensus on key findings and issues. (Clarke & Braun, 2017).

Initial codes were independently developed by categorizing the findings. These initial codes were then consolidated and merged to form broader codes, thus creating preliminary

TABLE 1 Search terms.

['midwi*' **OR** 'nurs*'] **AND** ['early warning tool' **OR** 'early warning system' **OR** 'early warning score']
AND
['Hospital' **OR** 'Ward*' OR 'Maternity Ward*']
AND
['Adult Patient' **OR** 'Inpatient']
AND
['practice*' **OR** 'response*' **OR** 'care*']
AND
['emergency*' **OR** 'obstetric emergency*' **OR** 'deteriorate*']

TABLE 2 Inclusion and exclusion criteria.

Included	Excluded
Any type of published literature (primary research, literature reviews, reports)	Literature exploring use of early warning tools/systems/scores involving neonates or paediatric patients or older adults/geriatrics
Published in English between Jan 2013 and Oct 2023	Literature exploring early warning tools within a specific condition or disease context
Full text available	Literature that only included the experiences of doctors
Literature discussing use of early warning tools/systems/scores by nurses and midwives whilst caring for adult inpatients within the hospital care setting	Literature that only included the experiences of patients
Literature exploring the nurse/midwife's clinical practice and response to an early warning tool/system/score when caring for inpatients	Literature that only included the experiences of healthcare managers
Literature that arrived at findings related to any aspect of nursing and midwifery practice whilst using an early warning tool/system/score	Literature that included healthcare settings outside of hospitals or non-admitted patients
	Weblog or online posts without identifiable authors
	Literature that explored the efficacy and validity of early warning tools

TABLE 3 Data extraction.

Author/s, year, country	Study type/aim/purpose	Population	Sample size	Methods	Key relevant comments/findings/conclusions
Ashbeck et al. (2021), USA	Research paper evaluating EWT for patient deterioration	1 team	Six doctors Unknown number of nurses	Mixed methods - surveys, interviews and data collection	EWTs improved practice and outcomes, increased awareness of physical changes and provided structured approach to care. Clear protocols boosted confidence in recognizing deterioration and improved interprofessional communication
Augutis et al. (2023), Australia	Literature review: EWT in rural and remote contexts	Rural and Remote Healthcare facilities	Six papers	Scoping review	Non-compliance and communication challenges in rural and remote contexts reduce EWT effectiveness. Professional hierarchies negatively impact communication, leading to delayed escalation jeopardizing patient safety
Burke & Conway . (2023), Ireland	Literature review synthesized data from nurses' escalation of care arising from the use of EWTs	Nurses	18 studies across seven countries	Systematic review with thematic analysis	EWT implementation can be difficult due to low staffing levels. EWTs facilitate effective communication and offer legal protection to nurses. Hierarchy, cross-professional communication, poor staffing, and increased workloads impact nurses' use of EWT
Burns et al. (2018), USA	Qualitative research paper exploring how EWTs impact nursing practice	Nurses	25	Descriptive phenomenology Semi-structured interviews	EWTs positively impact nurses' practice, increasing awareness of issues, promoting investigation of alerts. EWTs indirectly improved communication, collaboration and accountability, resulting in a proactive culture
Capan et al. (2017), USA	Research paper exploring an electronic EWT coupled with nursing assessment and its integration	Patients & nurses	18 patients 92 nurses	Mixed methods – retrospective observational study, survey, and data analysis from EWT	Time constraints caused data collection errors in EWTs, and nurses suggested using clinical judgement skills alongside EWTs. Communication with doctors was difficult, and escalation to senior nursing staff was more successful.
Cherry and Jones (2015), UK	Research paper exploring nurses' attitudes regarding EWTs	Nurses	21	Qualitative Questionnaire focus groups	Nurses' incorrect EWT scores were attributed to workloads, time constraints and lack of consideration for patient history and comorbidities. Communication with medical officers hindered by dismissive responses. EWT use impacts safety communication

