

## **Assessment Of Infection Control Practices In Bolan Medical Complex And Sandeman Provincial Hospital Of Quetta, Balochistan, Pakistan**

### **Abstract**

Pakistan has a double burden of disease, with more than 40% of the population suffering from infectious diseases. Therefore, in order to lower the risk of dangerous, avoidable infections among patients and healthcare staff, effective hospital infection control programmes are crucial from both an economic and a therapeutic standpoint. The goal of the study was to locate any gaps in current infection control and preventive procedures. The two teaching hospitals Bolan Medical Complex and Sandeman Provincial Hospital in Quetta were the sites of this cross-sectional investigation. In the SAMPLE, 161 people participated. The Statistical Package for Social Sciences (SPSS) version 16.0 was used to analyse the data, which was gathered via data sheets and questionnaires. The findings revealed that the Infection Control Committee (ICC) member's view of health-associated infections (HAIs) was ultimately determined to be inconsequential ( $P=0.6$ ), and their perception that the staff education level may be a contributing factor was also shown to be unimportant ( $P=0.1$ ). The operation theatre, labour room, lab and blood bank, OPD, and wards at BMC were evaluated in reference to the steps taken there for infection control and prevention, and the results were observed 30, 25, 15, 14, and 15 accordingly. It was shown that the primary reason for the poor results was the negative perception of the ICC towards infection control and prevention. Therefore, it is necessary to alter how ICC is seen.

**Keywords:** Infection Control, prevention Practices, standard precautions

### **Introduction**

Pakistan has a double illness burden, with infectious diseases accounting for more than 40% of the total. The remaining percentage is accounted for by non-communicable illnesses. Because hospitals are sites where sick and healthy customers and providers contact the most, the likelihood of "breakup of the chain of infection" increases there. In the course of providing services to the public, hospitals create both infected and non-infectious trash. Approximately 25% of the garbage created is contagious and harmful, while the remaining 75% is non-infectious and classified as municipal waste. However, the 25% infectious waste poses a risk to hospital employees and the general public<sup>1</sup>.

Health Care Associated Infection (HCAI) is a critical issue for patient safety, and preventing it should be a top goal all settings and organisations dedicated to making health care safer. Despite the fact that the danger of getting HCAI is ubiquitous and infects every health-care institution and system worldwide, the global burden is unclear due to the difficulties in obtaining appropriate diagnostic data. This is mostly owing to the complexity and lack of universality of criteria used in diagnosing HCAI, as well as the fact that most nations lack HCAI monitoring systems<sup>2</sup>.

According to the Centers for Disease Control and Prevention, 5%-10% of hospitalised patients get a healthcare-associated infection (HAI), resulting in over two million HAIs and nearly 100,000 fatalities each year in US hospitals. The risk of significant consequences from HAIs is especially high in patients who require intensive care<sup>3</sup>.

For many decades, hospital-based infection surveillance, prevention, and control systems have been in place to monitor the occurrence of HAIs and restrict the spread of hospital acquired infections through internal quality improvement efforts<sup>4</sup>. Several studies in various nations have demonstrated a lack of adherence to prescribed

disinfection and sterilization recommendations. Failure to follow scientifically established rules has resulted in a number of outbreaks<sup>5</sup>.

The Centers for Disease Control and Prevention (CDC) created and reprinted a baseline definition for HAIs in 2004. HAIs were defined as infections that emerge during hospitalisation but are not present or incubating at the time of the patient's admission; usually, infections that arise more than 48 to 72 hours after admission and within 10 days after hospital discharge<sup>6</sup>.

Infection control concepts apply to anything from a simple vaccination administered to a child in the field to complicated interventional procedures in the hospital. The breakage of the infection chain poses a significant risk to the community and service providers at all levels. Following recent constitutional amendments in the nation, there is a need to review every area of the health system in order to make suggestions to the Balochistan provincial health department. To educate the National Infection Prevention and Control Manual's Standard Infection Control Precautions (SICP) section on routine cleaning of the environment in the hospital context in order to ease the prevention and control of healthcare-associated infections in teaching hospital settings. The study's goal was to examine the state of infection control methods at Lahore's teaching hospitals.

#### **Objectives:**

1. To evaluate the infection control methods at Lahore's two teaching hospitals.
2. To document hospital administrators' perspectives on the operation of institutional infection control committees

#### **Research Question**

1. What is the consensus on infection control and preventive methods among experts on the BMC/SPH Infection Control Committee in Quetta?
2. What is the status of infection control and prevention at BMC/SPH in Quetta?
- 3.

