INTERPROFESSIONAL COLLABORATION AMONG EMERGENCY, NURSING, SURGICAL, AND ECG TECHNICIANS: IMPACT ON PATIENT OUTCOMES

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Abstract

Background: The current state of health care delivery involves an intricate system of service delivery requiring interface across different professionals. The interprofessional collaboration (IPC) of emergency technicians, nurse, surgeons, and electrocardiogram (ECG) technicians is pivotal for determining outcomes, especially in emergency care settings.

Objective: The research focuses on the interprofessional collaboration of emergency nurses, surgeons and ECG technicians and its effect on patient outcomes including: death, length of hospital stay, medical errors, and patient satisfaction.

Methods: A comprehensive literature review was completed across several databases, including PubMed, CINAHL and Cochrane Library, covering literature published from 2015-2024. The IPC reviews included quantitative studies, systematic reviews and meta-analyses. The reviews focused on the effectiveness of IPC in the acute care settings.

Results: The evidence is overwhelming on the effectiveness of interprofessional collaboration and its positive impact on patient outcomes. Institutions with organized IPC reported 23-35% medical errors reduction, 15-28% lower death rates, and 18-32% increase

in patient satisfaction. Effective collaboration is impeded by problems in communication, gaps in training, and hierarchies.
Conclusions: Integration of emergency, nursing, surgical, and ECG technicians interprofessional collaborations, changes patient outcomes for the better. For healthcare institutions to reap the benefits of improved patient safety and clinical efficiency, the development of supportive organizational structures for interprofessional collaborative training, and structured communication and team enhancement organizational culture is essential.
Keywords: Interprofessional collaborations, emergency services, nursing, surgical, ECG technicians, patient outcomes, healthcare services, team care.

1. INTRODUCTION

1.1 Background and Overview

Modern healthcare is constantly changing and adapting. Over the last several decades, the discipline of healthcare is changing from a physician-centered practice to a more inclusive practice of team-based care. As healthcare has developed, the complexity of patient care, the need for technological advancements, and the expected care for quality have all moved toward both collaboration and team-based Interprofessional collaboration (IPC). Today, healthcare is no longer the domain of a single specialist, and several medical professionals must work together to deliver the best care to a patient.

Interprofessional collaboration occurs when professionals from different disciplines work in partnership. With interprofessional collaboration, healthcare providers are able to deliver patient-centered care and, with the collaboration, all professionals work in partnership, and it goes beyond the interprofessional collaboration framework of developing relationships to work in partnership. These partnerships enhance healthcare quality, reduce clinical errors, and improve clinical outcomes.

In acute care environments, including emergency departments, operating rooms, and cardiac care units, the coordination of emergency medical technicians, nurses, surgeons, and ECG technicians becomes very important. These professionals work at the forefront of patient care, and their rapid evaluation, precise diagnosis, and timely action can mean the difference between life and death. The interconnectedness of these roles creates a sophisticated pattern of relationships, which, when well coordinated, results in excellent patient care.

1.2 The Critical Roles in Acute Care

Emergency medical technicians are the first healthcare professionals to assess critically ill patients, and perform rapid lifesaving medical interventions, and then relay the pertinent patient information to the healthcare team who will take care of the patient. Their assessment and lifesaving interventions will determine the trajectory of the care to follow.

Nurses are the core of every healthcare system, and work to perform ongoing patient observation, treatment administration, monitoring of the patient, and coordination of care, while also serving as the communication link between various health professionals. Because of their continued contact with the patients, nurses are in the best position to detect deterioration in the patient's condition, and take action to advocate for the patient.

Surgical teams, which are composed of a surgeon and surgical nurses and technicians, perform complex surgeries that require a high level of coordination, communication, and trust. Siloed teams are a major factor that Abstracts the efficiency of surgical procedures.

ECG technicians monitor hearts and provide detail-critical information necessary for decision-making when treating heart problems. Their ability to quickly identify problems

and provide the information necessary to intervene during a myocardial infarction, arrhythmias, and heart failure is invaluable.

1.3 Why Interprofessional Working is Crucial

In healthcare, errors are one of the leading causes of ill health and death, and it is estimated that nearly 250,000 - 400,000 people die each year in the US due to medical errors, many of which are due to a lack of communication. A large percentage of these errors occur at the boundaries of various healthcare professionals, which is why interprofessional collaboration is essential.

When healthcare is delivered in a fragmented manner, and when professionals work in silos and do not share information, it poses a significant risk to patients and is ineffective. In contrast, interprofessional teams that communicate and work in a coordinated fashion achieve better clinical outcomes such as lower mortality, shorter hospital stays, fewer complications, and higher satisfaction.

1.4 Research Objectives

For the purposes of this study, the researcher will accomplish the following objectives:

1. To assess the state of interprofessional collaboration amongst the emergency, nursing, surgical, and ECG technicians in the acute care setting.

2. To determine how interprofessional collaboration positively affects patient outcomes in barriers such as patient mortality, morbidity, length of stay, and patient satisfaction.
3. To assess the barriers and facilitators that promote or hinder successful interprofessional collaboration.
4. To identify evidence based methods and practices to improve interprofessional collaboration.
5. To give and provide health care organizations that improve and maximize their delivery of care, prioritizing interprofessional collaboration, the tools to improve and fasten their delivery of care.

1.5 Significance of the Study

The study of interprofessional collaboration also brings some improvements to the impact of patient outcomes, which to some extent, is beneficial to health care policymaking, organizational management, and clinical practice. As most of the healthcare systems are experiencing pressures to improve and maintain low operational costs, the interprofessional collaboration becomes an essential component of great value.

The present study contributes to the extant literature that supports the implementation of team based care models to improve the collaborative practice. This study also tackles an important issue in the literature to enhance care (most especially in high urgent clinical setting) and improves the care coordination in this field.

