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Implementing Psychological Safety in the Emergency Department Guided by the CFIR 2.0 Framework: Introducing the SAFE-ED Programme

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ABSTRACT

Organizations of all types and sizes need to enable employees to speak up without fear if they are to make the most of the resources they have and meet the challenges of this age of uncertainty.

Psychological Safety (PS) in the Emergency Department (ED) is the shared belief of every staff that the clinical environment is safe for interpersonal risk taking, allowing individuals to speak up, admit mistakes, ask for help without fear of humiliation or retaliation. EDs are high stakes, fast-paced environments with multi-tiered hierarchies, all of which increase risk to both patient and staff. PS directly correlates with improved diagnostic accuracy, lower burnout rates and lower patient mortality. However, PS is not experienced uniformly across all ED teams.

The SAFE-ED Programme (psychological Safety Acceleration FramEwork for Emergency Departments) represents a structured and practical implementation strategy to embed psychological safety into the culture and daily operations of the ED. It proposes a multilevel implementation strategy designed to embed psychological safety into the culture and daily operations of the ED; built directly on the Consolidated Framework for Implementation Science Research, CFIR 2.0 analysis, designed to address specific barriers and leverage specific facilitators identified across its five domains. The programme is organised around three interdependent pillars: Leadership Modelling, Structural Embedding, and Sustained Reinforcement. These pillars are intended to operate simultaneously and synergistically rather than sequentially, though the relative emphasis on each will shift across the phases of implementation.

The SAFE-ED Programme is proposed, not as a finished product but as a theoretically grounded starting point and platform for prospective evaluation, contextual adaptation, and cumulative knowledge-building. Its ultimate test will be in the lived experience of ED teams who implement it, and in the evidence that rigorous evaluation generates about what works, for whom, and under what conditions. That evidence, in turn, will contribute to the broader project of making EDs not only places of clinical excellence but genuinely safe environments for the staff, and through them, for the patients they serve.

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Introduction

Emergency departments (EDs) are complex and high-stakes environments, where staff encounter time pressure, diagnostic uncertainties, high acuity patients who require immediate interventions and constant interruptions. ED practice demands seamless teamwork with open and closed loop communication flows, including a willingness to speak up and look out for one another, good procedural skills capabilities and a strong basis in both the medical and surgical sciences [1,2]. These behaviours are precisely the ones that are most susceptible to erosion when staff do not feel psychologically safe [3-5]. Psychological safety (PS),

defined as the shared belief that the team is safe for interpersonal risk-taking, has emerged as one of the most consequential determinants of team performance, learning, and patient safety in healthcare settings [3,5]. Despite this, its deliberate cultivation in emergency medicine remains rather nebulous and nascent. There is a stark dearth of practical, evidence-informed frameworks for its implementation, in the literature [6-9].

The consequences of low psychological safety in the ED are not trivial. When staff fear blame or professional repercussion for raising concerns, asking questions or reporting errors, unsafe practices may remain and become perpetuated [7]. In this context, junior doctors may hesitate to question senior clinical decisions and nurses may withhold observations that could alter a patient's

trajectory [10]. Paramedics and allied health professionals may become disengaged from team discussions. These individual silences may appear unimportant but collectively, they can constitute a significant and underappreciated threat to patient safety and staff wellbeing. Burnout, moral injury, and workforce attrition may stem from practices and can be further compounded by cultures that punish vulnerability and reward stoicism [11,12].

Addressing this challenge requires a systematic, theory-driven approach to implementation that can account for the unique structural, cultural, and relational dynamics of the ED [13]. Implementation science (IS) offers a rigorous body of knowledge pertaining to how evidence-based practices can be translated into real-world settings effectively, consistently and sustainably [14,15]. The Consolidated Framework for Implementation Research version 2.0 (CFIR 2.0), developed by Damschroder et al provides one of the most comprehensive and widely applied frameworks to address the multilevel factors that influence implementation success [16] (Figure 1).

This paper introduces the **SAFE-ED Programme** (psychological Safety Acceleration FramEwork for Emergency Departments) It represents a structured and practical implementation strategy to embed PS into the culture and daily operations of the ED. (Figure 2) Using CFIR 2.0 as a reference framework, this paper maps the key barriers and facilitators to implementing PS across the five CFIR 2.0 domains, and proposes targeted implementation strategies. (Fig 1) The **SAFE-ED Programme** is designed to be adaptable across EDs and is scalable from single departments to larger health systems. It is intended as a practical guide for ED leaders, clinicians, and implementation practitioners seeking to create environments where every member of the team feels safe to speak, learn, question, contribute and even challenge the status quo, in the name of patient and staff safety.

Psychological Safety: The Theoretical Foundation.

