

DOI: <https://doi.org/10.63332/joph.v4i1.3670>

The Impact of Coordination Between Nursing and Patient Care Technicians on Reducing Critical Errors in Intensive Care Units

Seham Mutlq Alhuzli¹, Mohammed Hamed Alshomrani², Khadijah Hasan Alasmari³, Reema Ali Etuoody⁴, Yahya Ahmed Najmi⁵, Abdulaziz Mohammed Saleh Alwadai⁶, Ali Yahay Ali Almani⁷, Safya Abdulla Mohammad Al Shabi⁸, Zohoor Jaber Ali Hakami⁹, Fatmah Abdu Ibrahim Hamadi¹⁰, Tasneem Shaker Faqehi¹¹

Abstract

The Intensive Care Unit (ICU) represents a nexus of high-acuity patient care, advanced technology, and profound human vulnerability, creating an environment where the potential for critical error is exceptionally high. This research paper posits that effective, structured coordination between Registered Nurses (RNs) and Patient Care Technicians (PCTs) is a critical, yet often under-examined, determinant of patient safety within this complex setting. The analysis explores the ICU as a complex adaptive system, where linear, mechanistic approaches to safety are insufficient. It meticulously delineates the distinct, yet interdependent, roles of the ICU RN, who holds responsibility for clinical assessment and care coordination, and the PCT, who provides essential direct patient support and frontline data collection. The fundamental mechanisms of coordination failure are examined, including communication breakdowns rooted in hierarchical barriers and divergent care priorities, as well as flawed delegation practices that violate established professional standards. The paper synthesizes evidence from peer-reviewed literature and authoritative reports from organizations such as the World Health Organization (WHO), the American Association of Critical-Care Nurses (AACN), and the Institute for Healthcare Improvement (IHI) to identify evidence-based strategies that mitigate these risks. These strategies include the implementation of structured communication protocols like SBAR, the cultivation of a psychologically safe environment, and the use of interprofessional simulation-based training. The paper concludes by presenting a multi-level set of recommendations for healthcare organizations, unit-level leaders, and frontline clinicians, arguing that cultivating a high-reliability Nurse-PCT dyad is an indispensable component of any comprehensive patient safety program.

Keywords: Nursing collaboration, patient care technicians, critical errors, intensive care, teamwork, patient safety

Introduction

The Intensive Care Unit (ICU) is the epicenter of modern medical intervention for the most critically ill patients. It is a domain characterized by unparalleled complexity, where the

¹ Ministry of health - Makkah Health Cluster -Saudi Arabia

² Ministry of health - Makkah Health Cluster -Saudi Arabia

³ Ministry of health - Makkah Health Cluster -Saudi Arabia

⁴ Ministry of health - Ministry of Health branch in Makkah -Saudi Arabia

⁵ Ministry of health - Asir Health Cluster-Saudi Arabia

⁶ Ministry of health - Asir Health Cluster-Saudi Arabia

⁷ Ministry of health - Asir Health Cluster-Saudi Arabia

⁸ Ministry of health – Jazan Health Cluster-Saudi Arabia

⁹ Ministry of health – Jazan Health Cluster-Saudi Arabia

¹⁰ Ministry of health – Jazan Health Cluster-Saudi Arabia

¹¹ Ministry of health – Jazan Health Cluster-Saudi Arabia



convergence of severe illness, invasive technology, and high-stakes decision-making creates a fertile ground for medical error [1]. To comprehend the challenges of ensuring patient safety in this environment, one must first appreciate the ICU not merely as a specialized hospital ward, but as a dynamic, high-risk system where flawless team coordination is a non-negotiable prerequisite for positive patient outcomes. The imperative for robust collaboration, particularly between Registered Nurses and Patient Care Technicians, is magnified by the unforgiving nature of this setting, where minor lapses can rapidly cascade into catastrophic events.

1.1 Characterizing the ICU as a Complex Adaptive System

Traditional models of patient safety often reflect mechanistic assumptions, where cause-and-effect dynamics are stable and predictable, and outcomes can be achieved through the consistent application of guidelines and role expectations. However, the ICU environment defies such simplistic frameworks. Complexity science offers a more accurate lens, viewing the ICU as a complex adaptive system (CAS)—a dynamic, living social system where human agents, including doctors, nurses, technicians, patients, and families, are constantly interacting, exchanging information, and adjusting their behavior [2]. In a CAS, patient outcomes are highly sensitive to multiple, interacting inputs, and relationships between variables change as new information is received and behaviors adapt. This dynamism and nonlinearity challenge the efficacy of rigid, one-size-fits-all protocols and underscore the need for teams that can adapt in real-time to emergent, unpredictable situations [3].

The complexity of the ICU is multi-faceted. It is a sophisticated socio-technical system where cutting-edge technology and highly trained personnel converge to manage patients with extreme acuity [4]. This environment is emotionally charged, provoking a range of conflicting emotions for healthcare professionals, while patients and their families experience significant anxiety, depression, and the long-term sequelae of critical illness, known as Post-ICU Syndrome [1]. The quality and value of care delivered within this system are influenced by a combination of structural variables (e.g., nurse-to-patient ratios, "closed" vs. "open" ICU organizational models), process variables (e.g., the implementation of a "daily goals of care" plan), and patient-level data [5]. This multi-layered reality was starkly illuminated during the COVID-19 pandemic, which forced the adoption of adaptive care models that dramatically heightened the physical and cognitive workload on staff, stretching the system to its limits. The unprecedented patient-to-nurse ratios, sometimes as high as 1:4 or 1:5 for a single ICU nurse supervising a team of redeployed staff, created an environment of constant unpredictability and stress, further amplifying the potential for error [6].

The characterization of the ICU as a complex adaptive system is not merely an academic exercise; it fundamentally reframes the problem of error prevention. It suggests that safety cannot be achieved solely by enforcing rigid procedures. Rather, safety is an emergent property of a team's adaptive capacity. The ability of the Nurse-PCT dyad to "ride out the chaos" depends less on their ability to follow a checklist and more on their capacity for shared situational awareness, mutual monitoring, and flexible, collaborative problem-solving. The challenges observed during the pandemic—extreme workload, the immense supervisory burden on experienced nurses, and pervasive role ambiguity—were not new problems but rather the acute manifestation of chronic, systemic weaknesses in how care teams are structured and supported. This reveals that strategies

designed to improve teamwork in "normal" times are not just about enhancing efficiency; they are critical investments in organizational resilience. A well-coordinated Nurse-PCT dyad, operating with clear roles and robust communication channels, forms a fundamental building block of a resilient ICU capable of absorbing systemic shocks.

