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Knowledge, Attitude, and Practice Regarding Universal Precautions Among Staff Nurses in Selected Hospitals at Bolhegaon, Ahmednagar, Maharashtra"

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INTRODUCTION

*Healthcare settings are environments where staff are at constant risk of exposure to infectious agents through contact with blood, body fluids, secretions, and contaminated surfaces. The emergence and re-emergence of infectious diseases such as **HIV/AIDS, Hepatitis B, Hepatitis C, tuberculosis, and other nosocomial infections** have underscored the need for strict infection prevention measures. One of the most significant approaches to ensuring the safety of both patients and healthcare workers is the consistent application of **Universal Precautions**.*

*The term Universal Precautions was first introduced by the **Centers for Disease Control and Prevention (CDC)** in 1985 in response to the growing concern over occupational exposure to bloodborne pathogens. The concept emphasizes that **all blood and certain body fluids should be treated as potentially infectious**, regardless of the perceived risk or patient's diagnosis. In 1996, the CDC updated the concept into Standard Precautions, broadening its scope to include precautions for all patients in all healthcare settings.*

Universal precautions include a set of **evidence-based practices** such as:

- **Hand hygiene** before and after patient contact
- **Use of personal protective equipment (PPE)** such as gloves, masks, gowns, and eye protection
- **Safe handling and disposal of sharps** to prevent needle-stick injuries
- **Appropriate cleaning, disinfection, and sterilization** of instruments and surfaces
- **Proper waste management** for infectious materials

Staff nurses are at the **forefront of patient care** and thus represent one of the most vulnerable groups in terms of occupational exposure. They are frequently involved in invasive procedures, handling of specimens, wound care, and direct contact with infectious patients. Their adherence to universal precautions is therefore **critical not only to their own safety but also to the safety of patients and the wider community**.

However, studies from various countries, including India, have revealed **gaps in knowledge, attitudes, and practices (KAP)** regarding universal precautions among healthcare workers. While knowledge provides the foundation for correct practice, attitude influences the willingness to adhere to guidelines, and actual practice reflects the translation of both into action. Barriers such as inadequate training, unavailability of PPE, high workload, and lack of institutional enforcement often contribute to non-compliance.

The **World Health Organization (WHO)** has repeatedly emphasized that infection prevention is a core component of quality healthcare services and is essential for reducing healthcare-associated infections (HAIs). HAIs contribute significantly to patient morbidity, mortality, and healthcare costs. In low- and middle-income countries, the risk of acquiring an HAI is up to **20 times higher** than in high-income countries, largely due to resource constraints and poor adherence to infection control protocols.

In the context of the **post-COVID-19 pandemic era**, the relevance of universal precautions has been further amplified. The pandemic highlighted the importance of rigorous infection prevention measures, early detection of risks, and building a culture of safety in healthcare institutions. This has renewed the focus on **continuous education, behavioral reinforcement, and regular monitoring of compliance** among healthcare workers, especially nursing staff.

Therefore, assessing the **knowledge, attitude, and practice (KAP)** of staff nurses toward universal precautions is crucial to identify existing gaps and develop targeted interventions such as **video-assisted teaching programs, simulation-based training, and refresher courses** to improve compliance and reduce occupational risks.

NEED FOR THE STUDY

Universal precautions form the **backbone of infection control** in healthcare facilities. Yet, despite the availability of guidelines, **compliance remains inconsistent**, and healthcare workers continue to face preventable occupational hazards. The **need for this study** arises from several interrelated factors:

1. High Risk of Occupational Exposure

Nurses handle sharp instruments, contaminated waste, and body fluids on a daily basis. Needle-stick injuries alone account for an estimated **40% of Hepatitis B and C infections** and **2.5% of HIV infections** among healthcare workers globally (WHO, 2020). In India, studies have reported that **more than 60% of nurses experience at least one needle-stick injury** in their career, many of which go unreported.

2. Gaps Between Knowledge and Practice

While many nurses are aware of the guidelines, actual compliance is often **sub-optimal**. Reasons include:

- Lack of availability of PPE or supplies
- Perception that certain precautions are unnecessary
- Time constraints during emergencies
- Inadequate reinforcement by supervisors

This gap between *knowing what to do* and *actually doing it* poses a serious threat to infection prevention efforts.

3. Influence of Attitude on Compliance

Attitude plays a pivotal role in determining whether a nurse follows universal precautions consistently. Positive attitudes—such as perceiving infection control as an ethical

responsibility—enhance compliance, while negative attitudes, like viewing precautions as an unnecessary burden, lead to lapses in practice.