The concept of psychological safety was first introduced by Amy Edmondson, whose work in the 1990s demonstrated that team PS (the shared belief that the interpersonal climate is safe for risk-taking) was a stronger predictor of team learning and performance, than team composition or individual competence [5,12]. Her early research showed a counterintuitive finding that higher-performing medical teams reported more errors. This was not because they made more mistakes, but it was because PS enabled them to surface, discuss, and learn from errors that lower-performing teams were concealing or not speaking up about [5,12]. This insight reframed PS not as a soft cultural “nicety” but as a fundamental mechanism of organisational learning and safety [17,18].

Subsequent decades of research have substantially extended and validated Edmondson’s foundational work. PS has been associated with improved team learning behaviours, a greater willingness to speak up, reduced error concealment, enhanced creativity and innovation, and stronger individual wellbeing outcomes such as reduced burnout and greater job satisfaction. Google’s landmark Project Aristotle, which analysed the determinants of team effectiveness across hundreds of teams, identified PS as the single most important factor distinguishing high-performing teams. This finding brought on renewed attention to the construct in healthcare [19, 20].

Although the evidence base for PS in healthcare is not broad, it has grown steadily. Studies across surgical teams, intensive

care units, primary care settings, and interprofessional education contexts have consistently demonstrated associations between PS and outcomes including medication error reporting, adherence to safety protocols, quality of clinical decision-making, and staff retention [6,21-23]. The ED, with its acute hierarchy, time pressure, and interprofessional complexities, represents perhaps the most demanding test case for PS in clinical practice [24]. It remains poorly operationalised in emergency medicine, with most interventions being ad hoc, underspecified and insufficiently attentive. There is a certainly a clear need for a structured, implementation science-informed approach, and the time is now [1, 25].

The Consolidated Framework for Implementation Research 2.0:

Its Application for Implementation of Psychological Safety in the ED

Implementation science (IS) is the scientific study of methods and strategies that facilitate the uptake of evidence-based practices into routine use. Its central concern is the so-called “know-do gap”, which refers to the persistent distance between what research shows and what actually happens in clinical practice. Bridging this gap requires not only knowledge of what to implement, but a sophisticated understanding of the contextual factors that enable or impede implementation in specific settings, eg. the ED [14-16].

The Consolidated Framework for Implementation Research (CFIR), is one of the most widely used implementation frameworks globally [14]. Drawing on over a dozen existing theories and frameworks, CFIR provides a comprehensive taxonomy of constructs organised into domains that together capture the multilevel complexity of real-world implementation. The updated CFIR 2.0, published in 2022, refined the original framework based on extensive empirical use and stakeholders’ feedback, improving construct definitions, reducing redundancy, and strengthening its applicability across diverse contexts. CFIR 2.0 organises its constructs across five domains: [15, 16] (Figure 1).

1. **Innovation** — characteristics of psychological safety as the “innovation” being implemented (relative advantage, adaptability, complexity, etc.)
2. **Outer Setting** — external factors like health system pressures, policy environment, patient population
3. **Inner Setting** — the ED itself: culture, leadership, communication, structural characteristics
4. **Individuals** — staff knowledge, beliefs, self-efficacy, and individual characteristics
5. **Implementation Process** — how the implementation is actually planned and executed (engaging, planning, executing, reflecting)

Together, these five domains provide a comprehensive and structured map of the terrain that any implementation effort must navigate. When applied to the task of introducing PS into the ED, CFIR 2.0 offers both a diagnostic tool (identification of the key barriers and facilitators) as well as a generative framework for designing targeted, context-responsive implementation strategies. The proposed **SAFE-ED Programme**, is built on this foundation.

The following analysis maps each CFIR 2.0 domain to the specific implementation challenges and opportunities presented by the introduction of PS in the ED.

Domain 1: Innovation

Psychological Safety as the Implementation Target

The characteristics of psychological safety as an innovation present both advantages and challenges for implementation. PS carries a strong relative advantage over the status quo in most EDs. The costs of low psychological safety such as error concealment, staff disengagement, burnout and compromised patient safety are increasingly well-documented and thus, resonate with ED clinicians and staff who have experienced them firsthand [3,24]. This means that the case for change is not difficult to make, and early adopters are likely to be found among staff who have witnessed or experienced the consequences of psychologically unsafe environment. PS also benefits from strong compatibility with existing values in emergency medicine such as patient safety, teamwork and quality improvement. PS can therefore be framed as an enabler of these existing priorities. This compatibility can reduce the cognitive and motivational resistance that often accompanies innovation adoption [3,26].

However, PS also presents implementation challenges that are specific to its nature as an innovation. Unlike a clinical protocol or a new piece of equipment, PS is not a discrete, observable intervention. It is a relational and cultural construct that manifests in patterns of behaviour and communication. This intangibility creates challenges around trialability and observability, two constructs that CFIR 2.0 identifies as important facilitators of implementation. Staff cannot easily “try out” PS in a bounded way, and its effects are not immediately visible in the way that a new triage tool can. This means that implementation strategies must work harder to make psychological safety concrete, observable, and experiential for ED staff. The complexity of PS as an innovation is also worth acknowledging. It requires change at multiple levels simultaneously. This will be linked to individual behaviour, team dynamics, leadership practice and organisational culture. Implementation strategies must therefore be designed with this complexity in mind, building in sufficient time, support and iterative learning rather than expecting rapid or linear change [27,28].

