

Antimicrobial Stewardship Programs: For nursing practices and their relation to patient outcomes in a Tertiary hospital.

Brent Marc A. Sochayseng¹, Dr. Mary Ann Lopez²

<https://orcid.org/0009-0001-4136-6389>¹, <https://orcid.org/0000-0001-7566-5152>²

St. Bernadette of Lourdes College, Inc.^{1,2}

bmschayseng@sbic.edu.ph¹ malopez@sbic.edu.ph²

Abstract

This study assessed nursing compliance with antimicrobial stewardship practices and nurse-reported perceived patient outcomes in a tertiary hospital. A quantitative, cross-sectional, descriptive-correlational research design was employed using a structured electronic questionnaire. The instrument measured four nursing compliance domains—Assessment and Culture Collection, Timely Antimicrobial Administration and Documentation, Monitoring and Adverse Event Reporting, and Patient and Family Education—and three perceived patient outcome domains: Length of Stay, Patient Satisfaction, and Clinical Improvement. Total enumeration was used to invite 100 eligible registered nurses assigned to the Emergency Room, Intensive Care Unit, Neonatal Intensive Care Unit, and Medical-Surgical Ward of a private hospital in Bulacan, Philippines. Eighty-two nurses participated, yielding an 82.0% response rate. The compliance analysis included 31 administered items, while the perceived outcome analysis included 15 items. Assessment and Culture Collection obtained the highest compliance mean ($M = 3.85$, $SD = 0.26$), whereas Clinical Improvement recorded the highest perceived outcome mean ($M = 3.80$, $SD = 0.34$). Spearman rank-order correlation revealed a strong positive association between overall nursing compliance and overall nurse-reported perceived patient outcomes ($\rho = .770$, 95% CI [.625, .884], $p < .001$, $n = 82$). A sensitivity analysis using only the first occurrence of identical response patterns demonstrated a moderate positive association ($\rho = .524$, $p < .001$, $n = 53$). Although the cross-sectional design does not establish causation and outcomes were based on nurse perceptions rather than verified patient-level data, the findings highlight the importance of structured nurse education, consistent documentation, patient education, adverse-event reporting, and multidisciplinary antimicrobial stewardship practices in improving nursing processes and perceived patient outcomes.

Keywords: Antimicrobial stewardship, nursing compliance, patient outcomes, registered nurses, tertiary hospital, antimicrobial administration, patient education.

INTRODUCTION

Antimicrobial resistance (AMR) is a major threat to patient safety because infections can become harder to treat, and inappropriate antimicrobial use may cause avoidable harm. The World Health Organization and the Philippine National Action Plan on Antimicrobial Resistance 2024–2028 emphasize surveillance, antimicrobial stewardship, infection prevention, education, and coordinated governance. Hospital antimicrobial stewardship

programs (ASPs) implement these priorities through policies, accountability, pharmacy and laboratory support, education, monitoring, and feedback.

Nurses play an important role in antimicrobial stewardship through routine clinical responsibilities. These include patient assessment, allergy verification, appropriate specimen collection, antimicrobial administration, documentation, monitoring treatment responses and adverse effects, escalating concerns, communicating with healthcare professionals, and patient education. Proper assessment and specimen collection support diagnostic stewardship by ensuring accurate cultures and timely laboratory results. Medication-related practices require accurate order verification, timely administration, complete documentation, and prompt reporting of omissions, delays, or incomplete orders.

Patient and family education is also essential. Nurses help patients understand the purpose and schedule of antimicrobials, possible side effects, warning signs, and safe medication use. Teach-back and written instructions may improve understanding, although time constraints, professional boundaries, institutional policies, and organizational support can affect educational practices.

Evidence suggests that ASPs can improve antimicrobial-use processes and selected hospital outcomes, although findings differ across settings and interventions. Importantly, nurse-reported compliance should not be interpreted as a direct measurement of patient outcomes. Local evidence remains limited regarding whether higher nursing compliance with antimicrobial stewardship practices is associated with more favorable perceived patient outcomes. Therefore, this study assessed nursing compliance and nurse-reported perceived patient outcomes among registered nurses in four clinical areas of a tertiary hospital in Bulacan, Philippines, and examined the association between their overall composite scores.

