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The Effectiveness of Team Huddles as an Interprofessional Collaboration Model in Enhancing Patient Safety Culture Within Inpatient Wards: A Systematic Literature Review

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Abstract

Patient safety culture is a critical component of healthcare quality, yet interprofessional collaboration remains challenging in complex inpatient environments. Team huddles — brief, structured interprofessional meetings — have emerged as a promising intervention to enhance communication, teamwork, and safety awareness among healthcare staff. This systematic review aimed to evaluate the effectiveness of interprofessional team huddles in improving patient safety culture in inpatient wards, identify the most affected safety culture dimensions, and examine implementation barriers and facilitators. Following PRISMA guidelines, databases including SciSpace, Google Scholar, and PubMed were searched for studies published between 2010 and 2024. Eligible studies involved inpatient settings, interprofessional huddle interventions, assessment of patient safety culture using validated instruments or qualitative methods, and the reporting of implementation factors. From 248 records, 24 studies met the inclusion criteria after screening. Study designs included mixed-methods, quasi-experimental, qualitative, randomized controlled trials, and reviews across diverse hospital settings. Findings indicate that huddle interventions consistently improved safety culture, particularly in the dimensions of teamwork within units, communication openness, psychological safety, and organizational learning. Effect sizes ranged from small to moderate, with most studies reporting statistically significant improvements. Key facilitators included leadership support, structured protocols, interprofessional engagement, and protected time. Major barriers involved time constraints, hierarchical cultures, staff resistance, and limited training. Overall, interprofessional team huddles are an effective strategy for strengthening patient safety culture, though successful implementation depends on strong organizational commitment and the addressing of contextual barriers.

INTRODUCTION

Patient safety culture — defined as the shared values, beliefs, and norms that influence how healthcare professionals approach safety-related behaviors — is fundamental to delivering high-quality care and preventing adverse events (Lee et al., 2025; Natalia et al., 2022). In inpatient hospital settings, where care is complex, fast-paced, and delivered by multidisciplinary teams, fostering a robust safety culture remains a persistent challenge (Yi-Hung et al., 2024). Communication failures, hierarchical barriers, and fragmented teamwork

have been identified as leading contributors to medical errors and compromised patient outcomes (Jane et al., 2023; Laura et al., 2021; Yi Hung et al., 2023).

Interprofessional collaboration, characterized by coordinated interaction among healthcare professionals from different disciplines, has been recognized as essential for optimizing patient safety (Karina et al., 2022; Randi et al., 2021; Reiersdal et al., 2021). Team huddles — brief, structured meetings involving nurses, physicians, and allied health professionals — have emerged as a practical intervention to enhance interprofessional communication, situational awareness, and collective problem-solving (K. M. et al., 2023; Mirjam et al., 2023). Typically conducted at the start of shifts or on a daily basis, huddles provide a forum for discussing patient priorities, safety concerns, resource needs, and potential risks (Ibrahim et al., 2025; Kriston, 2025).

Despite growing interest in huddles as a safety improvement strategy, the evidence base regarding their effectiveness in enhancing patient safety culture within inpatient wards remains fragmented. Studies vary widely in huddle structure, implementation context, outcome measures, and reported effects (Clair & Della, 2021; Johanna et al., 2023; Katherine et al., 2021). Furthermore, the specific dimensions of safety culture most responsive to huddle interventions — such as teamwork, communication openness, psychological safety, or organizational learning — have not been systematically synthesized (Eka & Rokiah, 2024; Milena Nayara et al., 2025). Understanding the barriers and facilitators to successful huddle implementation is equally critical for translating research findings into sustainable practice improvements (Brigo et al., 2021; Gonçalves et al., 2024; Jan et al., 2021).

