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# KNOWLEDGE AND PRACTICE REGARDING STANDARD PRECAUTIONS AMONG NURSES WORKING IN TERTIARY CARE HOSPITALS: A CROSS-SECTIONAL STUDY

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**Abstract**

***Background:*** *Standard precautions are fundamental infection prevention measures that reduce the transmission of microorganisms in healthcare settings. Nurses play a key role in implementing these practices and ensuring patient safety.*

***Objective:*** *To assess nurses' knowledge and practice regarding standard precautions in tertiary care hospitals.*

***Methods:*** *A descriptive cross-sectional study was conducted among 113 registered nurses working in tertiary care hospitals in South Punjab, Pakistan. Data were collected using a structured questionnaire comprising demographic characteristics, the Knowledge of Standard Precautions Scale (KSPS), and the Compliance with Standard Precautions Scale (CSPS). Data were analyzed using SPSS version 27 using descriptive statistics, chi-square tests, and Pearson correlation analysis.*

***Results:*** *Most participants were female (55.8%) and aged 18-27 years (48.7%). Overall, 62.9% of nurses demonstrated good-to-excellent knowledge of standard precautions, with a mean knowledge score of 15.13 ± 4.87. Satisfactory practice was observed among 58.4% of participants, with a mean practice score of 3.12 ± 0.76. Educational qualification was significantly associated with knowledge level ($p = 0.041$). A significant positive correlation was found between knowledge and practice ($r = 0.36$, $p < 0.001$).*

***Conclusion:*** *Nurses demonstrated moderate-to-good knowledge and satisfactory practice regarding standard precautions. Higher educational attainment was associated with better knowledge, and improved knowledge was linked to better compliance. Continuous education and infection prevention training are recommended to strengthen adherence to standard precautions.*

## 1 | INTRODUCTION

Standard precautions are a set of evidence-based infection prevention practices designed to reduce the risk of transmission of microorganisms in healthcare settings. These precautions include hand hygiene, use of personal protective

equipment (PPE), safe injection practices, proper disposal of sharps, respiratory hygiene, and environmental cleaning. Standard precautions are applied to all patients regardless of their diagnosis or infection status and represent the foundation of infection prevention and control (IPC) programs in healthcare institutions [1,2]. Nurses, being the largest group of healthcare professionals with direct and continuous patient contact, play a crucial role in implementing these precautions and preventing healthcare-associated infections (HAIs) [10,17].

Healthcare-associated infections remain a significant global public health concern despite advances in medical technology and infection control policies. HAIs contribute to increased patient morbidity, mortality, prolonged hospital stay, and rising healthcare costs. Nurses working in tertiary care hospitals frequently encounter blood, body fluids, and contaminated equipment, placing both patients and healthcare workers at risk of infection transmission [3,4]. Effective implementation of standard precautions is therefore essential for reducing occupational exposure and improving patient safety [17,20].

The successful implementation of standard precautions depends largely on nurses' knowledge and clinical practice. Adequate knowledge enables nurses to recognize infection risks and apply appropriate preventive measures during patient care. However, studies have reported variability in nurses' knowledge and compliance with standard precautions, particularly in areas such as hand hygiene, PPE use, and sharps disposal [10,19]. Deficiencies in infection prevention awareness and practice remain a major challenge in healthcare settings [9,18].

### 1.1 | Knowledge and Practice of Standard Precautions Among Nurses

Standard precautions require nurses to consistently apply infection prevention measures during all patient care activities. These include hand hygiene, proper use of PPE, safe handling of sharps, waste management, and prevention of exposure to blood and body fluids [1,17]. Nurses' knowledge of these precautions is essential for ensuring compliance and reducing infection risks. Evidence shows that higher knowledge levels are associated with better adherence to standard precautions and improved patient safety outcomes. Nurses who are more aware of infection prevention principles are more likely to implement recommended practices consistently [1,17,19].