(Continues)

TABLE 3 (Continued)

Author/s, year, country	Study type/aim/purpose	Population	Sample size	Methods	Key relevant comments/findings/conclusions
Chua et al. (2023), Singapore	Research paper exploring a rapid response system and nurses' detection of deterioration	Nurses	168	Mixed methods Questionnaire semi-structured interviews	Automated escalation can be a safety net for nurses, but relying solely on it may overlook other vital signs. Nurses can feel caught between escalation policies and professional hierarchies, leading to a power disparity with doctors
Dall'Ora et al. (2020), UK	Systematic Review analysing nurses' experiences recording vital signs	Papers about nurses using Early Warning Systems	16 papers	Systematic literature review	Electronic systems for recording vital signs are more efficient than pen-and-paper methods, reducing documentation times. Automated EWT calculation can improve accuracy and save time
Ebert et al. (2023), Australia	Research paper reports midwives' behaviours and beliefs concerning EWTs	Midwives	87	Qualitative	EWTs divide midwives' opinions. Some find them useful, while others rely on clinical judgement. Lack of training for casual staff reduce tool efficiently. Accurate completion of EWTs during each observation is crucial for detecting deterioration
Elliott et al. (2015), Australia	Research paper exploring experiences of track and trigger systems	Doctors and nurses	218	Qualitative Focus groups	EWT layout caused challenges leading to duplication. Recommended actions to deterioration did not always align with nurses' clinical judgement. Incorporating escalation protocols into charts was empowering, however there was varied understanding of how to apply escalation to practice
Ferguson et al. (2022), Australia	Research paper exploring midwives' use of EWT during labour	Midwives	18	Qualitative Semi-structured interviews	Tensions in midwifery practices influenced by EWTs emphasizes the need for managerial intervention to balance EWT utilization and midwifery expertise
Foley and Dowling (2019), Ireland	A research paper exploring nurses' use of EWTs in an acute medical ward	Nurses	8	Qualitative Semi-structured interviews, observation, and document analysis	Nurses valued the EWT but faced challenges adjusting parameters for patients with chronic diseases. EWTs need a cultural shift to ensure better protocol compliance and continuous education to improve practices

TABLE 3 (Continued)

Author/s, year, country	Study type/aim/purpose	Population	Sample size	Methods	Key relevant comments/findings/conclusions
Fox and Elliott (2015), Ireland	Research paper evaluating nurses' experiences of using NEWS and its effects on clinical decision-making	Nurses	140	Qualitative Survey	NEWS was found helpful for patient monitoring, but doctors' unawareness led to delayed responses and difficulties in modifying parameters
Langkjaer et al. (2023), Denmark	Research paper exploring two EWTs, and their use by nurses	Nurses	32	Qualitative Participant observation	NEWS scores are collected from the electronic health record, but direct observation is needed for validation. I-EWS allows nurses to modify scores for better patient-centred care
Lee et al. (2020), South Korea	Systematic Review assessing EWTs impact on clinical performance of nurses in hospital wards	Peer-reviewed and grey literature from 4 databases	five studies	Systematic Review	EWT implementation reduces adverse events and in-hospital mortality rates
Liu et al. (2023), China	Research paper exploring the experiences of emergency nurses' recognition and management of deterioration	Nurses	18	Qualitative Semi-structured interview	EWTs are effective but can cause warning fatigue. Communication between physicians and nurses is crucial. A supportive culture is needed to enhance nurses' abilities in managing clinical deterioration
McGaughey et al. (2017), UK	Research paper exploring a rapid response system programme against actual practice	Nurses, doctors, policymakers, managers	66	Qualitative Semi-structured interviews, focus groups, observation, and document analysis	EWT challenges such as traditional referral cultures, low staffing and lack of communication and teamwork were identified. Cultural changes, education and support are critical to overcoming these challenges and improving patient safety
Moore et al. (2019), Ethiopia	Research paper exploring the introduction of a MOEWS	Midwives, doctors	60 cases 65 staff	Mixed Methods Retrospective case notes review, questionnaire and interviews	The Modified Obstetric Early Warning System (MOEWS) improved patient outcomes, yet some staff reported difficulties in understanding MOEWS without training and increased workload
Smith et al. (2021), UK	Research paper explored the barriers and enablers of nurses' recognizing and responding to deterioration	Registered Nurses and healthcare assistants	16 nurses 16 assistants	Qualitative Semi-structured interviews	Challenges to the use of EWTs were identified as inconsistent knowledge, role confusion, mixed beliefs and environmental obstacles. Positive reinforcement and intentions to increase monitoring frequency were viewed as important factors