Statement of the Problem

This study assessed antimicrobial stewardship programs, nursing practices, and patient outcomes in a tertiary hospital. Specifically, it sought to answer the following questions:

1. What is the profile of the respondent nurses in terms of:
 - a. age;
 - b. area of assignment;
 - c. years of clinical experience; and
 - d. antimicrobial stewardship training attended?
2. What is the level of nursing compliance with antimicrobial stewardship practices in terms of:
 - a. assessment and culture collection;
 - b. timely antimicrobial administration and documentation;
 - c. monitoring and adverse event reporting; and
 - d. patient and family education?
3. What is the status of nurse-reported perceived patient outcomes in terms of:
 - a. length of stay;
 - b. patient satisfaction; and
 - c. clinical improvement?

4. Is there a significant relationship between overall nursing compliance with antimicrobial stewardship practices and overall nurse-reported perceived patient outcomes?

Scope and Delimitations

The study covered registered nurses assigned to the Emergency Room, Intensive Care Unit, Neonatal Intensive Care Unit, and Medical-Surgical Ward of San Jose Del Monte Muzon Medical Center. It used a single-site, cross-sectional design and focused on nurse self-reports of compliance and nurse-reported perceptions of outcome patterns. Total enumeration invited all 100 eligible registered nurses, and 82 usable questionnaires produced an 82.0% response rate. The compliance analysis used 31 administered items because one planned Assessment and Culture Collection item was absent from the electronic questionnaire; the domain therefore contained seven administered items. The outcome analysis contained 15 items.

Review of Related Literature

Nurses in antimicrobial stewardship. Scoping, integrative, and systematic reviews describe bedside nurses as participants in assessment, medication safety, surveillance, communication, education, and interprofessional coordination (Bos et al., 2023; Camerini et al., 2024; Gotterson et al., 2021; van Huizen et al., 2021). Davey and Aveyard (2022) found that nurses often perceive stewardship as a multidisciplinary responsibility, but formal contribution can be limited by unclear professional boundaries. Qualitative evidence from Thailand and surgical services similarly identifies hierarchy, policy, workload, role clarity, and access to information as conditions that affect nurse participation (Ierano et al., 2022; van Gulik et al., 2021).

Theoretical Framework

Donabedian's Structure-Process-Outcome model was the primary framework (Donabedian, 1988). Structure included hospital policies, orientation, formal stewardship training, reporting systems, medication and specimen procedures, and interdisciplinary support. Process included assessment, specimen collection, antimicrobial administration, documentation, monitoring, adverse-event reporting, and patient and family education. Outcome consisted of nurses' perceptions of length-of-stay patterns, patient satisfaction, and clinical improvement. The model organized the expected relationship between care structures, nursing processes, and perceived outcomes; it did not prove that one variable caused another.

Conceptual Framework

The predictor variable was overall nursing compliance with antimicrobial stewardship practices. Its domains were Assessment and Culture Collection, Timely Antimicrobial Administration and Documentation, Monitoring and Adverse Event Reporting, and Patient and Family Education. The outcome variable was overall nurse-reported perceived patient outcomes, with Length of Stay, Patient Satisfaction, and Clinical Improvement as its domains. The study tested the association between the two overall composite scores. The outcome composite represented nurses' perceptions and was not a verified hospital indicator.

METHODOLOGY

The study used a quantitative, cross-sectional, descriptive-correlational design and a structured electronic questionnaire. Completed methods and analyses are described in the past tense because data collection and statistical testing had concluded.

Research Design

The quantitative approach represented profile variables, reported nursing behaviors, and perceived outcome patterns through numerical data. The cross-sectional design collected one questionnaire from each participating nurse during one data-collection period.