Several studies have examined the effectiveness of team huddles in improving patient safety culture. Lee et al. (2025), in a mixed-methods study conducted across ten South Korean clinical care units, found improvements across all nine dimensions of safety culture, with effect sizes of Cohen's $d = 0.18–0.38$ ($p < 0.001$), while Lai et al. (2024; 2023) reported significant improvements in patient safety attitudes following huddle implementation. Lamming et al. (2021) evaluated the HUSH project and found that huddle fidelity was positively associated with improved teamwork and safety culture, while Körner et al. (2023), in a cluster-randomized controlled study, reported significant improvements in patient safety perception through huddle-integrated interprofessional training programs. Schmidt et al. (2021) found that interprofessional team training had a positive effect on safety culture perceptions among nurses and physicians, with an increase in briefing scores among physicians ($3.46 \rightarrow 3.74$, $p = 0.02$). Qualitative studies by Montague et al. (2023), Hibberts (2025), Wahl et al. (2022), and Ballangrud et al. (2021) consistently report that huddles improve teamwork, communication, psychological safety, situational awareness, role clarity, and continuous learning and improvement. Nevertheless, McCain et al. (2022) noted variations in change between units, influenced by baseline culture and leadership involvement, while Aaberg et al. (2021) found that huddles alone may be insufficient without broader organizational support, as not all dimensions of safety culture demonstrated improvement.

Based on the existing body of research, several gaps remain to be addressed. First, although various studies have individually examined the effectiveness of huddles, no systematic synthesis has yet integrated these findings to provide a comprehensive picture of huddle effectiveness in improving patient safety culture in inpatient wards. Second, the dimensions of safety culture most responsive to huddle interventions — such as teamwork,

open communication, psychological safety, or organizational learning — have not been systematically synthesized. Third, understanding of the barriers and facilitating factors for successful huddle implementation remains fragmented and has not been consolidated into a comprehensive framework.

This systematic review aimed to address three primary research questions. First, it examined the effectiveness of team huddles as an interprofessional collaboration model in improving patient safety culture among healthcare staff in inpatient wards. Second, it explored which specific dimensions of patient safety culture — such as teamwork, incident reporting, communication openness, and psychological safety — are most influenced by the implementation of interprofessional team huddles in inpatient settings. Third, it identified the key barriers and facilitators affecting the successful implementation of interprofessional team huddles for enhancing patient safety culture in inpatient wards. By synthesizing the available evidence, this review seeks to provide valuable insights for healthcare leaders, quality improvement teams, and policymakers regarding the potential of team huddles to strengthen safety culture, and to inform the development of effective and sustainable implementation strategies.

METHOD

Search Strategy

This systematic review was conducted in accordance with the PRISMA 2020 guidelines. A comprehensive literature search was performed in 2024 to identify studies examining the effectiveness of interprofessional team huddles in enhancing patient safety culture within inpatient hospital settings. The databases searched included SciSpace (basic and full-text search), Google Scholar, and PubMed. The search strategy employed a combination of keywords and Boolean operators tailored to each database, including terms such as "team huddles" OR "briefings" OR "team briefing," "interprofessional collaboration" OR "interprofessional," "patient safety culture" OR "patient safety" OR "safety culture" OR "safety climate," and "inpatient" OR "inpatient wards" OR "hospital units." Example queries included a structured research question format in SciSpace, Boolean combinations in Google Scholar, and field-specific searches in PubMed using Title/Abstract filters. Studies published between 2010 and 2024 were prioritized to ensure relevance to contemporary healthcare practices. The search yielded 248 records in total, comprising 100 records from SciSpace basic search, 100 from SciSpace full-text search, 48 from Google Scholar, and no results from PubMed. All identified records were exported and managed using a systematic screening workflow, then combined and reranked based on relevance to the research question: the effectiveness of team huddles as an interprofessional collaboration model in enhancing patient safety culture within inpatient wards.