(Continues)

TABLE 3 (Continued)

Author/s, year, country	Study type/aim/purpose	Population	Sample size	Methods	Key relevant comments/findings/conclusions
Stewart et al. (2014), USA	Research paper exploring the impact of EWTs on risk identification and decision-making processes by nurses	Nurses	11 nurses	Mixed methods Document review, focus groups	EWTs help in triaging patient assignments, detecting changes in patient condition and activating response. However, EWTs utilization faces barriers such as customizing parameters and difficulties in data entry
Wood et al. (2019), Australia	Scoping review exploring nurses' use of EWT	Peer-reviewed and grey literature	23 articles	Scoping review	EWTs are helpful in triaging patients, detecting changes in condition, interdisciplinary communication and providing administrative support in nurse decision-making and rapid response activation. EWT utilization faces barriers such as customizing parameters and difficulties in data entry

themes. Within the context of the coded excerpts, amalgamated codes underwent further refinement, ultimately leading to finalization and naming of themes. The final themes were collectively agreed upon.

5 | FINDINGS

Twenty-one (21) documents met the criteria for inclusion. Of these, five reported mixed methods studies (Ashbeck et al., 2021; Capan et al., 2017; Chua et al., 2023; Moore et al., 2019; Stewart et al., 2014), 11 reported qualitative studies (Burns et al., 2018; Cherry & Jones, 2015; Ebert et al., 2023; Elliott et al., 2015; Ferguson et al., 2022; Foley & Dowling, 2019; Fox & Elliott, 2015; Langkjaer et al., 2023; Liu et al., 2023; McGaughey et al., 2017; Smith et al., 2021), three were systematic reviews (Burke & Conway, 2023; Dall'Ora et al., 2020; Lee et al., 2020) and two were scoping reviews (Augutis et al., 2023; Wood et al., 2019). Five of the included papers originated in Australia (Augutis et al., 2023; Ebert et al., 2023; Elliott et al., 2015; Ferguson et al., 2022; Wood et al., 2019), with four from the United States of America (Ashbeck et al., 2021; Burns et al., 2018; Capan et al., 2017; Stewart et al., 2014), four from the United Kingdom (Cherry & Jones, 2015; Dall'Ora et al., 2020; McGaughey et al., 2017; Smith et al., 2021), three papers were from Ireland (Burke & Conway, 2023; Foley & Dowling, 2019; Fox & Elliott, 2015), one from Singapore (Chua et al., 2023), one from Denmark (Langkjaer et al., 2023), one from South Korea (Lee et al., 2020), one from China (Liu et al., 2023) and one from Ethiopia (Moore et al., 2019). Three papers pertained to experiences of midwives (Ebert et al., 2023; Ferguson et al., 2022; Moore et al., 2019), whilst the remaining 18 papers involved experiences of nurses (Ashbeck et al., 2021; Augutis et al., 2023; Burke & Conway, 2023; Burns et al., 2018; Capan et al., 2017; Cherry & Jones, 2015; Chua et al., 2023; Dall'Ora et al., 2020; Elliott et al., 2015; Foley & Dowling, 2019; Fox & Elliott, 2015; Langkjaer et al., 2023; Lee et al., 2020; Liu et al., 2023; McGaughey et al., 2017; Smith et al., 2021; Stewart et al., 2014; Wood et al., 2019).

