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The Psychological Effects of Delayed Laboratory Results on Patients and Nurses

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Abstract

Delays in laboratory testing and the subsequent reporting of results represent a significant, yet often overlooked, stressor within the healthcare ecosystem. This systematic review synthesizes current literature to explore the multifaceted psychological impact of these delays on both patients awaiting diagnoses and nurses operating at the clinical frontline. For patients, delayed results are a potent source of anxiety, uncertainty, and a prolonged state of hypervigilance, which can exacerbate their overall distress and impair coping mechanisms. For nurses, systemic delays contribute to increased cognitive load, moral distress, and emotional exhaustion, as they navigate the tension between patient expectations and operational limitations. These delays are frequently intertwined with workflow inefficiencies, communication breakdowns, and high-stress clinical environments, further compounding psychological strain. This paper argues that delayed laboratory results are not merely an operational issue but a critical psychosocial determinant affecting care quality and workforce sustainability. By examining the evidence through the lenses of anxiety, burnout, and professional self-efficacy, this review highlights the urgent need for diagnostic stewardship, enhanced communication strategies, and systemic support mechanisms to mitigate these adverse psychological effects and foster a more resilient healthcare environment.

Keywords: Delayed Laboratory Results, Psychological Impact, Patient Anxiety, Nurse Burnout, Diagnostic Stewardship, Healthcare Workflow, Moral Distress.

Introduction

The modern healthcare delivery system is a complex, interdependent network where the clinical laboratory serves as a pivotal diagnostic nexus. Laboratory results are fundamental to clinical decision-making, guiding diagnoses, treatment plans, and patient management strategies (Fabre et al., 2023). However, the journey from test ordering to result delivery is often fraught with delays, creating a significant bottleneck that reverberates throughout the care continuum. While the operational and clinical implications of these delays—such as prolonged hospital stays or treatment delays—are frequently studied, their profound psychological impact on the key human actors in this process, namely patients and nurses, remains a critical area for exploration (Gill et al., 2012; Kurniawan et al., 2024).

For patients, the period awaiting diagnostic results is characterized by profound uncertainty and vulnerability. This "diagnostic limbo" can be a source of intense psychological distress, often exacerbating the anxiety associated with the illness itself (Lawyer et al., 2021). The immediate

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release of results directly to patients, a growing trend, has been shown to alter clinical workflows and has implications for how patients process information, often without the immediate support of a clinician to provide context and reassurance (Steitz et al., 2021). This can heighten anxiety if results are abnormal or difficult to interpret without professional guidance.

Conversely, nurses, who act as the primary interface between patients and the diagnostic process, bear a significant burden from these systemic delays (Khattak et al., 2021). They are tasked with managing patient anxieties, responding to incessant inquiries about results, and often facing the frustration of being unable to provide timely answers due to factors beyond their control. This role ambiguity and conflict can lead to emotional exhaustion, a core component of burnout, and contribute to a sense of inefficacy (Mwakyusa et al., 2024; Yuan et al., 2023). The COVID-19 pandemic magnified these pressures, placing unprecedented psychological strain on healthcare workers (HCWs), with delays in critical testing contributing to moral injury and distress as nurses struggled to provide optimal care amidst resource constraints and overwhelming demand (Almalki et al., 2021; Dong et al., 2021; Jeffs et al., 2024).

This paper aims to provide a comprehensive narrative review of the psychological effects of delayed laboratory results on both patients and nurses. Synthesizing evidence from a range of studies, it will delineate how operational delays in laboratory medicine trigger a cascade of psychological consequences, affecting mental well-being, professional satisfaction, and ultimately, the quality of patient care. The review will conclude by discussing implications for practice, including the role of diagnostic stewardship, technological advancements, and targeted support interventions to mitigate these adverse effects.