Domain 2: Outer Setting

The External Pressures and Enablers

The outer setting of the ED encompasses the broader health system, regulatory environment, professional bodies, and societal context within which the department operates. Several features of this outer setting are particularly relevant to the implementation of PS. At the health system level, there is growing policy and regulatory momentum behind PS and related constructs. Patient safety frameworks in many jurisdictions increasingly emphasise the importance of speaking-up cultures, just culture principles, and workforce wellbeing; all of which are conceptually aligned with psychological safety. Accreditation bodies and health system regulators are progressively incorporating these expectations into their standards, creating an external mandate that can serve as a powerful facilitator for implementation. ED leaders can leverage on this to build internal support for the **SAFE-ED** Programme, framing it not only as the right thing to do but as an organisational imperative.

At the same time, the outer setting presents significant barriers. EDs operate within health systems that are under sustained and often severe pressure, such as workforce shortages, bed block, escalating demands, expectations and constrained resources. These are daily realities for most EDs globally [1]. These systemic pressures create a context in which culture change initiatives can easily be perceived as luxuries that compete with more immediate

operational priorities. Implementation strategies must therefore be designed to work within and alongside these pressures rather than in spite of them. They must demonstrate clearly that PS is not an additional burden but a resource that helps teams function better under pressure [1,3].

Inter-organisational relationships also feature in the outer setting. EDs do not operate in isolation as they are embedded in hospital systems, and the PS climate of the broader organisation inevitably influences what is possible within the ED. Emergency Medicine is at the core of inter-professional collaborative practice in most institutions. If the wider hospital culture is characterised by blame, hierarchy, and punitive responses to error, ED-level interventions will face significant headwinds [25,28]. Conversely, where hospital leadership is actively committed to PS and just culture, ED implementation efforts will be substantially facilitated. This suggests that the most effective implementations will involve alignment between ED-level and hospital-level efforts, and that ED leaders should seek to engage hospital executive sponsors as part of their implementation strategy [29].

Domain 3: Inner Setting

The ED as an Implementation Environment

The inner setting domain is arguably the most consequential for the **SAFE-ED** Programme, as it captures the structural and cultural features of the ED itself that will most directly shape implementation success or failure. EDs present a distinctive and rather challenging inner setting for PS implementation [3].

Structurally, EDs are characterised by features that complicate culture change. Shift-based rostering means that the workforce is fragmented across time, with different teams working at different hours with limited opportunity for the whole department to come together. High staff turnover and the frequent presence of rotating trainees and locum clinicians mean that the team composition is constantly changing, making it difficult to build and sustain shared norms. The physical environment of the ED (open, noisy, fast-paced, and often chaotic) is not naturally conducive to the reflective conversations and interpersonal attunement that PS requires [1,30].

The cultural features of the ED inner setting are equally important. Emergency Medicine has historically cultivated a culture of resilience, decisiveness, and stoicism. These are qualities that are genuinely adaptive in acute clinical situations but that can become barriers to PS when they translate into norms that discourage vulnerability, uncertainty or the expression of distress. The “ED personality”, often reflected as confident, action-oriented, and self-reliant is a source of professional pride for many emergency clinicians, and implementation strategies must not position PS as a challenge to this identity but rather as its complement and enabler [1,2].

Leadership engagement is a critical inner setting construct for the **SAFE-ED** Programme. Research consistently demonstrates that leader behaviour is the most powerful determinant of PS in teams. When leaders model vulnerability, invite input and respond non-punitively to mistakes, PS flourishes. When they do not, it withers regardless of other interventions. In the ED, this means that the behaviour of consultants, senior registrars, and senior nurses is of paramount importance. Implementation strategies must therefore prioritise leadership development and behavioural modelling as a central mechanism of change [5,7, 28-30].

Available resources such as time, funding, and implementation support are a significant inner setting barrier in most EDs. PS interventions require investment in training, facilitation, and ongoing measurement, and these resources are rarely available without deliberate allocation. Implementation planning must include explicit resource mapping and, where possible, integration of **SAFE-ED** activities into existing structures such as team meetings, handovers, and other mandatory training programmes to minimise the additional resource burden [3].

Communication and information flow within the ED also merit attention. EDs that have strong existing mechanisms for team communication, structured handovers, regular huddles, peer review sessions and after-action reviews provide a more fertile inner setting for psychological safety implementation [31]. These structures can be leveraged and enriched rather than created from scratch. Where such mechanisms are weak or absent, their development may need to precede or accompany the **SAFE-ED** Programme.