#### **Methodology**

**Study Site:** Bolan Medical Complex (BMC) and Sandeman Medical Complex/College Hospital (SMCH), Quetta, Pakistan.

**Study Duration:** 03 months

**Study Type:** Cross-sectional descriptive study

#### **Sample Size:**

In the Balochistan, there are two teaching hospitals, and both were chosen to evaluate infection control techniques. Members of the infection control committee questioned 161 participants to record their perceptions.

**Data Collection Technique:** The practices regarding the infection control were observed at the (1) Outpatient Departments (2) Operation Theatres (3) Labour Rooms (4) Laboratory and Blood Banks of the hospitals.

#### **Inclusion Criteria: -.**

- Teaching hospitals of Lahore
- Members of infection control committee.

#### **Exclusion Criteria:**

Hospital managers who were on leave at the time of survey

**Data Collection Instruments:** There are multiple tools available for the data collection and Centers for Disease Control Atlanta Georgia tools were adapted for assessing hospital practices for infection control.

A field guide was used to assess perception of members of infection control committee. The principal investigator will collect data.

### Data Analysis Plan:

The completed questionnaires were checked for errors, edited, cleaned, coded and data was entered into SPSS for statistical analysis. The descriptive analyses included proportions of the categorical variables and were expressed as percentages whereas means and standard deviations of Continuous variables were calculated. Cross tabulation will be done to see the relationship between two variables by applying chi-square. A p-value of less than 5% was considered as statistically significant.

### Results

The infection control committee at Bolan Medical Complex (BMC) comprised on Administrator, ICP Specialist (Head), Representative of Medicine department, Representative from Surgery department, Pathologist, Pharmacist and Nursing Head.

### Infection Control Committee BMC and SMCH

**Table 1: Infection Control Committee**

Infection Control Committee		Frequency	Precent
1	Administrator	1	14.3
2	ICP Specialist (Head)	1	14.3
3	Representative of Medicine dept	1	14.3
4	Representative from Surgery dept	1	14.3
5	Pathologist	1	14.3
6	Pharmacist	1	14.3
7	Nursing Head	1	14.3
	Total	7	100.0

**Table 2: Perception of ICC members on Infection control and prevention at SMCH and BMC**

Question asked	Response at SMCH		Total	Response at BMC		Total
	Yes	No		Yes	No	
Perceived time constrain	2	5	7	2	5	7
Thinks ICP inconvenient	3	4	7	4	3	7
Presumption that Pt was not infected	3	4	7	4	3	7
Measurable SOPs	4	3	7	4	3	7
SOPs for IPC in Hospital	2	3	5	3	4	7
Easy Applicable SOP	3	4	7	3	4	7
Daily monitoring ICP	2	5	7	2	5	7
Check List ICP	3	4	7	3	4	7

available						
Frequent Meeting ICP Weekly	7	0	7	7	0	7
CME on HAI/IPC for Staff	1	6	7	1	6	7
Regular Hand washing practice of staff	4	3	7	4	3	7
Necessity of SOP for ICP	4	3	7	4	3	7
Satisfaction on ICP in Hospital	2	5	7	2	5	7
Conduct survey for evaluation of ICP	0	7	7	0	7	7
Hazards of HAIs due to Drug resistant microorganism	3	4	7	3	4	7
Stewardship in antimicrobial Use	3	4	7	3	4	7
Existing Surveillance system for Outbreak control	0	7	7	0	7	7
Posters of Hand washing (ICP)	1	6	7	1	6	7
Availability of Disposable PPE	1	6	7	1	6	7
Use of sterile barrier (mask, cap, gloves etc)	3	4	7	3	4	7
Remove PPE after use	2	5	7	2	5	7
Hospital waste management	7	0	7	7	0	7
Disinfection and sterilization system	1	6	7	1	6	7
Total Responded Q	<b>61</b>	<b>97</b>		<b>64</b>	<b>97</b>	

Regarding the perception of members of ICC on infection control and prevention at SMCH and BMC, out 161, they collectively obtained 61 and 64 score, 37.8% and 39.7%, which are poor.

**Table 3: Factors of Hospital Acquired Infections due to Administrative reasons**

Factors of HAIs on Administration	Frequency	Percent
Nurse patient ratio	3	42.9
Level of staff education	3	42.9

Lack of instruments/equipments for ICP	1	14.3
Total	7	100.0

There were 42.9% of the ICC members who believed that the administrative factors for causing HAI were Nurse patient ratio and level of staff education on infection control and prevention. Only 14.3 % thought of lack of equipments for ICP.