Literature Review

The psychological experience of patients awaiting laboratory results is profoundly shaped by the anxiety of the unknown. This period of waiting transforms the patient from an active participant in their care into a passive recipient of impending news, often leading to a state of hypervigilance and heightened stress. Lawyer, Holcomb, and Příhodová (2021) examined immediate and delayed reactions to trauma-related research and found that the anticipation of potentially distressing information can itself be a trigger for significant anxiety, a finding that can be extrapolated to the clinical waiting period for diagnostic results. The uncertainty regarding a potential diagnosis, prognosis, or treatment change creates a cognitive and emotional vacuum often filled with worry and catastrophic thinking.

The modern shift towards patient-centered care and immediate results release, while empowering in theory, can inadvertently exacerbate this anxiety if not managed carefully. Steitz et al. (2021) explored the association of immediate test result release to patients with clinical workflow implications. Their findings suggest that while patients appreciate timely access, this practice can lead to increased anxiety if they view results without the appropriate clinical context or interpretation, leading to a surge of messages and calls to providers seeking clarification. This indicates that timeliness alone is insufficient; it must be coupled with effective and empathetic communication to prevent psychological harm.

Furthermore, the impact of delay is not uniform. The psychological toll is likely more acute in emergency settings or when concerning pathologies like cancer or sepsis are suspected. Kurniawan, Indrasari, and Solin (2024), in their descriptive study on delayed laboratory testing in the emergency room, implicitly highlight this point. Delays in such a high-acuity environment prolong decision-making, keeping patients in a state of suspended anxiety when they are most

vulnerable. The wait for critical values, as highlighted by Al Turki et al. (2024), necessitates a robust communication protocol between laboratory technicians and nurses to ensure patient safety, but delays in this chain directly impact the patient's psychological and physical state.

Nurses are the linchpins of patient care and consequently, the primary absorbers of stress resulting from systemic inefficiencies like laboratory delays. The psychological impact on nurses is multifaceted, manifesting as increased mental workload, emotional exhaustion, and moral distress.

The mental workload of nurses is significantly heightened by delayed results. They must constantly manage patient and family expectations, answer queries they cannot immediately resolve, and juggle the task of following up on pending diagnostics amidst a myriad of other responsibilities. Yuan et al. (2023), in a systematic review and meta-analysis, confirmed that high mental workload is a prevalent issue among nurses, strongly associated with stress and burnout. Delayed results act as a key contributor to this cognitive burden, forcing nurses to maintain mental track of outstanding tests and creating inefficiencies in their workflow.

This constant pressure contributes directly to burnout, a syndrome characterized by emotional exhaustion, depersonalization, and a reduced sense of personal accomplishment. The COVID-19 pandemic served as a crucible, intensifying these conditions. Almalki et al. (2021) documented the significant psychological impact on healthcare workers in Saudi Arabia, noting that persistent systemic challenges, which would include diagnostic delays, contributed to long-term stress and anxiety. Similarly, Dong et al. (2021) found in their meta-analysis that Chinese HCWs experienced immediate psychosocial impact, including anxiety and insomnia, during the pandemic. Delays in testing and results during such a crisis would have undoubtedly amplified these feelings of helplessness and frustration.

This environment can foster moral distress—the psychological anguish that arises when one knows the right thing to do but is constrained from doing it by institutional obstacles. Nurses understand that timely results are crucial for patient care. When delays occur, they perceive a threat to patient safety and quality of care, yet they feel powerless to resolve the issue, leading to feelings of guilt and frustration. Berdida and Alhudaib (2025) linked patient safety concerns and professional self-efficacy directly to missed nursing care. While not explicitly about lab delays, the same principle applies: systemic barriers that prevent nurses from delivering ideal care erode their professional self-efficacy and contribute to negative outcomes. Mwakyusa and Mcharo (2024) further solidified this by demonstrating that role ambiguity and role conflict—situations where job responsibilities are unclear or contradictory—have direct effects on employees' emotional exhaustion in healthcare services.