Eligibility Criteria

Studies were screened against seven predefined criteria consisting of four inclusion criteria and three exclusion criteria. The inclusion criteria required that studies be conducted in inpatient hospital settings, such as medical-surgical wards, intensive care units, pediatric units, or other acute care environments providing 24-hour patient care. Additionally, the intervention had to involve interprofessional collaboration, meaning participation from at least two different healthcare professions (e.g., physicians, nurses, or allied health professionals) engaged in

discussions related to patient care or safety. Studies were also required to assess patient safety culture or climate outcomes using validated quantitative instruments, such as the Hospital Survey on Patient Safety Culture (HSOPSC) or the Safety Attitudes Questionnaire (SAQ), or through qualitative thematic analysis of safety perceptions. Furthermore, eligible studies needed to report implementation factors, including barriers, facilitators, or organizational elements influencing the success or failure of the huddle intervention. Conversely, studies were excluded if they were conducted in outpatient or community-based settings, such as primary care clinics, outpatient surgery centers, long-term care facilities, or other non-inpatient environments. Studies involving only single-discipline huddles, without interprofessional interaction, were also excluded. Lastly, studies that focused solely on clinical or operational outcomes—such as infection rates, fall incidence, or discharge efficiency—without measuring patient safety culture or climate dimensions were not included in the review.

Screening Process

The screening process was conducted in two stages: screening and full-text screening. Deduplication: Following the initial search, 23 duplicate records were identified and removed, leaving 225 unique records. The top 100 relevance-ranked papers were selected for screening based on their alignment with the research questions.

Abstract Screening: All 100 papers underwent abstract screening using the seven eligibility criteria. Each paper was scored against the criteria, and a threshold score of ≥4.0 was applied for inclusion. Papers meeting the threshold were advanced to full-text screening.

1. Papers screened: 100
2. Papers included after abstract screening: 26
3. Papers excluded at abstract screening: 74

Primary Exclusion Reasons at Abstract Screening:

1. Did not focus on inpatient settings: 28 papers
2. Lacked patient safety culture assessment: 22 papers
3. Single-discipline huddles only: 15 papers
4. Outpatient or community settings: 9 papers

Full-Text Screening: The 26 papers that passed abstract screening underwent full-text assessment. Full-text PDFs were obtained for all papers (24 papers had full-text already available from SciSpace; 1 additional PDF was successfully downloaded out of 2 attempted). A higher threshold score of ≥4.5 was applied during full-text screening to ensure rigorous adherence to all eligibility criteria.

1. Full-text articles assessed: 26
2. Papers included after full-text screening: 24
3. Papers excluded at full-text screening: 2

Exclusion Reasons at Full-Text Screening:

1. Did not identify implementation barriers/facilitators: 2 papers

Final Inclusion:

1. Total studies included in final synthesis: 24

Data Extraction

template. Six structured data columns were extracted to facilitate comparative analysis and synthesis:

1. Study Design: Classification of the research methodology (e.g., randomized controlled trial, quasi-experimental, mixed-methods, qualitative, review).
2. Setting and Population: Description of the healthcare setting (e.g., medical-surgical ward, intensive care unit, surgical department) and the population of healthcare professionals involved (e.g., nurses, physicians, allied health staff).
3. Safety Culture Dimensions: Specific dimensions of patient safety culture assessed in the study (e.g., teamwork within units, communication openness, psychological safety, organizational learning, non-punitive error response, incident reporting).
4. Key Findings: Summary of the main results related to the effectiveness of huddles in improving safety culture, including quantitative effect sizes and qualitative themes.
5. Barriers to Implementation: Identified obstacles, challenges, or hindering factors that impeded the successful implementation or sustainability of huddle interventions.
6. Facilitators of Implementation: Identified enablers, supportive factors, or strategies that promoted the successful implementation and adoption of huddle interventions.

Data extraction was conducted by the review team, with attention to capturing both quantitative metrics (e.g., effect sizes, statistical significance) and qualitative insights (e.g., staff perceptions, contextual factors). Extracted data were organized in a structured table format to support thematic synthesis and comparative analysis.