**Table 4: Factors of HAIs on Pts care at BMC**

Factors of HAIs on Pts care	Frequency	Precent
Antibiotic Use	1	14.3
Invasive Medical Device	5	71.4
Other	1	14.3
Total	7	100.0

There were majority 71.4% of the ICC members who believed that the patients care factors for causing HAI was invasive medical device. Only 14.3 % thought of improper antibiotic use and others may be lower immunity level of the patients.

**Table 5: Factors of Hospital Acquired Infections due to Administrative reason at SMCH**

Factors of HAIs on Administration	Frequency	Precent
Nurse patient ratio	2	28.6
Level of staff education	3	42.9
Lack of instruments/equipments for ICP	2	28.9%
Total	7	100.0

There were 28.6% of the ICC members who believed that the administrative factors for causing HAI, 42.9% were Nurse patient ratio and level of staff education on infection control and prevention. Only 28.6 % thought of lack of equipments for ICP.

**Table 6: Factors of HAIs on Pts care at SMCH**

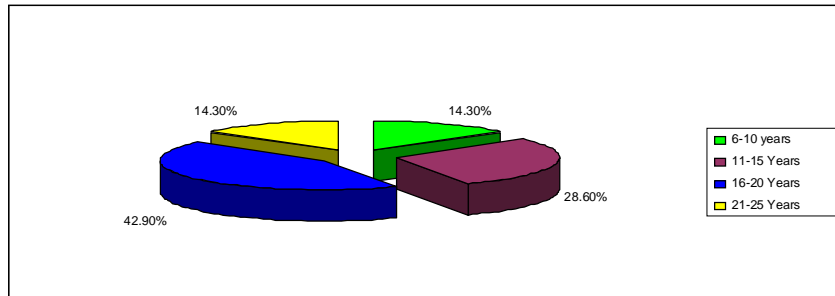
Factors of HAIs on Pts care	Frequency	Precent
Antibiotic use	3	42.9
Invasive medical device	3	42.9
Others	1	14.3
Total	7	100.0

There were 42.6 % of the ICC members who believed that the patients care factors for causing HAI was invasive medical device. Only 14.3 % thought of improper antibiotic use and others may be lower immunity level of the patients.

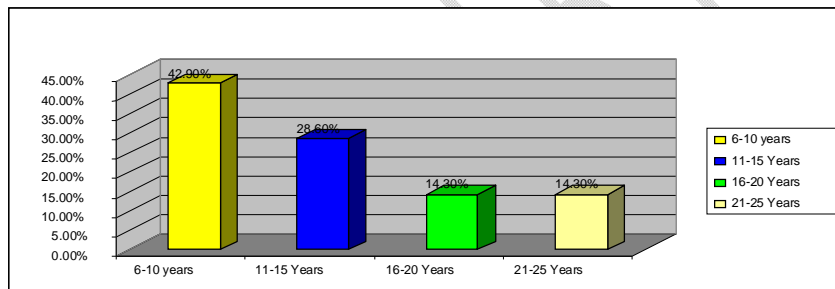
### Experience of ICC at BMC and SMCH

The maximum 3 members in ICC possessed the experience of 6-10 years, 2 members have had experience of 11-15 years, one each member gained experience of 16-20 and 21-25 years, respectively are shown in figures 1 and 2.

**Fig. 1: Experience of ICC at BMC**



**Fig. 2: Experience of ICC at SMCH**



### Assessment of ICP at BMC and SMCH

#### Labour room

The outcome scores of the assessment of labour room regarding the measures taken there for infection control and prevention in BMC and SMCH were 25 and 28 good assessment are shown in figures 3 and 4.

#### Laboratory/Blood Bank

The outcome scores of the assessment of laboratory/Blood bank regarding the measures taken there for infection control and prevention in BMC and SMCH were resulted in 15 and 17 are Poor one.

#### OT

The outcome scores of the assessment of Operation Theater regarding the measures taken there for infection control and prevention in both hospitals are 30 and 26 which are bit good.

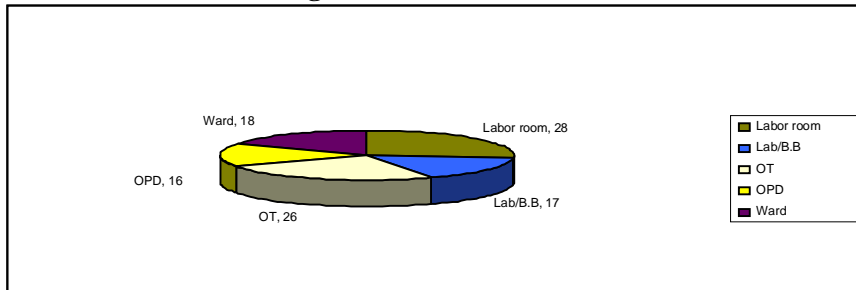
#### OPD

The outcome scores of the assessment of OPD regarding the measures taken there for infection control and prevention in both hospitals were calculated 14 and 16 are Poor enough.

