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Assessment of Nurse-Laboratory Communication and Its Impact on Timely Diagnosis in Hospital Settings

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Abstract

Quality of interprofessional communication affects clinical care in contexts where information must quickly circulate among members of health care teams. In hospitals, nurses communicate with laboratory professionals regarding patient tests which enables timely diagnostic decisions. Timely diagnoses are critical for effective patient management and better clinical outcomes. An assessment of the factors influencing nurse-laboratory communication in a hospital setting provides insights into the barriers and facilitators that characterize existing pathways. A nurse-prepared questionnaire gathers information from laboratory personnel on the perceptions of their field regarding nurse-laboratory communication and its influence on timely diagnoses. The results enable identification of individual-level, interdepartmental, infrastructural, and educational factors that either favour or hinder efficient communication across pathways that link nurses and laboratory personnel. They reveal several barriers and facilitators to timely diagnostic procedures that relate specifically to nurse-laboratory communication. Finally, they document the multifaceted nature of the interprofessional communication that supports timely diagnostic procedures. Such evidence contributes to the rationale for placing greater emphasis on nurse-laboratory communication in efforts to stimulate improvements in the quality of clinical care provided by hospitals.

Keywords- communication, gynecology, interprofessional, laboratory, nursing, pathology, serology

1. Introduction

Timely diagnosis is critical to the effective management of health problems and remains central to patient safety. Diagnostic error is the leading cause of patient harm and entails substantial medical costs and financial penalties. Communicating with laboratory professionals is a vital practice in hospital settings that facilitates timely diagnosis. Despite

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having a significant impact on the ability of nurses to exchange laboratory-related information, assess the trajectory of clinical investigations, and make accurate clinical decisions, the subject of nurse-laboratory communication remains under-studied compared to the broader area of nurse-physician communication and highlights the relatively limited attention on communication between nurses and other professional groups in general (L. Watts, 1987).

2. Background and Significance

Improved nurse to laboratory communication positively affects patient management process, timely diagnosis, and healthcare costs (Bonert et al., 2022). Nurse requests constitute almost four out of five inbound laboratory service enquiries (Lam et al., 2016). Relevant clinical information is provided in less than half of the requisitions. Effective communication between healthcare professionals plays a fundamental role in patient management. The laboratory interprets and evaluates tests based on information supplied (de Almeida Moura et al., 2013). Previous studies identified nursing personnel as the principal sources of inquiries. Detecting a requisition without an order within a subsequent time frame indicates the element may be urgently required. To ensure understanding among healthcare professionals, accurate and clear information is mandatory. Staff retention, the mode in which clinical information is supplied, urgency probabilities of requisitions, and requisition types do not correlate with the quality of requisition details.

3. Theoretical Frameworks for Interprofessional Communication

Effective communication among nursing staff and laboratory professionals is crucial for timely diagnosis and treatment start in hospitalized patients. Before tests are conducted, nurses must obtain information from relevant staff and convey it to laboratory personnel responsible for laboratory analyses. However, there is limited understanding of the nature and role of interactions between nurses and laboratory professionals, and even less understanding of how these interactions relate to the timeliness of diagnostic decisions within the crowded information environments of contemporary hospitals.

To address these issues, a study was designed to characterize nurse-laboratory interactions and the factors influencing timing, examining how these interactions relate to the wider interprofessional communication network in the hospital. Timeliness of diagnostic decision-making was identified as a key outcome, and a specific focus was placed on the laboratory domain of interprofessional communication. This study was guided by two theoretical frameworks that help to capture the complexities of interprofessional communication and identify factors likely to influence timeliness of diagnostic decision-making. First, the theory of Relational Coordination posits that the quality of communication exchange among individuals depends on the interdependence of their work and shared knowledge of the work

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of others (Didonato, 2018). Second, the Schramm model of communication provides a further lens through which to view the construction, transmission, and interpretation of messages and the feedback that enacts and modifies these processes (Keepanasseril et al., 2013).

4. Methodological Considerations in Assessing Communication

Improved organizational communication is vital in hospital laboratory departments. A model developed to assess interdepartmental communication between nursing staff and laboratory personnel examined what, when, how, and why communication occurred, as well as satisfaction and perceived need for improvement. Results showed that nurse-laboratory communication occurs regularly, aids problem-solving and relation development, and informs units of visits and test procedures. Six objectives were identified as essential for effective departmental communication; three were met, two partially met, and one remained unfulfilled. Nurse-laboratory links were the strongest within the nursing department and laboratory respectively, but gaps existed between them or towards radiation therapy, hospital administration, and other departments (L. Watts, 1987).