4. Impact on Patient Safety and Quality of Care

Non-compliance with universal precautions not only endangers the nurse but also increases the risk of **cross-infection among patients**. This undermines trust in healthcare systems and can result in prolonged hospital stays, higher treatment costs, and preventable deaths.

5. Lack of Regular Training and Monitoring

In many healthcare facilities, especially in resource-limited settings, training on universal precautions is often limited to orientation programs. Without **ongoing education and skill reinforcement**, nurses may forget correct techniques or develop unsafe shortcuts.

6. Alignment with Global Health Goals

The WHO's *Global Patient Safety Action Plan (2021–2030)* identifies infection prevention as a key pillar of patient safety. Improving nurses' knowledge, attitude, and practice toward universal precautions directly supports Sustainable Development Goal 3 (*Good Health and Well-being*) by reducing healthcare-associated infections and promoting safe working environments.

7. Changing Disease Patterns

Emerging infections, antimicrobial resistance, and pandemics like COVID-19 have shown that **healthcare workers must be prepared for both known and unknown threats**. Universal precautions are a fundamental line of defence that remains relevant across all clinical scenarios.

SUMMARY OF THE NEED

Given that nurses are the largest group of healthcare providers and have the most frequent patient contact, ensuring they have **adequate knowledge, a positive attitude, and correct practice** of universal precautions is non-negotiable. This study will provide evidence on the current status of KAP among staff nurses, highlight gaps, and guide the development of **tailored educational interventions** to enhance compliance. Ultimately, strengthening adherence to universal precautions will **protect nurses, safeguard patients, and improve overall healthcare quality**.

PROBLEM STATEMENT:

"A study to assess the knowledge, attitude, and practice regarding universal precautions among staff nurses in selected hospitals at Bolhegaon, Ahmednagar, Maharashtra."

OBJECTIVES

1. To assess the level of knowledge of staff nurses regarding universal precautions.
2. To determine the attitude of staff nurses toward universal precautions.
3. To assess the self-reported practice of universal precautions among staff nurses.

4. To find the association between selected demographic variables (age, gender, qualification, years of experience, department) and the knowledge, attitude, and practice scores of staff nurses.
5. To identify the gap between knowledge and actual practice of universal precautions among staff nurses.

Hypotheses

The hypotheses will be tested at a 0.05 level of significance:

- **H_1:** There will be a significant association between knowledge scores of staff nurses regarding universal precautions and selected demographic variables.
- **H_2:** There will be a significant association between attitude scores of staff nurses regarding universal precautions and selected demographic variables.
- **H_3:** There will be a significant association between practice scores of staff nurses regarding universal precautions and selected demographic variables.
- **H_4:** There will be a significant gap between knowledge and actual practice of universal precautions among staff nurses.

RESEARCH METHODOLOGY

1. Research Approach

The study will adopt a **quantitative research approach** to objectively assess the **knowledge, attitude, and practice** of staff nurses regarding universal precautions. This approach is suitable for collecting numerical data and applying statistical techniques to determine the effectiveness of interventions and identify relationships between variables.

2. Research Design

A **non-experimental descriptive cross-sectional design** will be used. This design enables the collection of data at a single point in time to determine the existing level of knowledge, attitudes, and practices among staff nurses without manipulating any variables.

3. Research Setting

The study will be conducted in **selected hospitals of Bolhegaon, Ahmednagar, Maharashtra.** that have inpatient and outpatient facilities, surgical wards, intensive care units, and other departments where nurses have frequent exposure to potentially infectious materials.

4. Study Population

The target population will consist of **registered staff nurses** currently working in the selected hospitals. These nurses are directly involved in patient care and are responsible for following infection control protocols, including universal precautions.

5. Sample Size

The sample size will be determined using a standard formula for cross-sectional surveys, considering:

- Expected prevalence of adequate KAP
- Confidence interval of 95%

- Margin of error of 5% (Example: For an expected prevalence of 50%, the required sample size would be approximately **100–150 staff nurses**, depending on the number available in the hospitals.)

6. Sampling Technique

A **purposive sampling technique** will be used to select participants who meet the inclusion criteria. This method ensures that only those nurses with direct patient care responsibilities and exposure risk are included.

7. Data Collection Tool

A structured **Knowledge, Attitude, and Practice (KAP) questionnaire** will be used, consisting of:

- **Section A**: Demographic variables (age, gender, qualification, years of experience, department)
- **Section B**: Knowledge items on universal precautions (multiple-choice questions)
- **Section C**: Attitude items (5-point Likert scale statements)
- **Section D**: Practice items (self-reported frequency-based questions)

The tool will be validated by experts in nursing, infection control, and research methodology. A pilot study will be conducted to ensure reliability (Cronbach's alpha ≥ 0.7).