1.2 The Epidemiology of Critical Errors in Intensive Care

The high-stakes nature of the ICU environment means that the consequences of error are often severe. Research has consistently shown that poor communication is a leading root cause of medical errors and sentinel events—unexpected occurrences that result in death or serious physical or psychological injury [7]. Studies estimate that communication failures contribute to as many as 70% to 80% of such events, highlighting a critical vulnerability in patient care delivery [8]. In the ICU, where patients are physiologically unstable and dependent on multiple complex therapies, the potential for error is high, and the margin for recovery is slim [9].

The interdependence of practitioners and the reliance on team functioning make the ICU particularly prone to medical errors [10]. These errors can manifest in various forms, including medication errors, delays in treatment, hospital-acquired infections, and failure to rescue a deteriorating patient [11]. The consequences extend beyond direct patient harm to include prolonged ICU stays, increased healthcare costs, and profound moral distress for the clinicians involved [2]. The connection between communication, teamwork, and safety has long been established; units that foster effective communication and collaboration among all staff members, including nurses, physicians, and other professionals, experience shorter patient stays and lower mortality rates. Conversely, a lack of communication or ineffective communication leads to management problems and mistakes at the team level, increasing the potential for patient harm.

1.3 The Imperative for High-Reliability Team Functioning

Given the inherent risks of the ICU environment, achieving patient safety requires adopting the principles of high-reliability organizations (HROs). HROs are organizations that operate in complex, high-hazard domains for extended periods without serious accidents or catastrophic failures. A core principle of HROs is a shift in focus from preventing individual errors to designing resilient systems and teams that can anticipate, detect, and mitigate errors before they cause harm.

In modern critical care, the interprofessional team is the fundamental unit of a resilient system. The World Health Organization (WHO) and its regional body, the Pan American Health Organization (PAHO), have unequivocally stated that interprofessional teams are essential for improving health systems' ability to meet population needs and respond to health emergencies [12]. The evidence is clear: interprofessional collaboration improves health outcomes by decreasing morbidity and mortality rates, reduces medical errors and preventable complications, and increases both patient and provider satisfaction. Effective teamwork allows for the collective expertise of diverse healthcare workers to be leveraged, leading to more comprehensive assessments, better-informed clinical decisions, and more coordinated care [13]. This collaborative approach is not merely a desirable quality but a fundamental requirement for providing the highest quality of care in the high-stakes, complex adaptive system of the ICU [14].

2. Delineating the Roles and Responsibilities in the Nurse-PCT Dyad

At the heart of bedside care in the ICU is the dyad of the Registered Nurse (RN) and the Patient Care Technician (PCT). While both are dedicated to the patient's well-being, their roles are distinct, complementary, and governed by a strict legal and professional framework of delegation. Understanding the specific responsibilities, scope of practice, and locus of accountability for each member of this dyad is essential for analyzing how coordination failures occur and how they can be prevented. The clarity of these roles forms the bedrock upon which safe and effective teamwork is built.

2.1 The Registered Nurse: Clinical Assessment, Critical Thinking, and Coordination of Care

The ICU RN is the primary professional responsible for the holistic and comprehensive care of critically ill patients. This role is defined by advanced skills, in-depth scientific knowledge, and the continuous application of critical thinking. The RN's responsibilities far exceed the execution of basic tasks; they involve a continuous, high-intensity process of assessment, diagnosis, planning, intervention, and evaluation. ICU nurses manage patients with profound clinical instability, requiring them to make crucial clinical decisions based on the best available evidence, their clinical experience, and patient preferences [15].

The daily practice of an ICU RN involves a complex array of high-stakes activities. These include managing mechanically ventilated patients, titrating multiple potent intravenous medications simultaneously, interpreting complex cardiac and hemodynamic monitoring data, and performing advanced physical assessments. A patient's condition can change in a matter of seconds, demanding that the ICU RN possess sharp observational skills and the ability to respond appropriately and immediately. Beyond these technical skills, a core function of the ICU RN is to serve as the central coordinator of care. They are the nexus of communication, responsible for providing critical updates on the patient's status to the interdisciplinary team—which may include physicians, respiratory therapists, pharmacists, and physical therapists—as well as to the patient's family, who are often experiencing extreme stress. In this capacity, the RN acts as a vital patient advocate, helping patients and families navigate complex medical information and make informed decisions about their health [16].

2.2 The Patient Care Technician: Direct Patient Support and Data Collection

The Patient Care Technician, often referred to as an Unlicensed Assistive Personnel (UAP), provides essential direct care and support to patients under the supervision of a registered nurse. The PCT's role is foundational to ensuring patient safety, comfort, and dignity, particularly in the ICU where patients are at their most vulnerable. As indispensable members of the medical team, PCTs often serve as the bridge between patients and the comprehensive care they receive from nurses and doctors [17].

The core duties of a PCT combine clinical tasks with personal care, making them an "invaluable extra set of hands" in the fast-paced ICU environment. Key responsibilities include assisting patients with activities of daily living (ADLs) such as bathing, dressing, and eating; helping with mobility by transferring patients from bed to chair or assisting with mobility devices; and

ensuring the patient's environment is clean and safe. Critically, PCTs are also responsible for vital data collection, including measuring and reporting blood pressure, heart rate, respiratory rate, and temperature. In some settings, their role may extend to more technical tasks like performing phlebotomy or obtaining electrocardiograms (EKGs). Within the ICU, the PCT's role of closely observing patients and promptly reporting any changes in their condition is paramount. They often spend more cumulative time at the bedside than any other clinician, making them a crucial liaison who can communicate a patient's concerns or subtle changes in condition to the nursing team [18].

2.3 The Principle of Delegation: Scope of Practice, Accountability, and the Five Rights

The professional relationship between the RN and the PCT is formally structured by the principle of delegation. Delegation is a complex managerial skill in which an RN, using professional judgment, authorizes a competent individual to perform a selected nursing task in a selected situation [19]. According to the American Nurses Association (ANA) and the American Association of Colleges of Nursing (AACN), while the RN may delegate a task, they retain ultimate responsibility and accountability for the overall nursing care provided and the patient's outcomes. The nursing process itself—the systematic functions of assessment, diagnosis, planning, and evaluation—is a professional responsibility that can never be delegated to a UAP [20].