Despite clear guidelines, gaps between knowledge and practice remain common. Studies have identified insufficient training, lack of awareness, workload pressure, and inadequate access to protective equipment as major barriers to compliance [4,5,20]. Research conducted among nursing students and healthcare workers in Pakistan has also reported similar inconsistencies between knowledge and actual practice [6,13].

Workplace factors such as occupational stress, staffing shortages, and limited institutional support further influence adherence to infection prevention measures [7,14]. These challenges highlight the importance of continuous professional development and supportive healthcare environments to strengthen compliance with standard precautions.

### 1.2 | Bridging International Evidence With the Pakistani Tertiary Care Context

Globally, adherence to standard precautions is recognized as a cornerstone of infection prevention and patient safety [17-23]. Studies have shown that structured training programs, continuous education, and organizational support significantly improve nurses' compliance with infection prevention guidelines [3,20,25].

In Pakistan, healthcare institutions continue to face challenges including limited resources, high patient load, and workforce shortages, which negatively affect infection prevention practices [3-5]. Although several studies have explored infection control practices among healthcare workers, relatively limited research has specifically examined nurses' knowledge and practice regarding standard precautions in tertiary care hospitals [1-5].

Tertiary care hospitals manage large numbers of critically ill and high-risk patients, increasing

exposure to blood and body fluids. Nurses working in these settings are expected to maintain strict adherence to infection prevention protocols to ensure both patient and occupational safety. However, inconsistent compliance highlights the need for further evaluation of current knowledge and practice levels.

Understanding these gaps is essential for developing targeted educational interventions, strengthening infection control policies, and improving patient safety outcomes in tertiary healthcare settings.

### 1.3 | Aim and Objectives

The aim of this study was to assess the level of knowledge and practice regarding standard precautions among nurses working in tertiary care hospitals.The specific objectives were to: (1) To assess nurses' knowledge regarding standard precautions. (2) To evaluate nurses' practices related to standard precautions. (3) To determine the association between selected demographic and professional characteristics and nurses' knowledge regarding standard precautions. (4) To determine the association between selected demographic and professional characteristics and nurses' practices regarding standard precautions.

## 2 | METHODS

### 2.1 | Study Design and Setting

A descriptive cross-sectional study was conducted among nurses working in tertiary care hospitals in South Punjab, Pakistan. Data were collected from March to April 2026.

### 2.2 | Study Participants and Sampling

The target population consisted of registered nurses working in medical, surgical, intensive care, coronary care, and other inpatient units of the selected tertiary care hospitals.

A purposive sampling technique was used to recruit participants. The sample size was calculated using Cochran's formula with a 95% confidence level and 5% margin of error. The final sample comprised 113 nurses.

Inclusion criteria were registered nurses with at least six months of clinical experience who agreed to participate in the study. Nursing students, interns, and nurses on leave during the data collection period were excluded.

### 2.3 | Study Instruments

Data were collected using a structured self-administered questionnaire adopted from [27] and consisting of three parts: (1) Demographic Characteristics, (2) Knowledge of Standard Precautions Scale (KSPS), (3) Compliance with Standard Precautions Scale (CSPS)

### 2.4 | Data Collection Procedure

After obtaining informed consent, questionnaires were distributed to eligible nurses during duty hours and collected upon completion.

### 2.5 | Ethical Considerations

Ethical approval and administrative permissions were obtained from the relevant authorities before data collection. Participation was voluntary, and confidentiality and anonymity were maintained throughout the study.

### 2.6 | Data Analysis

Data were analyzed using Statistical Package for the Social Sciences (SPSS) version 27. Descriptive statistics including frequencies, percentages, means, and standard deviations were used to summarize the data. Chi-square tests were used to examine associations between demographic variables and knowledge and practice levels. Pearson correlation analysis was performed to determine the relationship between knowledge and practice regarding standard precautions. Statistical significance was set at $p < 0.05$.