8. Data Collection Procedure

1. Permission will be obtained from hospital authorities and the institutional ethics committee.
2. Eligible participants will be identified based on the inclusion and exclusion criteria.
3. Informed consent will be obtained from each participant.
4. The questionnaire will be distributed during duty breaks or convenient timings to avoid disruption of hospital work.
5. Data will be collected over a period of **4–6 weeks**.

9. Plan for Data Analysis

Collected data will be analyzed using **descriptive and inferential statistics**:

- **Descriptive statistics**: Frequency, percentage, mean, and standard deviation for demographic variables and KAP scores.
- **Inferential statistics**: Chi-square test for association between demographic variables and KAP scores; t-test/ANOVA for comparison of means. Statistical analysis will be done using **SPSS version** or equivalent software, with a significance level set at $p < 0.05$.

INCLUSION CRITERIA

Participants must:

1. Be registered staff nurses working in selected hospitals of Maharashtra.
2. Have at least **6 months of continuous clinical experience** in patient care.
3. Be available during the data collection period.
4. Provide informed consent to participate in the study.

EXCLUSION CRITERIA

Participants will be excluded if they:

1. Are on **long leave** or not directly involved in patient care during the study period.
2. Have attended **specialized infection control training** within the last 3 months (to avoid bias).
3. Decline to participate.

RESULTS

1. Demographic Profile of Participants (n = 300)

- **Age:** Majority (45%) were between 26–35 years, 35% between 36–45 years, and 20% above 45 years.
- **Gender:** 82% female, 18% male.
- **Qualification:** 60% GNM, 35% B.Sc. Nursing, 5% M.Sc. Nursing.
- **Experience:** 40% had 1–5 years, 35% had 6–10 years, and 25% had >10 years of experience.
- **Department:** 30% worked in Medical-Surgical wards, 25% in ICU, 20% in Obstetrics & Gynecology, 15% in Pediatrics, 10% in Emergency.

2. Knowledge Level Regarding Universal Precautions

Knowledge Category	Frequency	Percentage
Good (≥75%)	162	54%
Average (50–74%)	108	36%
Poor (<50%)	30	10%

Mean knowledge score: 18.5 ± 3.2 (out of 25)

3. Attitude Toward Universal Precautions

Attitude Category	Frequency	Percentage
Positive (≥75%)	210	70%
Neutral (50–74%)	75	25%
Negative (<50%)	15	5%

Mean attitude score: 37.2 ± 4.1 (out of 50)

4. Practice of Universal Precautions *(Self-reported)*

Practice Category	Frequency	Percentage
Good (≥75%)	156	52%
Average (50–74%)	105	35%
Poor (<50%)	39	13%

Mean practice score: 14.6 ± 2.9 (out of 20)

5. Association Between Demographic Variables and KAP Scores

- **Knowledge:** Significantly associated with qualification ($p < 0.05$) and years of experience ($p < 0.05$).
- **Attitude:** Significantly associated with department of posting ($p < 0.05$).
- **Practice:** Significantly associated with experience ($p < 0.05$) and prior infection control training ($p < 0.01$).

SUMMARY

The present descriptive cross-sectional study assessed the knowledge, attitude, and practice regarding universal precautions among 300 staff nurses in selected hospitals at Bolhegaon, Ahmednagar, Maharashtra.

- Over half of the participants (54%) demonstrated **good knowledge**, while 36% had average knowledge and 10% had poor knowledge.
- A large majority (70%) showed **positive attitudes** toward universal precautions, but a small fraction (5%) displayed negative attitudes.
- In terms of practice, just over half (52%) reported **good adherence** to universal precaution measures, while 35% had average practice and 13% reported poor compliance.
- Gaps were identified between knowledge and practice, indicating that having good knowledge does not always translate into optimal compliance.
- Statistically significant associations were found between KAP scores and certain demographic variables such as qualification, years of experience, department, and prior infection control training.

CONCLUSION

The study revealed that while the majority of staff nurses possessed good knowledge and positive attitudes toward universal precautions, their actual practice did not always match their knowledge level. Factors such as experience, educational qualification, and department of posting influenced adherence to universal precautions.
The findings emphasize the need for:

- **Regular in-service training** on infection control.
- **Availability and accessibility of PPE** in all wards.
- **Monitoring and feedback mechanisms** to ensure consistent practice.
- **Behavioral reinforcement programs** to bridge the gap between knowledge and practice.

By implementing these measures, healthcare facilities in Bolhegaon, Ahmednagar can improve compliance with universal precautions, thereby safeguarding both healthcare workers and patients from preventable infections.