This legal and professional framework is codified by each state's Nurse Practice Act, which defines the legal scope of practice for RNs and outlines the permissible activities for UAPs. Healthcare organizations are required to develop policies and procedures that align with these state-level regulations. Safe delegation is guided by the "Five Rights of Delegation": the Right Task, Right Circumstances, Right Person, Right Direction/Communication, and Right Supervision/Evaluation. The RN is accountable for making these five determinations before delegating. This includes assessing the patient's condition and stability, the complexity of the task, and the proven competence and abilities of the PCT to whom the task is being delegated [21].

This formal structure of delegation creates a unique and challenging dynamic. It establishes an information-asymmetry dyad, where the RN possesses the deep, holistic clinical context and understanding of the patient's pathophysiology and treatment plan (the "why"), while the PCT is often the most frequent and direct collector of raw, frontline data (the "what," such as vital signs or a patient's subjective complaint). Critical errors are therefore likely to arise not simply from poor execution of a task, but from a failure to effectively bridge this information gap. For example, a PCT may accurately measure and report a single elevated heart rate, but without the RN's clinical context, this data point may be dismissed. However, if the PCT is empowered to report with context—"The patient's heart rate is up, and they seem much more anxious and restless than before"—they provide a richer data stream that the RN can integrate into their holistic assessment, potentially identifying early signs of deterioration.

Furthermore, the legal principle of delegation creates a significant psychological and organizational tension. The RN is held accountable for outcomes but is functionally dependent on the PCT for task completion and patient surveillance. This creates a high-stakes dependency

where the individual with the most authority and accountability (the RN) has the least direct, hands-on contact for certain delegated tasks, while the individual with the most direct contact (the PCT) has the least authority. This dependency without direct control can lead RNs to adopt compensatory behaviors that are themselves risky, such as micromanagement, which can demoralize PCTs and distract the RN from other critical duties, or, conversely, insufficient supervision, which can lead to missed care or undetected errors. This underscores that safe delegation is not merely a matter of individual RN skill; it requires robust organizational systems that support this high-stakes relationship. Such systems must include stable staffing to allow for the development of trust, standardized and rigorous PCT training with competency validation, and structured communication forums where RNs and PCTs can build rapport and a shared understanding of patient needs.

3. The Nexus of Collaboration: Mechanisms of Effective Nurse-PCT Coordination

Having defined the distinct roles within the Nurse-PCT dyad, the analysis must now shift to the active processes that enable successful teamwork. Effective coordination is not a passive state but a dynamic, ongoing effort built upon specific cognitive and behavioral foundations. High-functioning teams in the ICU, including the Nurse-PCT dyad, do not emerge by accident; they are cultivated through the deliberate practice of shared situational awareness, structured communication, and unwavering mutual support. These mechanisms transform the relationship from a hierarchical, task-based exchange into a collaborative partnership focused on a single, unified goal: ensuring the patient's safety and well-being.

3.1 Shared Situational Awareness: Building a Common Mental Model of Patient Status

A cornerstone of effective teamwork in any high-stakes environment is the development of a shared mental model. This is a cognitive construct where all team members possess a common understanding of the situation, the goals, the tasks, and each other's roles and responsibilities. In the ICU, this translates to a shared, up-to-date understanding of the patient's health status and the overarching plan of care. This requires a continuous and dynamic exchange of information to build and maintain consensus among the care team [22].

For the Nurse-PCT dyad, cultivating a shared mental model elevates their interaction from a simple command-and-response structure to a collaborative partnership in patient surveillance. It means the PCT understands not just what task to perform, but why that task is clinically significant in the context of the specific patient. For example, an RN might delegate hourly urine output measurements to a PCT. In a purely transactional model, the PCT simply records a number. In a shared mental model, the RN briefly explains, "We are watching this patient's urine output very closely because we're concerned about a potential kidney injury from their sepsis." Armed with this context, the PCT is no longer just a data collector; they are a more sensitive and specific monitor. They are more likely to report a downward trend in output with a greater sense of urgency or to correlate it with another observation, such as the patient appearing more lethargic. This small investment of time by the RN to convey the "why" behind the task transforms the PCT's observations from raw data into intelligent, contextualized information, significantly enhancing the team's ability to detect early signs of deterioration. Formal mechanisms like daily rounds, multidisciplinary team meetings, and brief shift huddles are

designed to create and reinforce this shared understanding across the entire care team [13].

3.2 Communication Dynamics: From Task Assignment to Closed-Loop Feedback

If a shared mental model is the cognitive foundation of teamwork, then effective communication is the behavioral mechanism that builds and maintains it. Communication is universally cited as the cornerstone of teamwork in the ICU. To be effective in this high-stress environment, communication must be clear, concise, timely, and unambiguous to prevent the misunderstandings that can lead to patient harm. Research consistently shows that units prioritizing clear and open communication channels report lower rates of adverse events [23].

Key elements of effective communication include the use of standardized handoff protocols to ensure the safe transfer of care between shifts, the use of communication tools that support real-time information sharing, and participation in regular interdisciplinary team meetings [7]. A particularly critical communication practice for the Nurse-PCT dyad is "closed-loop communication." This is a technique, borrowed from HROs like aviation, where the sender initiates a message, the receiver accepts the message and provides feedback confirmation, and the sender verifies that the message was received and understood [24]. In practice, this means an RN delegate a task, the PCT verbally acknowledges the instruction and any key parameters, and after completing the task, the PCT reports back to the RN with the results and any relevant observations. The RN then confirms that they have received and understood the report. This simple, structured exchange ensures that tasks are not forgotten, information is not lost, and both parties have a shared understanding of the status of the delegated activity.

3.3 Mutual Support and Task Assistance in High-Workload Scenarios

High-performing teams are characterized by a strong sense of mutual support, where team members actively monitor each other's workload and proactively offer assistance without being asked [14]. This behavior is not just a sign of collegiality; it is a critical safety function. It builds a safety net that helps prevent individual team members from becoming overwhelmed, which is a state that significantly increases the risk of error. In the unpredictable environment of the ICU, where a patient's condition can deteriorate rapidly and demand an "all hands-on deck" response, this flexibility and willingness to provide backup is essential [25].