5.1 | Themes

EWTs contribute to advancing clinician capability, and a converse view, where EWTs add to the suite of mandatory tasks. In the contrary view, EWTs can be viewed as benign or others may argue EWTs impact negatively on care provision. Three distinct dominant themes emerged from the reviewed literature: _shaping communication, promoting (dis)engagement and rethinking philosophy of practice_. Collectively, they assist development of a coherent understanding of how EWTs affect 'agency' and ultimately clinicians' philosophy of practice. There were visible tensions within each of the identified themes. The impact of using EWTs across each of the themed topic areas of communication, engagement and philosophy or practice

was described as being both positive and negative, which are reflected in the sub-themes.

EWTs serve as objective indicators that help healthcare providers identify 'at risk' patients, leading to increased surveillance, improved communication and assisting development of clinical knowledge (Elliott et al., 2015; Langkjaer et al., 2023; Lee et al., 2020; McGaughey et al., 2017; Moore et al., 2019). They provide a standard way to assess and interpret clinical data, detecting changes that may go unnoticed, thus reducing potential for human error (Burns et al., 2018; Capan et al., 2017; McGaughey et al., 2017).

5.1.1 | Theme 1: Communication

Effective communication is fundamental to quality, safe nursing and midwifery care (Augutis et al., 2023) and how EWTs shape communication was evidenced in most of the reviewed papers. Nearly all studies indicated that nurses and midwives use EWTs to improve communication with colleagues: Only three did not, namely, Dall'Ora et al. (2020), Moore et al. (2019), and Foley and Dowling, (2019). Many discussed capacity of EWTs to empower nurses to actively communicate with other team members, and trigger interventions critical in hierarchical healthcare systems (Cherry & Jones, 2015; Chua et al., 2023; Liu et al., 2023; McGaughey et al., 2017; Smith et al., 2021). Nurses and midwives agree EWTs are valuable tools for escalation of issues, facilitating timely communication of patient deterioration to prompt immediate care (Augutis et al., 2023; Chua et al., 2023; McGaughey et al., 2017; Moore et al., 2019).

Subtheme: Communication and its role in development of practice
Nurses and midwives use EWTs to enhance communication by presenting objective and physiological contextualized data that supports their concerns (Augutis et al., 2023; Burke & Conway, 2023; Capan et al., 2017; McGaughey et al., 2017; Stewart et al., 2014). This improves the overall effectiveness of interprofessional communication and collaboration, increasing chances of nurses and midwives being heard by doctors when expressing concerns (Augutis et al., 2023; McGaughey et al., 2017; Stewart et al., 2014). Nurses and midwives leverage EWTs to increase the impact of their communication, subsequently increasing access to specialized resources and mobilizing expertise that may not be easily obtained otherwise (Burke & Conway, 2023; Liu et al., 2023). By using EWTs, nurses and midwives can also identify instances where deterioration may have been missed during their assessments, prompting self-talk, self-reflection and refinement of clinical judgement (Burke & Conway, 2023; Elliott et al., 2015; Langkjaer et al., 2023). The use of EWTs involves reflective cognitive processes that can help nurses and midwives confirm their suspicions and identify knowledge gaps, which can enhance their expertise (Burns et al., 2018; Langkjaer et al., 2023; Liu et al., 2023; McGaughey et al., 2017). This promotes a proactive approach to patient care and helps clinicians conceptualize their level of competence in identifying risk (Burns et al., 2018).