### Ward

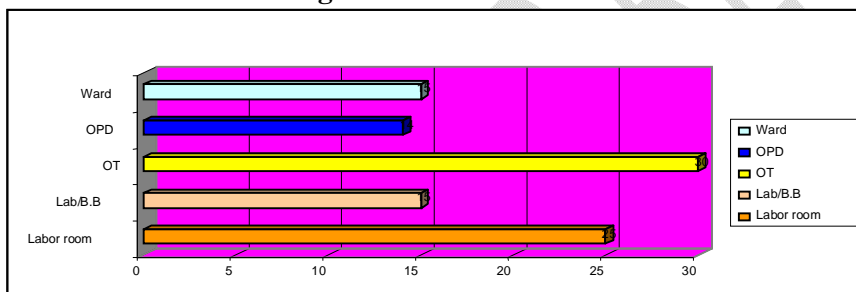
The outcome score of the assessment of ward regarding the measures taken there for infection control and prevention in BMC and SPH were 15 and 18 are poor.

**Fig. 3: Assessment of ICP at SMCH**



**Scoring: Labour Room: 28= Good, Lab/ Blood Bank: 17= Poor, O.T: 26 = Good  
OPD: 146= Poor, Ward: 18 = Poor**

**Fig. 4: Assessment of ICP at BMC**



**Scoring: Labour Room: 25= Good, Lab/ Blood Bank: 15 = Good, O.T: 30 = Poor  
OPD: 14 = Poor, Ward: 15 = Poor**

### Discussion

The primary purpose of Infection Control Services is to guarantee that the healthcare community has the knowledge necessary to safeguard patients and workers from adverse occurrences. The department provides epidemiological approach expertise through teaching, research, consultancy, disease cluster surveillance and investigation, environmental laboratory services, quality improvement, and policy creation. These services are available to address the requirements of all those involved with the BMC/SPH Lahore, notably patients, in order to prevent infectious problems. The department is an accountable and helpful component of the hospital community. At BMC, infection control committee members are the Administrator, ICP Specialist (Head), Medicine Department Representative, Surgery Department Representative, Pathologist, Pharmacist, and Nursing Head. The Infection Control Services (ICS) department is an administrative unit within the University of Michigan Medical Center (UMMC).

A manager, four staff experts, and a medical secretary makes up the team of six. An administrator and a medical director (the hospital epidemiologist) hold the management responsible<sup>7</sup>. Because BMC/SPH is in the public sector, there is an administrator (MS) rather than the Manager that was at UMMC in our research. Because of the arrangement of the public sector, the composition of our research area differs. To design its mission statement, identify clients, define customer requirements, and develop quality improvement targets to satisfy the criteria, the Infection Control Services department employed complete quality methodologies. ICPs should employ continuous quality improvement methods and procedures to improve their operations inside their institutions, better satisfy the demands of their customers, and ensure that they match the goal of their institution<sup>7</sup>. Creating a strategy for identifying infections or suspected sources of infection through departmental rounds, clinical report reviews, and identifying at-risk patients and taking necessary action. Ongoing evaluation of whether to recommend precautions, such as hand hygiene, waste management, disinfection, and sterilization, are being followed.

A KAP research was undertaken in Nigeria between HCW from two tertiary hospitals. A questionnaire was used to collect data for examining the key parts of KAP of conventional precautions. The study included 290 HCW (76% response rate), comprising 111 (38.3%) doctors, 147 (50.7%) nurses, and 32 (11%) laboratory scientists. The overall median knowledge and attitude scores for routine precautions were greater than 90%, however the median practice score was 50.8 The findings indicate a pervasive lack of compliance with recommended infection control practises among<sup>8</sup>.

A cross-sectional research was conducted at three hospitals in northern Jordan. The questionnaire was completed by 266 registered nurses out of 300 (88.7% response rate). The bulk of the participants (33.1%) were medical/surgical RNs, with just 8.3% coming from pediatric/gynecology departments. The overall knowledge score was 16.27 (standard deviation = 3.15), while the overall compliance score was 49.15 (standard deviation = 12.36). Furthermore, the study found a somewhat favourable link between degree of knowledge, years of experience, and standard precautions compliance ( $r = 0.387$ ,  $p = 0.01$ ), respectively<sup>9</sup>.