2. LITERATURE REVIEW

2.1 Conceptual Foundations of Interprofessional Collaboration

There have been many definitions of Interprofessional Collaboration (IPC) but all of them see Interprofessional Collaboration as a key concept in modern health care. Based on theories of teamwork, organization behavior, and systems thinking, the World Health Organization Interprofessional Education and Collaborative Practice states that, "IPC takes place when an interprofessional health care team collaborates with the patients, families, caregivers, and communities to provide the best possible health care."

The basic theories of IPC stem from solid frameworks. Social interdependence theory suggests that working together as a team, rather than in isolation or in a competitive

environment, fosters increased individual accomplishment and higher productivity outcomes. When applied to health care, this theory suggests that when the professionals working together realize their interdependence and work toward a common objective, there are substantial improvements in patients' health outcomes.

Health care professionals develop strong professional identities and role theories primarily through education and socialization within the field. This can either aid or act as a barrier to collaborative teamwork, especially when professional identities have been undervalued within team contexts.

2.2 Historical Evolution of Team-Based Care

Over the years, the structure of health care alongside patient care has evolved from individual practice to collaborative work. This has been influenced by the complexity of the field of medicine and the changing needs of patients. In the early years, physicians exercised considerable freedom and decision-making power, working without the collaboration of other members of the health care team. This hierarchical approach, whereby nurses, and other health care technicians, were constrained to the lower levels of the organization, continued unchallenged for decades.

The patient safety movement and the publication of formative work like the Institute of Medicine's "To Err is Human" (2000) took this challenge from the formal hierarchical structure. Realizations that medical errors were often the result of the failure to work collaboratively and poor communication within the health care team. This prompted the advocacy of collaborative team practice across the health care systems. Other reports, like, "Crossing the Quality Chasm (2001)," that followed the above publication also advocated that health care be provided by coordinated teams working together rather than by individual practitioners.

2.3 Evidence on Interprofessional Collaboration and Patient Outcomes

2.3.1 Mortality and Morbidity

There is evidence from several studies that effective interprofessional collaboration has impacted some clinical settings and has a positive impact on reducing mortality and morbidity. In a systematic review carried out by Pannick et al. (2015), of 35 studies, it was found that there was a significant reduction of mortality attributable to structured teamwork interventions that were implemented in some acute care settings and this was evidenced by odds ratios of between 0.67 and 0.82 in some of the studies.

In an emergency department setting, Flowerdew et al. (2012) reported that better team teamwork and collaboration resulted in a decrease in the trauma resuscitation death and complications rate by 34%. Increased role assignment, closed loop leadership, and more team huddles were the main causes of the improved team function.

The collaboration of surgical teams and its impact on outcomes has also been studied extensively. Neily et al. (2010) studied 74 veterans affairs hospitals and found that surgical mortality decreased by 18% in the two years following the implementation of TEAM training. The study attributed the results to improved communication, consistent use of safety checklists, and a psychologically safe team environment.

2.3.2 Hospital Length of Stay and Resource Utilization

The impact of interprofessional collaboration on the operational efficiency of a hospital, particularly length of stay and resource use, is also significant. Zwarenstein and Reeves (2006) systematic review showed that interprofessional rounding and joint collaborative care planning resulted in a decreased length of stay of 2.3 days on average across several studies.

Collaborative practice models demonstrate great effectiveness in cardiac care units where ECG technicians are part of the team. Interdisciplinary cardiac care teams cut average

length of stay by 26% and improved patient outcomes simultaneously (Brennan et al. 2013). ECG punctuality in both interpretation and communication with clinical teams is paramount.

Much like other areas of the health care system, emergency department throughput and efficiency has improved in part due to interprofessional collaboration. Evidence shows that communication protocols are effective in reducing patient boarding time, and that they improve workup times and admission/discharge timeliness.

Medical Errors and Patient Safety

Interprofessional collaboration is essential for patient safety since communication failures are estimated to cause 70-80% of major medical errors. Sentinel events (such as wrong site surgeries, medication errors, delays in treatment, etc.) have been attributed to communication failures by The Joint Commission, which continues to identify these events as top safety concerns.

Studies, including the one by De Meester et al. (2013) that reported 30% fewer adverse events because of SBAR, link the adoption of structured communication approaches, like SBAR (Situation-Background-Assessment-Recommendation), to reduced communication-related errors. In the adverse events case, enhanced communication during shift changes was reported.

Formalized interprofessional collaboration in emergency phases of a surgery has brought about great safety advancements. A WHO Surgical Safety Checklist study involving over 7,000 patients across 8 hospitals demonstrated a 36% decrease and a 47% decrease in major complications and mortality, respectively, post checklist implementation.

2.3.4 Patient Satisfaction and Experience

Interprofessional collaboration's impact on patient perception of care as high quality has contributed to patient satisfaction becoming a more prominent quality measure. There are numerous patient satisfaction surveys that have shown a direct connection to the quality of teamwork and its observed behaviors in the setting, as shown by Korner et al. (2016) with a direct correlation of the observed teamwork quality to patient satisfaction through r values ranging from 0.42-0.58.

When patients feel that their health care team is unified, and that there is a collegial and collaborative workflow toward a common goal, patient satisfaction scores are higher. Schmutz et al. (2013) found that team behaviors, such as decision-making and support, were strong predictors of collaboration with patient satisfaction, explaining 67% of the variance in their model.

2.4.2 The Role of EMTs within Integrated Care

Emergency Medical Technicians and Paramedics play a pivotal part in the continuity of care within the crisis management. EMTs perform a pre-hospital evaluation, perform some immediate interventions, and communicate with the destination facilities and prepare the personnel for the delivery of care. Jensen et al. (2013) reported that there was an averaged time savings of 18 minutes to receive definitive therapy for ST-Elevation Myocardial Infarctions when there was a structure communication protocol in place between the EMS and the ED.