Subtheme: Communication and passive response
The escalation aligned to EWTs commands action, but responses are mixed: Some studies show concerns are recognized and heard (Langkjaer et al., 2023; Moore et al., 2019), and at other times they are ignored (Smith et al., 2021). Enforced communication policies can re-establish hierarchical communication patterns and systems, yet this does not encourage pro-action by nurses' and midwives' (Elliott et al., 2015; Liu et al., 2023; McGaughey et al., 2017). Furthermore, there is still a risk of being ignored, especially when a collaborative and receptive communication culture does not exist (Burke & Conway, 2023; Fox & Elliott, 2015). Doctors may disregard escalation if they are time-poor or suspect the patient has a known chronic condition causing deranged vital signs, which is common for the patient (Burke & Conway, 2023; Cherry & Jones, 2015; Chua et al., 2023; Elliott et al., 2015; Foley & Dowling, 2019; Fox & Elliott, 2015). In some cases, doctors only review patients when alerted by a senior nurse (Cherry & Jones, 2015; Elliott et al., 2015; Liu et al., 2023; Stewart et al., 2014). This reinforces hierarchical structures and a sense of subordination, inhibiting communication between staff (Augutis et al., 2023; Burke & Conway, 2023; Langkjaer et al., 2023; Liu et al., 2023). Conversely, some staff may fail to escalate or respond when the EWT identifies an abnormality, especially when persistent elevated scores become normalized (Cherry & Jones, 2015; Smith et al., 2021). Doctors can alter and customize EWTs for individual patients that may assist with individualized plans, but often they do not (Burke & Conway, 2023; Elliott et al., 2015; Foley & Dowling, 2019; Fox & Elliott, 2015; Wood et al., 2019). Equally, inaccurate use of EWTs results in problematic communication, leading to embarrassment when reported deterioration is incorrect (Burke & Conway, 2023; Chua et al., 2023). False alarms cause unnecessary stress for clinicians and patients, resulting in shame for getting risk scores wrong (Chua et al., 2023; Stewart et al., 2014; Wood et al., 2019).

5.1.2 | Theme 2: Promoting (dis)engagement

Engagement may be enabled or disabled by the use of EWTs. Theme 2, Promoting (dis) Engagement, highlights the opposing influences EWTs on how nurses and midwives engage to escalate care, or not. Nurses and midwives can be time-poor. They often manage multiple tasks and patients simultaneously, resulting in cognitive overload, fatigue and inattention. EWTs offer valuable support for time-strapped healthcare providers: EWTs through rapid discernment of significant indicators. EWTs can quickly flag problems: In such cases, they serve as a safety net when they are busy, fatigued, distracted, or unable to attend to patients directly (Chua et al., 2023; Ferguson et al., 2022; Smith et al., 2021). Arguably EWTs can act as a surrogate when they are occupied with other patients or duties (Burns et al., 2018; Langkjaer et al., 2023). Engagement is most effective when a balance is struck between structured work organization tools with personalized aspects of patient care to maintain safety.

Subtheme: Purposeful engagement

EWTs can be successfully incorporated as a proxy carer by outsourcing the collection and interpretation of biological data, especially when using electronic tools and technology (Capan et al., 2017; Elliott et al., 2015). Care shifts as clinicians become custodians of EWTs rather than direct carers (Elliott et al., 2015; Ferguson et al., 2022; McGaughey et al., 2017). For junior staff the tool directs practice due to their inexperience (potentially advancing comprehension and understanding of practice), alternatively, senior staff are more likely to use the tool as an adjunct and may defy the rules for its use (Elliott et al., 2015; Langkjaer et al., 2023; Liu et al., 2023). Some nurses and midwives expressed satisfaction with the support accompanying EWTs, as they assist with timely interventions and additional review (Burns et al., 2018; Ebert et al., 2023). EWTs serve a dual purpose because they are time-saving, enabling nurses and midwives to oversee multiple patients simultaneously thus providing a safety net (Chua et al., 2023; Ferguson et al., 2022; Smith et al., 2021).