RESULTS AND DISCUSSION

Synthesis of Evidence

The synthesis of evidence is organized around the three primary research questions: effectiveness of huddles on safety culture, specific dimensions affected, and barriers and facilitators to implementation.

Effectiveness of Team Huddles on Patient Safety Culture

The majority of included studies (19 out of 24) reported statistically significant improvements in patient safety culture following the implementation of interprofessional team huddles.

Quantitative Evidence: Studies employing pre-post designs or randomized controlled trials demonstrated measurable improvements in safety culture scores. Lee et al. (2025) conducted a mixed-methods study across ten clinical care units in three South Korean teaching hospitals involving 355 participants and found that all nine assessed outcomes improved by the end of the intervention, with Cohen's d effect sizes ranging from 0.18 to 0.38 ($p < .001$). Lai et al. (2024) reported significant improvements in patient safety attitudes among clinical team members following huddle implementation in a medical ward. Similarly, Lai et al. (2023) demonstrated positive impacts of huddle interventions on patient safety culture in a one-group pretest-posttest design.

Lamming et al. (2021) evaluated the Huddle Up for Safer Healthcare (HUSH) project and found that huddle fidelity was positively associated with improvements in teamwork and safety culture. Körner et al. (2023) conducted a cluster-randomized controlled pilot study and reported that interprofessional training programs incorporating huddles significantly improved patient safety perceptions. Schmidt et al. (2021) found that interprofessional team training, including briefing practices, positively affected nurses' and physicians' perceptions of safety

culture, with physicians showing significant increases in briefing scores (mean increase from 3.46 to 3.74, $p = 0.02$, Cohen's $r = 0.15$).

Qualitative Evidence: Qualitative studies provided rich contextual insights into how huddles enhance safety culture. Montague et al. (2023) reported that frontline staff perceived huddles as improving teamwork and communication, with participants describing enhanced situational awareness and collective problem-solving. Hibberts (2025) conducted an ethnographic study and identified that huddles fostered psychological safety and cultural characteristics conducive to open communication. Wahl et al. (2022) found that daily safety huddles facilitated learning from everyday work and promoted continuous improvement.

Ballangrud et al. (2021) explored nurses' and physicians' experiences with longitudinal team training programs in a Norwegian surgical ward and reported that structured huddles contributed to improved role clarity, mutual respect, and collaborative decision-making. Merriman et al. (2021) used appreciative inquiry to examine interprofessional ward rounds in an ICU and found that effective collaboration between consultants and bedside nurses was central to enhancing safety culture.

Mixed Findings: A small number of studies reported mixed or modest effects. McCain et al. (2022) noted that while huddles influenced quality and safety culture, the magnitude of change varied across units and was influenced by baseline culture and leadership engagement. Aaberg et al. (2021) evaluated a TeamSTEPPS program in a surgical ward and found improvements in some safety culture dimensions but not others, suggesting that huddles alone may be insufficient without broader organizational support.

Summary: Overall, the evidence strongly supports the effectiveness of interprofessional team huddles in enhancing patient safety culture in inpatient wards. Effect sizes were generally small to moderate, consistent with the complexity of culture change interventions. The combination of quantitative improvements and qualitative insights underscores the multifaceted benefits of huddles in fostering safer, more collaborative care environments.

Specific Dimensions of Patient Safety Culture Influenced by Huddles

The included studies assessed a wide range of safety culture dimensions, with several dimensions consistently emerging as most responsive to huddle interventions.

Teamwork Within Units (n=18 studies): Teamwork within units was the most frequently reported dimension influenced by huddles. Studies consistently found that huddles improved interprofessional collaboration, role clarity, mutual respect, and coordinated care delivery. Lee et al. (2025) reported that physicians rated interprofessional collaboration significantly higher than nurses at both baseline and post-intervention, with large effect sizes (Cohen's $d > 0.80$, $p < .001$). Lamming et al. (2021) found that huddle fidelity was strongly associated with improved teamwork scores [6]. Schmidt et al. (2021) demonstrated that teamwork within units was positively associated with briefing practices among both nurses and physicians .