There is a care continuity communication gap that is well known when transitioning from pre-hospital to hospital. Studies show that approximately 30% of the key information is lost when there is a verbal handoff from the paramedic to the ED staff. The use of structured handoff methods and the introduction of electronic communication methods have documented a significant improvement in the extent of information flow.

2.4.3 Surgical Teams and Collaborative Excellence

Effective collaboration and coordination among the surgical staff are key determinants to positive surgical outcomes. In the aviation industry, lessons pertaining to crew resource management have been tailored to surgical settings, focusing on the development of shared mental models, cultures where speaking up is the norm, and the systematic approaches to error detection.

Mazzocco et al. (2009) researched 2,316 surgical cases and discovered that there was a lack of teamwork and collaboration in 30% of general surgical cases and this lack of collaboration resulted in higher rates of complications. On the contrary, there was a phenomenon where surgical teams outperformed their peers and exhibited exemplary teamwork, and such teams communicated effectively.

2.4.4 ECG Technicians and Cardiac Care Coordination

ECG technicians have a unique and specialized role in the diagnostic and management of cardiac emergencies. Their ability to rapidly procure, analyze, and relay significant electrocardiographic data is a key factor in timely management of patients in scenarios such as acute myocardial infarction, where every minute counts.

With respect to percutaneous coronary intervention, there have been numerous studies that analyze the door-to-balloon time and, in doing so, have established that ECG acquisition and interpretation are pivotal in this timeframe. In research conducted by Bradley et al. (2006), hospitals that had the implementation of efficient ECG protocols, along with interprofessional communication systems, were able to achieve door-to-balloon time that was 23 minutes shorter than hospitals that utilized conventional systems.

2.5 Barriers to Effective Interprofessional Collaboration

Though there is ample evidence in support of interprofessional collaboration, there exists considerable barriers to its practical application.

2.5.1 Professional Silos and Hierarchies

For years, each healthcare profession has operated within their own silos, each with their own education pathways, regulatory bodies, and distinct professional cultures. These silos manifest barriers to collaboration and strengthen professional hierarchies, which may inhibit the opportunity for open dialogue and mutual acknowledgement.

The disproportionate hierarchies, particularly the traditional head of the physician, are noted as major barriers to the effective functioning of a team. Manser (2009) found that the steepness of the hierarchical gradient disencouraged the lower members of the team from speaking out on issues pertaining to safety, even when the relevant information was present with them.

2.5.2 Communication Problems

Communication problems come in many forms, with some of these being the lack of information sharing, the omission of key information, misunderstanding of the message, and, in some instances, failure to disclose key information. The lack of sharing information and of collaboration are a result of the difference in professional jargon and texts that is used as well as the standards of communication across varying professions.

The environmental conditions in the acute care setting that further exacerbate the communication problems include the high levels of noise, too many distractions, and the time pressure involved in care delivery. Studies show that in communication interruption analysis of the emergency department, communication was interrupted, on average, once every 6-9 minutes. The overall collaboration of the information communicated was diminished greatly.

2.5.3 Gaps in Education and Training

In many traditional health care educational programs, the focus is on the knowledge and skills that are profession-specific to the learner, with interprofessional education being minimal. Surveys indicate that many health professionals receive inadequate education with regards to the competencies of team work, collaborative decision making, and conflict resolution.

Absence of standardization of knowledge and skills results in inequitable interdisciplinary work and competencies among various disciplines and sectors. Some graduates of educational programs that have some elements of interprofessional practice will enter the workforce without any formal education on teamwork.

2.5.4 Organizational and Systemic Factors

Healthcare institutions do not have the necessary infrastructure to support interprofessional collaboration. Negative team interactions and poor information sharing can result from the design of the physical workspaces, the scheduling of the work, and the systems used to document work.

Collaborative work is difficult to achieve when there is little time available, when there is little budget to allow for the employment of collaboration enhancing tools, or when the use of collaboration enhancing tools has not been budgeted, and when there are staffing and time constraints.

3. THEORETICAL FRAMEWORK

3.1 Systems Theory and the Delivery of Health Care

This research considers systems theory as the main approach to understanding collaborative-competence across professional boundaries. Systems theory considers health organizations as complex adaptive systems and individual health professionals as components of the system. In the system, individual health professionals interact and, in the process, determine the health outcomes of the patients.

From a systems viewpoint, the quality of patient care in health services delivery results from the interaction and interdependence of emergency response, nursing care, surgery, and other diagnostic and treatment sub-specialties as collaborative subsystems of the care (patient) system. High system quality is a function of excellence in all components and sub-systems, coupled with seamless integration, specified interdependence, and collaborative synchronization.

The focus of systems thinking on feedback loops emphasizes interdependence, and nonlinearity in the complex and dynamic framework of health care services delivery systems. In particular, the framework shows how the absence of any single subsystem (for instance, interpreting an ECG in a timely manner) can cascade through the system and \ultimately result in poor patient outcomes.

3.2 Teamwork and Models of Team Effectiveness Elaboration

The model of the Big Five teamwork of Salas and his colleagues provided another model to ground this research. The model identifies five teamwork competencies as core to effective teamwork.

Team Leadership: This is the ability to manage the activities of a team, including resource allocation, motivation, and facilitation of problem solving for the team.

Mutual Performance Monitoring: This is the ability of team members to observe, identify, and give feedback to each other on their performance, errors, and/or omissions.

Backup Behavior: The cooperation and teamwork of individuals to help each other and temporarily share different tasks or roles every now and then to help sustain the same level of productivity of the collective.
Adaptability: The ability that a given team possesses, to change or modify the techniques, achieve different task redistribution, or change their actions in response to the team and the ever-changing circumstances the environment is offering.
Team Orientation: The value that a given individual or a team of people willingly place on the aim of the team as a whole and the collaborative working process, as opposed to only working toward their goal.
In the context of healthcare, such actions as aforementioned illustrated these competences. In team leadership participants such role like charge nurse who coordinate the activities of care or the surgeon who lead a team of operative is seen to be in charge. Mutual performance monitoring as in nurse checking the orders for medication or ECG technician warning the clinician on abnormal rhythms of the heart. Backup behaviour is demonstrated for and by team members relieving the other team of their work overload or taking over duties in unforeseen emergencies / crisis.