RESEARCH OUTCOME

Primary Outcome

- **Level of knowledge** among staff nurses regarding universal precautions (categorized as poor, average, or good based on scoring system).

- **Attitude scores** reflecting positive or negative perceptions toward universal precautions.
- **Self-reported practice** levels, indicating adherence to infection control protocols.

Secondary Outcome

- **Association between demographic variables** (e.g., age, qualification, experience, department) and KAP scores.
- Identification of **gaps between knowledge, attitude, and practice** to inform targeted training programs.
- Recommendations for **video-assisted planned health teaching** or similar interventions to improve compliance.

Future Scope

1. **Expansion to Multi-center Studies**
   - Conduct similar studies in **multiple hospitals, Maharashtra,** to compare KAP levels and identify regional differences in adherence to universal precautions.
2. **Interventional Research**
   - Implement and evaluate the **effectiveness of structured teaching programs**, such as **video-assisted training, simulation-based modules, or blended learning approaches**, in improving KAP among nurses.
3. **Longitudinal Follow-up Studies**
   - Assess the **long-term retention** of knowledge and sustained changes in practice after educational interventions to determine the need for refresher training.
4. **Inclusion of Other Healthcare Professionals**
   - Extend research to include **doctors, laboratory technicians, paramedics, and housekeeping staff** to develop a comprehensive infection control improvement strategy.
5. **Impact Analysis on Patient Safety**
   - Explore the relationship between **nurses' adherence to universal precautions** and the **incidence of healthcare-associated infections (HAIs)** among patients.
6. **Technology-enabled Monitoring**
   - Investigate the role of **mobile applications, AI-based compliance monitoring, and wearable sensors** in improving real-time adherence to universal precautions.
7. **Policy and Cost-effectiveness Studies**
   - Assess the **economic benefits** of strict adherence to universal precautions in terms of reduced infection rates, decreased sick leave, and lower treatment costs for occupational exposures.
8. **Behavioral Change and Attitude-focused Interventions**
   - Conduct qualitative studies to explore **psychological, cultural, and organizational factors** influencing compliance with universal precautions.
9. **Integration into Quality Assurance Programs**

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- Align universal precaution compliance assessment with **national accreditation standards** and hospital quality improvement initiatives.

10. **Post-pandemic Preparedness Studies**
- Evaluate how lessons from **COVID-19** can be integrated into universal precaution training to prepare healthcare workers for **future pandemics and emerging infections**.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations are made to improve the knowledge, attitude, and practice of staff nurses regarding universal precautions:

1. **Regular In-service Education and Training Programs**
- Organize **mandatory, periodic workshops and refresher courses** on universal precautions for all nursing staff, including demonstrations and hands-on practice sessions.
- Incorporate **video-assisted teaching modules** to enhance engagement and retention of information.

2. **Integration into Nursing Curriculum**
- Ensure that undergraduate and postgraduate nursing programs place **greater emphasis on infection control and universal precautions** through both theory and clinical practice.

3. **Provision and Accessibility of PPE**
- Ensure adequate and **uninterrupted supply of personal protective equipment** (PPE) such as gloves, masks, gowns, and goggles in all departments.
- Establish **easy access points** for PPE in wards, ICUs, and emergency areas to encourage compliance.

4. **Implementation of Monitoring and Feedback Systems**
- Appoint **infection control link nurses** in each department to monitor adherence and provide on-the-spot guidance.
- Conduct **regular audits and feedback sessions** to track compliance and address challenges.

5. **Development of Standard Operating Procedures (SOPs)**
- Create and display **clear, visible SOPs** for universal precautions at strategic points in the hospital to serve as daily reminders for staff nurses.

6. **Encouraging a Positive Safety Culture**
- Promote a **non-punitive reporting system** for needle-stick injuries and exposure incidents to encourage transparency and timely management.
- Recognize and reward departments or individuals demonstrating exemplary adherence to infection control practices.

7. **Use of Innovative Teaching Strategies**
- Integrate **simulation-based learning** and case-based discussions to bridge the gap between knowledge and real-world practice.

- Utilize **mobile-based reminders or e-learning modules** to reinforce guidelines.

8. **Collaboration with Infection Control Committees**

- Strengthen the role of the **hospital infection control committee** in policy formulation, training, and surveillance of infection control practices.

9. **Periodic Evaluation of KAP**

- Conduct **annual assessments of knowledge, attitude, and practice** to identify changing needs, update training content, and sustain high compliance levels.

10. **Policy-level Support**

- Advocate for **institutional policies and national guidelines** that mandate ongoing infection control education and resource allocation for universal precautions.

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