

**Assessing the awareness of Doctors and Nursing staff regarding Hospital Acquired Infections in a Tertiary Care Hospital of Jammu and Kashmir.**

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**Abstract**

**Introduction:** In spite of advancements in health-care facilities, HAIs still continue to affect hospitalized patients resulting in morbidity, mortality and additional costs. Doctors and Nursing staff can play critical role in its prevention and control. The purpose of the study was to assess their awareness regarding HAIs.

**Material and Methods:** This cross sectional study was conducted among doctors and nursing staff working at GMC, Rajouri, J&K, India. A pre-designed questionnaire was used for data collection regarding awareness on hospital acquired infections.

**Result:** A total of 80 doctors and nursing staff participated. 60% knew that UTI was the most common HAI and 51.25% were aware that direct skin to skin contact was the most common mode of transmission. 88.75% changed their gloves after touching potential sources of microbial colonization. 48.75% didn't clean their apron regularly after hospital duty.

**Conclusion:** Doctors and nursing staff had low to moderate awareness regarding HAIs. Continuous education programs can help in the improvement of awareness of hospital staff. Written SOPs and guidelines should be made available to all health care workers.

**Keywords:** Awareness, Colonization , Hospital Acquired Infections, Health-care workers.

**Introduction**

Hospital-acquired infection (HAI) is an infection occurring in a patient in a hospital or other healthcare facility in whom the infection was not present or incubating at the time of admission.

These infections first appear 48 hours or more after hospital admission or within 30 days after discharge following in-patient care.<sup>1</sup> These nosocomial infections occur among 7-12% of the hospitalized patients globally with more than 1.4 million people suffering from the infectious complications acquired in the hospital. The risk for infection escalates to 15-20% for those patients in intensive care units.<sup>2</sup>

Hospitals provide a favorable transmission pathway for the spread of nosocomial infections, owing partly to poor infection control practices among health workers on one hand and overcrowding of patients in most clinical settings on the other. Most HAIs are transmitted by health care personnel who fail to practice proper hand washing procedures or change gloves between patient contacts. Health care workers such as nurses, doctors can be a major source of pathogens.<sup>3</sup> HAIs not only impact the mortality and mortality rate of a developing country but

also has many profound economic implications which include prolonged duration of hospitalization, increased severity of the primary illness and increased cost of care.<sup>4</sup> Thus this study was conducted to assess the awareness of Doctors and Nursing staff regarding HAIs in our Tertiary Care Hospital. This will not only help the infection control committee of the hospital in identification of barriers in adopting proper infection prevention measures by HCWs but also suggest measures for betterment of necessary facilities in helping to reduce such infections.

### **Material and Methods**

This was an observational, descriptive, cross-sectional study conducted by the Department of Microbiology, Government Medical College, Rajouri, Jammu and Kashmir. The study was conducted in the months of January- February 2020. The study participants included 40 doctors and 40 nursing staff. An informed consent was taken from the participants. For data collection, a pre-designed questionnaire which comprised of 20 questions regarding the awareness on hospital acquired infections was distributed among the doctors and nurses from various departments. Confidentiality of the participants was maintained. The data was analyzed using Statistical Package for Social Sciences (SPSS) version 15.0. The percentage of correct and incorrect answers for each question from all the participants was obtained.

### **Results**

A hospital based cross sectional study was carried out among 40 doctors and 40 nurses in the month of January, 2020. The survey showed majority of the study participants were from 26 to 33 years age group (65%) , females (67.5%) and (77.5%) were married. 52.5 % of the HCWs had < 5 years of service and maximum participants (40%) were from medicine ward. (Table 1)

The responses of the doctors and nursing staff regarding their awareness on HAIs are tabulated in Table 2. The majority (80%) of the participants had correct knowledge regarding definition of HAIs. 48 (60%) knew that UTI was the most common HAI and 41 (51.25%) were aware that direct skin to skin contact was the most common mode of transmission. 53 (66.25%) responded correctly that long stay in hospital was the most common risk factor whereas only 45 (56.25%) knew that hand washing was the most common method of prevention.

50 (62.5%) of the participants were not aware that HAIs can be manifested after discharge from hospital while 71(88.75%) changed their gloves after touching potential sources of microbial colonization. 60 (75%) of the participants believed that HAIs can be transmitted through unsterile needles and sharp objects. Only 14(17.5%) washed their hands when moving from a contaminated body site to a clean body site during patient care. 100% of the doctors and nursing staff were aware that patient equipments should be sterilized properly in ICUs. Very low 44 (55%) of the participants covered spills of blood or body fluids with 10% of freshly prepared sodium hypochlorite for 15 minutes.