For EDs that have conducted PS surveys or applied a PS calculator to their department prior, the findings can be used as a baseline. For those who have not done so, we have proposed a one-page PS Calculator of 25 items which can be readily executed on paper or electronically. (Table 1)

Domain 4: Individuals

The People at the Heart of Implementation

The Individuals domain refers to the knowledge, beliefs, attitudes, and personal characteristics of the people who will be involved in implementing and experiencing the **SAFE-ED** Programme. In the ED context, this encompasses a diverse and complex workforce including emergency physicians, registrars, residents, nurses, paramedics, allied health professionals as well as administrative and support staff. Knowledge and beliefs about PS vary considerably across this workforce. Many ED staff will have limited familiarity with the construct, and a commonly held misconception is the equation of PS with the absence of accountability, or with a permissive culture that tolerates poor performance. These misconceptions are a significant barrier, as they can generate resistance from staff who value high standards and professional rigour. Implementation strategies must therefore invest in education that clearly distinguishes PS from low standards. This makes the evidence base for its impact on performance and patient safety accessible and compelling to a clinical audience.

Self-efficacy is the belief in one's ability to succeed at a task, in this case, to enact the behaviours associated with PS. This is another important individual-level construct. For leaders, this means confidence in their ability to model vulnerability, facilitate open dialogue, and respond constructively to mistakes. The 'hidden curriculum' can be very powerful. For frontline staff, it means confidence in their ability to speak up, raise concerns, and engage in interpersonal risk-taking without negative consequence. Both forms of self-efficacy are likely to be variable across the ED workforce and will need to be explicitly developed through skills-based training and supported practice [32].

It is also prudent to consider the individual stage of change each staff may be at, which may range from being a committed advocate for PS to being ambivalent or even wholeheartedly resistant. Effective implementation strategies will thus need to differentiate the approach across these groups, engaging early adopters as champions, providing evidence and dialogue for the open but uncertain, and addressing the concerns of sceptics with respect and honesty rather than dismissal.

The interprofessional dimension of the Individuals domain deserves particular emphasis in the ED context [2]. PS is not experienced uniformly across professional groups. Nurses, junior doctors, and allied health professionals consistently report lower PS than senior physicians, reflecting the influence of professional hierarchy and status differentials on interpersonal risk-taking. Implementation strategies must be explicitly attentive to these differentials, designing interventions that actively redistribute voice and create conditions in which all professional groups feel equally entitled to contribute.

Domain 5: Implementation Process

Planning, Engaging, Executing, and Reflecting

The Implementation Process domain describes the active work of putting the **SAFE-ED** Programme into practice. (Fig 1) CFIR 2.0 organises this domain around four key activities: engaging stakeholders, planning, executing, as well as reflecting and evaluating.

Engaging stakeholders is the foundation of effective implementation. This means identifying and involving a broad coalition of champions and supporters from across the professional hierarchy. This means not only recruiting senior physicians and nurse managers, but also junior staff, allied health professionals, and administrative personnel whose buy-in is essential for genuine culture change. Engagement should begin early, before the programme is fully designed, and should involve genuine co-design rather than consultation. Staff who have been involved in shaping the **SAFE-ED** Programme are more likely to feel empowered and take ownership of it and will sustain its practices over time.

Implementation Phases

The "Implementation" of the **SAFE-ED** Programme can be delivered in phases, each with distinct goals and activities. (Figure 2)

A. The Foundation phase (Figure 2) focuses on building the conditions for successful implementation. Key activities include conducting a baseline assessment of PS across the department. This can be done with any scale available in the literature such as the Edmondson scale [33]. A Leadership Development Workshop, recruiting and training the initial cohort of Peer Champions, establishing the implementation team and governance structures, and communicating the goals and rationale to the whole department. As per CFIR 2.0 recommendations, this phase would also include a detailed contextual analysis using a process model such as Quality Implementation Framework to identify the specific barriers and facilitators in your ED in order to ensure that the programme delivery is tailored to the local context from the start [34-36,53].

B. The Activation phase (Figure 2) is the period of most intensive implementation activity. This is the active operation phase where leaders are engaged in peer coaching and supported practice. Structurally embedded activities are introduced and refined across all shifts and teams, and the Peer Champion Network is fully operational. The implementation team meets regularly during this phase to review progress, address emerging barriers, and coordinate the activities. PS measurement is conducted at the midpoint of this phase to provide an early indication of progress and to identify any areas requiring additional attention or customization [37].

C. The Consolidation phase (Fig 2) shifts the focus from active implementation to sustainability. During this phase, the activities

are progressively transferred from the implementation team to the department's leadership and champion network, reducing external support and building internal capacity for ongoing self-management. The Leadership Community of Practice can be established, the annual review cycle is initiated, and the measurement of PS and feedback mechanisms are integrated into the routine quality improvement processes. By the end of the Consolidation phase, the **SAFE-ED** Programme should be operating as a self-sustaining feature of the ED culture and governance, with the implementation team transitioning to a light-touch advisory role [38].

