

*Brief report***Assessing awareness of methicillin-resistant *Staphylococcus aureus* (MRSA) among nursing students: A survey from 2018**MFA Fazil¹, M Sutharsan², M Sutharsan³*Sri Lankan Journal of Infectious Diseases 2025 Vol.15(1):E79:1-6*DOI: <https://doi.org/10.4038/sljid.v15i1.8772>**Abstract**

This study aimed to assess knowledge and awareness of methicillin-resistant *Staphylococcus aureus* (MRSA) among nursing undergraduates at the Faculty of Allied Health Sciences, University of Peradeniya. A self-administered questionnaire was distributed to nursing students between 12th to 24th April 2018. The questionnaire focused on various aspects of MRSA, including its causative agent, transmission methods, clinical manifestations, infection control practices, and treatment options. The findings revealed a high awareness of MRSA, with 98.2% of participants recognizing the term. However, significant knowledge gaps were identified, particularly in areas related to MRSA resistance mechanisms, treatment options, and infection control practices. Notably, only 32.1% of participants acknowledged the importance of dressing MRSA-infected wounds before other patients' wounds, highlighting a critical area for improvement. In terms of infection control, most participants correctly identified the importance of using personal protective equipment (PPE), hand washing, and proper disposal of contaminated materials, but there was a lack of consensus regarding specific management protocols for MRSA patients. These findings suggest that while awareness is high, further education and targeted training are essential to address knowledge gaps and improve adherence to infection control measures for managing MRSA infections in clinical settings.

Keywords: *Methicillin-Resistant Staphylococcus aureus, Nursing Students, Health Knowledge, Attitudes, Practice, Infection Control, Clinical Competence.*

Introduction

Methicillin-resistant *S. aureus* (MRSA) is a Gram-positive bacterium known for its resistance to methicillin and other beta-lactam antibiotics, due to the *mecA* gene encoding a modified penicillin-binding protein (PBP2a) that blocks beta-lactam binding.^{1,2} MRSA colonises the skin and mucosa without causing symptoms in carriers, but can lead to infections ranging from mild skin issues to severe conditions such as sepsis, pneumonia, and endocarditis.³

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MRSA is classified into healthcare-associated (HA-MRSA), community-associated (CA-MRSA), and livestock-associated (LA-MRSA) strains, each with distinct transmission patterns and clinical implications.⁴ HA-MRSA causes most nosocomial infections, while CA-MRSA increasingly affects healthy individuals, highlighting its public health impact.⁵ MRSA significantly contributes to global morbidity and mortality, causing tens of thousands of deaths annually.⁶ MRSA infections significantly burden healthcare systems, leading to prolonged hospital stays, advanced medical care, and costly antibiotic treatments, straining resources.⁷ In addition, MRSA-related outbreaks often necessitate extensive infection control measures, further exacerbating the economic impact.⁸

Nurses play a key role in preventing and managing MRSA infections by implementing infection control practices, providing patient care, and enforcing hygiene protocols to limit pathogen spread.⁹ Equipping nurses with knowledge and skills to identify risk factors, practice hand hygiene, and handle medical equipment properly is crucial for mitigating MRSA transmission.¹⁰ Studies highlight challenges in MRSA awareness among healthcare professionals, particularly nursing undergraduates. Knowledge gaps in MRSA transmission and prevention can compromise infection control, leading to poor compliance with observing appropriate precautions.³ Targeted education and training are crucial to improving adherence to infection control protocols and reducing transmission.⁵

Assessing MRSA awareness among nursing undergraduates is essential, as they will play a key role in preventing infection. Identifying knowledge gaps can guide effective educational interventions and ensure nursing curricula adequately prepare students to manage and prevent the spread of antimicrobial resistance in clinical practice. This study aims to assess MRSA awareness among nursing undergraduates and identify knowledge gaps to inform targeted educational strategies, ultimately enhancing infection control practices and reducing MRSA transmission in healthcare settings.

