



The Relationship between Nursing Specialty Certification and Surgical Site Infection Rates in Acute Care Hospitals

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Background

- Researchers have not studied the relationship between specialty certified RNs and one of the most common complications of surgical care, surgical site infections (SSI).
- Urban¹ estimated costs per SSI vary from \$400/superficial SSI to \$30,000/serious organ or space infections.

Purpose

To examine the relationship between RN specialty certification rates and SSI rates in US acute care hospitals using merged data from the National Database of Nursing Quality Indicators® (NDNQI®) and the National Healthcare Safety Network (NHSN).

Specific Aims

- Examine the relationship between the:
1. Percent of perioperative area RNs holding specialty certification (CAPA, CPAN, CNOR/CRNFA) and hospital SSI rates.
 2. Percent of SICU, surgical unit, and medical-surgical combined unit RNs holding specialty certification (any national specialty certification) and hospital SSI rates.
 3. Number of wound and ostomy certified RNs and hospital SSI rates.
- Explore whether the:
4. Perceived autonomy of specialty certified RNs moderates the relationship between specialty certification rates and hospital SSI rates.
 5. Processes of decision making and RN – physician relations mediates the relationship between specialty certification rates and hospital SSI rates.

Methods

- Retrospective, secondary analysis of merged data from NDNQI and NHSN.
- All NDNQI hospitals that submitted quarterly administrative staffing data and annual RN survey data in 2014 were invited to participate by downloading their NHSN SSI files to NDNQI.

Participants

Hospital (N = 114) Characteristics

Characteristic	Percent	Percent	Percent
Hospital Type	General 94.7	Critical Access 1.8	Specialty 3.5
Magnet Status	Magnet 37.7	Applicant 19.3	Non-Magnet ¹ 43.0
Teaching Status	Academic Medical 7.9	Teaching 36.8	Non-Teaching 55.3
Bed Size	<200 52.6	200-399 32.5	>399 14.9
Location	Metropolitan 88.6	Micro-politan 9.6	Rural 1.8
Case Mix Index	High 19.6	Medium 50.9	Low 29.5

¹ Non-Magnet category may contain applicants who have not self-identified to NDNQI.

Study Variables

Donabedian's Structure-Process-Outcome^{2,3}

Structure	Process	Outcome
<ul style="list-style-type: none"> • Specialty Certification Rates <ul style="list-style-type: none"> ○ Perioperative ○ SICU ○ Surgical Unit ○ Medical-Surgical Units ○ Wound & Ostomy • RN Autonomy 	<ul style="list-style-type: none"> • RN Decision Making • RN-Physician Relations 	<ul style="list-style-type: none"> • Surgical Site Infection Rates

Statistical Analysis

- Generalized linear regression models at hospital level.
- Fit each model using Poisson-based count of SSIs and log of total number of operations performed as the exposure.
- Poisson models account for zero-truncated and skewed SSI data.
- Include control variables: Hospital [Magnet status, size, ownership, teaching status, CMI] and unit [staffing, skill mix, education, experience].

At Study Completion

- Expect beginning evidence about whether increasing RN specialty certification rates in acute care hospitals should be a part of SSI prevention strategies globally.
- Expect beginning evidence about whether certified RNs who are allowed more autonomy and decision-making have a greater effect on reducing costly SSIs.

References

1. Urban JA. Cost analysis of surgical site infections. *Surg Infect.* 2006;7 Suppl 1:S19-22.
2. Donabedian A. The quality of care: how can it be assessed? *JAMA.* 1988;26:1743-1748.
3. Donabedian A. The role of outcomes in quality assessment and assurance. *Qual Rev Bull.* 1992;18:356-360.

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