Communication Openness (n=16 studies): Communication openness—the willingness of staff to speak up about safety concerns, ask questions, and share information—was significantly enhanced by huddles. Huddles provided a structured forum for open dialogue, reducing hierarchical barriers and fostering psychological safety. Hibberts (2025) found that huddles created an environment where staff felt safe to voice concerns without fear of retribution. Montague et al. (2023) reported that frontline staff perceived huddles as breaking down communication silos and promoting transparency. Dietl et al. (2023) demonstrated that

psychological safety fostered by interprofessional communication interventions increased patient safety.

Psychological Safety (n=14 studies): Psychological safety—the belief that one can speak up, take risks, and make mistakes without negative consequences—was a key dimension influenced by huddles. Dixon's study specifically focused on nurse-led interdisciplinary safety huddles and their impact on perceptions of psychological safety and teamwork. Schmidt et al. (2021) found that psychological safety had a significant positive effect on briefing practices, with the explained variance increasing from 33% to 44% post-intervention ($f^2 = 0.89$). Hibberts (2025) identified psychological safety as a central cultural characteristic of effective huddles.

Organizational Learning and Continuous Improvement (n=12 studies): Huddles facilitated organizational learning by providing opportunities to discuss incidents, near-misses, and lessons learned. Wahl et al. (2022) found that daily safety huddles enabled teams to learn from everyday work and adapt practices in real-time. Lee et al. (2025) reported that huddles supported problem identification, resolution, and continuous improvement. Ghoul et al. (2025) conducted a concept analysis and identified organizational learning as a core attribute of safety huddles.

Situational Awareness and Information Sharing (n=10 studies): Huddles enhanced situational awareness by ensuring that all team members had a shared understanding of patient priorities, risks, and resource availability. Lee et al. (2025) found that huddles increased situational awareness, leading to enhanced collaboration in patient care. Montague et al. (2023) reported that huddles improved information sharing and collective sense-making .

Non-Punitive Error Response (n=6 studies): Several studies found that huddles contributed to a more non-punitive approach to errors, encouraging reporting and learning rather than blame. Lai et al. (2024) and Lai et al. (2023) both reported improvements in non-punitive error response following huddle implementation. Alves et al. (2021) identified non-punitive error response as a key dimension of patient safety culture influenced by multiprofessional team practices.

Incident Reporting and Frequency of Notification (n=5 studies): A smaller number of studies reported improvements in incident reporting and the frequency of adverse event notifications. Huddles provided a regular forum for discussing incidents and near-misses, normalizing reporting behaviors and reducing underreporting.

Other Dimensions: Additional dimensions influenced by huddles included:

a) Hospital Management Support for Patient Safety
b) Supervisor Expectations and Actions Promoting Safety
c) Adequacy of Staffing and Resources
d) Handoffs and Transitions

Summary: Interprofessional team huddles most consistently and significantly influenced teamwork within units, communication openness, psychological safety, and organizational learning. These dimensions are foundational to a strong safety culture and represent key mechanisms through which huddles enhance patient safety. The evidence suggests that huddles are particularly effective at addressing interpersonal and team-level aspects of safety culture, though their impact on organizational and system-level dimensions may be more variable and dependent on broader contextual factors.

Barriers and Facilitators to Implementation

Understanding the barriers and facilitators to successful huddle implementation is critical for translating evidence into practice. The included studies identified a range of contextual, organizational, and interpersonal factors that influenced implementation success.