Methods

Study Design

This was a descriptive cross-sectional study carried out among 112 students in the Department of Nursing, Faculty of Allied Health Sciences (FAHS), University of Peradeniya between April 12th and 24th, 2018. All undergraduate nursing students of FAHS who had commenced clinical training and were willing to participate in the study were included. Informed written consent was collected from the participants. A pre-validated, pre-tested, and self-administered questionnaire was used to collect data. The questionnaire was administered in English

Statistical analysis

Data from the questionnaire was extracted and analysed using MS Excel (2010) and SPSS version 20. Descriptive statistics summarised demographic data, and mean $\pm$ SD was calculated for overall knowledge, basic knowledge, and knowledge of MRSA care.

Results

Socio-demographic profile of the study participants: One hundred and twelve (112) B.Sc. nursing students participated in the study. There were 40 (35.7%) males and 72 (64.2%) females. There were 24 (21.4%) first-year students, 31 (27.6%) second-year students, 29 (25.8%) third-year students and 28 (25%) fourth-year students.

Source of knowledge: Among the participants, 110 (98.2%) students had heard about MRSA infection while 2 (1.8%) students had not heard about MRSA infection. Lectures (66.4%), clinical setting (92%), and peers (32%) were reported as the major sources of knowledge.

Experience in caring for MRSA patients: Nursing students reported receiving training in the care of MRSA-positive patients primarily in surgical wards (52.2%), followed by medical wards (41.1%), intensive care units (12.5%), and operating theatres (7.1%)."

Knowledge of MRSA: Participants' MRSA knowledge was assessed with "Yes", "No", "No idea" in the questionnaire (Table 1)

Table 1: Knowledge of MRSA among the participants

Statements	Yes (%)	No (%)	No idea (%)
<i>S aureus</i> is the causative agent of MRSA infection	93.8	2.7	3.6
<i>S aureus</i> is a Gram-positive bacterium	50.9	22.3	26.8
MRSA can spread by direct contact with the patient	70.5	16.1	13.4
MRSA mostly colonises the nasal cavity, axillae, and groin region of a patient.	51.8	18.8	29.5
MRSA is resistant to cloxacillin	34.8	15.2	50.0

Knowledge of caring for MRSA positive patients:

Methods of transmission of MRSA from a patient

Participants identified various MRSA transmission methods: through healthcare workers' hands (75.9%), patient-used linen (68.8%), equipment (68.8%), direct contamination of blood and body fluids (79.5%), and mosquitoes (21.4%).

Manifestations and nursing procedures related to MRSA patients

Most participants agreed that MRSA-infected patients must be isolated (82.1%), healthcare workers can carry MRSA (69.6%), and MRSA can infect blood and tissues (61.6%). Fewer agreed that MRSA wound dressing should be prioritised (32.1%), *S. aureus* is common on healthcare workers' skin (48.2%), MRSA presents with fever, abscesses, and pimples (42%), and vancomycin/teicoplanin are used in treatment of MRSA (46.4%) infections.

Knowledge regarding control and prevention of MRSA: The study assessed students' knowledge on MRSA prevention, including hospital protocols, universal precautions, and PPE use (Table 2).

Table 2: Knowledge regarding control and prevention of MRSA among participants

Statements	Yes (%)	No (%)	No idea (%)
Have you ever heard about personal protective equipment (PPE)?	98.2	0.9	0.9
PPE act as a barrier between MRSA colonised infectious materials and the carrier	81.3	16.1	2.7
Wearing PPE is not important to prevent MRSA transmission	25.9	68.8	5.4
Hand washing is not important to prevent MRSA infection	22.3	72.3	5.4
MRSA infected wound must be properly covered to reduce transmission.	68.8	13.4	17.9
Sharing of personal items including towels, razors does not transmit MRSA.	20.5	67.9	11.6
MRSA is a causative agent of hospital acquired infections.	75.0	9.8	15.2
Used needles and wound dressings of MRSA patients must be disposed properly	74.1	15.2	10.7
Alcohol hand rub can be used after touching a MRSA infected patient to prevent transmission	69.6	17.9	12.5
Wearing gloves before touching patients is a must in prevention of MRSA transmission	71.4	25.9	2.7
Forceps and other equipment used to care for MRSA infected patients must be disposed after use	36.6	50.0	13.4
Always wear face mask before caring for MRSA infected patients	67.0	19.6	13.4
Decolonisation of MRSA colonised patients is important in prevention of transmission	57.1	19.6	23.2