### 2.7 | Indicators to Evaluate the Knowledge:

- The following indicators are used to evaluate the Nurses`s Knowledge based on the scores of the structured questionnaire. (1) Excellent: >80%, (2) Good: 65-80%, (3) Average: 50-65%, (4) Poor:<50% [26].

### 2.8 | Bibliography:

- Vancouver Style.

## 3 | RESULTS

### 3.1 | Response rate and data collection summary

A total of 113 nurses participated in the study. All questionnaires were returned completely filled, yielding a 100% response rate. Data were analyzed using SPSS version 27. Descriptive statistics, chi-square tests, and Pearson correlation were applied according to the study objectives.

**3.2 | Socio-demographic characteristics of participants:** Table 1 shows the socio-demographic characteristics of 113 nurses. The majority were female (55.8%) and most participants were in the 18-27 years age group (48.7%), followed by 28-37 years (42.5%). Most nurses held a BSN/college qualification (70.8%), while fewer had diploma (19.5%) or master's degrees (9.7%). In terms of experience, the largest proportion had 1-5 years of experience (43.4%), followed by ≤1 year (38.9%). Overall, the sample mainly consisted of young and early-career nurses.

**Table 1 | Socio-demographic characteristics of nurses (n = 113)**

| Variable | Category | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Gender | Male | 50 | 44.2 |
| | Female | 63 | 55.8 |
| Age (years) | 18-27 | 55 | 48.7 |
| | 28-37 | 48 | 42.5 |
| | 38-47 | 6 | 5.3 |
| | ≥48 | 4 | 3.5 |
| Education | Diploma | 22 | 19.5 |
| | College/BSN | 80 | 70.8 |
| | Master/PhD | 11 | 9.7 |
| Experience | ≤1 year | 44 | 38.9 |
| | 1-5 years | 49 | 43.4 |
| | >5 years | 20 | 17.7 |

### 3.3 | Level of knowledge regarding standard precautions

The findings revealed that nurses demonstrated varying levels of knowledge. Overall, the majority showed good to excellent knowledge, while a smaller proportion had poor knowledge.

**Table 2 | Knowledge level of nurses regarding standard precautions (n = 113)**

| Knowledge Level | Frequency (n) | Percentage (%) |
|---|---|---|
| Excellent (>80%) | 28 | 24.8 |
| Good (65-80%) | 43 | 38.1 |
| Average (50-65%) | 30 | 26.5 |
| Poor (<50%) | 12 | 10.6 |
| **Total** | **113** | **100** |

Overall, **62**.9% of nurses fell in good to excellent categories**, while** 37.1% had average to poor knowledge, indicating a generally adequate but improvable level of understanding regarding standard precautions.

The mean knowledge score was **15.13 ± 4.87**.

### 3.4 | Knowledge regarding standard precautions (item-wise responses)

**Table 3 | Selected knowledge responses (n = 113)**

| Knowledge Item | Correct Response n (%) |
|---|---|
| Heard about standard precautions | 105 (92.9) |
| Standard precautions apply to all patients | 84 (74.3) |
| Incorrect belief: only HIV/HBV patients | 61 (54.0) |
| Needle recapping is safe | 66 (58.4) |
| Proper PPE use awareness | 98 (86.7) |
| Safe disposal of sharps | 101 (89.4) |

The results indicate that while overall knowledge was satisfactory, misconceptions still exist regarding universal application of standard precautions and unsafe needle recapping practices.

### 3.5 | Level of Practice Regarding Standard Precautions

The majority of nurses demonstrated satisfactory infection prevention practices. More than half of the participants showed adequate compliance with standard precautions, although a considerable proportion still exhibited unsatisfactory practice levels.

The mean practice score was 3.12 ± 0.76, indicating overall moderate to good compliance with standard precautions among nurses. Figure 1 illustrates the distribution of practice levels among nurses regarding standard precautions. The majority of nurses (58.4%) demonstrated satisfactory practice, while 41.6% showed unsatisfactory practice levels, indicating that although compliance is generally acceptable, a significant proportion still requires improvement.