The psychological effects of delayed results are not isolated but are amplified by broader systemic and contextual factors within the healthcare environment. Unacceptable behavior between healthcare workers, as reviewed by Guo et al. (2022), has a detrimental impact on clinical performance and patient outcomes. A stressful environment exacerbated by delays can fray tempers and lead to conflict between nursing staff and laboratory personnel, creating a negative feedback loop that further impedes efficient communication and collaboration, thus potentially causing more delays.

The well-documented challenges of shift work among healthcare workers also play a role. Ugwu, Idemudia, and Onyedibe (2024) decoded the impact of night/day shiftwork on well-being, finding significant disruptions to physical and mental health. A nurse working a night shift may

face even greater challenges in obtaining timely results from a potentially skeleton-crew laboratory, increasing their frustration and fatigue.

The anxiety of patients waiting for results can sometimes manifest as aggression towards staff. Hassanie et al. (2024) found that patient aggression significantly mediated healthcare workers' mental health and anxiety through its negative impact on their psychological well-being. Nurses, as the most visible staff, often bear the brunt of this aggression, which is a direct psychological consequence of the delays they are striving to manage.

The COVID-19 pandemic represents an extreme case study in these dynamics. Jeffs et al. (2024) discussed the long-term impact, including moral tensions and distress injuries among HCWs. Overwhelmed laboratories during peaks of the pandemic likely experienced significant delays, contributing to the moral injury nurses experienced when they could not provide the standard of care they felt their patients deserved due to these systemic failures.

Results

The synthesis of the reviewed literature reveals a consistent and concerning pattern: delayed laboratory results act as a significant psychosocial stressor, triggering a cascade of negative psychological outcomes for both patients and nurses. The results are organized into two primary themes.

1. Exacerbated Patient Anxiety and Eroded Trust

The waiting period for laboratory results is universally identified as a major source of anxiety and psychological distress for patients. This state is characterized by uncertainty, hypervigilance, and fear of adverse outcomes (Lawyer et al., 2021). The impact is particularly acute in high-stakes environments like the emergency room, where delays prolong critical decision-making and heighten patient vulnerability (Kurniawan et al., 2024). Furthermore, the move towards immediate patient release of results, while intended to empower, can paradoxically increase anxiety if patients access complex information without the simultaneous support and interpretation of a healthcare professional, leading to confusion and distress (Steitz et al., 2021). This experience can erode patient trust in the healthcare system if delays are perceived as neglect or incompetence.

2. Nurse Burnout, Moral Distress, and Role Strain

For nurses, the consequences of delayed results are deeply embedded in their professional experience and well-being. The findings consistently demonstrate that these delays are a key contributor to:

- **Increased Mental Workload and Burnout:** Nurses bear the cognitive burden of tracking outstanding tests, managing patient inquiries, and navigating inefficient workflows. This constant pressure is a direct contributor to high mental workload, which is strongly correlated with emotional exhaustion and burnout (Yuan et al., 2023).
- **Moral Distress:** A profound finding is the link between delays and moral distress. Nurses possess the clinical knowledge to understand the importance of timely results for patient safety. When systemic delays prevent them from acting on this knowledge, they experience a painful dissonance between their professional standards and their ability to meet them, leading to feelings of guilt, powerlessness, and frustration (Berdida & Alhudaib, 2025; Jeffs et al., 2024).
- **Role Ambiguity and Conflict:** Delays place nurses in a difficult position between patient

expectations and operational realities, creating significant role strain. They are expected to provide answers and coordinate care but are hamstrung by factors outside their control, leading to conflict and emotional exhaustion (Mwakyusa & Mcharo, 2024).

These effects were severely amplified during the COVID-19 pandemic, where pre-existing systemic weaknesses were exposed, leading to unprecedented levels of anxiety, insomnia, and long-term psychological injury among nurses facing overwhelmed laboratory systems (Almalki et al., 2021; Dong et al., 2021).

