

---

# Staff Developed IP Program Increases Antimicrobial Stewardship and Decreases HAIs Rates

---

Yousef I. Aljeesh, PhD, RN

Said Abusalem, PhD, RN

Naeem Alkariri, MSN, RN

John A. Myers, PhD, MSPH

Fawwaz Alaloul, PhD, RN

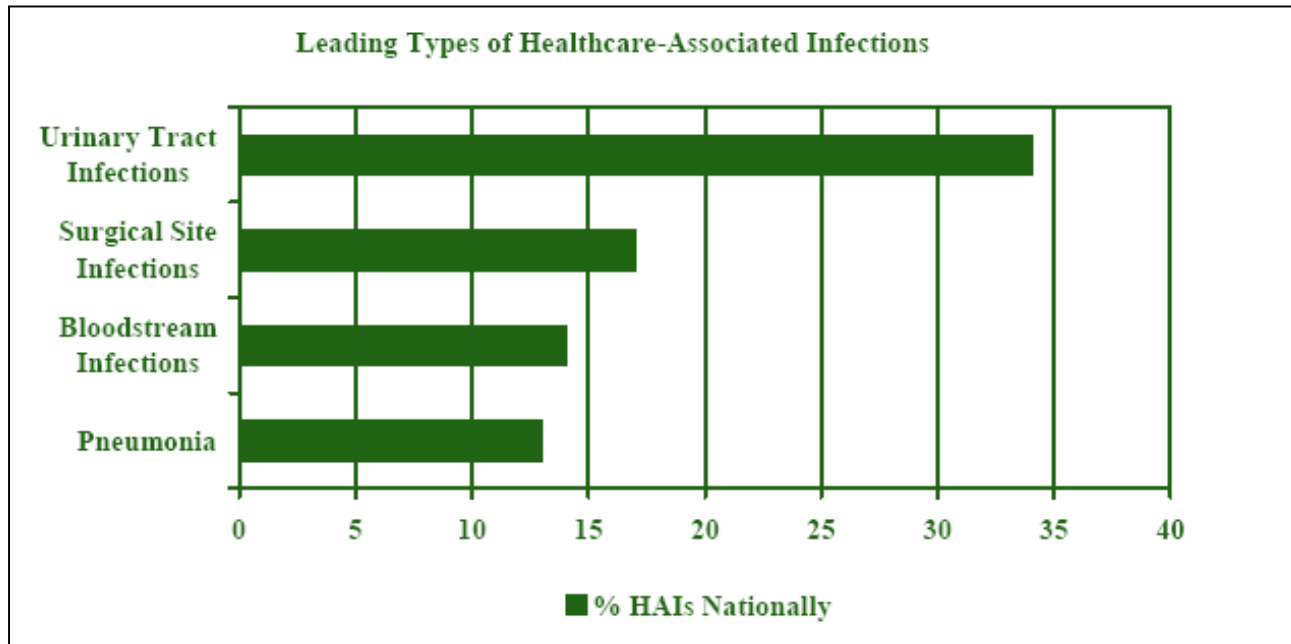
---

# How Big is the Problem?

- ❖ Healthcare Associated Infections (HAIs) are an international problem that represents an estimated 10% of all hospital admissions globally.
  - ❖ HAIs not only increase morbidity and mortality in patients but also causes considerable economic burden on health care.
  - ❖ According to the CDC,
    - ❑ The incidence is 1.7 million infections and 99,000 deaths per year.
    - ❑ HAIs cost an estimated \$28 billion to \$33 billion each year.
-

# How Big is the Problem?

- 26% are Catheter Associated Urinary Tract Infections (CAUTIs),
- 16.7% are Surgical Site Infections (SSIs),
- 5.2% Central Lines Bloodstream Associated Infections (CLABSIs),
- 10.25% Clostridium Dificile- associated Infection (CDI),
- and 3% are Ventilator Associated Pneumonia (VAP).