Each correct answer was given 1 mark and each wrong answer or answer with “no idea” was given zero (0). Three (3) levels of overall knowledge were defined as low (score 0-10), moderate (score 11-20), and satisfactory (score 21-30). The majority of students (55.35%) showed a moderate level of knowledge regarding MRSA infection. The mean knowledge for different components assessed is given in Table 3.

Table 3: Mean scores of knowledge on MRSA infection among nursing students

Section	Mean Score $\pm$ SD	Range
General knowledge	3.01 $\pm$ 1.22	0-5
Caring	6.92 $\pm$ 2.25	0-12
Control and prevention	8.24 $\pm$ 2.33	0-13
Grand total	18.17 $\pm$ 4.84	0-28

Discussion

This study assessed MRSA awareness among nursing undergraduates, with 98.2% reporting awareness, primarily from lectures, clinical exposure, and peers. While 55.3% showed moderate knowledge levels, critical gaps were identified in understanding MRSA resistance, treatment options, and infection control measures, such as prioritising wound dressing for MRSA-infected patients (32.1%). These findings highlight the need to strengthen nursing curricula to address knowledge deficits and improve MRSA management preparedness.

Comparison with existing literature reveals similar challenges in MRSA knowledge among healthcare students. Studies report moderate awareness with notable deficits in areas like antibiotic resistance and isolation protocols.¹¹ For instance, a Malaysian study found only 45% of nursing students were aware of MRSA treatment options, comparable to the 46.4% in this study. Similarly, research in India highlighted gaps in hand hygiene and PPE usage, aligning with the current finding that only 71.4% recognized the importance of wearing gloves before patient contact. These findings underscore the global need to strengthen MRSA-related education.

The study highlights the need for improved nursing education to address MRSA knowledge gaps that affect infection control practices. Hands-on clinical training, interactive workshops, and real-life case studies in the curriculum can enhance understanding and compliance. Future research should evaluate the effectiveness of such interventions in improving knowledge and infection control behaviors among nursing students.

A key limitation of this study is that the data was collected in 2018, and the findings may not fully reflect current knowledge and awareness of MRSA among nursing undergraduates. Advances in infection control guidelines, curriculum updates, and increased exposure to clinical training since then may have influenced students' understanding of MRSA. The results should therefore be interpreted with caution, and further studies are recommended to assess the current state of MRSA awareness in this population. Further, the single-centre design may limit the generalisability of the findings to other institutions with different curricula or clinical settings. Additionally, the reliance on self-reported data may introduce bias, as participants might overestimate their knowledge. This method of data collection may not fully capture the extent of knowledge gaps or misconceptions, as self-reported responses are subject to social desirability bias and inaccuracies.

Conclusion

This study found high MRSA awareness (98.2%) among nursing undergraduates but noted critical knowledge gaps in resistance mechanisms, treatment, and infection control. Addressing these gaps through targeted education and practical training is crucial to improving infection control practices and ensuring patient safety.

Future directions

Further research should evaluate the impact of educational interventions on MRSA knowledge and practices among nursing and other healthcare students. Equipping undergraduates with essential skills is vital for reducing infections, improving patient outcomes, and enhancing infection control.

Declaration

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Authors' contributions:

Mohamed Faiz Ahamed Fazil contributed to the development of the research proposal, study design, and preparation of the data collection instrument,

S. Mathanki drafted the manuscript.

M.Sutharsan revised and approved the final manuscript for submission.

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