3.3 Communication and Information Processing Theory

The very core of every multidisciplinary collaboration is communication. In this study, we will attempt to explain and understand the flow of information between the different actors in the system: emergencies, nurses, surgeon, ECG technician, and the level of communication in the system to understand the value of collaboration.
The theory of shared mental models states that a high performing / effective team has developed a shared mental model in that they understand the goals of the team, the roles of the different members, the situational context, and the tasks that need to be accomplished. With synchronized mental model, the team members are able to predict each other's needs and perform seamless cooperation with autonomous individual actions. In health care situations, mental models allow teams to manage and operate efficiently during challenging situations. For instance, trauma teams develop and execute resuscitation in concert, and each professional on the team plays their part and moves to acquire their resources, and no one communicates.

3.4. Merging Different Theories

These theoretical lenses inform the research in conceptual frameworks. Systems theory gives the research framework a macro level perspective. Collaboration across disciplines in teams and organizations of different levels is a meso level approach, and in this case, teamwork models give the thinking framework. Communication theory is used at the micro level, which encompasses the daily work done in collaboration.
Using all these different perspectives makes it possible to answer how inter-professional collaboration in emergency care, nursing, surgery, and ECG technicians improves care delivery by influencing the outcomes on patients in many different ways and through different systems**.**

4. IMPACT ON PATIENT OUTCOMES: EVIDENCE SYNTHESIS

4.1 Clinical Outcomes and Mortality

Interprofessional relationships and their influence on clinical advantages and even the deaths that occur have been studied the most. Meta-analysis has found a 15-35% reduction in deaths across studies, with effective collaboration becoming a practice in facility-acute care.

For instance, a meta-analysis conducted by Zwarenstein et al. (2009) reviewed 15 RCTs and showed a reduction in mortality in IPC outcomes with a pooled odds ratio of 0.73 (95% CI: 0.63-0.85). Larger effect sizes were noted in the ICUs and in surgery, where the quality of teamwork most directly influenced patient survival.

The mortality reduction collaborative effect includes:

Prompt Problem Derivation: Collaborative teams are able to identify clinical deterioration and determine clinical deterioration faster due to team monitoring and information-sharing across various professions.

Timely Decision Derivation: There is a faster rate of clinical diagnostic and therapeutic decisions in the presence of effective professional collaboration. Mortality is directly affected with faster collaboration in time-constricted conditions, e.g. sepsis, stroke, and acute myocardial infarction.

Increased Error Prevention and Recovery: Collaborative teams are superior in detecting and recovering from errors. Defective monitoring of a patient status by several professionals provides a safety net that removes harm from errors.

Sepsis Treatment Implementation: Coordinated team compositions including emergency physician, nurse, and laboratory technician pairs exhibit higher degrees of participation and fulfillment of treatment bundles for sepsis.

4.2 Morbidity and Complications

Interprofessional collaboration also affects the rates of morbidity and complications. In surgical outcomes, various literatures show and suggest that structured collaboration of the modules in the team decreases the rate of major complications to a significant level of 20-40%. One of the studies is the WHO Surgical Safety Checklist Study. This study is the first of its kind to demonstrate the impact of checklists on interprofessional collaboration in various sites and with various patient populations. The study showed that the checklist approach reduced complications overall from 9.0 to 7.0%. This 36% reduction was in the total complications. Several specific complications that improved included surgical site infection, unplanned reoperation, and pulmonary complication.In cardiac care, the absence of ECG technicians is disadvantageous. Collaborative practice models have positive outcomes of reduced adverse events. In the studies of Managing Acute Coronary Syndrome, institutions that have structured ECG technician integration into care teams demonstrated 28% fewer major adverse cardiac events than those in traditional models.In emergency department, research shows that structured teamwork in trauma resuscitation reduces the incidence of {[missed injuries]} and {[inappropriate interventions.]} It allows for improved patient assessments and treatment plans.

4.3 Hospital Length of Stay and Resource Utilization

Healthcare efficiency metrics respond favorably to enhanced interprofessional collaboration. Across varying patient populations and interventions dimensions, research shows a diminishing hospital length of stay, recorded between 1.5 and 3.5 days. Hospital length of stay shows a steady decrease.

Efficiency improvement mechanisms driving these results include:

In some hospitals, Coordinated Care Planning involves Subsequently removing individual professionals to work as one unit instead of to themselves. Integration facilitates unit coordination and patient pathways. Interprofessional daily rounds. improve interdisciplinary coordination. Hospital stay lenght.

Reduced Complications: Complications extend hospital stays; therefore, reductions due to collaboration result in improved efficiency metrics.

Enhanced Discharge Planning: Nurse, case manager, and physician interprofessional teams more effectively resolve discharge barriers for a seamless transition to post-acute care.

Optimized Resource Allocation: Interdisciplinary teams communicate to prevent unnecessary testing and treatment and avoid medication errors that require prolonged monitoring, intensive care, and over-utilization of healthcare resources.

Economic analyses demonstrate substantial cost savings associated with collaborative practice models. A study by Schmalenberg and Kramer (2009) noted that hospitals with a culture of interprofessional collaboration experienced a decrease in length of stay and complications resulting in annual savings of $1.2-2.8 million.

4.4 Patient Safety and Error Reduction

Perhaps the most important component of interprofessional collaboration is patient safety. Communication failures account for 60-70% of sentinel events reported to The Joint Commission. Enhancing cooperative work within a team is a way to address that issue.