---

# HAIs Internationally

- ❖ The mean prevalence of HAIs in Europe is 7.1 per 100 patients.
  - ❖ In England, £1,000 million annually is budgeted by the National Health Service for HAIs.
  - ❖ In Canada, the incidence of HAIs is greater than 220,000 per year and results in 8,500-12,000 deaths.
  - ❖ The direct costs of HAIs in Canada are estimated at \$1 billion annually.
-

---

# HAIs in ICUs

- ❖ ICU patients represent 8% to 15% of all hospital admissions.
  - ❖ HAIs in the ICU settings can cultivate in a number of places:
    - ❖ numerous invasive lines,
    - ❖ mechanical ventilation,
    - ❖ Foley catheters, central lines,
    - ❖ arterial lines,
    - ❖ endotracheal tubes,
    - ❖ or other mechanisms in ICU patients.
-

---

# Healthcare Associated Infections

- ❖ While can occur in any care setting, are particularly related to:
    - ❑ Use of medical devices
    - ❑ Complications of surgical procedures
    - ❑ Transmission between patients and healthcare workers
    - ❑ Antibiotic overuse
-

---

# The Study Aimed at:

- ❖ Involving the health care team in identifying causes of HAIs and antibiotic use.
  - ❖ Involving the health care team in developing activities and interventions to improve the quality of health care in the ICU at Rantisi Pediatric Hospital (RPH).
  - ❖ The research team then evaluated the effectiveness of these interventions.
-

---

# Purpose of the Study

- The purposes of this study were to explore nurses perceptions of causes of HAIs and antibiotic misuse and to develop and implement prevention measures to improve the quality of health care in the ICU in a specialty Pediatric Hospital in Gaza.
-



---

# Design

- ❖ A quasi-experimental pretest-posttest design was used.
  - ❖ All staff members who worked in the intensive care unit participated in the study.
  - ❖ The three phases of the project included:
    - Assessing the preexisting stage and defining the problem,
    - Developing and implementing the interventions,
    - And evaluating their effectiveness 6 months after implementation.
-

---

# Study Design

- ❖ **In the first phase**, the information from the brain storming sessions was gathered and a survey was developed to further assess consensus among staff about the interventions.
  - ❖ **In the second phase**, interventions suggested by staff were implemented using a quasi-experimental design.
  - ❖ **In the third phase**, the researchers measured the effects of the interventions by evaluating antibiotic use and HAIs before, during, and after 6 months of implementation.
-

---

# Setting

- ❖ The Rantisi Specialty Pediatric Hospital (RSPH), a referral center for tertiary medical services in Gaza,
  - ❖ Has an average of 76 new patients each month.
  - ❖ The bed occupancy rate in the hospital during the first year of the study was 77.3% with an average length of stay of nine days.
  - ❖ The hospital has capabilities across the full spectrum of tertiary care services for both inpatient and outpatient care.
  - ❖ The hospital seeks to meet the standards of WHO quality of care.
-

