Section: Community Medicine

Original Research Article

KNOWLEDGE AND PRACTICE OF STANDARD PRECAUTIONS FOR INFECTION CONTROL AMONG DOCTORS IN A TERTIARY CARE HOSPITAL OF RAJASTHAN: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Healthcare-associated infections (HAIs) remain a major public health concern worldwide. Adherence to standard precautions (SPs) is the most effective and economical strategy for preventing transmission of infections in healthcare settings. The objective is to assess the knowledge and practices of doctors regarding standard precautions and to determine sociodemographic factors associated with knowledge and practice levels.

Materials and Methods: A cross-sectional observational study was conducted among 100 doctors at P.B.M. Hospital, Bikaner, Rajasthan, from March to August 2022. Participants were selected through simple random sampling. Data were collected using a structured interview schedule. Knowledge and practice were assessed using seven items each and categorized as poor (1–3), average (4–5), and good (6–7). Data were analyzed using Epi Info software. A p-value <0.05 was considered statistically significant.

Results: Overall, 80% of doctors demonstrated good knowledge and 75% demonstrated good practice regarding standard precautions. Mean knowledge and practice scores were 5.85 ± 0.76 and 5.12 ± 0.84 respectively. Hand hygiene awareness was universal (100%). Marital status showed a statistically significant association with both knowledge (p=0.032) and practice (p=0.049). Religion was significantly associated with practice (p=0.01), while other sociodemographic variables showed no significant association.

Conclusion: Although knowledge levels were satisfactory, gaps remain in compliance with certain components such as gown usage. Regular training programs and strengthening institutional infection control mechanisms are recommended.

Keywords: Healthcare-associated infection, standard precautions, infection control, knowledge, practice, doctors.

INTRODUCTION

Healthcare-associated infections (HAIs), also known as nosocomial infections, are infections acquired during the course of healthcare delivery that were neither present nor incubating at the time of admission. They may manifest during hospitalization or after discharge and may also include occupational infections among healthcare workers.[1]

Globally, HAIs affect hundreds of millions of patients annually. According to the World Health Organization (WHO), the prevalence ranges from 3.5%–12% in developed countries and 5.7%–19.1% in developing countries.[1,2] Intensive Care Units (ICUs) report the highest burden, with infection rates two to three times higher in low- and middle-income countries compared to high-income settings.[2]

In India, infection control infrastructure remains inadequate in many healthcare facilities, and a

nationwide HAI surveillance system is lacking. The consequences of HAIs include prolonged hospitalization, increased morbidity and mortality, higher treatment costs, and greater psychological and financial burden.[1]

Standard precautions (SPs) are a set of infection prevention practices applied universally to all patients, irrespective of diagnosis or presumed infection status.[3] These include hand hygiene, use of personal protective equipment (PPE), safe injection practices, environmental sanitation, waste management, respiratory hygiene, and prevention of sharp injuries.[4,5]

Effective implementation of standard precautions significantly reduces infection transmission. Hand hygiene is considered the single most important measure for preventing HAIs.[3,6]

However, studies from India and other developing settings have shown variable compliance among healthcare workers.[7,8] Despite adequate knowledge, adherence to recommended practices often remains suboptimal.[9] However, compliance gaps persist due to inadequate training, insufficient resources, and heavy workloads. Therefore, assessing knowledge and practice levels among doctors is essential for strengthening infection control programs. Strengthening infection prevention and control (IPC) programs in accordance with WHO core components is essential.[10]

Objectives:

General Objective

To document measures for improvement in knowledge and practice levels of doctors regarding standard precautions.

Specific Objectives

1. To assess the existing level of knowledge of doctors regarding standard precautions.
2. To evaluate practices followed by doctors.
3. To determine sociodemographic factors associated with knowledge and practice.
4. To suggest measures for improvement.

MATERIALS AND METHODS

Study Design: Cross-sectional observational study.
Study Setting: P.B.M. Hospital, S.P. Medical College, Bikaner, Rajasthan.
Study Period: March–August 2022 (6 months).
Study Population: All doctors working at PBM Hospital.
Sample Size: 100
Sampling Method: Simple random sampling.
Data Collection Tool: Structured one-to-one interview schedule.

Ethical clearance and institutional permission were obtained prior to study initiation. A pilot study was conducted to validate the questionnaire. Informed consent was obtained from all participants.

Scoring Criteria

Score	Level
1–3	Poor
4–5	Average
6–7	Good

Data were entered in Microsoft Excel and analyzed using Epi Info software. Appropriate statistical tests were applied, and $p < 0.05$ was considered significant.

RESULTS

Table (a): Sociodemographic Characteristics

Demographic variables	Frequency N = 100 (100.0%)
Gender	
Male	77(77)
Female	23 (23)
Age (Years)	
<30	19 (19)
30 – 39	43 (43)
40 – 49	23 (23)
>50	15 (15)
Marital Status	
Married	60(60)
Single	34 (34)
Widow/Widower/ Divorced/Separated	6(6)
Religion	
Hindu	88 (88)
Islam	6 (6)
Others	6 (6)
Years of service	
<5	42 (42)
6 – 10	21 (21)
11 – 15	14 (14)
16 – 20	11 (11)

21 – 25	6 (6)
26 – 30	5 (5)
>30	1 (1)

- 77% were male.
- 43% belonged to 30–39 years age group.
- 42% had <5 years of service.
- 60% were married.
- 88% belonged to Hindu religion.