Some of the safety benefits of IPC include:

Reduction of Errors Related to Medication: Managed medication therapy in collaboration with a pharmacist, nurse, and physician team model has shown a 30-50% decrease in medication errors in studies. Safety is improved with closed-loop communication in the medication administration process, systematic double-checking of high-risk medications, and interprofessional medication reconciliation.

Falls Prevention: Interprofessional falls prevention programs have been shown to decrease falls by 20-35%. Risk mitigation is achieved by having nurses present at the bedside, mobility assessments by physical therapists and medication reviews by physicians.

Controlling Hospital Acquired Infections: Coordinated efforts to prevent infection at the interprofessional level involving nursing, environmental services, and medical teams, significantly lower the infection rate of healthcare-associated infections. A 25-40% reduction in infection rates has been reported for central line infections, catheter-associated urinary tract infections, and surgical site infections.

Handoff Safety: Interdisciplinary collaboration to standardize handover procedures has reduced information loss during care transitions. Standardized handoff tools have been shown to improve information retention from 45% to 85%, which increases continuity and safety.4.5 Patient Satisfaction and Experience

Outcomes reported by patients are increasingly used in assessing quality in health care and determining payment for health care services. Collaborative practice in multiple domains affects patients' satisfaction:

Communication Quality: Patients experience enhanced communication in such instances when care teams interact with one another. Communication among professionals and patients is constant, prompt, and clear when concerns are addressed and explained, and when professionals collaborate.

Care Coordination: Patients and families are reassured by teamwork they observe. Studies indicate that patients report higher satisfaction in their care when health care providers are seen communicating and working together.

Responsiveness: Collaborative teams are more prompt in addressing patients needs. A shared understanding of the patients condition and willingness to act as backup ensures that requests are addressed in a timely manner, even when some staff are unavailable.

Involvement in Decision-Making: Members of interprofessional teams engage patients in the care planning process more effectively, and are able to present cohesive treatment plans that outline patient preferences and are aligned with the goals of the health care team.

Quantitative studies show IPC and patient satisfaction have a strong correlation. Schmutz et al. (2013) showed that teamwork quality explained 67 % of variance in patient satisfaction scores. Hospitals that report having broad collaboration initiatives are able to achieve 15 to 25 percentage points increase in patient satisfaction scores.Retention and

Turnover**:** Organizations with strong collaboration cultures experience lower turnover rates. Studies indicate 12-18% reductions in nursing turnover associated with positive teamwork climates, generating substantial cost savings and continuity benefits.

Professional Development: Interprofessional environments facilitate learning and skill development. Professionals gain insights from colleagues' expertise, develop broader clinical perspectives, and enhance their own competencies through collaborative practice.

5. STRATEGIES FOR ENHANCING INTERPROFESSIONAL COLLABORATION

5.1 Structural Interventions

Interprofessional rounds as a form of collaboration include; physicians; nurses; pharmacists; and social workers. They are a form of structural collaboration as they occur daily and help to review patients' care plans and share concerns for coordination of efforts. Structured interprofessional rounds are associated with a stay reduction of 1.5 to 2.5 days. They are associated with a negative event reduction of 202 to 30%. They are also associated with an improvement of patient satisfaction of scores attain. The effectiveness of this model stems from setting aside time to address communication gaps and care planning from diverse perspectives to attain shared responsibility on the outcome of the patients.

Intervention briefings also enhance collaboration through synchronized understanding of team members with respect to patients' conditions, planned actions as interventions, probable complications and the resource gaps to help the patient. These meetings also have a positive output on the team with only 3 to 5 minutes spent.

Shared Physical Spaces

The design of physical workspaces also impacts interprofessional interaction the most. Studies indicate that workers from different professions have an increase in spontaneous communication, relationship building and efficient care coordination.

Healthcare organizations that have embraced changes in design have focused on turning units into team stations that are centralized. They have casemated where nurses, doctors and other professionals work closely to design new units that eliminate the traditional separate physician and nursing stations that have collaborative working spaces.

Collisional workspace designs are one pliable design that emergency departments have specifically gained from. Research shows that because of integrated design systems, emergency departments are able to have decreased treatment times, increased communication, and improved team separation compared to the traditional separated design systems.

Interprofessional Documenting Systems

EHR systems that allow interprofessional documentation and communication are one of the most valuable core infrastructures for interconnected collaboration. An optimal system of EHR designs allows professionals to obtain communication and access relevant documentation, as well as monitor interdisciplinary care plans.

Research shows that incorporating EHR systems designed with interprofessional workflows for collaboration is more efficient and valuable. Key systems to optimize work interprofessionally are integrated care plans, real-time notifications for important findings, and communication tools.

5.2 Process Interventions

Standardized Communication Protocols

Implementation of structured communication tools more specifically addresses one of the main barriers to effective collaboration. One of the most taken up communication

protocols is SBAR, which is a framework for message communication that is complete, clear, and concise.

Studies show that communication errors are decreased by 30 to 40 percent due to the implementation of SBAR, and information retention during handoffs increased by 45 to 85 percent. Interprofessional understanding along the collaboration improved due to communication that was effective and outlined shared expectations.

Additional communication tools consist of:

TeamSTEPPS: It establishes systems for communication, leadership, and structure of teams. Studies indicate that the use of TeamSTEPPS improves the culture of safety and adversely Events and Teamwork behaviors.

Here, message acknowledge and verification contribute to communication breakdown for high-stakes situations. In the literature on surgery and emergency, significant errors have been attributed to closed-loop systems.

CUS: Studies have shown that the standardization of phrases such as I am Concerned, I am Uncomfortable, This is a Safety issue, gives team members the ability to raise issues of higher order and promotes behaviors of speaking up, particularly in lower hierarchical positions.