---

# Outcome Measures Pre and Post the Intervention

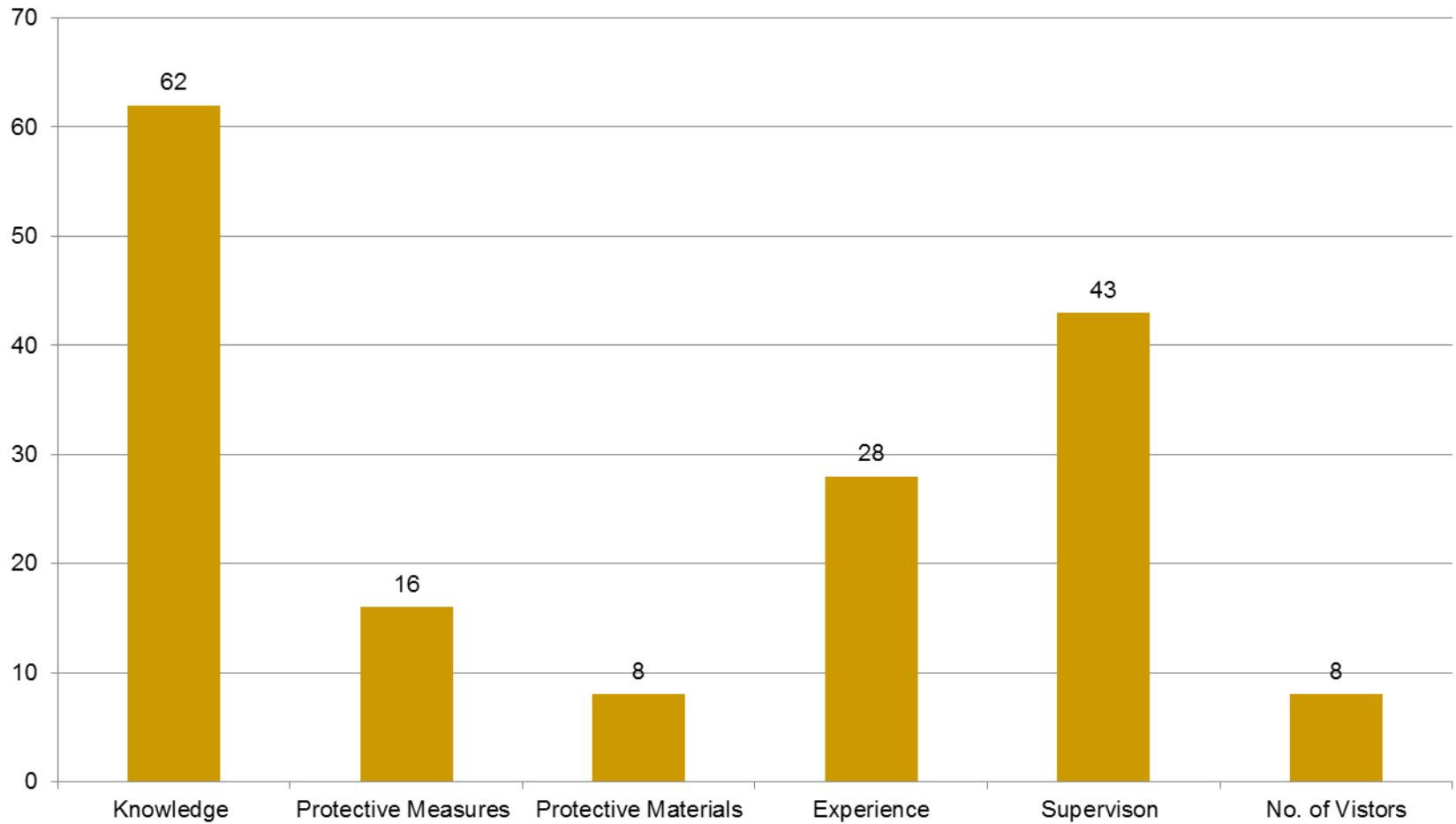
- ❖ (1) antimicrobial stewardship (average number of antibiotics vials used in one week);
  - ❖ (2) infections rates (number and percentage of different positive cultures [blood, sputum, urine, wounds, or cerebrospinal fluid] in the ICU).
  - ❖ Hand hygiene compliance was assessed using a staff survey of perceived compliance.
-

---

# Development of the Intervention

- The ICU team members (RNs, MDs, pharmacists, and lab workers) identified possible causes of HAIs and misuse of antibiotics in the ICU.
  - Six possible causes were identified in Figure 1 next slide.
  - A questionnaire and a check list were developed by the researchers to collect possible ways to prevent HAIs and to foster effective antibiotics use.
-

## Six Identified Causes by Staff



---

# The Intervention

- 1. Offering infection prevention medical supplies and equipment.
  - 2. Educational sessions and training programs.
  - 3. Implemented methods to improve compliance with infection prevention and control precautions.
-

---

# Findings

- There were 76 positive cultures out of the 120 cultures collected for the first year with infection rate 63.3%.
    - In the first half of the second year, the researchers collected 60 cultures and only 21 were positive cultures (35%).
    - The infection rate significantly decreased from the first year to the second following the implementation of the intervention (63.3% vs. 35.0%, OR = 3.21, 95% CI 1.87-5.11,  $p < 0.001$ ).
-