Subtheme: Purposeful disengagement

EWTs can result in depersonalized care by nurses and midwives when interactions become task-orientated rather than patient-centred (Elliott et al., 2015; Langkjaer et al., 2023; Stewart et al., 2014), that is, they focus on technical activities and using devices (Dall'Ora et al., 2020; Ferguson et al., 2022; Liu et al., 2023). Both nurses and midwives noted EWTs tend to provide standardized care, which may neglect the nuances of individual patient factors such as their medical history, physiology, and co-morbidities (Burke & Conway, 2023; Foley & Dowling, 2019; McGaughey et al., 2017; Stewart et al., 2014). Of concern is fear or embarrassment, primarily when a clinician has relied on EWTs for detection, and the finding was incorrect. This can impact professional pride and developing clinical competence (Chua et al., 2023; Ebert et al., 2023). In these circumstances nurses and midwives can become distanced further from patients, report a loss of autonomy, and overreliance on EWTs to direct action (Chua et al., 2023; Elliott et al., 2015; Ferguson et al., 2022). Multiple papers described that overreliance on EWTs can lead to diminished critical thinking, contributing to false alarms (Chua et al., 2023; Elliott et al., 2015; Liu et al., 2023; McGaughey et al., 2017; Stewart et al., 2014; Wood et al., 2019) which, in turn, may influence how clinicians enact practice and their professional sense of self. Further, these potential drawbacks may pose challenges to incorporating individual patient factors, and actioning issues arising from automated responses (Chua et al., 2023; Dall'Ora et al., 2020; Elliott et al., 2015; Liu et al., 2023).

5.1.3 | Theme 3: Rethinking philosophy of practice

Theme three, rethinking philosophy of practice describes the tensions that exist between operationalizing policy and recognizing autonomous practice. Hospital policies mandate the use of EWTs, positioning them as necessary intermediaries between clinicians and patients. Incorporation of EWTs into practice introduces a complex interplay between standardized protocols and professional philosophies (Elliott et al., 2015). Professional philosophy refers to a belief system that comprises values, principles and ethics. It serves as a foundation that guides the actions, decisions and behaviours of nurses and midwives in their professional roles. Professional philosophy is based on compassion and respect for individuals whilst providing evidence-based care. Nurses provide care for patients with medical conditions, identifying and acting on warning signs (Chua et al., 2023). Midwives concentrate on offering support to women during the natural processes of childbearing, with a focus on holistic and wellness-oriented practices (Ferguson et al., 2022). Balancing the integration of EWTs with a philosophy of person-centred care is a significant challenge that both professions grapple, impacting their autonomy and interactions with patients (Ebert et al., 2023; Elliott et al., 2015; Ferguson et al., 2022; Foley & Dowling, 2019).

Conflict arises from tensions between standardized protocols and personalized, context-sensitive care (Burke & Conway, 2023; Elliott et al., 2015; Foley & Dowling, 2019; Langkjaer et al., 2023) For example, the use of EWTs may inadvertently diagnose situations that are not deterioration but rather individualized to the patient context such as childbirth or preexisting co-morbidities (Ebert et al., 2023; Ferguson et al., 2022). This creates a conflict for clinicians when they are mandated to respond to the EWT findings. Nurses and midwives respond to these competing regimes based on their care philosophy. Their behaviour and responses when using EWTs largely depend on their 'agency' which is informed through their philosophy of practice. Clinicians may feel EWT use diminishes their professional autonomy (Chua et al., 2023; Elliott et al., 2015; Ferguson et al., 2022). However, experienced, and confident staff may choose to challenge the policy and use the tool as an adjunct to their well-established professional practice (Ebert et al., 2023; Ferguson et al., 2022; Liu et al., 2023).

Subtheme: Making the best of what is

Across both professions, especially more capable clinicians, they use their experience, intuition and knowledge alongside EWTs to reassert autonomy and minimize the gap between themselves and the person (Ebert et al., 2023; Elliott et al., 2015; Ferguson et al., 2022; Liu et al., 2023). Clinicians were cognisant that elevated normal values on EWTs may lead to misdiagnosis or overly pathologize patients with preexisting conditions (Burke & Conway, 2023), contrary to the individualized, person-centred philosophy of care that nurses and midwives strive for. Some clinicians find ways to integrate the tools with philosophies that emphasize person-centred care, individuality, and the normalcy of certain life events (Burke & Conway, 2023; Ferguson et al., 2022). In this way, clinicians across disciplines have found a working solution that supports their individual philosophy of practice that ensures compliance with organizational policies. The unique position that these professionals have negotiated allows for blending of the positive elements of autonomous practice and a structured framework to optimize patient outcomes.