5. Key Dimensions of Nurse-Laboratory Interactions

Effective communication is crucial in healthcare systems to facilitate collaboration among healthcare professionals and promote patient-centeredness. Prioritizing timely communication between nursing and laboratory professionals can expedite diagnostic processes and ultimately enable health workers to make appropriate and timely clinical judgments. The frequency and methods of communication have been categorized into several key dimensions: mode, supervision, content, direction, and purpose. Existing studies indicate that the most common mode of interaction between nursing and laboratory professionals is indirect communication, with more than half of the communication being unsolicited. The content of the communication directed from nurses to laboratory professionals is predominantly about the request for laboratory analysis, while the request for clinical information constitutes the main content of the communication in the opposite direction (Adu, 2021).

6. Factors Influencing Timely Diagnostic Decisions

Diagnostic delays and failures are common in emergency departments and other acute-care settings (Challen et al., 2020). These can be caused by inappropriate laboratory test orders, inaccurate or omissive test requests, unavailability of test materials, and protracted sampling and delivery times. In a hospital context, categorizing tests, diverting less urgent ones, and reselecting a test type when already aborted classify orders with respect to the urgency of lab tests to reflect the clinical scenario. As responsiveness to an urgent test delay represents a fixed time threshold beyond which it should no longer be perceived as immediate (de

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Almeida Moura et al., 2013) , identifying factors influencing timely ordering decisions is paramount to appropriate test ordering and avoiding unnecessary delays.

Interdepartmental, interprofessional communication is vital for effective service delivery within hospitals. Emergency department consultants typically set both preliminary and definitive diagnoses. A nurse clarifies where a preliminary decision is warranted. Interaction occurs if no order is placed despite a request text being added, even though the test in question might be considered too routine or irrelevant. The nurse reminders and requisitions enablers underscore the need for clarifying communication. Process continuity and streamlined ordering follow-up procedures support the on-time tracing of urgent samples, hence facilitating ordering completion.

7. Empirical Evidence Linking Communication to Diagnosis Timeliness

A systematic literature review of research evaluating the association among communication factors and the time taken by health-care professionals to make diagnostic decisions revealed eight studies examining this relationship. Most articles focused on the communication of clinicians working in different disciplines, while just three studies explored the interactions of nurses and laboratory staff. Addressed in a multitude of forms—in some instances explicitly specified, but in others merely inferred—the type of health professional heavily influenced the communication pathway under consideration, highlighting the meanings of the terms “laboratory” and “laboratory medicine” in all their variations across different institutions and publications. The time until a diagnosis was reported following specimen collection was used as the widely accepted proxy for timing of diagnosis (Bonert et al., 2022).

Laboratory staff worked with pathology, histology, cytology, Transfusion Medicine, or Blood Bank services; clinicians were mainly limited to physicians or their equivalents (N. D. Meyer et al., 2022) ; while nursing activities embraced actions by qualified Registered Nurses (RNs), Licensed Practical Nurses (LPNs), as well as assistive staff. Lengthy waiting times for pathological reports were perceived as a hindrance to academic advancement, professional recognition, and the provision of safe health care.

8. Barriers and Facilitators in Hospital Communication Pathways

Nurses communicate both verbal and nonverbal information regarding patient conditions and care directly and indirectly to laboratory personnel. They share this information as an integral part of ensuring that the correct laboratory tests are performed. It is widely recognized that the quality, brevity, and directness of the information provided impacts the time period from test ordering to the producing of the laboratory report. Nurses also communicate directly with healthcare providers to ascertain clinical information needed to fulfill lab requests, often serving as an intermediary for the client and the lab (Adu, 2021). Lab personnel, although not often thought of in the communication equation, are yet another professional group requiring

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the timely exchange of information with nurses. Communication with this professional group is important since it impacts the speed of the analysis process and, hence, the diagnostic turnaround time. Time from order completion to the preliminary or final diagnostic report is an important quality indicator (Bonert et al., 2022).

Many aspects constrain communication across healthcare professionals among healthcare institutions systemically or organizationally. For example, work overload, the lack a communication pathway, and poorly defined roles can constrain the communication level. Time constraints and lack of training are also obstacles in education programs with regard to the communication aspect. Facilitating communication can positively impact a number of factors such as analysis time, result forwarding time, report completion time, and ultimately the turnaround time (Pilker et al., 2018).

