

Research Design and Methods Hallmark Assignment

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Introduction

Correctional health systems across the United States are under increasing strain because of chronic understaffing and rising inmate healthcare demands (Nowotny et al., 2021). Incarcerated individuals often present with complex health profiles, including chronic conditions, mental health disorders, and infectious diseases (Nowotny et al., 2021). However, the infrastructure and staffing levels within many correctional facilities remain inadequate to meet these needs (Nowotny et al., 2021). National data confirm that nurse-to-patient ratios in prisons are significantly lower than in community health settings, a disparity that has been linked to delays in medical triage, medication errors, and adverse health outcomes (Cloud et al., 2021). Recent scholarship has turned to nurse-led care models as a potential solution to address these structural deficits. Studies have demonstrated that when nurses assume leadership roles in care coordination, task delegation, and triage, measurable improvements in efficiency, patient safety, and timeliness of care can follow (Hooper et al., 2025; Bellas et al., 2022).

Despite these promising findings, there remains a notable lack of implementation-focused research on how nurse-led care delivery models operate in high-pressure, understaffed correctional environments (Hooper et al., 2025). Most evaluations are either limited to small pilot programs or general healthcare settings, which limit their applicability in correctional health contexts (Bellas et al., 2022). As such, the proposed study seeks to examine whether implementing nurse-led patient care teams in correctional facilities can improve the timeliness of care delivery compared to traditional, physician-led models. The focus will be on U.S.-based prison systems operating under conditions of known staff shortages and high patient loads (Rosen et al., 2023). Addressing this question is critical for both operational efficiency and the

ethical obligation to provide timely and adequate healthcare to justice-involved populations (Nowotny et al., 2021).

Research Question:

In correctional facilities experiencing short staffing and high workloads, how does the implementation of nurse-led patient care teams, compared to traditional physician-led models, influence the timeliness of patient care over six months?

Synthesis and Summary of Literature Review

The literature review explored the potential of nurse-led care teams as a strategic response to chronic understaffing and operational inefficiencies in correctional health environments. Evidence across multiple studies confirms that these teams can improve timeliness in patient care delivery, although their effectiveness is shaped by the unique structural and cultural dynamics of correctional institutions (Blume et al., 2021; Holloway et al., 2023; Tate et al., 2024). Nurse-led teams consistently outperform traditional models in reducing patient wait times and enhancing workflow responsiveness (Holloway et al., 2023). However, success is conditional on contextual factors such as facility location, staffing levels, communication flow, and institutional readiness (Tate et al., 2024).

A recurring theme in the literature is the challenge coming from entrenched hierarchies and rigid organizational structures. Studies such as those by Abdelhadi et al. (2021), Kraaij et al. (2024), and Forte et al. (2024) stress how inefficient task distribution and security-driven delays undermine even the most well-designed nursing interventions. Similarly, widespread staffing shortages documented by Rosen et al. (2023) and Forman-Dolan et al. (2022) further complicate the delivery of timely care.

Further, the review also showed the growing role of Advanced Practice Nurses (APNs) and delegation models. These roles expand nurses' scope and enable task redistribution, which supports continuity and responsiveness (Carthon et al., 2020; Moradi et al., 2024). While promising, APN-led models face institutional resistance and regulatory barriers, limiting consistent implementation across correctional systems (Kleinpell et al., 2023). As a result, implementation studies using frameworks like PDSA and RE-AIM show that successful integration of nurse-led teams depends on leadership support, staff engagement, and adaptability to local conditions (Glasglow et al., 2022; Hadida et al., 2024). While evidence supports the viability of these models, further research is required to examine long-term sustainability, equity considerations, and scalability across diverse correctional settings (Glasglow et al., 2022).

Research Design and Methods

Study Design and Justification

To answer the research question, this study will employ a quantitative, quasi-experimental design using secondary data to examine whether nurse-led patient care teams improve the timeliness of care delivery in correctional facilities compared with traditional physician-led models. A quasi-experimental approach is justified given the inherent constraints of conducting randomized trials in prison settings, which often entail complex logistical and ethical challenges (Tate et al., 2024; Hadida et al., 2024). The research will leverage existing data collection from health services across selected correctional institutions in the United States (Cheraghi et al., 2023). This approach aims to avoid disrupting operations and reduce the burden on institutional staff (Polit & Beck, 2021). This design enables analysis of naturally occurring variations in staffing models while preserving the practical feasibility necessary in high-security settings (Tate et al., 2024).