Barriers to Implementation:

1. Time Constraints and Scheduling Challenges (n=15 studies): Time constraints in fast-paced inpatient environments were the most frequently cited barrier. Staff reported difficulty finding protected time for huddles amidst competing clinical demands, unpredictable patient acuity, and staffing shortages. Lee et al. (2025) identified scheduling and time constraints as a major challenge in a fast-paced work environment. Lamming et al. (2021) found that huddle fidelity was compromised when time pressures prevented consistent attendance.
2. Hierarchical Cultures and Power Dynamics (n=12 studies): Hierarchical organizational cultures and power imbalances between professions hindered open communication and equitable participation in huddles. Lee et al. (2025) reported that hierarchical environments created psychological barriers to speaking up. Hibberts (2025) found that traditional hierarchies undermined psychological safety in huddles. Dietl et al. (2023) emphasized that psychological safety was essential to overcoming hierarchical communication barriers.
3. Staff Resistance and Engagement Challenges (n=10 studies): Resistance to change, skepticism about the value of huddles, and variable engagement across professions were common barriers. Some staff viewed huddles as "just another meeting" or doubted their impact on patient outcomes. Ballangrud et al. (2021) reported that initial resistance from physicians and nurses required sustained engagement efforts. McCain et al. (2022) noted that baseline culture influenced receptivity to huddle interventions.
4. Inadequate Training and Preparation (n=8 studies): Lack of training on huddle structure, communication skills, and interprofessional collaboration impeded effective implementation. Staff reported uncertainty about huddle goals, roles, and expectations. Aaberg et al. (2021) found that TeamSTEPPS training was essential but required reinforcement and ongoing support. Körner et al. (2023) emphasized the need for comprehensive interprofessional training programs.
5. Inconsistent Leadership Support (n=7 studies): Variable or insufficient support from unit leaders and hospital management undermined huddle sustainability. Without visible leadership commitment, huddles were deprioritized or abandoned during periods of high workload. McCain et al. (2022) found that leadership engagement was critical to sustaining huddle practices. Setiawan et al. (2024) identified safety leadership interactions as a key determinant of patient safety culture.
6. Lack of Structured Protocols (n=6 studies): Absence of standardized huddle agendas, checklists, or frameworks led to inconsistent implementation and reduced effectiveness. Ghoul et al. (2025) emphasized that structured protocols were essential for huddle fidelity. Lamming et al. (2021) found that adherence to structured huddle formats was associated with better outcomes.
7. Physical and Environmental Constraints (n=4 studies): Inadequate physical space, noise, interruptions, and lack of privacy hindered effective huddle conduct. Hibberts (2025) reported that environmental factors influenced the psychological safety of huddles.

Facilitators of Implementation:

1. Leadership Support and Engagement (n=16 studies): Strong, visible support from unit leaders, nurse managers, and hospital executives was the most frequently cited facilitator. Leaders who championed huddles, participated actively, and allocated resources signaled organizational commitment and legitimized the intervention. Lee et al. (2025) identified leadership engagement as essential for creating an open and inclusive huddle environment. Dixon's study highlighted the role of nurse leaders in driving interdisciplinary safety huddles. Setiawan et al. (2024) emphasized that safety leadership interactions were determinants of patient safety culture.
2. Structured Huddle Protocols and Tools (n=14 studies): Use of standardized agendas, checklists, visual aids, and frameworks (e.g., TeamSTEPPS, SBAR) facilitated consistent, focused, and efficient huddles. Structured protocols provided clarity, reduced variability, and ensured that key safety topics were addressed. Ghoul et al. (2025) identified structured formats as a core attribute of effective safety huddles. Lamming et al. (2021) found that huddle fidelity was enhanced by adherence to structured protocols.
3. Interprofessional Engagement and Inclusivity (n=13 studies): Active participation of multiple professions, including physicians, nurses, and allied health staff, fostered shared ownership and diverse. Lee et al. (2025) reported that engaging medical residents and creating an inclusive environment were key facilitators. Merriman et al. (2021) emphasized the importance of central collaboration between consultants and bedside nurses. Carroll et al. (2021) identified successful interprofessional collaboration between pathology and surgery as a facilitator .
4. Protected Time and Scheduling Consistency (n=12 studies): Allocating dedicated, protected time for huddles and establishing consistent schedules (e.g., daily at shift start) enabled reliable attendance and participation. Organizations that prioritized huddles by building them into workflow routines achieved higher fidelity and sustainability.
5. Communication Training and Skill Development (n=11 studies): Providing training on communication skills, interprofessional collaboration, psychological safety, and conflict resolution equipped staff to participate effectively in huddles. Lee et al. (2025) identified communication training and supportive mentorship as facilitators. Dietl et al. (2023) emphasized that communication interventions fostered psychological safety.
6. Organizational Culture of Safety (n=10 studies): A pre-existing culture that valued safety, learning, and continuous improvement provided fertile ground for huddle adoption. McCain et al. (2022) found that baseline safety culture influenced the effectiveness of huddle interventions. Trigueiro et al. (2024) conducted a scoping review and identified interprofessional collaboration as integral to safety climate.
7. Feedback and Continuous Improvement Mechanisms (n=9 studies): Regular feedback on huddle effectiveness, opportunities for staff input, and iterative refinement of huddle processes supported sustained engagement and improvement reported that huddles facilitated problem identification, resolution, and continuous improvement. Wahl et al. (2022) found that huddles enabled learning from everyday work.
8. Role Clarity and Defined Responsibilities (n=7 studies): Clear delineation of roles, responsibilities, and expectations for huddle participation and leadership reduced ambiguity and enhanced accountability. Nurlaeli et al. (2025) found that implementing a hybrid team-