Table (b): Knowledge of Standard Precautions

S.N.	Knowledge about standard precaution	Yes	No
1	Hands should be washed after contact with patient.	100	0
2	Hands should be washed before contact with patients.	95	5
3	Hands should be washed after accidental exposure to blood or body fluid.	100	0
4	Gloves should be worn when there is a risk of splashes of blood and body fluids.	94	6
5	Mask should be worn when there is a risk of splashes of blood and body fluids.	93	7
6	Goggles should be worn when there is a risk of splashes of blood and body fluids.	91	9
7	Gown should be worn when there is a risk of splashes of blood and body fluids.	89	11

- 100% knew that hands should be washed after patient contact and after accidental exposure.
- 95% knew hands should be washed before patient contact.
- 94% knew gloves should be worn during risk of splashes.
- 89% knew gown usage is required during splash-risk procedures.

Mean knowledge score: 5.85 ± 0.76
80% demonstrated good knowledge.

Demographic Variable	Knowledge Score			P Value
	Poor	Average	Good	
Gender				
Male	15	40	22	0.561
Female	5	14	4	
Age (Years)				
< 30	6	7	6	0.094
30 – 39	6	30	7	
40 – 49	6	8	9	
>50	2	9	4	
Marital Status				
Married	18	27	15	0.032
Single	2	22	10	
Widow/Widower/Divorced/Separated	0	5	1	
Religion				
Hindu	18	47	23	0.963
Islam	1	4	1	
Others	1	3	2	
Years of service				
< 6	8	21	13	0.338
6 – 10	6	13	2	
11 – 15	1	10	3	
16 – 20	1	5	5	
21 – 25	2	2	2	
26 – 30	1	3	1	
> 30	1	0	0	

Marital status showed statistically significant association with knowledge (p = 0.032). No significant association was observed with gender, age, religion, or service tenure.

Table (c): Practice of Standard Precautions

S.N.	Practices of standard precautions	Yes	No
1	I wash my hands after contact with patients.	95	5
2	I wash my hands before contact with patients.	85	15
3	I wash my hands after accidental contact with blood, body fluid , secretion or contaminated items.	98	2
4	I wear gloves when procedure and activities are likely to generate splash or spray of blood or body fluids	92	8
5	I wear goggles when procedure and activities are likely to generate splash or spray of blood or body fluids	83	17
6	I wear gown when procedure and activities are likely to generate splash or spray of blood or body fluids	77	23
7	I wear masks when procedure and activities are likely to generate splash or spray of blood or body fluids	87	13

- 98% practiced hand washing after accidental exposure.
- 95% practiced hand washing after patient contact.
- 92% wore gloves during splash-risk procedures.

- •7% wore gowns appropriately.

Mean practice score: 5.12 ± 0.84
75% demonstrated good practice.

Demographic variables	Practice Score			P Value
	Poor	Average	Good	
Gender				
Male	17	41	19	0.611
Female	3	13	7	
Age (Years)				
< 30	4	8	7	0.621
30 – 39	7	28	8	
40 – 49	5	11	7	
>50	4	7	4	
Marital Status				
Married	17	29	14	0.049
Single	1	22	11	
Widow/Widower/Divorced/Separated	2	3	1	
Religion				
Hindu	13	51	24	0.01
Islam	2	2	2	
Others	5	1	0	
Years of service				
< 6	9	18	15	0.108
6 – 10	4	15	2	
11 – 15	1	8	5	
16 – 20	1	9	1	
21 – 25	2	3	1	
26 – 30	2	1	2	
> 30	1	0	0	

Marital status (p = 0.049) and religion (p = 0.01) showed statistically significant associations with practice. Other variables were not statistically significant.

Doctors with more than 20 years of service were less likely to demonstrate good practice compared to those with fewer years of experience.

DISCUSSION

The present study revealed satisfactory knowledge (80%) and practice (75%) levels among doctors. Universal awareness of hand hygiene is encouraging and aligns with findings from similar Indian studies.[6,7]

However, lower compliance was observed regarding gown usage (77%), indicating partial adherence to PPE guidelines.[3,4] This finding is consistent with previous studies where knowledge did not always translate into practice.[7-9]

Interestingly, longer service tenure was negatively associated with knowledge and practice levels, possibly reflecting inadequate updating of earlier medical training curricula regarding infection control practices.

These findings highlight the importance of continuous medical education and institutional reinforcement of infection control policies.[10]

CONCLUSION

Doctors in the present study demonstrated generally good knowledge and practice regarding standard precautions; however, compliance gaps persist in certain components. Experience duration showed a negative association with knowledge and practice, suggesting the need for periodic refresher training.

Strengthening training programs and ensuring adequate resource availability are essential to improve adherence to infection prevention practices.[2,10]

Recommendations

1. Regular training programs and Continuing Medical Education (CME) on infection control.
2. Ensuring consistent availability of PPE and infection control materials.
3. Strengthening Infection Prevention and Control (IPC) committees for monitoring and supervision.
4. Periodic audits and feedback mechanisms.

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