Role Clarification and Scope of Practice Unclear professional roles and responsibilities frequently impede collaboration. Team function can be improved by activities that define roles, establish boundaries of scope of practice, and build understanding.

Lingard et al. 2012, demonstrates that role clarification activities can reduce interprofessional conflict by 40 percent, while encouraging behaviors that are collaborative. Assigning roles allows professionals to function unencumbered, and facilitates respectful cooperation to coordination their efforts.

Emergency departments that have introduced protocols for role delineation report improved throughput, reduced error rates, and greater satisfaction within their teams. Specifying which professionals are responsible for particular tasks, such as ECG acquisition, IV placement, and medication administration, optimizes workflows and eliminates gaps and overlaps in tasks.

Regular Team Debriefings Regular post-event debriefing allows teams to reflect on their performance, identify potential improvement opportunities, and strengthen their relationships. Lower complication rates and improved quality of teamwork are among the benefits.

The effectiveness of debriefing is conditional on psychological safety. Team members should feel comfortable with the possibility of discussing errors, raising concerns, and challenging practices without fear of punishment. Research indicates that in the presence of psychological safety, debriefing leads to greater improvement in learning and performance, and the absence of psychological safety debriefing leads to blame, and is judgmental.

5.3 Educational Improvements

Interprofessional education (IPE) programs. Educational Improvements are the core of all strategies that aim at fostering collaboration competencies. IPE brings together students or professionals of different fields to learn with, from, and about each other.

Reeves et al (2015), in their systematic review of 46 studies, observed IPE to positively affect the collaborative knowledge, skills, attitudes and behaviors of the participants. Programs that had positive outcomes included experiential learning, realistic clinical situations, and opportunities for prolonged contact among learners.

Some IPE fundamental pillars are:

Simulation Based Training: High fidelity simulations provide an opportunity for teams to collaborate and practice for scenarios where patients would otherwise be at risk. Evidence shows that simulations result in improved behaviors, better teamwork, communication, and crisis management.

Case Based Learning: Evaluating a patient's situation from different professionals' viewpoints helps to understand other roles, and develop appreciation for different specialties.

Interprofessional Clinical Rotations: Collaboration with students of other professions in clinical environments helps to develop practical skills for collaboration, and build professional relationships that could span an entire career.

Continuing Professional Development: A career-long ongoing IPE helps to maintain and build collaborative competencies. One-off education interventions are shown to have minimal, if any, lasting behavior change. Continuous education helps strengthen the outcomes.

Employee Development Programs

Systematic training programs derived from aviation crew resource management demonstrate positive impact on performance across healthcare teams. These trainings enhance particular competencies related to teamwork, including leadership, situational awareness, mutual support and communication.

One example of the effectiveness of training programs on teams is the Veterans Affairs Medical Team Training program. After implementation in 74 hospitals, there was an 18% reduction in surgical mortality and a 7% reduction in surgical morbidity. This program integrated didactic training, simulation, and clinical coaching.

TeamSTEPPS is another training program that is based on evidence and is proven to have a positive impact. TeamSTEPPS implementation is associated with improved safety culture, decreased adverse events, and enhanced teamwork behaviors**.**

Leadership Development

For effective interprofessional collaboration to occur, there needs to be effective organizational partnerships at all levels in the organization. Building partnerships at all levels in the organization can be achieved by incorporating leadership training focused on frontline leaders, middle managers, and top-tier leaders.

Transformational leadership, as defined by Bass, consists of four distinct factors: inspiration, intellectual stimulation, individualized consideration, and idealized influence. Of the four types of leadership in Bass's model, transformational leaders are more effective at fostering and maintaining collaborative environments. Specific training on transformational behaviors has a positive impact on teams by increasing their satisfaction and performance.

5.4 Cultural and Organizational Interventions

Fostering Integrated Organizational Culture

The nature of the organizational culture can either promote or inhibit collaboration. A culture of psychological safety, trust and respect, shared responsibility, and learning fosters effective interprofessional collaboration

Organizational leadership is primarily responsible for shaping the culture of an organization. A focus on building a culture of collaboration can be achieved by active engagement of senior leaders in collaborative interprofessional activities and by holding their teams accountable for collaboration.

The impact on collaboration is particularly strong when organizations implement strategic change designed to amend their culture. Edmondson (2012) found that organizations with

a learning culture, where individuals are able to admit mistakes, ask questions, and challenge ideas, are able to achieve higher levels of quality and safety.

Reducing the Impact of Hierarchy

The presence of a traditional hierarchical structure in an organization can act as a barrier to communication, collaboration, and joint decision making. Organizations that have successfully reduced the impact of hierarchy have described improved speaking-up behaviors, better error detection, and improved teamwork.

Strategies to flatten structure include:

Encouraging Voice - Actively seek contributions from all members of the team, especially from junior members who might be more reluctant to share their views.

Psychological Safety Initiatives - Establish settings in which professionals can freely oppose, be uncertain, and admit their fallibility.

Shared Governance - It is the inclusion of people on the front lines in the decision-making that pertains to the activities of their jobs.

Recognition - Input from all categories of professionals, not just the medical doctors, is acknowledged.

Measuring and Accountabilities of Performances - Organizations that are successfully improving collaboratives have defined oriented toward performance, measured the quality of collaboration, and have designed accountability for collaborative actions.

More actionable examples of measurement include:

Direct measurement - Qualified observers using validated tools (OTAS, TeamSTEPPS) for measuring/assessing teamwork behaviors.

Team Climate - Continuous measurement of collaboration, the psychological safety, and the effectiveness of the team.

Outcomes - Measuring outcomes that should be impacted by collaboration such as communication failures, incomplete handoffs, and safety events related to the team.

360 assessments - The inclusion of peers and other members of the team in the evaluation of the individual's professional performance strengthens the accountability for collaboration.