During these Implementation phases, there are multiple concomitant initiatives, actions and commitment required on the part of all levels of ED staff. Leadership behaviour is the single most powerful determinant of psychological safety in teams. Leadership modelling is thus a central active ingredient [3, 13, 19, 20]. Leaders can operationalize and set good example by setting the appropriate stage in inviting participation and questions. They can also reframe the ED work environment to make inter-personal risk taking feel safe and worthwhile. It must be clear here that "risk taking" is not frivolous and unjustified risk taking. Leaders can openly acknowledge the complexity and uncertainties in the practice of Emergency Medicine and their articulation of a clear and consistent message will encourage staff to speak up and ask important questions [28, 29, 31]. Encouraging this behaviour across team-based patient management, handovers, resuscitations, and even within everyday interactions and conversations will increase the kindness capital in the ED. Team leaders and supervisors must also be more comfortable soliciting feedback and input from staff lower in the professional hierarchy; a group that is at risk of self-silencing. Targeting questions to the juniors, presenting them with the opportunity to speak and ensuring seniors do not dominate the conversation are positive practices. Leaders at every level and supervisors should be mindful of their natural responses under pressure so as not to appear defensive when challenged. For newer leaders, a targeted course (Leadership Development Pathway) to create awareness and understanding to these elements may be useful. An experiential course would certainly be more beneficial compared to a didactic one [3,7,31].

Integrating psychologically safe practice across the ED takes time and requires culture change and assimilation. It needs to be embedded into existing structures and routines and should not just be a parallel process that competes for the already scarce time and attention of staff in the ED [3]. The aim would be to move PS from aspiration to a daily practice routine. Current ED structures such as shift huddles, clinical handovers, post resuscitation and incident debrief as well as discussions during mortality and morbidity rounds are good platforms to showcase, share and incorporate PS practices. One unique platform in the ED is the Hot Debrief that occurs after a critical incident, usually led by a more senior staff. The emotional processing component of the debrief is particularly important for psychological safety as it will signal that the ED values the contributions of every member of the team, clinical and non-clinical staff alike. It can also convey that distress and uncertainty are natural responses during challenging clinical events [39].

With any programme, sustainability is always a challenge. Sustained reinforcements will allow the SAFE ED programme to keep its momentum, continually embed learning and ensure that psychological safety becomes a durable feature of the ED culture rather than just a time-limited initiative [40]. This is also where

a Peer Champion Network, drawn from all professional groups, can play a crucial role. Members are often chosen because they represent respected peers whose credibility is derived from their clinical role as well as genuine and strong commitment to the SAFE ED goals. They model PS in their daily practice and provide a lot of informal support, nurturing and encouragement to their colleagues. Their efforts should be recognized and encouraged by the ED leadership, which may not only help in sustaining their motivation to continue but also sends a strong signal to the rest of the ED staff that PS is a genuine and important departmental or organizational priority [41].

Implementation Outcomes

The primary implementation outcomes for the SAFE-ED Programme are acceptability, fidelity, penetration, and sustainability, each of which can be measured using a combination of quantitative and qualitative methods.

A. Acceptability (Table 2) refers to the degree to which ED staff perceive the SAFE-ED Programme as agreeable, palatable, and satisfactory. It can be measured using a brief, validated acceptability survey administered at the end of each phase supplemented by qualitative data from focus groups and individual interviews. If acceptability is low amongst an identified group, the implementation team can use this information to adapt the design or delivery to better meet any specific needs [3].

B. Fidelity (Table 2 and Fig 3) refers to the degree to which the SAFE-ED Programme is delivered as intended. Given that the programme involves both structured activities such as the Leadership Development Workshop, hot debrief protocol and leadership modelling practices, fidelity measurement should address all dimensions. Structured activity fidelity is assessed through attendance records, facilitator checklists, and brief post-activity surveys. Behavioural fidelity, the degree to which leaders are consistently enacting the behavioural domains (eg. setting the stage, inviting participation, and responding productively) is assessed through periodic structured observation, peer coaching records, and staff perceptions of leader behaviour captured through the measurement instruments which the ED can set up. It is important to note that fidelity in the context of a complex cultural intervention such as the SAFE-ED Programme does not mean rigid adherence to a fixed protocol, but rather consistent delivery of the core components with appropriate contextual adaptation [42, 43].

C. Penetration (Table 2) refers to the degree to which the SAFE-ED Programme reaches all intended staff groups and all areas of the ED operations. Penetration is particularly challenging given the shift-based workforce structure, the diversity of professional groups, and the variation in working patterns across day, evening, and night shifts. Penetration is measured through participation records for all programme activities, disaggregated by professional group, seniority level, and shift pattern. Where penetration gaps are identified, eg. night shift staff are consistently less engaged with the programme than day shift staff, the implementation team should develop customized and targeted strategies to address them [43].