Figure 1 | Level of practice regarding standard precautions among nurses

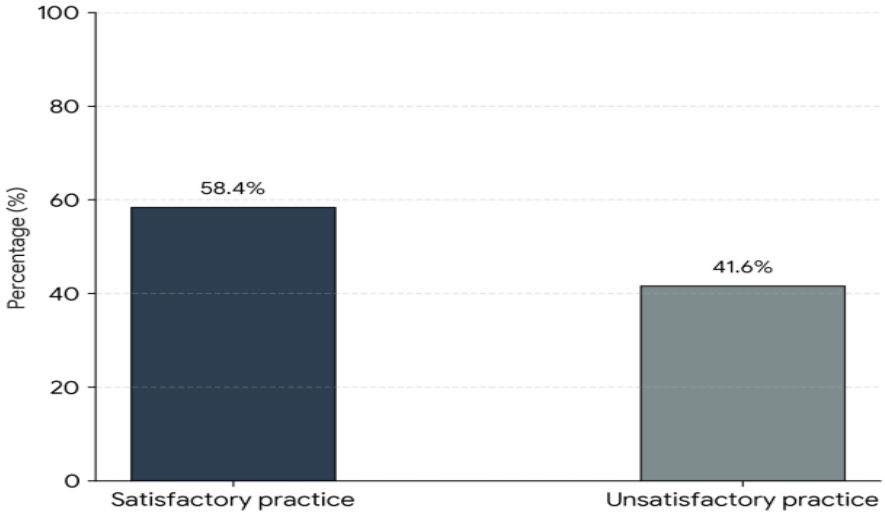


**Figure 1 | Level of practice regarding standard precautions among nurses**

### 3.6 | Practice regarding standard precautions (item-wise responses)

Table 4 presents nurses' responses regarding practice of standard precautions. Overall, responses show a positive compliance pattern. The majority of nurses strongly agreed or agreed that all blood and body fluids are infectious (81.4%) and that PPE should be used during exposure risk (81.4%). Similarly, most participants reported safe disposal of needles in sharps boxes (79.6%) and use of gloves during cleaning (77.0%). Hand hygiene after exposure also showed generally good compliance, with 75.2% positive responses (strongly agree/agree). However, a small proportion of nurses still reported neutral or negative responses, indicating some inconsistency in adherence to standard precaution practices.

**Table 4 | Selected practice responses (n = 113)**

| Practice Item | Strongly Agree n (%) | Agree n (%) | Neutral n (%) | Disagree n (%) |
|---|---|---|---|---|
| All blood/body fluids are infectious | 54 (47.8) | 38 (33.6) | 10 (8.8) | 11 (9.7) |
| Use PPE during exposure risk | 50 (44.2) | 42 (37.2) | 12 (10.6) | 9 (8.0) |
| Dispose needles in sharps box | 60 (53.1) | 30 (26.5) | 14 (12.4) | 9 (8.0) |
| Wear gloves during cleaning | 48 (42.5) | 39 (34.5) | 15 (13.3) | 11 (9.7) |
| Perform hand hygiene after exposure | 40 (35.4) | 45 (39.8) | 16 (14.2) | 12 (10.6) |

### 3.7 | Association between demographic variables and knowledge level

Table 5 presents the association between demographic variables and nurses' knowledge level regarding standard precautions. The chi-square test showed a statistically significant association only between educational level and knowledge ($\chi^2 = 8.44$, $p = 0.041$), indicating that nurses with higher qualifications demonstrated better knowledge scores.

However, no statistically significant association was found between knowledge level and age ($p = 0.156$), gender ($p = 0.348$), or years of experience ($p = 0.546$). Although some variation was observed across categories, these differences were not statistically significant.