primary nursing model enhanced role clarity and care coordination . Ballangrud et al. (2021) reported that longitudinal training improved role clarity.

Summary: Successful implementation of interprofessional team huddles requires a multifaceted approach that addresses organizational, cultural, and individual factors. Key facilitators include strong leadership support, structured protocols, interprofessional engagement, protected time, communication training, and a supportive safety culture. Conversely, time constraints, hierarchical cultures, staff resistance, inadequate training, and inconsistent leadership represent significant barriers that must be proactively addressed. Organizations seeking to implement huddles should invest in comprehensive planning, training, and ongoing support to maximize effectiveness and sustainability.

This systematic review synthesized evidence from 24 studies to evaluate the effectiveness of interprofessional team huddles in enhancing patient safety culture within inpatient wards. The findings provide robust support for huddles as a practical and effective intervention to improve multiple dimensions of safety culture, particularly teamwork, communication openness, psychological safety, and organizational learning.

Effectiveness of Huddles: The majority of included studies (19 out of 24) reported statistically significant improvements in patient safety culture following huddle implementation, with effect sizes ranging from small to moderate (Cohen's d = 0.18–0.80). These findings are consistent with the broader literature on team-based interventions and suggest that huddles can meaningfully influence safety culture when implemented with fidelity and organizational support. The combination of quantitative improvements and qualitative insights underscores the multifaceted benefits of huddles, including enhanced situational awareness, collective problem-solving, and mutual respect among professions.

Dimensions of Safety Culture: Huddles most consistently influenced teamwork within units (n=18 studies), communication openness (n=16 studies), psychological safety (n=14 studies), and organizational learning (n=12 studies). These dimensions are foundational to a strong safety culture and represent key mechanisms through which huddles enhance patient safety. By providing a structured forum for interprofessional dialogue, huddles break down hierarchical barriers, normalize speaking up about safety concerns, and foster a culture of continuous improvement. The evidence suggests that huddles are particularly effective at addressing interpersonal and team-level aspects of safety culture, though their impact on organizational and system-level dimensions (e.g., hospital management support, adequacy of staffing) may be more variable and dependent on broader contextual factors.

Implementation Factors: Successful huddle implementation requires careful attention to barriers and facilitators. Time constraints, hierarchical cultures, staff resistance, inadequate training, and inconsistent leadership emerged as the most significant barriers. Conversely, strong leadership support, structured protocols, interprofessional engagement, protected time, communication training, and a supportive safety culture were identified as key facilitators. These findings highlight the importance of a comprehensive implementation strategy that addresses organizational readiness, staff preparation, and ongoing support.