An effective Nurse-PCT team demonstrates this principle by functioning as a fluid and adaptable unit. The PCT might notice the RN is busy with a complex dressing change on one patient and proactively attend to the call light of another. Conversely, the RN might see that the PCT is struggling to reposition a particularly heavy patient and immediately step in to help. This dynamic of task assistance and proactive support ensures that patient needs are met in a timely manner and prevents important care activities from being missed or delayed. The American Association of Critical-Care Nurses (AACN) formalizes this concept in its standard of "True Collaboration," which requires that every team member contribute to the achievement of common goals by giving power and respect to each person's voice, resolving competing interests, and safeguarding the essential contribution each makes to achieve optimal outcomes [26]. This culture of mutual support is essential for building the trust and cohesion that allow the Nurse-PCT dyad to function at the highest level of reliability.

Applying the broader principles of interprofessional teamwork, as outlined by organizations like PAHO/WHO, to the specific Nurse-PCT relationship reveals a critical insight. These principles—including clear goals, a shared team identity, and interdependence—are often discussed in the context of collaboration between different professions, such as doctors, nurses, and pharmacists [12]. However, the healthcare system often fails to apply these same principles intra-professionally to the relationship between licensed nurses and unlicensed assistive personnel. Practices such as excluding UAPs from shift handovers or failing to include them in collaborative care planning actively undermine the formation of a "shared team identity" [11]. When a PCT is not included in the shift report, the implicit message is that they are not a core member of the team but rather an ancillary service provider. This reinforces hierarchy, discourages proactive communication, and inhibits the development of the very mutual support that defines high-performing teams. Therefore, to truly improve coordination, healthcare organizations must undertake a structural and cultural shift, intentionally integrating PCTs into the team's core rituals and communication workflows, such as mandatory inclusion in huddles and handoffs. This is not simply a matter of skills training; it is about fundamentally redefining the "team" to explicitly and consistently include the PCT as an integral member.

4. Pathophysiology of Error: Analyzing Breakdowns in Nurse-PCT Coordination

Just as understanding the pathophysiology of a disease is essential for effective treatment, understanding the mechanisms of failure in Nurse-PCT coordination is crucial for designing effective interventions to prevent critical errors. Breakdowns in this vital dyad are not random events; they follow predictable patterns rooted in communication failures, flawed delegation processes, divergent cognitive frameworks, and systemic pressures. This section dissects these common failure modes, exploring the root causes and cascading effects that transform a seemingly minor lapse into a significant threat to patient safety.

4.1 Communication Failures: Information Gaps, Misinterpretation, and Hierarchical Barriers

Communication breakdown is consistently identified as a primary contributor to medical errors and adverse patient outcomes. These failures can manifest in several ways: a complete lack of communication, the transmission of incorrect information, or the misunderstanding of correctly transmitted information. In the context of the Nurse-PCT dyad, these failures create dangerous information gaps. For example, a PCT may observe a subtle but significant change in a patient's condition—such as new-onset confusion or a slight change in skin color—but fail to report it, leaving the RN unaware of an early sign of deterioration [27].

A significant barrier to open communication is the "authority gradient," the perceived power differential between different roles in the healthcare hierarchy. This gradient can make a PCT, who is in a subordinate position, hesitant to speak up, question an RN's instruction, or assertively communicate a concern, even when they believe a patient is at risk. This creates a culture of silence where critical information is withheld. Furthermore, a landmark study revealed a critical nuance: a high frequency of communication does not necessarily equate to high-quality collaboration. While over 90% of RNs and PCTs in the study reported speaking with each other during a shift, their level of agreement on the patient's top care priorities was remarkably low—

even lower than the agreement between RNs and physicians. This suggests that the vast majority of their communication was purely transactional (e.g., "Please empty the Foley catheter") and lacked the substantive, goal-oriented dialogue needed to build a shared mental model and align on care priorities. This gap between the quantity and quality of communication is a major pathway to error [28].

4.2 Delegation Errors: Improper Task Assignment, Inadequate Supervision, and Competency Mismatches

Ineffective delegation is a direct and potent cause of missed nursing care and adverse patient events. Errors in this domain can take several forms. One of the most dangerous is delegating a task that is outside the PCT's legal scope of practice or for which the individual PCT has not demonstrated competency. This places the patient at immediate risk and exposes both the RN and the institution to legal and professional liability [29].

Even when a task is appropriate to delegate, errors can occur due to inadequate supervision. Research has shown that a substantial percentage—as high as 37% in one study—of adverse outcomes resulting from delegated tasks are related to the UAP's failure to receive or follow directions, which is directly linked to the RN's failure to provide adequate supervision and communication. This problem is compounded by the fact that RNs themselves often report a lack of formal education on how to delegate effectively and a significant discomfort with the supervisory aspect of their role [11]. This can lead to a dysfunctional cycle of either avoiding delegation altogether, which increases the RN's workload and risk of burnout, or delegating without the necessary oversight, which increases the risk of patient harm.

4.3 Divergent Care Priorities and Their Impact on Error Detection

Perhaps the most insidious mechanism of failure is the documented divergence in how RNs and PCTs perceive patient care priorities. Studies have shown that physicians and RNs tend to focus on the holistic clinical picture—diagnostics, treatments, and managing the patient's response to illness. PCTs, by contrast, tend to have a more task-oriented focus centered on personal care activities like feeding, bathing, and toileting [28].

This cognitive divergence is the central mechanism that connects poor communication to critical errors. The RN and the PCT are, in effect, observing the same patient through different conceptual lenses. The PCT's lens is focused on task completion ("Did I complete the bath and record the vital signs?"), while the RN's lens is focused on clinical trajectory ("Is this patient's condition improving or deteriorating?"). A critical error occurs when a vital piece of clinical information observed through the PCT's lens is not recognized as significant and therefore is not translated into a priority for the RN's clinical assessment. For instance, a PCT might notice that a patient who was previously cooperative is now slightly agitated during their bath. From a task-oriented perspective, this might be seen as a behavioral issue that makes the task more difficult. From a clinical perspective, however, this new agitation could be an early sign of hypoxia, sepsis, or delirium. If the PCT's divergent priority framework prevents them from reporting this "behavioral" change, the RN loses a critical opportunity for early intervention. This illustrates that errors are often not the result of a single, active failure but rather a systemic failure of two

parallel workstreams to intersect at a crucial moment.

4.4 System-Level Factors: The Influence of Staffing Models, Workload, and Organizational Culture

The failures described above do not occur in a vacuum; they are heavily influenced by the organizational systems and culture in which the Nurse-PCT dyad operates. Insufficient staffing is a major system-level factor that directly impacts safety. It increases the workload, stress, and burnout for all staff members, which has been shown to be a leading cause of missed nursing care and a significant predictor of adverse patient outcomes, including medication errors, falls, and infections [11].