Overall, the findings suggest that education is the most influential factor affecting knowledge of standard precautions, while other demographic variables did not show a meaningful effect in this study population.

**Table 5 | Association between demographic variables and knowledge level (n = 113)**

| Variable | Category | Satisfactory n (%) | Unsatisfactory n (%) | $\chi^2$ | p-value |
|---|---|---|---|---|---|
| Age | 18-27 | 40 (35.4) | 15 (13.3) | 5.21 | 0.156 |
| | 28-37 | 27 (23.9) | 21 (18.6) | | |
| | 38-47 | 3 (2.7) | 3 (2.7) | | |
| | ≥48 | 1 (0.9) | 3 (2.7) | | |
| Gender | Male | 34 (30.1) | 16 (14.2) | 0.88 | 0.348 |
| | Female | 37 (32.7) | 26 (23.0) | | |
| Education | Diploma | 12 (10.6) | 10 (8.8) | 8.44 | 0.041* |
| | College/BSN | 53 (46.9) | 27 (23.9) | | |
| | Master/PhD | 6 (5.3) | 2 (1.8) | | |

| | | | | | |
|---|---|---|---|---|---|
| Experience | ≤1 year | 26 (23.0) | 18 (15.9) | 2.13 | 0.546 |
| | 1-5 years | 30 (26.5) | 19 (16.8) | | |
| | 6-10 years | 10 (8.8) | 0 (0.0) | | |
| | >10 years | 4 (3.5) | 6 (5.3) | | |

*Significant at $p < 0.05$

### 3.9 | Relationship between knowledge and practice

Figre 2 highlights a moderate positive relationship ($r = 0.36$, $p < 0.001$) between the variables. This indicates that nurses with higher knowledge levels are significantly more likely to demonstrate better compliance with standard precautions.

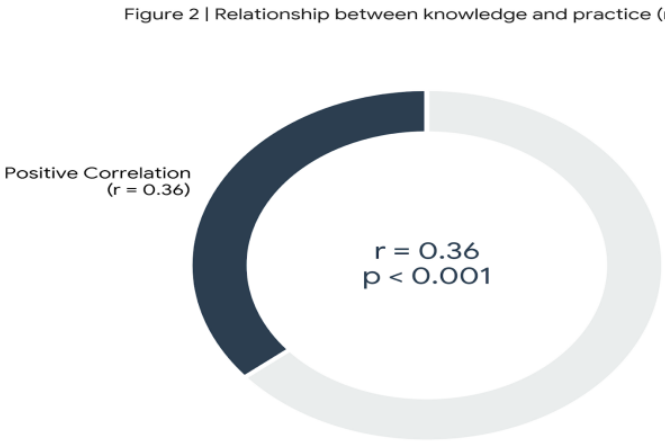


**Figure 2 | Relationship between knowledge and practice (n = 113)**

➢ This indicates that nurses with higher knowledge levels are more likely to demonstrate better compliance with standard precautions.

### 3.10 | Summary of findings

Overall, nurses demonstrated moderate to good knowledge and satisfactory practice of standard precautions. Education level was significantly associated with knowledge, while no demographic variables were associated with practice. A statistically significant positive correlation was found between knowledge and practice, highlighting the importance of continuous education and training to improve infection prevention compliance in tertiary care hospitals.

## 4 | DISCUSSION

The present study assessed nurses' knowledge and practice regarding standard precautions in tertiary care hospitals of South Punjab, Pakistan. A total of 113 nurses participated in the study, with the majority being female, young adults, and holding BSN/college-level qualifications. Most participants had less than five years of clinical experience, reflecting an early-career nursing workforce. These demographic characteristics may influence nurses' understanding and implementation of infection prevention and control measures in clinical settings.