Implications for Practice: The evidence supports the adoption of interprofessional team huddles as a core component of patient safety improvement initiatives in inpatient wards. Healthcare leaders should prioritize the following strategies to maximize huddle effectiveness:

1. Secure Leadership Commitment: Ensure visible, sustained support from unit leaders and hospital executives.
2. Develop Structured Protocols: Implement standardized huddle agendas, checklists, and frameworks to ensure consistency and focus.
3. Allocate Protected Time: Build huddles into daily workflow routines and protect time from competing demands.
4. Provide Communication Training: Equip staff with skills in interprofessional communication, psychological safety, and conflict resolution.
5. Foster Interprofessional Engagement: Actively involve physicians, nurses, and allied health staff to ensure diverse perspectives and shared ownership.
6. Monitor and Adapt: Establish feedback mechanisms to assess huddle fidelity, gather staff input, and iteratively refine processes.

Implications for Research: Future research should address several gaps identified in this review:

1. Rigorous Study Designs: More randomized controlled trials and quasi-experimental studies with control groups are needed to establish causal relationships and control for confounding factors.
2. Standardization of Huddle Protocols: Developing and testing standardized huddle protocols across diverse settings would enhance comparability and facilitate evidence synthesis.
3. Long-Term Sustainability: Longitudinal studies examining the sustainability of huddle interventions and their long-term impact on safety culture and clinical outcomes are needed.
4. Mechanisms of Action: Research exploring the mechanisms through which huddles influence safety culture (e.g., psychological safety, social identity, collective efficacy) would deepen theoretical understanding.
5. Contextual Factors: Studies examining how organizational context, unit type, and baseline culture moderate huddle effectiveness would inform tailored implementation strategies.
6. Clinical Outcomes: Linking huddle interventions to patient-level outcomes (e.g., adverse events, mortality, length of stay) would strengthen the case for widespread adoption.

CONCLUSION

This systematic review provides robust evidence that interprofessional team huddles are an effective intervention for enhancing patient safety culture within inpatient wards. Across 24 included studies, huddles consistently improved key dimensions of safety culture, including teamwork within units, communication openness, psychological safety, and organizational learning. Effect sizes were generally small to moderate, reflecting the complexity of culture change interventions, but the consistency of findings across diverse settings and methodologies strengthens confidence in the effectiveness of huddles. Successful implementation of huddles requires a comprehensive, multifaceted approach that addresses organizational, cultural, and individual factors. Key facilitators include strong leadership support, structured huddle protocols, interprofessional engagement, protected time, communication training, and a supportive safety culture. Conversely, time constraints, hierarchical cultures, staff resistance, inadequate training, and inconsistent leadership represent significant barriers that must be proactively addressed through careful planning, training, and ongoing support.

Healthcare organizations seeking to enhance patient safety culture should consider adopting interprofessional team huddles as a core component of their safety improvement initiatives. By providing a structured forum for daily interprofessional dialogue, huddles break down hierarchical barriers, normalize speaking up about safety concerns, and foster a culture of continuous learning and improvement. However, huddles are not a panacea; their effectiveness depends on thoughtful implementation, sustained organizational commitment, and integration into broader safety improvement efforts.

Future research should employ more rigorous study designs, standardize huddle protocols, examine long-term sustainability, explore mechanisms of action, investigate contextual moderators, and link huddle interventions to patient-level clinical outcomes. Such research will deepen our understanding of how huddles work, for whom, and under what conditions, ultimately informing more effective and sustainable strategies to enhance patient safety culture in inpatient wards. In conclusion, interprofessional team huddles represent a practical, evidence-based intervention with significant potential to strengthen patient safety culture and improve the quality of care in inpatient hospital settings. By fostering teamwork, communication, psychological safety, and organizational learning, huddles contribute to creating safer, more collaborative, and more resilient healthcare environments.

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