High turnover among UAPs is another critical systemic issue. It creates an unstable work environment where RNs are forced to constantly re-teach tasks and re-evaluate the trustworthiness and competence of their delegates. This erodes the foundation of mutual trust that is essential for safe and effective delegation. Furthermore, the prevailing work culture of a unit can either foster or inhibit collaboration. A culture that systematically excludes PCTs from key communication events like shift handovers and care planning meetings actively prevents the formation of shared goals and perpetuates dangerous information silos [11].

These observations lead to a crucial conclusion: many of the challenges identified in Nurse-UAP teamwork—such as role ambiguity, poor communication, and ineffective delegation—are not merely individual skill deficits but are symptoms of a flawed organizational design. The healthcare system, often driven by economic pressures, can fall into the trap of treating PCTs as a fungible, low-skill resource pool rather than as integrated and essential members of the care team [30]. This organizational mindset creates the very conditions that precipitate "individual" failures. For example, if an organization relies heavily on agency PCTs with high turnover rates and provides only minimal, generic orientation, it creates a system where safe delegation is nearly impossible. The RN cannot reasonably build the knowledge of a delegatee's specific competencies that is required by professional standards for safe delegation [20]. Therefore, placing the full burden of responsibility for delegation errors on the individual RN is a form of blaming the victim of a poorly designed system. True, sustainable improvement requires a shift in focus from "fixing the nurse" to "fixing the system" through organizational-level interventions such as stable staffing models, robust competency programs for PCTs, and the structural integration of PCTs into all unit communication workflows.

5. Evidence-Based Frameworks for Fostering a Culture of Safety and Collaboration

To address the complex challenges of ensuring safety in the ICU, healthcare organizations do not need to start from scratch. Several leading patient safety organizations have developed comprehensive, evidence-based frameworks that provide a roadmap for creating high-reliability systems. These models move beyond isolated, reactive initiatives to promote a holistic approach where a culture of safety and collaboration is the foundation for all clinical processes. While often applied at a broad, interprofessional level, their core principles are directly applicable to strengthening the specific, high-frequency interactions of the Nurse-PCT dyad.

5.1 The Institute for Healthcare Improvement (IHI) Framework for Safe, Reliable, and

posthumanism.co.uk

Effective Care

The Institute for Healthcare Improvement (IHI) has developed a widely recognized framework that conceptualizes patient safety as a "system of safety," not merely a collection of standalone improvement projects. This comprehensive model is built upon two foundational domains: Culture and the Learning System. The framework posits that a positive, safety-oriented culture is the substrate upon which all effective processes are built, while a robust learning system ensures that the organization can continuously improve and adapt [31].

Within the Culture domain, a key component is Psychological Safety. This is defined as creating an environment where all staff members, regardless of their position in the hierarchy, feel comfortable speaking up, asking questions, reporting errors, and suggesting ideas without fear of blame, ridicule, or retribution [32]. This concept is of paramount importance for the Nurse-PCT relationship. A psychologically safe environment is one where a PCT feels empowered to voice a concern to an RN, to question an instruction that seems unclear or unsafe, and to report a near-miss without fear of negative consequences. Without psychological safety, the authority gradient can lead to a culture of silence, where critical safety information is withheld. Another core component of the IHI framework is Teamwork and Communication, which the IHI supports with a toolkit of practical, evidence-based strategies and tools designed to structure and improve interprofessional interactions [33]. The framework also uniquely emphasizes the engagement of patients and their families as the core of the system—the engine that drives the focus of all safety work [34].

5.2 The American Association of Critical-Care Nurses (AACN) Standards for a Healthy Work Environment

The American Association of Critical-Care Nurses (AACN) has long recognized that patient safety is inextricably linked to the well-being and functional capacity of the clinical staff. To this end, the AACN has established six evidence-based standards for creating and sustaining Healthy Work Environments (HWEs) [35]. These standards provide a framework for improving the organizational culture in which critical care is delivered.

A central standard within this framework is "True Collaboration." This standard requires that nurses be relentless in pursuing and fostering genuine collaboration among all members of the healthcare team. For organizations, this means providing resources for interprofessional education, establishing clear processes that define each team member's accountability for collaboration, and ensuring that the decision-making authority of nurses is acknowledged and respected. For individuals, it demands the mastery of skilled communication, acting with a high level of personal integrity, and contributing to the achievement of common goals by respecting each person's voice [26]. Other essential HWE standards that directly impact the Nurse-PCT dyad include Skilled Communication, which focuses on proficiency in communication skills, and Appropriate Staffing, which addresses the critical system-level factor of ensuring an effective match between patient needs and nurse competencies [35].

5.3 TeamSTEPPS®: Applying a Standardized Teamwork System to the Nurse-PCT Interface

TeamSTEPPS® (Team Strategies and Tools to Enhance Performance and Patient Safety) is a highly regarded, evidence-based teamwork system developed by the Agency for Healthcare Research and Quality (AHRQ) in collaboration with the U.S. Department of Defense [25]. Incorporating over two decades of scientific research on teams and team performance, the TeamSTEPPS curriculum is designed to optimize performance among teams of healthcare professionals, enabling them to respond quickly and effectively to any situation that may arise [14].

The program is built around four core, teachable-learnable competencies: Communication, Leading Teams, Situation Monitoring, and Mutual Support. TeamSTEPPS provides a shared language and a toolkit of specific strategies that can be directly applied to improve the interactions between RNs and PCTs. For example, the SBAR (Situation-Background-Assessment-Recommendation) tool provides a structured format for conveying critical information. The CUS (I am Concerned, I am Uncomfortable, this is a Safety issue) technique provides a script for team members to assertively voice concerns in a graded manner. Other tools, such as standardized handoffs, check-backs, and briefs/huddles, provide a systematic approach to ensuring that the entire team, including the PCT, is operating with a shared mental model [36].

A critical synthesis of these leading frameworks reveals a powerful, convergent theme: culture is the essential prerequisite for the effective implementation of any tool or process. A healthcare organization can invest in training its staff on the SBAR communication tool, but that tool will be ineffective if there is no underlying culture of psychological safety that empowers a PCT to use it to challenge an RN or physician. The IHI framework explicitly names "Culture" as a foundational domain, and the AACN's HWE standards are, in essence, a detailed blueprint for creating a positive safety culture. This means that an organization cannot simply "train" its way to better teamwork. Leadership's primary responsibility is not merely to purchase and deploy training programs but to actively model and relentlessly enforce the behaviors that create psychological safety. This includes publicly celebrating PCTs who speak up, swiftly addressing intimidating or dismissive behavior by any team member, and intentionally flattening hierarchies during safety-critical discussions.