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7. FUTURE DIRECTIONS AND RECOMMENDATIONS

7.1. Research Priorities

Future research should address the following exceptional gaps in understanding:

Longitudinal Outcome Studies: Most established research collaboratively examines short-term effects. Studies tracking outcomes over extended periods would clarify the perseverance of collaboration intervention effects and the net result of organization stratagies.

Mechanism Elaboration: While the collaboration and more outcomes correlation exist, the mechanisms of collaboration still elude consideration. Research would need to elaborate the underlying routed effects of mechanisms dissipating established teams processes to desired outcomes and enable more definitive actions.

Comparative Effectiveness Research: The selective multitude of collaboration interventions is of little more than anecdotal substantiation. Evidence comparative effectiveness research would support alternatively grounded decisions.

Implementation Science: Evidence Research neglected the void of practice to guide the collaboration initiatives in Strategies Diffusion of Innovation. Understanding the barriers and facilitators of the void would amplify the advance in collaboration.

Technology Assessment: Research using diverse and proliferating digital health technologies to support interprofessional collaboration is of high importance. How and in what conclusion should electronic health records, secure messaging systems, telemedicine, and artificial intelligence be utilized to improve communication and coordination.

Economic Analysis: Evidence costing collaboration initiatives and analyses would support the business case for organizational investment and the return. Research should address direct costs and opportunity costs, as well as clinical and efficiency benefits.

7.2 Suggested Course of Action

Healthcare accreditation institutions ought to implement standards of interprofessional collaboration that result in organizational accountability. The requirement of demonstrating collaboration competencies for accreditation would be a stimulus for improvement to be made on a system level.

Integration of Expectations for Interprofessional Collaboration in Professional Practice Regulatory Frameworks: Licensing and regulatory authorities need to implement expectations for interprofessional collaboration in professional standards. Practice scope regulations need to be supportive of interprofessional role versatility on collaboration and not restrictive.

Recognize, and Reward Interprofessional Collaborative Care. The reimbursement policy should encourage interprofessional collaboration. Value-based reimbursement models should be set in place to encourage quality outcomes, thus encouraging interprofessional collaboration as quality outcomes encourage teamwork. Payment policies should support interprofessional team time and coordination efforts.

Education accreditation in healthcare should mandate that collaborative practices be implemented as interprofessional education be incorporated. All health profession programs should ensure that graduates are equipped with competencies that allow for collaboration.

7.3 Organizational Approaches

Healthcare organizations to optimize interprofessional collaboration should:

Clearly Articulate Vision and Commitment. Cohesion and unity in collaborative practice need to be articulated and demonstrated by senior leadership. It must be made an organizational priority with aligned resource allocation.

Allocate Resources for Collaboration. Budget for collaboration enhancing technologies, redesign of workspaces, and protected time for team activities. Understand that collaboration infrastructure requires sustained investment.

Conduct Interprofessional Education i.e. Comprehensive training that is didactic as well as experiential in nature to provide for practice opportunities needs to be arranged for all staff on both initial and continuing bases.Assess and Track Outcomes: Define specific metrics for assessing collaboration quality. Regularly track data for ongoing improvement and make collaboration performance outcomes transparent across the organization.

Foster and Encourage Psychological Safety: Create spaces staffed by professionals where it is safe to speak up, make mistakes, and criticize the status quo. Leadership role modeling is crucial for establishing psychological safety

Appreciate and Reward Teamwork: Integrate collaboration into performance reviews, criteria for promotions, and awards. Publicly acknowledge and celebrate successful teamwork

Tackle Barriers Thoroughly: Describe the specific challenges to collaboration within your organization, and construct tailored solutions. Barriers to collaboration and problem solving should include frontline staff

7.4 Professional Practice Implications

Individual healthcare professionals can enhance collaboration through:

Developing Communication Skills: Invest in learning effective communication techniques, including active listening, clear speaking, and constructive feedback delivery.

Understanding Other Roles: Seek opportunities to learn about colleagues' professional preparation, expertise areas, and practice constraints. Enhanced role understanding facilitates mutual respect and appropriate collaboration.

Practicing Humility: Recognize the limits of individual expertise and value others' contributions. Intellectual humility enables learning from colleagues and effective collaborative problem-solving.

Speaking Up for Safety: Advocate for patients by raising concerns about potential safety issues, even when doing so requires challenging higher-status team members.

Supporting Colleagues: Offer assistance proactively, particularly when colleagues face high workload or challenging situations. Backup behaviors strengthen team resilience and performance.

Engaging in Reflection: Regularly reflect on collaboration experiences, identifying personal areas for improvement. Seek feedback from colleagues on collaborative behaviors.

Participating in Team Development: Engage actively in team training, debriefings, and improvement initiatives. Collaboration requires collective effort; individual participation matters.

7.4 Professional Practice Implications

The collaboration of health care practitioners can be augmented by:

Improving Communication Ability: Learn how to be an effective communicator, of which a few ways are active listening, articulate speech, and giving positive feedback.

Role Familiarization: Try to gain knowledge of the professional training, areas of specialization, and practice domain of your coworkers. Understanding a role better leads to improved collaboration and collaboration.

Humility: Acknowledge the boundaries of your knowledge and the expertise of others, and be willing to accept it. A humble mind facilitates learning and effective problem solving with others.

Safety Advocacy: Defend the interest of the patients by voicing safety concerns in a situation, even if it puts you at odds with a member of your team of a higher position.

Collegiate Assistance: Help your colleagues in times of difficulty, especially when they are overwhelmed with work. Backup behavior increases the resilience and productivity of a team.

Collaborative Reflection: Think about your collaboration with others in the team and on an individual basis and form an opinion about your skills. Asses your team members for feedback on working together.

Team Integration: Participate in all team building activities, training, and team debriefs. Team collaboration is built on mutual contribution.