A large number 39 (48.75%) of the doctors and nursing staff didn't clean their apron regularly after hospital duty and 15 (18.75%) continued wearing ICU slippers when entering the bathroom. 62 (77.5%) answered that they never informed higher authorities in case of occurrence of HAI. Training on hospital infection control measures was done by only 27 (33.75%) of the participants.

**Table 1: Distribution of study participants according to demographic characteristics (n=80)**

| Demographic characteristics | Frequency | Percentage (%) |
|-----------------------------|-----------|----------------|
| <b>Age group (years)</b>    |           |                |
| 18- 25                      | 13        | 16.25          |
| 26-33                       | 52        | 65             |
| 34 to 41                    | 8         | 10             |
| 42 to 50                    | 5         | 6.25           |
| > 50                        | 2         | 2.5            |
| <b>Gender</b>               |           |                |
| Male                        | 26        | 32.5           |
| Female                      | 54        | 67.5           |
| <b>Marital Status</b>       |           |                |
| Married                     | 62        | 77.5           |
| Unmarried                   | 18        | 22.5           |
| <b>Work Experience</b>      |           |                |
| < 5 yrs                     | 42        | 52.5           |
| 5- 10 yrs                   | 22        | 27.5           |
| > 10 yrs                    | 16        | 20             |
| <b>Wards</b>                |           |                |
| Medicine                    | 32        | 40             |
| Surgery                     | 25        | 31.25          |
| Gynae and Obstretics        | 15        | 18.75          |
| Pediatrics                  | 8         | 10             |

**Table 2: Awareness of participants regarding Hospital Acquired Infections**

|  | Frequency |
|--|-----------|
| <b>1. HAIs are the result of self-infection, cross-infection, and environmental infection.</b> |           |
| Yes*   | 64 (80%)  |
| No   | 12 (15%)  |
| No response  | 4 (5%)    |
| <b>2. Which of the following is the most commonly seen HAI?</b>                                |           |
| Urinary tract infections*  | 48 (60%)  |
| Blood stream infections  | 12 (15%)  |

|   |             |
|---|-------------|
| Respiratory tract infections  | 6 (7.5%)    |
| Surgical site infections  | 14 (17.5%)  |
| <b>3. Which of the following is the most common mode of transmission of HAIs?</b> |             |
| Direct skin to skin contact*  | 41 (51.25%) |
| Droplet and Air-borne transmission  | 25 (31.25%) |
| Contaminated inanimate objects (dressings, gloves, stethoscope)                   | 12 (15%)    |
| <b>4. What is the most common risk factor of HAIs?</b>                            |             |
| Long stay in hospital*  | 53 (66.25%) |
| Malnutrition  | 18 (22.5%)  |
| Decreased immunity  | 9 (11.25%)  |
| <b>5. Which of the following is the most common method to prevent HAIs?</b>       |             |
| Hand washing*   | 45 (56.25%) |
| Personal protective equipment (apron, mask covers, shoe covers, gloves etc.)      | 16 (20%)    |
| Use of antibiotics, vaccination   | 9 (11.25%)  |

|  |            |
|--|------------|
| <b>6. HAI can be manifested after discharge from hospital?</b>   |            |
| Yes*   | 30(37.5%)  |
| No   | 50(62.5%)  |
| <b>7. Patients receiving immunosuppressive therapy are more susceptible to HAIs?</b>   |            |
| Yes*   | 76(95%)    |
| No   | 4(5%)      |
| <b>8. Should gloves be changed after touching potential sources of microbial colonization, such as diapers, ventilator tubing, or Foley catheters?</b> |            |
| Yes*   | 71(88.75%) |
| No   | 9(11.25%)  |
| <b>9. Should hands be properly disinfected before and after touching a patient?</b>  |            |
| Yes*   | 77(96.25%) |
| No   | 3(3.75%)   |
| <b>10. Can HAIs be transmitted through unsterile needles and sharp objects?</b>  |            |
| Yes*   | 60(75%)    |
| No   | 20(25%)    |

|  |             |
|--|-------------|
| <b>11. Do you wash your hands when moving from a contaminated body site to a clean body site during patient care?</b>                                  |             |
| Yes  | 14(17.5%)   |
| No   | 66(82.5%)   |
| <b>12. Do you clean your apron regularly after hospital duty?</b>  |             |
| Yes  | 41 (51.25%) |
| No   | 39 (48.75%) |
| <b>13. Do you follow the recommended guidelines for use of alcohol based solutions or other Anti septics before opening vascular access equipment?</b> |             |
| Yes  | 29 (36.25%) |
| No   | 51 (63.75%) |