Furthermore, while these frameworks are powerful, they are often presented and conceptualized at the broad interprofessional level (e.g., doctor-nurse-pharmacist collaboration during formal rounds). The significant implementation challenge, and a corresponding opportunity for future research, lies in the process of scaling and adapting these high-level principles to the specific, high-frequency, task-oriented micro-interactions that characterize the Nurse-PCT dyad. A full, formal SBAR report, for instance, may be too cumbersome and inappropriate for the rapid delegation of a simple task. The crucial work for healthcare organizations is to translate these macro-frameworks into practical "micro-practices." This could involve developing a simplified "mini-SBAR" for delegation, creating specific, validated scripts for PCTs to use when raising concerns, or designing huddle agendas that explicitly and efficiently solicit input from PCTs on specific observational data points. This translation from high-level theory to frontline practice represents a critical frontier for quality improvement initiatives and future patient safety research.

6. High-Impact Strategies for Enhancing Nurse-PCT Teamwork

Transitioning from theoretical frameworks to practical application, this section outlines concrete, evidence-based strategies that can be implemented at the unit and organizational levels to directly improve Nurse-PCT coordination and, by extension, patient safety. These strategies are not isolated tactics but interconnected components of a systematic approach to building a high-reliability care team. They focus on structuring communication, enhancing team skills through targeted education, providing supportive leadership, and ensuring role clarity and shared purpose.

6.1 Structured Communication Protocols: Implementing SBAR, Daily Huddles, and Standardized Handoffs

The implementation of structured communication protocols is one of the most effective ways to reduce ambiguity, prevent the omission of critical information, and create a shared language for teamwork. These tools provide a predictable framework for interactions, which is especially valuable in the high-stress, time-constrained ICU environment.

- **SBAR (Situation-Background-Assessment-Recommendation):** This widely adopted tool provides a clear, concise format for conveying critical information about a patient's condition. While traditionally used for nurse-to-physician communication, it can be powerfully adapted for use within the Nurse-PCT dyad. A PCT can be trained to structure their report to an RN using a simplified version of SBAR: "Here's the Situation: Mr. Smith's heart rate is 120. Background: It was in the 90s all morning. Assessment: He seems more restless and is picking at his sheets. I think something is wrong." This transforms a simple data report into a contextualized, actionable piece of clinical intelligence [37].
- **Daily Huddles:** Brief, standing meetings at the beginning of a shift offer a powerful forum for the entire team—explicitly including PCTs—to proactively manage safety for the day. Huddles can be used to review high-risk patients, anticipate potential problems, and ensure that all team members, including PCTs, are aligned on the key care priorities for each patient. This practice directly addresses the problem of divergent care priorities by creating a shared mental model at the outset of the shift [38].
- **Standardized Handoffs:** With some studies indicating that the majority of communication errors occur during the handover of patient care, implementing a standardized handoff process is a critical safety intervention. While the full, detailed RN-to-RN handoff may be too lengthy for PCTs, a structured, "mini-handoff" between the off-going and on-coming PCTs, ideally facilitated by the RN, can ensure that crucial information about patient needs, mobility status, and specific monitoring requirements is not lost between shifts [39].

6.2 Interprofessional Education and Simulation-Based Training

Didactic instruction alone is often insufficient to change ingrained team behaviors. Simulation-based interprofessional training (SBIT) has emerged as a highly effective methodology for allowing team members to practice and refine their teamwork and communication skills in a safe, controlled environment [40].

By recreating realistic, high-stakes ICU scenarios, simulation allows RNs and PCTs to practice their interactions under pressure. These scenarios can be specifically designed to challenge their

ability to communicate clearly, delegate effectively, provide mutual support, and escalate concerns. A crucial component of SBIT is the post-simulation debriefing, where a trained facilitator guides the team through a reflective discussion of their performance, identifying what went well and what could be improved. This experiential learning process has been shown to enhance clinical decision-making, improve understanding of different team members' roles and responsibilities, and directly address the hierarchical dynamics that can inhibit open communication [41]. Including both RNs and PCTs in the same simulation scenarios is essential for building a shared identity and practicing the specific interactions they will encounter in their daily work.

6.3 Leadership and Management Guidelines for Fostering Effective Collaboration

The quality of Nurse-PCT teamwork is heavily dependent on the leadership and management structures that support it. Nurse leaders at the unit and executive levels are responsible for creating and sustaining a culture that values collaboration and safety [42].

- **Cultural Leadership:** Leaders must actively cultivate a culture of mutual respect and shared decision-making. This involves practical behaviors such as regularly showing gratitude for the contributions of all team members (including PCTs), encouraging open dialogue where all ideas are welcomed, and avoiding a punitive, micromanagement style that demoralizes staff and discourages proactivity [43].
- **Policy and Accountability:** Organizations must have clear, accessible, and consistently enforced policies on delegation that are based on the state's Nurse Practice Act. RNs must receive formal education on these policies and on their legal and professional accountability when delegating tasks [44].
- **Workforce Stability and Competency:** A key leadership responsibility is to address the systemic factors that undermine teamwork. This includes implementing strategies to reduce high turnover among UAPs, which is a major barrier to building trust and cohesion. It also requires a commitment to providing robust, standardized training and ongoing competency validation for all PCTs to ensure they are prepared for the demands of the ICU environment and to give RNs confidence in their abilities [45].

6.4 Role Clarification and Shared Goal Setting at the Unit Level

Ambiguity regarding roles and responsibilities is a primary source of conflict and inefficiency in healthcare teams. At the unit level, managers should work with their staff to explicitly define and communicate the roles of RNs and PCTs and, most importantly, the expected workflows and communication patterns at their points of intersection.

A critical practice for fostering shared goals is the inclusion of PCTs in key communication events. The common practice of excluding PCTs from shift handovers is a significant barrier to teamwork, as it prevents them from hearing the overall plan of care and understanding the clinical context for their assigned tasks. While it may not be efficient for PCTs to attend the entire RN-to-RN report, a brief, targeted summary or a dedicated team huddle at the start of the shift can be used to align priorities and establish shared goals for patient care. This simple structural change

can have a profound impact on building a shared mental model and ensuring that both the RN and the PCT are working from the same playbook throughout the shift.