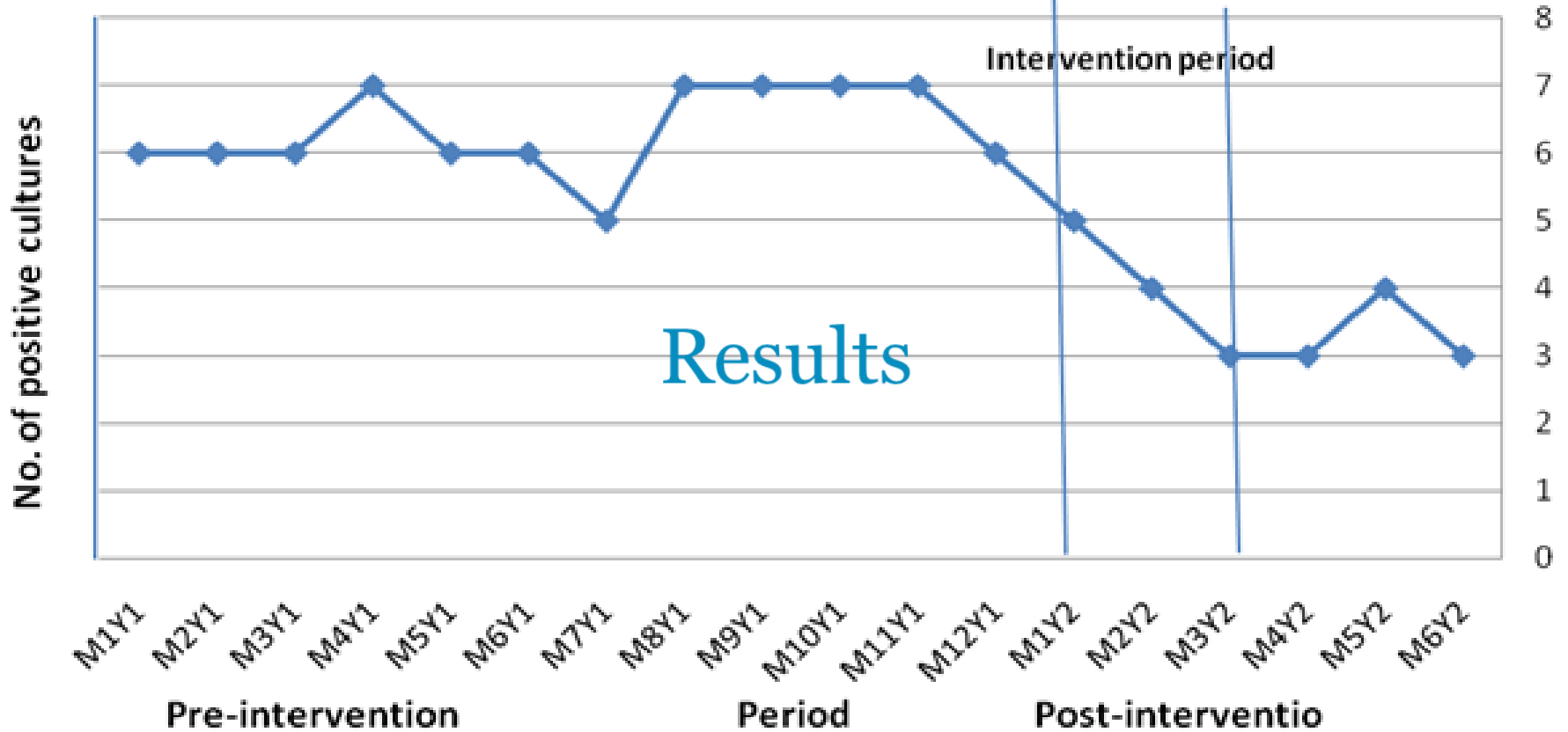


---

# Findings

- The mean number of antibiotic vials used before the intervention (in the first year) was 130 vials/week.
  - After the intervention, the mean number of antibiotics used weekly was 92 vials, representing a significant decrease in antibiotic use ( $p = 0.002$ ).
-

## Positive Cultures; Pre, During, and Post Intervention



---

# Results

- Lack of knowledge, supervision, and experience were the most widely perceived causes of HAIs in the ICU.
  - There was a significant decrease in the incidence of HAIs from pretest to posttest.
  - The number of positive cultures (blood, sputum, urine, wounds, or cerebrospinal fluid) decreased from 76% to 42%.
  - The use of antibiotic vials per week decreased from 130 to 92 vials.
-

---

# Conclusions

- These findings support the need for health education programs about infection control and prevention.
  - And for monitoring staff performance at RPH-ICU in order to reduce the incidence of HAIs and antibiotic use.
-