D. Sustainability (Table 2) refers to the degree to which the SAFE-ED Programme activities and effects are maintained beyond the initial implementation period. The programme must continue to deliver. The ongoing practice with sufficient fidelity, should produce the desired impact and subsequent improved outcomes [44, 45]. Schell et al developed a Programme

Sustainability Framework which can be used as reference [44]. Luke et al translated the framework into a measurement instrument, Programme Sustainability Assessment Tool (PSAT) [45] PSAT is user friendly, can be applied to both small and large programme interventions, is applicable to a wide variety of interventions and can also be used as a planning, evaluation or research tool [45] Sustainability should be assessed at regular intervals. It also examines the degree to which programme activities have been integrated into the ED's routine governance or quality improvement processes, a key indicator of genuine institutionalisation rather than surface-level compliance. A suggestion for the **SAFE-ED** programme intervention and sustained reinforcements can operate via three mechanisms:

- i. The Peer Champions Network
- ii. Regular, serial psychological safety measurements, via a tool agreed by the department, and
- iii. Having a Programme review cycle executed at strategic intervals (which should involve all segments of staff in the ED. It should also preferably be framed as a learning activity rather than an accountability exercise) [3,4,46-49].

Discussion

This paper shares the **SAFE-ED** programme and suggests an implementation strategy for embedding PS in the ED that was designed with the CFIR 2.0 framework in mind, allowing for more accurate prediction of potential barriers and facilitators to the success of the programme. The CFIR 2.0 framework is applied to a complex cultural intervention in a high acuity setting. Explicitly, this programme makes several unique contributions to the published literature:

A. The application of a rigorous IS framework to an issue that has often been approached in an atheoretical and unsystematic way, where previous efforts are ad hoc, context-insensitive and poorly specified, making it challenging to replicate in new settings or build on the cumulative knowledge. With the grounding of the **SAFE-ED** programme in CFIR, we have provided a level of theory and methodological transparency that will enable meaningful evaluation, replication and adaptation. The framework also helps us understand the multi-level complexities of PS implementation.

B. Our paper also features the ED as the implementation environment whilst much of the existing studies focuses on other settings. The shift-based workforce fragmentation, multi-tiered hierarchy, interprofessional complexities, time pressure and high emotional intensity pose implementation challenges. The **SAFE-ED** programme is designed with these considerations in mind and the focus of enriching the existing ED routines such as shift huddles, handovers, pre-arrival pre-briefing and post resuscitation debriefing.

C. In view that PS is not often experienced uniformly across all professional groups of staff, the programme stresses on equity by designing specific mechanisms such as The Peer Champion network, structured inputs from all groups of staff, redesigning Morbidity and Mortality Rounds process along the lines of "just culture" as well as redistribution of voices for more equitable participation.

D. In the **SAFE-ED** programme, the 'innovation' being 'implemented' and subjected to the CFIR 2.0 framework is PS, which itself is a cultural and relational construct. Thus, the boundary between 'innovation' and 'implementation' becomes very permeable. PS is not actually sampling a practice implemented through a process; rather, it is a property of the implementation process itself. The implementation process for PS should be

characterized by transparency, genuine stakeholder engagement, shared decision making and responsive adaptation, all of which are enactments of PS. This relationship between innovation and process is an interesting feature of cultural implementation which opens up the opportunity for the future development of an implementation framework that takes these constructs into consideration.

E. The structural features of an "Inner Setting" are often seen as barriers to be overcome during the implementation of various interventions. However, in the ED context, these are seen as constraints that fundamentally shape the design space for implementation, and calls for a dynamic understanding of the strategy to be reconstituted through an iterative process of contextual adaptation and deep cultural considerations.

Limitations

Whilst the **SAFE-ED** programme is guided by a robust evidence-based framework of PS and IS, it should be subjected to prospective evaluation in a real-world ED setting to fully realize its value and effectiveness. It is the hope of this publication that ED can pay more systematic attention to PS and apply these hypotheses to be tested.

The barriers and facilitators shared may not uniformly apply to all ED settings. Each ED will need to conduct their own contextual analysis, but the **SAFE-ED** Programme has specifically been designed to be very adaptable. There will also be differences across developed and developing countries, as well as between low-, middle- and high-income countries' EDs. Resource constraints and culturally distinct environment must be considered when conceptualizing implementation according to these appropriate setting. Modifications and customization are encouraged.

We also share a version of our proposed PS calculator (Table 1) in this paper. The development of an ED-specific PS measurement instrument is certainly a priority for future research.

Conclusions

Psychological safety is the shared belief that a team is safe for interpersonal risk-taking. It represents one of the most robustly evidenced determinants of team performance, error reporting, and learning in healthcare. In the ED, where the consequences of silence can be measured in patient harm and where the structural conditions for PS are among the most challenging in medicine, its importance is particularly acute [50-53]. Yet despite decades of evidence and growing clinical awareness, PS remains inconsistently realized in ED practice, and the implementation science infrastructure needed to translate evidence into sustained cultural change, has been largely absent from the literature.