7. Conclusion

The central argument of this analysis is that the Nurse-PCT dyad functions as the primary unit of bedside care delivery and surveillance in the ICU. Breakdowns in their coordination—stemming from predictable and preventable failures in communication, delegation, and alignment of priorities—are a significant contributor to critical errors. The evidence demonstrates that these failures are not merely the fault of individuals but are often symptoms of unsupportive organizational systems, ambiguous role definitions, and cultures that fail to foster psychological safety and mutual respect.

Conversely, building a high-reliability Nurse-PCT team is achievable through a multi-faceted, systematic approach. This approach must be grounded in established safety frameworks from leading organizations like the IHI and AACN. It requires the implementation of structured communication protocols, ongoing and joint training using methods like simulation, and visible, supportive leadership at all levels of the organization. When the Nurse-PCT relationship is intentionally cultivated as a collaborative partnership, it becomes a powerful defense against error, enhancing the team's collective ability to anticipate risks, detect patient deterioration earlier, and respond more effectively to the dynamic challenges of the ICU.

References

- Latour JM, Kentish-Barnes N, Jacques T, Wysocki M, Azoulay E, Metaxa V. Improving the intensive care experience from the perspectives of different stakeholders. *Critical Care* [Internet]. 2022 Jul 18;26(1). Available from: <https://doi.org/10.1186/s13054-022-04094-x>
- Daly BJ, Douglas SL, O'Toole E, Rowbottom J, Hoffer A, Lipson AR, et al. Complexity Analysis of Decision-Making in the critically ill. *Journal of Intensive Care Medicine* [Internet]. 2016 Nov 20;33(10):557–66. Available from: <https://doi.org/10.1177/0885066616678394>
- Chan B, Hulen E, Edwards S, Mitchell M, Nicolaidis C, Saha S. “It’s Like Riding Out the Chaos”: Caring for Socially Complex Patients in an Ambulatory Intensive Care Unit (A-ICU). *The Annals of Family Medicine* [Internet]. 2019 Nov 1;17(6):495–501. Available from: <https://doi.org/10.1370/afm.2464>
- Latte TE. Complexity and communication challenges in the intensive care unit when high patient acuity. *J Intensive Crit Care Nurs*. 2022;5(5):124
- Structure, Process, and Outcome in Critical Care | Emory School of Medicine [Internet]. Available from: <https://med.emory.edu/departments/medicine/divisions/pulmonary/research/critical-care/structure-process-outcome.html>
- Hall LM, Reali V, Canzian S, Johnston L, Hatcher C, Hayward-Murray K, et al. Examining adaptive models of care implemented in hospital ICUs during the COVID-19 pandemic: a qualitative study. *BMJ Open Quality* [Internet]. 2023 Dec 1;12(4):e002353. Available from: <https://doi.org/10.1136/bmjopen-2023-002353>
- Owen A, Knight M, IU International University of Applied Sciences. *The Role of Team Communication in Reducing Medical Errors in Critical Care Units*. ResearchGate. 2025;

- Siewert B, Brook OR, Hochman M, Eisenberg RL. Impact of communication errors in radiology on patient care, customer satisfaction, and Work-Flow efficiency. *American Journal of Roentgenology* [Internet]. 2016 Feb 22;206(3):573–9. Available from: <https://doi.org/10.2214/ajr.15.15117>
- Howick J, Bennett-Weston A, Solomon J, Nockels K, Bostock J, Keshtkar L. How does communication affect patient safety? Protocol for a systematic review and logic model. *BMJ Open* [Internet]. 2024 May 1;14(5):e085312. Available from: <https://doi.org/10.1136/bmjopen-2024-085312>
- Kiarie P, Elillä H, Lahti M. ASPECTS ON PATIENT SAFETY IN INTENSIVE CARE UNIT – A literature review [Internet] [thesis]. Turku University of Applied Sciences. 2011. Available from: <https://core.ac.uk>
- Wong KL, Chua WL, Griffiths P, Goh QLP, Low KWC, Tan JQA, et al. Teamwork between registered nurses and unlicensed assistive personnel in acute care settings: a scoping review. *International Journal of Nursing Studies Advances* [Internet]. 2025 Jan 13;8:100293. Available from: <https://doi.org/10.1016/j.ijnsa.2025.100293>
- Interprofessional health teams [Internet]. PAHO/WHO | Pan American Health Organization. 2025. Available from: <https://www.paho.org/en/topics/interprofessional-health-teams>
- Ervin JN, Kahn JM, Cohen TR, Weingart LR. Teamwork in the intensive care unit. *American Psychologist* [Internet]. 2018 May 1;73(4):468–77. Available from: <https://doi.org/10.1037/amp0000247>
- Despins LA. Patient safety and collaboration of the intensive care unit team. *Critical Care Nurse* [Internet]. 2009 Apr 1;29(2):85–91. Available from: <https://doi.org/10.4037/ccn2009281>
- UniCamillus A. The role of the ICU nurse [Internet]. Unicamillus. 2024. Available from: <https://unicamillus.org/en/news/the-role-of-the-icu-nurse/>
- Malinowski S. What does an intensive care nurse do and is it stressful? [Internet]. American Military University. 2024. Available from: <https://www.amu.apus.edu/area-of-study/nursing/resources/what-does-an-intensive-care-nurse-do>
- Furnal N. What does a patient care technician do? [Internet]. Florida National University (FNU). 2025. Available from: <https://www.fnu.edu/what-does-a-patient-care-technician-do/>
- Al DVE. PCT: Strategy and practice. Kluwer Law International B.V.; 2021.
- Calderon-Margalit R, Orinovsky I RN, Toren O. Nurses Working With Unlicensed Assistive Personnel: A Phenomenological Study. *Journal of Clinical and Practical Nursing* [Internet]. 2017 Jun 20;1(1):1. Available from: <https://oap-journals.org/jcnp/article/499>
- American Nurses Association. ANA's Principles for Delegation by Registered Nurses to Unlicensed Assistive Personnel (UAP). Silver Spring (MD): American Nurses Association; 2012.
- Nursing ORF, Ernstmeyer K, Christman E. Chapter 1 Scope of practice [Internet]. *Nursing Fundamentals* - NCBI Bookshelf. 2021. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK591808/>
- Chen Y, Gong Y. Teamwork and patient safety in intensive care units: challenges and opportunities. *Studies in Health Technology and Informatics* [Internet]. 2022 Jun 6; Available from: <https://doi.org/10.3233/shti220120>
- Meneses-La-Riva ME, Fernández-Bedoya VH, Suyo-Vega JA, Ocupa-Cabrera HG, Grijalva-Salazar RV, Di Deus Ocupa-Meneses G. Enhancing healthcare efficiency: The relationship between effective communication and teamwork among nurses in Peru. *Nursing Reports* [Internet]. 2025 Feb 7;15(2):59. Available from: <https://doi.org/10.3390/nursrep15020059>