The findings revealed that nurses demonstrated generally adequate knowledge regarding standard precautions. More than half of the participants fell within the good to excellent knowledge categories, while a smaller proportion exhibited poor knowledge. Although overall awareness was

encouraging, gaps were identified in specific areas such as the universal application of standard precautions and safe needle handling practices. Similar findings were reported by Yasmeen et al. [1], who found that nurses possessed satisfactory awareness of infection prevention measures. Likewise, Dhedhi et al. [2] reported knowledge gaps among healthcare professionals regarding standard precautions. Janjua et al. [9] also identified poor knowledge as a major predictor of non-adherence to universal precautions.

The item-wise analysis showed high awareness regarding PPE use and safe disposal of sharps. However, misconceptions regarding needle recapping and the application of standard precautions to all patients were still observed among some nurses. These findings are consistent with the study conducted by Al-Faouri et al. [16], who reported satisfactory overall knowledge but identified deficiencies in specific infection prevention practices. Similar observations were reported by Ghabayen et al. [19], who found that nurses possessed adequate knowledge but demonstrated inconsistencies in some precautionary measures.

Regarding practice, the study demonstrated that the majority of nurses reported satisfactory compliance with standard precautions. Most participants indicated regular use of PPE, appropriate disposal of sharps, glove use during cleaning procedures, and adherence to hand hygiene practices. These findings are comparable with those reported by Yasmeen et al. [1], who found acceptable compliance with infection prevention measures among nurses. Similar results were observed by Zahir et al. [4], who reported moderate adherence to standard precautions among healthcare workers in tertiary care hospitals. International studies by Arinze-Onyia et al. [21] and García-Zapata et al. [22] also reported moderate compliance levels despite adequate knowledge.

The present study found a statistically significant association between educational qualification and knowledge level. Nurses with higher educational attainment demonstrated better knowledge regarding standard precautions. This finding is supported by Acharya et al. [24], who reported that educational level significantly influences nurses' awareness and compliance with infection control practices. Similarly, Al-Faouri et al. [16] found that higher educational preparation was associated with improved knowledge and adherence to standard precautions.

Furthermore, the study identified a statistically significant positive correlation between knowledge and practice regarding standard precautions. Nurses with higher knowledge scores were more likely to demonstrate better compliance with infection prevention measures. This finding is consistent with the comparative study conducted by Zhu et al. [10], which reported that increased knowledge was associated with better infection prevention practices. Likewise, Sarani et al. [18] found that adequate knowledge positively influenced nurses' adherence to standard precautions. Ghabayen et al. [19] also reported a significant relationship between knowledge and compliance among nurses.

Overall, the findings suggest that while nurses in tertiary care hospitals possess moderate to good knowledge and satisfactory practices regarding standard precautions, important gaps remain. Continuous educational interventions, competency-based training programs, and institutional support are necessary to strengthen infection prevention practices. Similar recommendations have been proposed by Kiddeer et al. [3] and Ayed [25], who emphasized the importance of ongoing education and organizational support for improving compliance with standard precautions.

## 5 | CONCLUSION

Nurses working in tertiary care hospitals demonstrated generally adequate knowledge and satisfactory compliance with standard precautions. Educational attainment significantly influenced knowledge, and better knowledge was associated with improved compliance. Strengthening continuing professional education and institutional infection prevention programs may further improve adherence to standard precautions and enhance patient safety.

### 5.1 | LIMITATIONS

i. The study employed a cross-sectional design; therefore, causal relationships between knowledge and practice could not be established.
ii. Data were collected using self-administered questionnaires, which may be subject to recall bias and social desirability bias.
iii. The study was conducted in selected tertiary care hospitals of South Punjab, limiting the generalizability of findings to other healthcare settings.
iv. Practice was assessed through self-reported responses rather than direct observation of clinical behavior.
v. The sample size was relatively limited and may not fully represent all nurses working in tertiary care hospitals across Pakistan.