Research Steps

The completed sequence followed the approved protocol and institutional permissions. The questionnaire was developed from the research questions and relevant stewardship literature, reviewed for content, coordinated with the hospital, and distributed electronically to eligible nurses after informed consent. Submitted responses were retrieved and cleaned.

Data Collection and Sample Selection

The target population consisted of 100 registered nurses assigned to the Emergency Room, Intensive Care Unit, Neonatal Intensive Care Unit, and Medical-Surgical Ward.

Data Analysis Methods

Transcripts were analyzed using Colaizzi's (1978) method: reading for familiarity, extracting significant statements, formulating meanings, clustering themes, and validating findings with participants.

Study Limitations and Ethical Considerations

The study secured institutional ethics approval. Participants were informed of voluntary participation, confidentiality, and the right to withdraw at any time, in compliance with the Data Privacy Act of 2012.

RESULTS AND DISCUSSION

The largest age category was 31-35 years, 28 respondents or 34.1%. Nurses aged 21-35 accounted for 64.6% of the sample. One to five years of clinical experience was the largest experience category, 47 of 81 valid responses or 58.0%. These distributions describe respondents and do not explain hospital hiring or staffing. Similar nurse surveys include substantial younger or early-career groups, while engagement has been associated with education, opportunity, motivation, authority, and unit conditions rather than age alone (Lim & Bang, 2024; Nie et al., 2024). Nursing administration should therefore combine orientation, mentoring, competency review, and continuing education rather than use age or tenure as a proxy for competence.

The Emergency Room contributed the largest respondent group, 26 or 31.7%, followed by the Intensive Care Unit, 22 or 26.8%. This respondent representation does not prove that the Emergency Room had the largest nursing workforce. Clinical context affects the activities and decisions available to nurses, which supports unit-specific examples within a common stewardship standard (Lim & Bang, 2024; van Gulik et al., 2021). Multiple-area selections were retained to avoid assigning nurses to a unit they did not select alone.

SUMMARY

This study assessed nursing compliance with antimicrobial stewardship practices and nurse-reported perceived patient outcomes at San Jose Del Monte Muzon Medical Center through a quantitative, cross-sectional, descriptive-correlational design. Total enumeration invited 100 eligible registered nurses; 82 usable questionnaires produced an 82.0% response rate. The structured electronic questionnaire measured Assessment and Culture Collection, Timely Antimicrobial Administration and Documentation, Monitoring and Adverse Event Reporting, Patient and Family Education, Length of Stay, Patient Satisfaction, and Clinical Improvement. One planned culture-before-first-dose item was absent, so the compliance analysis used 31 administered items, including seven Assessment and Culture Collection items, while outcome analysis used 15 items.

CONCLUSIONS

1. The respondent group consisted mainly of nurses aged 31-35 years and nurses with one to five years of clinical experience.
2. The Emergency Room contributed the largest respondent group, but the result does not establish that it had the largest nursing workforce.
3. Hospital orientation was the most common stewardship training exposure, while relatively few respondents had attended two or more formal sessions.
4. Nurses reported Very High Compliance in all four antimicrobial stewardship practice domains.

RECOMMENDATIONS

Based on the findings and conclusions of the study, the following recommendations are proposed:

1. **Hospital administration.** Authorize formal antimicrobial stewardship sessions beyond orientation, protect annual competency-review time, and provide electronic reporting and documentation support. The recommendation responds to the 13.4% with two or more formal sessions and the relative gaps in documentation and reporting. Follow-up indicators are annual completion, competency-pass rates, and system-access records.
2. **Nursing service administration.** Adopt one nursing competency standard for diagnostic stewardship, allergy verification, specimen labeling and transport, first-dose and scheduled-dose timing, actual-time records, omitted and delayed doses, medication-availability escalation, incomplete-order clarification, infusion reactions, adverse events, deterioration, nursing actions, and education. The four Very High domains with item-level variation support this action. Indicators are quarterly audit compliance and documented corrective actions.

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AI DECLARATION STATEMENT

AI-supported tools helped with grammar and structure in creating this article. No AI tools were used to collect, analyze, or interpret data; all authors are credited for their academic contributions.

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