|   |             |
|---|-------------|
| <b>14. Do you wash your hands after touching inanimate surfaces and objects in patient's surroundings?</b>                                |             |
| Yes   | 47(58.75%)  |
| No  | 33(41.25%)  |
| <b>15. Patient equipments should be sterilized properly in ICUs?</b>  |             |
| Yes   | 80(100%)    |
| No  | 0(0%)       |
| <b>16. Do you continue wearing ICU slippers when entering the bathroom?</b>   |             |
| Yes   | 15 (18.75%) |
| No  | 65 (81.25%) |
| <b>17. Do you ensure that the used linen is not shaken in order to prevent dissemination of microorganisms into the environment?</b>      |             |
| Yes   | 6 (7.5%)    |
| No  | 74 (92.5%)  |
| <b>18. Do you cover spills of blood or body fluids with 0.5% of freshly prepared sodium hypochlorite for 15 minutes and then mop dry?</b> |             |
| Yes   | 44 (55%)    |
| No  | 36 (45%)    |
| <b>19. Do you always inform the higher authorities in case of occurrence of HAI?</b>  |             |
| Yes   | 18 (22.5%)  |

|   |             |
|---|-------------|
| No  | 62 (77.5%)  |
| <b>20. Have you received any training on Hospital infection control measures?</b> |             |
| Yes   | 27 (33.75%) |
| No  | 53 (66.25%) |

**Correct answer\***

**Discussion**

HAI's are a significant problem throughout the world and are increasing. Awareness of doctors and nursing staff can play a very important role in its prevention and infection control. This study showed interesting findings regarding awareness of HAI's among a random sample of doctors and nursing staff working in our hospital setting.

The data showed that majority of the study participants were females (67.5%) which is similar to studies conducted by Nag K et al<sup>1</sup> (70.5%) and Yassi A et al<sup>5</sup> (82%). Based on the results of the present study, the majority of the participants were between 25-33 years (65%). This result is similar to studies conducted by Ginny Kaushal et al<sup>6</sup>, Johnson et al<sup>7</sup>, and Reda et al<sup>8</sup> in various parts of the globe. 52.5% of health-care workers had <5 years of service. Such result indicates that new employees seem to be more cooperative than senior ones to participate in research.

51.25% of health care workers had correct knowledge that direct skin to skin contact was the most common mode of transmission of HAI's. Similar findings were found in the studies conducted by Gupta et al<sup>9</sup> and Taneja et al.<sup>10</sup> 56.25% of the participants knew that hand washing was the most common methods to prevent HAI's. This was in concordance with study carried out by Giri PA et al<sup>11</sup> which revealed 68% of the HCW's had correct knowledge about hand washing. Implementation of inappropriate

precaution standards becomes one of the risks of spreading infection in hospitals.

88.75% of the health-care personnel agreed that gloves should be changed after touching potential sources of microbial colonization. Similar findings were reported by Hailemariam Gezie et al<sup>12</sup> where 93.8% of the HCW's were in agreement. The findings of our study revealed that only 17.5% of the responders washed their hands when moving from a contaminated body site to a clean body site during patient care. This was in contrast to study conducted by Mudassar et al<sup>13</sup> where 43.3% of the participants washed their hands. The reason for this difference might be explained by the difference in facilities required for prevention of HAI in the study areas. Majority of the HCW's had poor knowledge on safe linen handling. Only 7.5% of the HCW's in our study ensured that the used linen is not shaken in order to prevent dissemination of microorganisms into the environment. A study conducted by Alrubaiee et al<sup>14</sup> showed that 60% of the staff had poor knowledge about linen handling. 66.25% of the participants had not received any training on hospital infection control measures. In particular, the results highlighted the necessity to implement training course on hospital infection control awareness with more focusing on hand washing and safe injection practices because HCW's had poor knowledge in these two aspects.

## Conclusion

Based on the findings of the study, it was concluded that doctors and nursing staff had low to moderate awareness regarding HAIs in our hospital setting. Doctors and nurses can play a very important role in preventing infection spread by performing standard precautions such as observing hand hygiene, proper disinfection of skin, wearing gloves and masks, preventing accidental needle stick injury and proper spill management.

Continuous education programs can help in the improvement of awareness among the hospital staff. Written standard operating procedures and guidelines should be made available to all health care workers. A regular system of monitoring infection rates as well as dissemination of the data will form a link between the management, doctors and nursing staff and thus help in implementing and improving strategies for prevention of hospital acquired infections.

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