### 5.2 | RECOMMENDATIONS

**i. Continuous Education:** Regular educational workshops and in-service training programs on standard precautions should be conducted for nurses.
**ii. Competency-Based Training:** Healthcare institutions should implement periodic competency assessments and simulation-based infection prevention training.
**iii. Policy Reinforcement:** Hospital management should ensure strict implementation and monitoring of infection prevention and control guidelines.
**iv. Professional Development:** Continuing nursing education programs should emphasize evidence-based infection prevention practices and occupational safety.
**v. Monitoring and Evaluation:** Routine audits and feedback mechanisms should be established to assess compliance with standard precautions and identify areas requiring improvement.
**vi. Future Research:** Larger multicenter studies and observational research are recommended to further evaluate nurses' compliance with standard precautions and factors influencing infection prevention practices.

### BIBLIOGRAPHY:

Yasmeen S, Ali TS, Khalid W, Kurji Z, Hazara SM, Bashir S. Knowledge and practices regarding standard precautions for infection control among nurses working at a public, tertiary care hospital Islamabad, Pakistan. International Journal of Current Research and Review. 2022;14(7):32.

Dhedhi NA, Ashraf H, Jiwani A. Knowledge of standard precautions among healthcare professionals at a Teaching Hospital in Karachi, Pakistan. Journal of family medicine and primary care. 2021 Jan 1;10(1):249-53.

Kiddeer M, Abbas A, Basit A, Ahmad T, Masood I. Assessment of knowledge, attitude and practices regarding standard precautions of infection prevention and control and associated factors among healthcare personnel working at tertiary care hospitals in Punjab, Pakistan. Infection Prevention in Practice. 2025 Sep 1;7(3):100464.

Zahir S, Khan K, Sardar N, Jahan S, Ali MM, Khan A, Khattak J, Mazhar S, Shah J. Insights into Standard Precaution Knowledge and Adherence among Healthcare Workers: Evidence from Tertiary Care Hospitals in Peshawar, Pakistan: Standard Precautions and Healthcare Workers. Pakistan Journal of Health Sciences. 2024 Apr 30:19-24.

Ather H, Khan A, Shabnum S. Knowledge and compliance toward standard precaution among health care workers at Bahria International Hospital Lahore, Pakistan. International Journal of Social Sciences and Management. 2020 Jan 27;7(1):17-20.

Iqbal H, Aftab F, Sarwar B, Hayat U, Sarwar M, Ali A. EVALUATION OF KNOWLEDGE AND COMPLIANCE TO STANDARD PRECAUTIONS AMONG NURSING STUDENTS: A CROSS-SECTIONAL STUDY. Journal of Medical & Health Sciences Review. 2025 Oct 25;2(4).

Yasmin S, Hussain M, Afzal Muhammad PK, Gillani SA. Factors That Influences on Standard Precautions among Nurses in Tertiary Hospital Lahore Pakistan. Saudi Journal of Medical and Pharmaceutical Sciences. 2017;3(8):917-25.

Tufail S, Afzal M, Perveen K, Waqas A, Gilani S. Knowledge, Attitude and Practice towards standard isolation precautions among registered Nurses. Saudi Journal of Medical and Pharmaceutical Sciences. 2017;3:534-44.

Janjua NZ, Razaq M, Chandir S, Rozi S, Mahmood B. Poor knowledge-predictor of nonadherence to universal precautions for blood borne pathogens at first level care facilities in Pakistan. BMC infectious diseases. 2007 Jul 24;7(1):81.

Zhu S, Kahsay KM, Gui L. Knowledge, Attitudes and Practices related to standard precautions among nurses: A comparative study. Journal of clinical nursing. 2019 Oct;28(19-20):3538-46.

Sattar A, Tehreem SY, Batool F, Danish M. The Infection Control Paradox: Exploring Knowledge and Practices of ICU Nurses Across Hospitals in Punjab, Pakistan.

Din SS, Bhullar M, Fatima A, Fatima A, Danish M. Nurses' Knowledge and Practices Regarding Safe Medication Administration at The Children's Hospital, Lahore. Journal of Health, Wellness and Community Research. 2025 Nov 30:e995-.