- Eduardo Salas. Patient Safety Curriculum Guide [Internet]. Available from: https://cdn.who.int/media/docs/default-source/patient-safety/curriculum-guide/resources/ps-curr-teach-guides/topic-04_being-an-effective-team-player_teaching-slides.pdf?sfvrsn=57b7a95_9
- Focusing on teamwork and communication to improve patient safety | AHA News [Internet]. American Hospital Association | AHA News. 2017. Available from: <https://www.aha.org/news/blog/2017-03-15-focusing-teamwork-and-communication-improve-patient-safety>
- True Collaboration - AACN [Internet]. AACN. Available from: <https://www.aacn.org/nursing-excellence/healthy-work-environments/true-collaboration>
- Dingley C, Daugherty K, Derieg MK, Persing R. Improving patient safety through provider communication strategy enhancements [Internet]. *Advances in Patient Safety: New Directions and Alternative Approaches (Vol. 3: Performance and Tools)* - NCBI Bookshelf. 2008. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK43663/>
- Evanoff B, Potter P, Wolf L, Grayson D, Dunagan C, Boxerman S. Can we talk? Priorities for patient care differed among health care providers [Internet]. *Advances in Patient Safety: From Research to Implementation (Volume 1: Research Findings)* - NCBI Bookshelf. 2005. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK20468/>
- Moradi T, Rezaei M, Alavi NM. Delegating care as a double-edged sword for quality of nursing care: a qualitative study. *BMC Health Services Research* [Internet]. 2024 May 7;24(1). Available from: <https://doi.org/10.1186/s12913-024-11054-4>
- Anthony M, Vidal K. Mindful Communication: a novel approach to improving delegation and increasing patient safety. *OJIN the Online Journal of Issues in Nursing* [Internet]. 2010 May 31;15(2). Available from: <https://doi.org/10.3912/ojin.vol15no2man02>
- A framework for safe, reliable, and effective care [Internet]. Institute for Healthcare Improvement. 2024. Available from: <https://www.ihl.org/library/white-papers/framework-safe-reliable-and-effective-care>
- Institute for Healthcare Improvement, Safe & Reliable Healthcare. Diagnostic Tool: a framework for safe, reliable, and effective care [Internet]. *Diagnostic Tool: A Framework for Safe, Reliable, and Effective Care*. Available from: <https://www.ihl.org/sites/default/files/IHI-Diagnostic-Tool-Framework-for-Safe-Reliable-Effective-Care.pdf>
- Frankel A, Haraden C, Federico F, Lenoci-Edwards J. *A Framework for Safe, Reliable, and Effective Care*. White Paper. Cambridge, MA: Institute for Healthcare Improvement and Safe & Reliable Healthcare; 2017.
- Patient Safety Essentials Toolkit [Internet]. Institute for Healthcare Improvement. 2023. Available from: <https://www.ihl.org/library/tools/patient-safety-essentials-toolkit>
- American Association of Critical-Care Nurses. *AACN scope and standards for acute and critical care nursing practice*. 2nd ed. Aliso Viejo (CA): American Association of Critical-Care Nurses; 2015.
- AHA TEAM TRAINING. *TeamSTEPPS POCKET GUIDE* [Internet]. *TeamSTEPPS POCKET GUIDE*. 2013. Available from: https://www.aha.org/system/files/media/file/2024/04/TeamTraining_PocketGuide_Feb2024_022824.pdf
- Shahid S, Thomas S. Situation, Background, Assessment, Recommendation (SBAR) Communication Tool for handoff in Health care – a narrative review. *Safety in Health* [Internet]. 2018 Jul 28;4(1). Available from: <https://doi.org/10.1186/s40886-018-0073-1>

- Pimentel CB, Snow AL, Carnes SL, Shah NR, Loup JR, Vallejo-Luces TM, et al. Huddles and their effectiveness at the frontlines of clinical care: a scoping review. *Journal of General Internal Medicine* [Internet]. 2021 Feb 8;36(9):2772–83. Available from: <https://doi.org/10.1007/s11606-021-06632-9>
- WHO Collaborating Centre for Patient Safety Solutions. Patient Safety Solutions | volume 1, solution 3 | May 2007. Patient Safety Solutions [Internet]. 2007 May; Available from: <https://cdn.who.int/media/docs/default-source/patient-safety/patient-safety-solutions/ps-solution3-communication-during-patient-handovers.pdf>
- Sung TC, Hsu HC. Improving critical care teamwork: Simulation-Based interprofessional training for enhanced communication and safety. *Journal of Multidisciplinary Healthcare* [Internet]. 2025 Jan 1; Volume 18:355–67. Available from: <https://doi.org/10.2147/jmdh.s500890>
- Kubbara A, Wong J, Capp K, Woldegerima S, Sundberg MA, Olson APJ, et al. Moving toward Interprofessional Teaching in the Intensive Care Unit: A Mixed Methods Study. *ATS Scholar* [Internet]. 2024 Dec 1;5(4):559–74. Available from: <https://doi.org/10.34197/ats-scholar.2024-0039oc>
- Teamwork in Nursing: Team-Building Strategies for Better Patient care [Internet]. ANA. 2024. Available from: <https://www.nursingworld.org/content-hub/resources/nursing-leadership/teamwork-in-nursing/>
- Shanker B. Leadership Behaviors that Bridge Cultural Divides: A Study of Transformational Leadership and Communication in Diverse Organizations [Internet]. Vol. 11, *Journal of Emerging Technologies and Innovative Research*. 2024. Available from: <https://www.jetir.org>
- NCSBN – ANA. National Guidelines for Nursing Delegation [Internet]. 2019 Apr p. 2–10. Available from: https://www.ncsbn.org/public-files/NGND-PosPaper_06.pdf
- Pigola A, De Moraes GHSM, Prado NBD, Lucas AC, Sigahi TFAC, Anholon R. Transformational leadership addressing team performance: situational challenges in corporate settings. *Journal of Work-Applied Management* [Internet]. 2024 Dec 20; Available from: <https://doi.org/10.1108/jwam-08-2024-0115>.