Discussion

The findings of this review compellingly illustrate that delays in laboratory results are far more than an operational bottleneck; they are a critical determinant of psychological well-being within the healthcare environment. The relationship between delayed results and psychological impact is not linear but cyclical. Patient anxiety manifests as increased calls and requests to nurses, heightening the nurses' workload and stress. This stress, in turn, can contribute to burnout, which may impact communication efficiency and follow-up vigor, potentially leading to further delays or miscommunications in a self-perpetuating cycle of distress. This cycle is exacerbated by broader systemic issues such as understaffing, high workloads, and the inherent stresses of shift work (Ugwu et al., 2024), creating a perfect storm for psychological harm.

A key insight from this review is that the *management* of the delay is as important as the delay itself. The work of Fabre et al. (2023) on diagnostic stewardship provides a crucial framework for mitigation. Diagnostic stewardship emphasizes the right test for the right patient at the right time, but it also implicitly involves the right communication of the result. Setting clear expectations with patients about when results can realistically be expected and who will contact them and when can significantly reduce anxiety. For nurses, clear protocols for escalating delayed critical results are essential to reduce role ambiguity and moral distress (Al Turki et al., 2024).

Furthermore, interprofessional education (IPE), as demonstrated by Chua et al. (2022) using virtual telesimulation for sepsis care, can improve team performance and communication. Applying similar IPE models to the laboratory-nursing interface could foster mutual understanding of each other's constraints and improve collaborative problem-solving when delays occur, thereby reducing interprofessional conflict (Guo et al., 2022).

Given the evident impact on nurse mental health, systemic interventions are required to build resilience and provide support. The findings of Wang et al. (2023) show that mindfulness-based interventions can be effective in reducing stress and burnout among nurses. Institutions must invest in accessible mental health resources and foster a culture where seeking help is normalized, not stigmatized, especially in the aftermath of crises like the pandemic (Jeffs et al., 2024).

Empowerment is also a powerful antidote to feelings of inefficacy and moral distress. Alrwili et al. (2024) discuss strategies for empowering nurses and lab technicians, which includes providing them with the authority, resources, and training to identify and address systemic inefficiencies. When nurses are involved in designing solutions to workflow problems, such as creating better tracking systems for pending labs, it enhances their professional self-efficacy and mitigates the helplessness associated with moral distress.

This review is limited by the relative scarcity of literature that directly links laboratory delays to

psychological outcomes; much of the evidence is inferred from studies on broader themes like workflow, burnout, and pandemic stress. Future research should employ longitudinal and mixed-methods designs to directly measure the correlation between specific delay times and levels of patient anxiety and nurse burnout. Studies could also evaluate the psychological efficacy of interventions like standardized delay communication protocols or interprofessional rounding between nursing and lab staff.

Conclusion

The journey of a laboratory sample from collection to result is a process measured in time, but its psychological impact is measured in human distress. This review has established that delayed laboratory results are a potent psychosocial stressor, creating a dual burden of heightened anxiety and uncertainty for patients and contributing significantly to burnout, moral distress, and role strain for nurses. These effects are not isolated but are intensified by systemic factors such as workplace culture, shift work, and large-scale crises like the COVID-19 pandemic.

Addressing this issue requires a paradigm shift—from viewing laboratory delays as solely an operational or logistical problem to recognizing them as a critical factor in patient and provider well-being. The path forward must be multi-faceted. It necessitates a commitment to diagnostic stewardship that includes empathetic and transparent communication strategies. It demands institutional investment in supporting the mental health of the nursing workforce through accessible resources and empowerment initiatives. Finally, it calls for enhanced collaboration and understanding between nursing and laboratory professionals to build more resilient systems.

Ultimately, improving the timeliness and management of laboratory diagnostics is not just about efficiency; it is a fundamental component of compassionate, patient-centered care and a sustainable, healthy healthcare workforce. By mitigating the psychological cascade triggered by delay, healthcare systems can not only improve outcomes but also honor their commitment to caring for both those who receive care and those who provide it.

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