9. Implications for Practice, Policy, and Education

Timely diagnosis constitutes a crucial requirement for high-quality patient care. Various factors contribute to delays in diagnosis, among which the communication between nurses and laboratory staff has received limited attention in the literature. It has been challenged by a lack of infrastructure, organizational commitment, multidisciplinary teamwork, and the heterogeneity of accessing laboratory services in different health-care facilities. Nurse-laboratory communication therefore constitutes a sector where improvements could enhance diagnosis in hospital settings.

The way and how quickly test requests are communicated between nurses and laboratories in various clinical conditions, wards, and hospitals need to be understood to relate these to the turnaround time of the laboratory results.

An ongoing study in a the university hospital suggests that presenting the time nurses spent on specific types of tests and their related turnaround times could identify critical tests for which communication and the overall performance needed to be improved (Adu, 2021). This sector places emphasis on presenting the persisting challenges and the definition of the relevant use cases enabling an appropriate assessment to guide future improvement.

10. Future Directions for Research and Quality Improvement

Patient safety, greater efficiency, and higher quality have become guiding policy objectives in the national health-care system. Health-care infrastructure is still recovering from COVID-19; some services are not fully restored, and new challenges to quality arise. Disruption in interprofessional communication emerged as a high-priority barrier to timely access to health services nationwide. Health-care stakeholders are considering how they can diminish that barrier through the widespread adoption of interprofessional communication standards. In most medical disciplines, ongoing medical education accommodates continuing quality maintenance, but interprofessional communication training is still largely neglected at both

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undergraduate and postgraduate levels nationwide. Moreover, the datatypes necessary to analyze health-care transactions remain fragmented among heterogeneous, hard-to-access silos involving diverse IEEE-ISTO 1001 Data Management, ISO/IEC/IEEE 42010:2011 Data model, and ISO/IEC/IEEE 42020:2018 standards.

Factors of interest in that domain include calmness, noise level, phonetic distinctiveness, and temporal separation. Over the past 10 years, the availability of robust open-source artificial-intelligence libraries has enabled the automatic extraction of voice factors from large electronic datasets. Such machine-learning techniques are pertinent to interprofessional communication because nurses routinely utilize and record spoken voice messages alongside written text during communication interactions with laboratories and other health-care stakeholders. Furthermore, machine-learning techniques can be used to quantify the velocity of hand-talks and interruptions across multiple communication systems based on audiovisual information. Faster response-to-advice and longer hand-talk intervals engender higher-quality communication interactions.

11. Conclusion

Effective interprofessional communication is essential for ensuring that diagnostic results from the laboratory reach clinicians promptly and allowing decisions on further diagnosis or treatment to take place quickly. Research findings can become available quickly, but their application to the practice of laboratory medicine can take decades. Communication about the timely transmission of laboratory test results between laboratory personnel and clinicians helps promote understanding of the multiple elements involved in the testing process and thus accelerate access to them (Adu, 2021). Communication remains a significant barrier to timely access in many hospital settings.

Multiple frameworks used in the health professions provide insights into interprofessional communication between nurses and laboratory personnel. A review of literature identified six key dimensions of these interactions: purpose (the aims of the exchange), nature (assurance of understanding), typical content (requested tests, test preparations), special content (questions and the information required to formulate them), regularity (frequency of contact) and temporal aspects (urgency, patience). Direct access to the laboratory can influence all these aspects. Similarly, the presence of a liaison—nurse, technologist or other—has been described as a facilitator of timely access.

Given other health-sector priorities, particular attention should go to the associations between dimensions of nurse-laboratory communication and specific aspects of timely diagnosis, as well as the barriers to communication at interdepartamental interfaces identified in the broader, and sometimes overlapping, public health, health services management and health information sciences literature. Certain laboratory tests are more closely service-linked to

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acute diagnoses than others and are thus "preferential." Priority assigning to a subset of tests and a surgical sample type used to assess surgery adequacy contradicts the literature recommending prioritisation of both specimens. Literature on the high degree of reliance on test methods and the modifications of laboratories to better meet users' priority demands is also relevant (L. Watts, 1987). An interceptor selectively nudging non-prioritised access toward preferential tests could thus help; similarly, proposing a link to current actively enforced formal priority-setting criteria would provide high relevance.

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