The **SAFE-ED** Programme represents a systematic attempt to address this gap. By applying the CFIR 2.0 to the specific context of the ED, this paper has produced a theoretically grounded, contextually sensitive, and operationally specific implementation strategy that attends to the full complexity of what embedding PS in the ED truly requires. The three pillars of leadership modelling, structural embedding, and sustained reinforcement are not arbitrary design choices but direct responses to the barriers and facilitators identified through rigorous CFIR 2.0 analysis. Their integration into a coherent, phased implementation strategy reflects the evidence that sustainable culture change requires simultaneous attention to multiple levels of the implementation system.

The **SAFE-ED** Programme is not a quick fix. It requests significant action from ED leaders, frontline staff, and health system managers. It requires sustained commitment, genuine behavioural change, willingness to examine uncomfortable truths about hierarchy and voice, and investment of time and resources in activities whose returns are real, but not always immediately visible. These are not trivial demands in an environment as pressured and resource-constrained as the contemporary ED; but the evidence is clear that the costs of low psychological safety (patient harm, staff burnout, workforce attrition, and organisational learning failure) are far greater than the costs of addressing it, and that the ED teams and health systems that invest seriously in PS are building something of enduring value i.e. a culture in which every member of the team can contribute their full knowledge, skill and judgement to the care of patients, without fear.

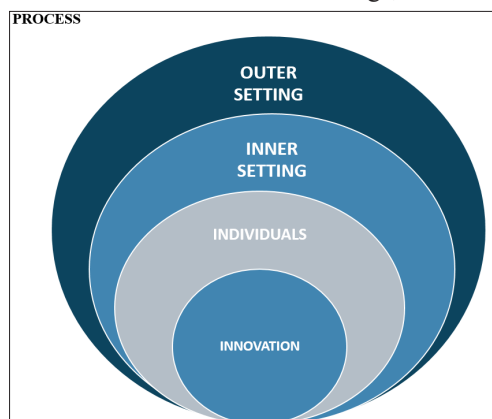


Figure 1: The Consolidated Framework for Implementation Research 2.0

The SAFE-ED Programme.

(psychological Safety Acceleration FramEwork for Emergency Departments)

Objective: To Embed PS into the Culture and Daily Operations of the ED



CFIR FRAMEWORK	Components
Innovation	The Innovation is “Psychological Safety”
Outer Setting	External factors: health system, policy, governance, environment, patient population
Inner Setting	Within ED: culture, leadership, communications, relationships, structure
Individual	Staff of ED: values, characteristics, self -efficacy, beliefs
Implementation Process	Execution of innovation: engaging, planning, executing, reflection

Implementation Phases	
1. Foundation Phase	- Assess baseline/ current psychological safety - Awareness and Communications - Leaders Buy-in: Leadership Development Workshop (build awareness, understanding, role modelling, “hidden curriculum”) - Appoint/ Train Peer Champions - Implement PS teams - Review Governance, Institution IPCP if applicable
2. Activation Phase	- Staffing information - Peer coaching - Supported practice across teams and ED shifts, shift huddles, post resus debriefing, hot debrief, handovers etc - Peer Champion Network in full operations - Measurement of PS, as deemed necessary - Self Efficacy reinforcements
3. Consolidation Phase	- Ownership and empowerment established - Staff are all familiar and aware - ED internal capacity fully functional on the Implementation - Community of Practice - Disseminate model / share with other departments/ institutions

Figure 2: Implementation of the SAFE ED Programme on Psychological Safety

Table 1: Sample ED Psychological Safety Calculator

	Domain 1: Voice and Speaking Up	Likert Scale
1	I feel safe raising concerns about patient safety, even if it means challenging a senior colleague	1 2, 3, 4, 5
2	When I notice a potential error, I speak up without hesitation	1 2, 3, 4, 5
3	I am free to ask questions during resuscitations/ high pressure situations without worrying how I will be perceived	1 2, 3, 4, 5
4	• I have held back from voicing concerns as I am afraid of reaction I would get	1 2, 3, 4, 5
5	• Junior staff are expected to follow orders without questioning	1 2, 3, 4, 5
6	My suggestions on patient care is considered regardless of my seniority	1 2, 3, 4, 5
	Domain 2: Error Reporting / Learning Culture	
7	In this ED, errors are treated as learning opportunities rather than occasions for blame	1 2, 3, 4, 5
8	I feel safe reporting near misses and errors without fear of punishment	1 2, 3, 4, 5
9	• Staff are afraid to report incidents as they are worried of the consequences	1 2, 3, 4, 5
10	Following an adverse event we reflect together as a team to see how to improve	1 2, 3, 4, 5
11	Leadership responds constructively when staff raise concerns on processes and safety	1 2, 3, 4, 5
	Domain 3: Team Inclusion and Respect	
12	All team members, regardless of seniority are treated with respect	1 2, 3, 4, 5
13	I feel like a valued member of this ED	1 2, 3, 4, 5
14	• Some staff groups in the ED are made to feel less important	1 2, 3, 4, 5
15	All staff (drs, nurses, allied health) collaborate as equals in decision making for patients	1 2, 3, 4, 5
16	I feel comfortable being myself at work, without masking my identity or personality	1 2, 3, 4, 5
	Domain 4: Support and Well-being	
17	If I am struggling emotionally or mentally I would feel comfortable telling some one in the ED	1 2, 3, 4, 5
18	My supervisor or team lead genuinely cares about my wellbeing	1 2, 3, 4, 5
19	• In the ED, showing vulnerability is a sign of weakness	1 2, 3, 4, 5
20	After a traumatic case, there is adequate support for staff	1 2, 3, 4, 5
21	Workload and expectations in my ED is manageable	1 2, 3, 4, 5
	Domain 5: Leadership Behaviour	
22	Leaders in the Ed model the behaviour they expect from other staff	1 2, 3, 4, 5
23	Senior staff encourage junior staff to speak up	1 2, 3, 4, 5
24	• Leadership in the Ed responds defensively when given feedback	1 2, 3, 4, 5
25	I trust that concerns raised to leadership will be addressed and acted upon	1 2, 3, 4, 5