8. CONCLUSION

Emergency and nursing, surgery, and ECG technician team work together in different areas of health care. Good health care teamwork and integration can lead to positive health

outcomes. Strong evidence confirms effective integration and teamwork in health care can lead to better outcomes through reduced mortality, complications, and improved safety and efficiency of care. Effective integration in health care can lead to greater satisfaction of patients and speed positive outcomes through improved identification of problems, decision making, prevention of and recovery from errors, and delivery of refined and optimized care.

Collaborative integration of teamwork in health care is supported by evidence. But integration of teamwork in health care still has many obstacles, i.e., professional silos, hierarchy, effective communication, resources, organization of work in health care. These obstacles can be solved through focused change in professional development to organization change and policy change.

Some of the effective approaches to integration of teamwork in healthcare include structural team work (interprofessional team rounds, team work, integrated work through sharing health care documentation), process team work (standard communication to be used, defined roles, team debriefing); educational integration (interprofessional education, team education, health care leadership education), and effective teamwork (psychological safety to team members, reduced hierarchy, and collaborative accountability).

Interprofessional teamwork has become a necessity in healthcare. Complexity in medicine requires it. Increasing age of patients and costs of health care demand it. Team based models in care delivery are essential. Collaboration of health care services provides a stragetic imperative. Effective integration and teamwork in health care should be a focus of health care services.

The way ahead depends on the dedication of all actors in the healthcare ecosystem. There must be regulatory and payment policies put in place by healthcare system policymakers. There must be partnerships grounded in collaboration from healthcare organizations as a core administrative focus. There must be educators training future practitioners in the healthcare field to possess competencies of collaboration. There must be individual practitioners who adopt collaborative healthcare and further their individual interprofessional collaboration skills.

The case for interprofessional collaboration is settled: emergency care, nursing, surgery, and ECG technicians cooperating bring down mortality, eliminate risks, and enhance healthcare. The focus must be on all healthcare environments and on establishing seamless clinical interprofessional collaboration. The patients we care for are entitled to the best integrated care we can provide.

References

1. Ajeigbe DO, McNeese-Smith D, Leach LS, Phillips LR. Nurse-physician teamwork in the emergency department: Impact on perceptions of job environment, autonomy, and control over practice. J Nurs Adm. 2013;43(3):142-148.
2. Bradley EH, Herrin J, Wang Y, et al. Strategies for reducing the door-to-balloon time in acute myocardial infarction. N Engl J Med. 2006;355(22):2308-2320.
3. Brennan CW, Daly BJ, Dawson NV, et al. The oncology nurse navigator: Impact on patient satisfaction and distress. Oncol Nurs Forum. 2013;40(5):502-508.
4. De Meester K, Verspuy M, Monsieurs KG, Van Bogaert P. SBAR improves nurse-physician communication and reduces unexpected death: A pre and post intervention study. Resuscitation. 2013;84(9):1192-1196.
5. Edmondson AC. Teaming: How Organizations Learn, Innovate, and Compete in the Knowledge Economy. San Francisco: Jossey-Bass; 2012.

6. Flowerdew L, Gaunt A, Spedding J, et al. A multicentre observational study to evaluate a new tool to assess emergency physicians' non-technical skills. Emerg Med J. 2013;30(6):437-443.
7. Institute of Medicine. To Err is Human: Building a Safer Health System. Washington, DC: National Academy Press; 2000.
8. Institute of Medicine. Crossing the Quality Chasm: A New Health System for the 21st Century. Washington, DC: National Academy Press; 2001.
9. Jensen JL, Travers AH, Marshall EG, et al. Insights into the implementation and operation of a novel paramedic long-term care program. Prehosp Emerg Care. 2013;17(1):86-92.
10. Kalisch BJ, Lee KH. The impact of teamwork on missed nursing care. Nurs Outlook. 2010;58(5):233-241.
11. Körner M, Bütof S, Müller C, et al. Interprofessional teamwork and team interventions in chronic care: A systematic review. J Interprof Care. 2016;30(1):15-28.
12. Lingard L, Espin S, Evans C, Hawryluck L. The rules of the game: Interprofessional collaboration on the intensive care unit team. Crit Care. 2004;8(6):R403-R408.
13. Makary MA, Daniel M. Medical error—the third leading cause of death in the US. BMJ. 2016;353:i2139.
14. Manser T. Teamwork and patient safety in dynamic domains of healthcare: A review of the literature. Acta Anaesthesiol Scand. 2009;53(2):143-151.
15. Mazzocco K, Petitti DB, Fong KT, et al. Surgical team behaviors and patient outcomes. Am J Surg. 2009;197(5):678-685.
16. Neily J, Mills PD, Young-Xu Y, et al. Association between implementation of a medical team training program and surgical mortality. JAMA. 2010;304(15):1693-1700.
17. Pannick S, Davis R, Ashrafian H, et al. Effects of interdisciplinary team care interventions on general medical wards: A systematic review. JAMA Intern Med. 2015;175(8):1288-1298.
18. Reeves S, Pelone F, Harrison R, et al. Interprofessional collaboration to improve professional practice and healthcare outcomes. Cochrane Database Syst Rev. 2017;6(6):CD000072.
19. Salas E, Sims DE, Burke CS. Is there a "Big Five" in teamwork? Small Group Res. 2005;36(5):555-599.
20. Schmalenberg C, Kramer M. Nurse-physician relationships in hospitals: 20,000 nurses tell their story. Crit Care Nurse. 2009;29(1):74-83.
21. Schmutz J, Manser T. Do team processes really have an effect on clinical performance? A systematic literature review. Br J Anaesth. 2013;110(4):529-544.
22. World Health Organization. Framework for Action on Interprofessional Education and Collaborative Practice. Geneva: WHO Press; 2010.
23. Zwarenstein M, Goldman J, Reeves S. Interprofessional collaboration: Effects of practice-based interventions on professional practice and healthcare outcomes. Cochrane Database Syst Rev. 2009;(3):CD000072.