In Brazilian hospitals, a cross-sectional survey conducted to assess the perceptions and attitudes of the health care workers (HCW) concerning ICP by using a self-administered online questionnaire. The ICC responded to the survey in 1998. Eight hundred sixty (40.4%) respondents stated that their institutions had an ICP in place for more than ten years. The poll provides critical information on ICC members' perspectives and attitudes, which may be utilised to develop essential interventions for effective ICP<sup>10</sup> implementation. In our research region, 14% of professionals (ICC members) believed that HAIs were caused by incorrect antibiotic usage. Academic hospitals are especially worried with IC. IC committees should address issues such as endemic hospital infection surveillance, specialised preventative procedures, antibiotics policy, and staff education. Although IC is widely established in Turkey, it still has a long way to go before reaching the levels observed in industrialised countries<sup>11</sup>. The assessment of Operation Theater at BMC for infection control and preventive methods yielded a score of 30, which is satisfactory.

### **Conclusion**

Academic hospitals are especially worried with IC. The IC committee should address issues such as endemic hospital infection surveillance, specialized preventative

procedures, antibiotics policy, and staff education. Many areas share the expanding responsibility for establishing and maintaining an efficient infection control program throughout the facility. Both hospital administrators and health care workers are tasked with demonstrating the efficacy of infection control practices, ensuring adequate infection control staff training, ensuring that surveillance results are linked to performance measurement improvements, evaluating changing priorities based on ongoing risk assessments, ensuring an adequate number of competent infection control practitioners, and performing program evaluations using quality improvement tools as indicated. The findings of our investigation revealed a general lack of perception of ICC members in both institutions.

### **Ethical Approval:**

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

### **Consent**

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

### **Reference**

1. Yaqub Km, et al, A survey of infection control practices of consultant anesthesiologists in teaching hospitals of Pakistan, *Journal of College of Physicians Surgeon Pak Sep*, 2007; 17(9): 523-6.
2. A Summary WHO Guidelines on Hand Hygiene in Health Care: ©World Health Organization 2009 WHO/IER/PSP/2009.07
3. Guidelines for Environmental Infection Control in Health-Care Facilities, CDC, [www.cdc.gov/ncidod/hip/enviro/guide.htm](http://www.cdc.gov/ncidod/hip/enviro/guide.htm).
4. Deborah S. Yokoe, MD, MPH; David Classen, MD, MS, *Infect Control Hosp Epidemiol* 2008; 29:S3-S11.
5. William A. Rutala, *Infection control in hospitals: a worldwide problem* CDC Guideline for Disinfection and Sterilization in Healthcare Facilities, 2008.
6. Evidence for Hand Hygiene Guidelines page No 6, WHO Guidelines on Hand Hygiene in Health Care (2009) [www.who.int/gpsc/5may/en/](http://www.who.int/gpsc/5may/en/).
7. Candace Friedman, *Infection Control, AJIC, JAM* 1993; 21:155-159.
8. Ogoina D, Pondei K, Adetunji B, Chima G, Isichei C, Gidado S. Knowledge, attitude and practice of standard precautions of infection control by hospital workers in two tertiary hospitals in Nigeria. *J Infect Prev.* 2015 Jan; 16(1): 16-22.
9. Al-Faouri I, Okour SH, Alakour NA, Alrabadi N. Knowledge and compliance with standard precautions among registered nurses: A cross-sectional study. *Ann Med Surg (Lond).* 2021 Jan 29;62: 419-424.
10. Guerra CM, et al. Perceptions and attitudes of the professional staff concerning infection surveillance and control programs in Brazilian hospitals, *Am J Infect Control.* 2010 Feb;38(1): 59-62.
11. Yaman H, Yayli G, Perceptions of physicians on infection control activities in Turkish hospitals: a cross-sectional survey, *Am J Infect Control.* 2003 Aug; 31(5): 325-8.

in 2008. A self-administered questionnaire used was based on different components of standard and transmission-based precautions. Participants from three different health care settings included 70 doctors and 124 nurses. Each health care facility was observed for standard and transmission-based precautions practice. The analysis of correlation between 'attitude' and 'practice' discovered a direct significant association at the level 0.01 ( $r=.412$ ). No significant correlation between knowledge and practice was found ( $r= -.001$ ), however the relationship tend to be negative. A marginally significant association was found between training precautions practices with a p value of 0.92. The significant association also was found with 'marital status' and 'practice' with a p value of 0.002.

UNDER PEER REVIEW