Ahmad A, Arshad H, Saman M, Naveed M, Shafiq N, Hussain MB, Danish M. OCCUPATIONAL HEALTH HAZARDS AMONG NURSES: ASSESSING KNOWLEDGE, ATTITUDES, AND PRACTICES IN SOUTHERN PUNJAB, PAKISTAN.

Makki M, Ajmal A, Makki A, Nosheen Z, Qayoom S, Talib Z, Danish M, Ain QU. Knowledge, Attitude, And Practice Of Donning And Doffing Among Nursing Students At Shahida Islam Nursing College Lodhran. Journal of Health, Wellness and Community Research. 2026 Mar 30:1-1.

Perveen R, Nazeer N, Iqbal N, Danish M, Ain QU. A Cross-Sectional Study on Nurses' Knowledge and Practices Regarding CLABSI Prevention in South Punjab. Journal of Health, Wellness and Community Research. 2026 Apr 15:1-1.

Al-Faouri I, Okour SH, Alakour NA, Alrabadi N. Knowledge and compliance with standard precautions among registered nurses: A cross-sectional study. Annals of medicine and surgery. 2021 Feb 1;62:419-24.

Eskander HG, Morsy WY, Elfeky HA. Intensive care nurses' knowledge & practices regarding infection control standard precautions at a selected Egyptian cancer hospital. prevention. 2013;4(19):160-74.

Sarani H, Balouchi A, Masinaeinezhad N, Ebrahimitabs E. Knowledge, attitude and practice of nurses about standard precautions for hospital-acquired infection in teaching hospitals affiliated to Zabol University of Medical Sciences (2014). Global journal of health science. 2015 Jul 27;8(3):193.

Ghabayen F, ALBashtawy M, Abdelkader RH, Jarrah S, Eshah N, Abdalrahim A, Saifan A, Alkhawaldeh A, Rayan A, Ayed A, Al-Amer R. Knowledge and compliance with standard precautions among nurses. SAGE open nursing. 2023 Jul;9:23779608231189966.

Chauke M. Knowledge and practice of standard precautions in public health facilities in Abuja, Nigeria. International Journal of Infection Control. 2012 Jan 1.

Arinze-Onyia SU, Ndu AC, Aguwa EN, Modebe I, Nwamoh UN. Knowledge and practice of standard precautions by health-care workers in a tertiary health institution in Enugu, Nigeria. Nigerian journal of clinical practice. 2018 Feb 1;21(2):149-55.

García-Zapata MR, e Souza AC, Guimarães JV, Tipple AF, Prado MA, García-Zapata MT. Standard precautions: knowledge and practice among nursing and medical students in a teaching hospital in Brazil. International Journal of Infection Control. 2010;6(1).

Yasmeen S, Ali TS, Khalid W, Kurji Z, Hazara SM, Bashir S. Knowledge and practices regarding standard precautions for infection control among nurses working at a public, tertiary care hospital Islamabad, Pakistan. International Journal of Current Research and Review. 2022;14(7):32.

Acharya AS, Khandekar J, Sharma A, Tilak HR, Kataria A. Awareness and practices of standard precautions for infection control among nurses in a tertiary care hospital. Nurs J India. 2013 Nov 1;104(6):275-9.

Ayed A. Knowledge & compliance of nursing staff towards standard precautions in the Palestinian hospitals.

Danish M, Jaffer M, Kashf A, Ain QU, Ajmal R, Bilal F. Assessment of nurses' knowledge regarding the theory-practice gap in hospitals of Bahawalpur. Frontier in Medical and Health Research. 2025 Apr 14;3(2):283-90.

Naeem A, Raza A, Ali A. Knowledge and Practice of Nursing Students Regarding Standard Precautions at a Tertiary Care Hospital. Indus Journal of Bioscience Research. 2025 May 20;3(5):474-82.