Annex to Table 1: ED Psychological Safety Calculator

Scoring System:

Step 1: For Items 4,5,9,14,19,24: These are negatively worded items. To score these, reverse-scoring is used. For example, if a respondent chooses an item raw score of 2, it should be scored as (6-2=4). If another negatively worded item is scored 5, then the corrected score will be (6-5=1)

For the other items, the raw score is the score taken for calculation

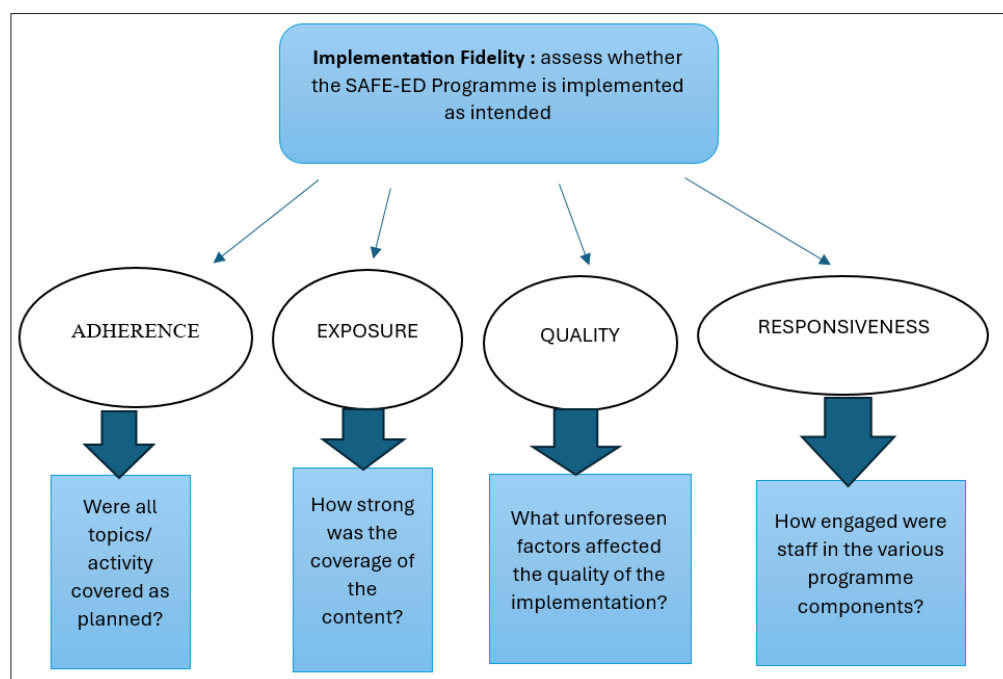
Step 2: Calculate the Domain Scores. Sum the scores for each domain and divide by the number of items to get the mean domain score (range will be between 1.0-5.0)

Step 3: Calculating the overall Psychological Safety Index (PSI). Average the 5 domains mean scores to produce the PSI (Range will be between 1.0-5.0)

Table 2: Implementation Outcomes for SAFE-ED Programme

Primary Implementation Outcomes	Descriptors/ Instruments/ Examples
Acceptability	- Acceptability of Intervention Measure (AIM) [eg. appealing, satisfactory, welcome] - Likert Scale rating (5 or 7 point scale) - Focused Group Discussion - Small group or individual interviews
Fidelity	- Structured Activity Fidelity: assessed through attendance records for programmes, facilitators checklists, post activity evaluation or surveys - Behavioural Fidelity: assessed through periodic structured observations, peer coaching records, staff perception of leadership in the ED
Penetration	- Can utilize measurement instrument: Penetration rate - Calculate: Activity Engagement - Total Eligible for Engagement - Or calculate: Teams exhibiting safe behaviour - Total number of teams - Direct Observation of Psychological safety behaviour adoption
Sustainability	- Consistency of Response or action - New hire integration and embedment - Peer to peer support

Figure 3: Implementation Fidelity



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