Subtheme: Sense of inevitable—Little authority over practice

Both nurses and midwives have expressed concerns regarding the loss of individualized and holistic care as a result of EWT scoring and escalation protocols (Ebert et al., 2023; Elliott et al., 2015; Langkjaer et al., 2023; Liu et al., 2023; McGaughey et al., 2017). When clinicians respond to EWTs and bring in others to take over care and decisions, it can lead to a loss of professional autonomy (Elliott et al., 2015; Ferguson et al., 2022; McGaughey et al., 2017). Evidence suggests EWTs may affect patient–provider relationships, particularly in midwifery where woman-centred approaches during a normal life event such as childbirth is fundamental (Ferguson et al., 2022). In altered care, when rules require default to the EWT, nurses and midwives can become a mere middleman.

Subordination and lack of confidence can hinder clinician–patient relationships and the enactment of care based upon a person-centred philosophy especially when this may challenge a hierarchical system with power imbalances (Chua et al., 2023). Nurses and midwives struggle with balance between individualism and adhering to mandated policies such as EWTs, originally designed for acute medical conditions.

6 | DISCUSSION

Healthcare institutions have a primary responsibility to provide safe, high-quality care. Care quality is largely determined by patient outcomes, which directly impact institutions' financial stability and reputation (Bhati et al., 2023). Safety and quality are sought through governance (Oikonomou et al., 2019). Clinical governance structures include policy and protocols for delivery of safe, efficient care. This may promote standardization (Sinsky et al., 2021) yet limit autonomy. The use of EWTs involves a protocol for escalation. However, the escalation trajectory can take various courses depending on the agency of the clinician and the system e.g. hierarchy structures, service demand and workforce shortages (Crevacore et al., 2023).

EWTs trigger activity but extra resources may not accompany the activity.

An alternate argument is that EWTs reduce the number and complexity of decisions through effective management of cognitive load. Healthcare services adopt standardized approaches for safety, ease of learning and establish task consistency (Menzies, 1967). Standardization of work makes non-compliance and substandard practice more noticeable and easily corrected, thus minimizing harm. The EWT fits this approach, by systematically organizing work which is also economically advantageous (Sinsky et al., 2021). However, the widespread implementation of automatization and standardized practices has varying effects on nurses and midwives (McIntyre et al., 2020), depending on how they engage with EWTs may impact on sense of autonomy, capability and their patient relationships, see Figure 2. For the benefits of EWTs to be successfully realized, that is, safety, consideration is needed in the adoption of EWTs into practice to optimize constructive 'agency' by the clinicians so drawing on the tool is constructive for decision-making and practice, thereby improving patient outcomes.

Healthcare is based on forming connections between individuals, which shape clinical expertise, decision-making and agency. Nurses and midwives combine their expertise with unique patient circumstances. Evidence-based protocols provide a structure, but professional–patient and professional–professional relationships are necessary for their practical application. These relationships enable tailored patient care and this coupled with agency can enhance outcomes. Evidence-based protocols such as EWTs should complement nursing and midwifery practice, acknowledging the importance of individualized care.