Setting and Population

The study will focus on four medium-security state prisons in the United States. The first two have implemented nurse-led care team models within the past year, while the other two will serve as comparison sites using traditional physician-led systems. All facilities will actively participate in statewide or regional correctional health reporting systems that maintain standardized electronic health data (Cheraghi et al., 2023). The target population consists of adult incarcerated individuals (age 18 and older) who accessed primary care services during a six-month retrospective window. Only non-emergency patient encounters initiated through scheduled clinics or sick-call systems will be included to maintain comparability. Encounters involving transfer between institutions or hospitalization will be excluded to reduce confounding from external care environments (Polit & Beck, 2021).

Sampling and Data Sources

A purposive sampling method will be used to select facilities with clear documentation of their staffing models and sufficient availability of care delivery data (Polit & Beck, 2021).

Within each facility, retrospective data from six consecutive months will be extracted through formal data-sharing agreements with correctional health authorities. This approach aligns with recommendations for using administrative health data to evaluate quality of care in closed systems (Cheraghi et al., 2023).

The primary sources of data will include 1) Electronic health records (EHRs), to extract encounter-level timestamps (for example, sick-call request, assessment, treatment initiation), 2) facility staffing reports to help document nurse-to-patient ratios and care team composition, and 3) internal performance dashboards to aid in accessing monthly timeliness indicators and quality assurance summaries (Bellas et al., 2022). Given the above, the key variables are as follows. The

independent variable will be the type of care delivery model (nurse-led vs. physician-led), and the dependent variable will be the timeliness of care, defined here as the hours elapsed from the patient-initiated request to the initial clinical assessment. The control variables will be the staffing levels, average daily patient census, patient age, gender, and medical acuity level (McHugh et al., 2021). To this end, focusing on facility-level and encounter-level records already in place will help the research maximize data validity while minimizing additional documentation requirements for correctional staff (Cheraghi et al., 2023).

Ethical Considerations

As the study involves only secondary analysis of de-identified institutional data, individual informed consent is not required (Polit & Beck, 2021). However, the project will undergo review by an Institutional Review Board (IRB) to confirm adherence to ethical standards governing research involving justice-involved populations. Facilities participating in the study will provide formal data-sharing approvals, and only aggregated or de-identified data will be stored or reported. All data will be encrypted, stored on secure servers, and accessed only by authorized members of the research team. Institutional identifiers will be masked in all analyses to protect facility confidentiality. All procedures will follow the ethical standards outlined in 45 CFR 46, Subpart C, and the recommendations of the National Commission on Correctional Health Care (NCCHC) regarding research in correctional settings.

Data Analysis Plan

Descriptive statistics will be calculated to summarize sample demographics and facility characteristics (Polit & Beck, 2021). The primary analysis will compare the average time to care delivery across nurse-led and physician-led models. Independent-samples t-tests or nonparametric Mann-Whitney U tests will be used depending on the data distribution (Polit &

Beck, 2021). Facility-specific averages will also be compared to detect patterns in institutional performance. To adjust for confounding variables, multivariable linear regression will be applied. Independent variables will include staffing ratios, facility size, and average patient acuity. The care delivery model (nurse-led vs. physician-led) will serve as the primary predictor variable. Facilities will be entered as fixed effects to account for institutional-level variation. Analyses will be conducted using SPSS or Stata, and significance will be determined at the 0.05 alpha level, with 95% confidence intervals reported.

Conclusion

The research study proposes a quantitative, quasi-experimental design using secondary data to explore whether nurse-led patient care teams improve the timeliness of care in correctional facilities affected by chronic understaffing and high workloads. Drawing on documented structural inefficiencies and implementation challenges in correctional health settings, the research responds to a well-documented gap in the literature by focusing specifically on institutional care models and their operational impact (Hooper et al., 2025). The proposed methodology allows for practical, ethical, and data-driven analysis across multiple state prison systems. It will use retrospective facility-level health records and operational dashboards, thereby maintaining feasibility and respecting institutional constraints while still providing strong comparative insights (Cheraghi et al., 2023).

Timeliness of care, as the central outcome, is particularly relevant to incarcerated populations, where access delays can lead to adverse events and legal liability (Nowotny et al., 2021). This design provides a realistic pathway to generate actionable findings for health administrators and policy stakeholders. The focus on secondary data ensures low intrusion, high efficiency, and scalability across facilities. Ultimately, the study aims to contribute to the

growing body of evidence supporting nurse-led care models as both clinically effective and operationally viable in resource-constrained correctional environments (Tate et al., 2024).

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