6.1 | Recommendations

This integrative review identifies that EWTs are designed to enhance patient safety function within diverse organizational and
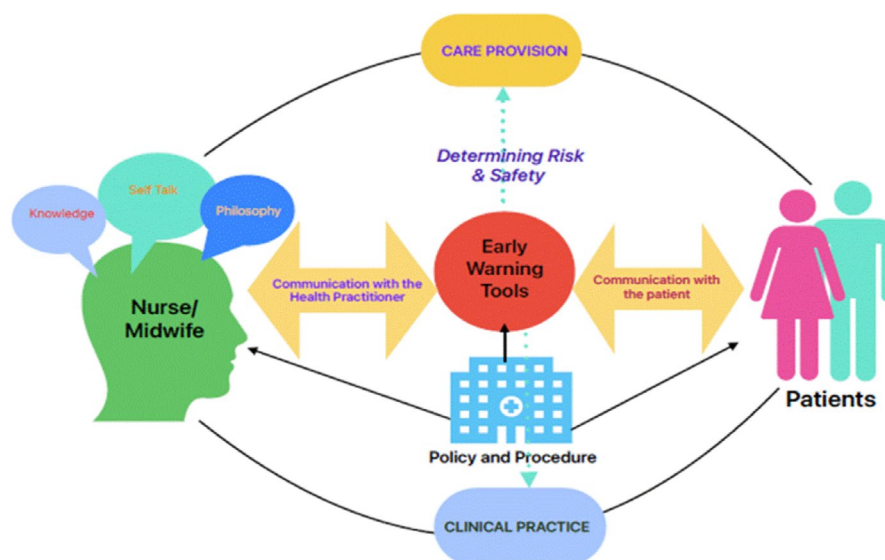

FIGURE 2 Sandwiching the clinician, patient and policy.

cultural settings. Improved patient safety may be hampered by inadequate agency and cooperation and communication between health professionals. Moreover, local protocols shaping EWT utilization could result in nurses and midwives becoming disconnected from patients and development of their clinical practice. For EWTs to truly bolster patient safety, meticulous consideration must be given to their integration into practice to ensure optimal efficacy. This review underscores an existing deficiency in effectively implementing EWTs. This may be addressed by adopting the following recommendations –.

Recommendation 1: Healthcare institutions should provide continuous training and education to nurses and midwives for proficiency in using EWTs, and associated technology and integrating this with their clinical judgement. The training should emphasize the importance of maintaining patient-centred care, clinician agency and interprofessional communication despite increased standardization.

Recommendation 2: Review and adapt policies and protocols to strike a balance between standardization for safety and efficiency and preserving nurses' and midwives' autonomy. Ensure that guidelines facilitate the effective use of EWTs while maintaining the focus on patient safety and quality care.

Recommendation 3: Adopt a user-centric design focus by involving nurses and midwives in the design and implementation process of EWTs to ensure that these tools enhance rather than hinder their clinical practice.

Recommendation 4: Consider the ethical implications of increased standardization and automation in healthcare, including the potential erosion of clinician autonomy and the impact on patient–clinician relationships. Ensure that technological advancements prioritize patient safety and uphold ethical standards of care.

6.2 | Strengths and limitations

This review emphasizes the importance of understanding the experiences and consequences of using EWTs for nurses and midwives. It highlights the need to consider how implementing EWTs can impact practice, hinder autonomy and reduce individualization. The review suggests that human relationships should be considered when designing and implementing organizational structures such as EWTs that guide safe, quality practice. There are some limitations to this review, including the limited amount of primary research on the experiences of midwives using EWTs. Among 21 papers, only three captured this phenomenon. Determining the hospital's clinical capabilities (tertiary referral centre, primary health) was difficult, and this potentially affects escalation and organizational culture. Lastly, most documents originated from high-income countries, yet the experiences of nurses and midwives in low to middle-income countries may be different. This geographical concentration is unlikely to represent a global reality because the issues identified are mostly relevant to high-income countries.

7 | CONCLUSIONS

This integrative review highlights the importance of the human factors and the relationships that are central to safe, quality healthcare provision. EWTs should be used in ways that support nurses and midwives to integrate their expertise, experiences and philosophy, while also considering the individuality of patients. This approach promotes a person-centred approach that values the contributions of human practitioners to enhance safety.

CONFLICT OF INTEREST STATEMENT
The authors declare no conflict of interest.

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