

## Awareness Regarding Universal Safety Precaution Among Nurses and Compulsory Rotatory Residential Internship in a Teaching Hospital

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The lack of awareness regarding the policies and procedures about universal precautions among medical students has resulted in higher accidental exposure to Blood Borne Pathogens and body fluids. So, the current situation needs such type of study which can help in improving awareness about universal precautions among Nurses and Compulsory Rotatory Residential Internships (CRRIs), those who constitute a major role in controlling deadly infections. A cross-sectional observational study was conducted among nurses of all departments and Compulsory Rotatory Residential Internships (CRRIs) between June & July 2020 in a teaching medical hospital near Kancheepuram. A total of 400 nurses who were deputed in various departments and 50 Compulsory Rotatory Residential Internships (CRRIs) were requested to take part in the study. The emails were gathered and formal informed consent was sent along with the standard questionnaire. The questions were prepared in a simple language from a valid & reliable measure. The data are entered and analysed by MS Excel. A chi square test is carried to test the association between the proportion. The level of knowledge among nurses and CRRIs were similar without a significant difference between them. The awareness regarding universal precaution in nurses with different working experience were also similar without any significant differences. About 95% of CRRIs were aware about the universal precautions. The awareness about universal precaution and practice was not statistically significant when compared between the nurses and CRRIs. The current study findings assure that the nurses and Compulsory Rotatory Residential Internship (CRRIs) were aware and are knowledgeable about the standard precautions and their importance in reducing infections. The present result shows the infectious committee has a great role in educating the health care workers and provide a better environment for serving the patients.

**Keywords:** Compulsory Rotatory Residential Internship; Health care workers; Infection; Pandemic; Universal safety precaution.

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Infection is one of the most significant complications in health care services during pandemic situations. A better health care service helps in promoting and maintaining health by which disease can be managed and prevented.

Proper care can reduce unnecessary disability and premature death. Mainly in

developing countries like India, there is a large gap between the provider's knowledge and the care provided<sup>1</sup>. In 1970 the initial set of guidelines was released by the Centre for Disease Control and Prevention (CDC) to safeguard the health care workers and patients from spreading of infection by micro-organisms. The universal precautions

should be followed to protect all the patients and the health care workers from infection<sup>2</sup>. According to WHO (2006) report, about 35 million health care workers worldwide and around 3 million health care workers sustained percutaneous exposure to bloodborne pathogens each year, including 2 million to hepatitis B virus, 0.9 million to hepatitis C virus, and 1,70,000 to human immune deficiency (HIV) virus. These injuries may result in 70,000 hepatitis B virus (HBV), 15,000 hepatitis C virus (HCV), and 5,000 human immune deficiency virus (HIV) infections<sup>3</sup>. Universal precautions are specified measures designed to prevent bloodborne pathogens transmission during health care services<sup>4</sup>. The guidelines included in universal precautions were dealing with body fluids, disregard contaminations with blood, non-intact skin, and mucous membranes. They also include hand decontamination, usage of personal protective equipment, secure usage and disposal of sharp equipment, and waste management. Whereas no specific guidelines were enlightened in handling feces, nasal secretions, sputum, sweat, tears, urine, saliva, and vomitus<sup>4</sup>.

An outbreak of infectious diseases such as Severe Acute Respiratory Syndrome (SARS) in 2003, Novel influenza A/H1N1 (Swine flu) in 2009<sup>5</sup>, and the pandemic outbreak of COVID 19 (Coronavirus Disease) has emphasized the importance of adhering to the universal precautions. World Health Organisation (WHO) confirmed around 3,579,479 cases and 2,48,445 deaths of COVID 19 on January 30, 2020. The transmission of coronavirus from one person to another is through droplets<sup>6</sup>. The infectious disease can increase the risk of community transmission when adequate education and practice of standard precautions are not followed<sup>7</sup>. The necessary safety precautions like wearing masks, using gloves, and personal protective equipment can reduce the massive damage to both human health and the economy<sup>8</sup>. Standard precautions have been widely promoted in high-income countries to protect health care workers from occupational exposure to blood-borne pathogens and the consequent risk of infection<sup>9</sup>.

The lack of awareness regarding the policies and procedures about universal precautions among medical students has resulted in higher accidental exposure to Blood Borne Pathogens and

body fluids<sup>10</sup>. The other reasons for rebelliousness in following standard precautions are due to uneasiness in handling needles while wearing gloves, lack of time when more patients attend the hospitals, and non-availability of the gloves, facemask, and others<sup>11</sup>.

Nurses play a vital role in the health care system<sup>10</sup>. They are exposed to various health and safety hazards during their day-to-day work nature<sup>12</sup>. The infection gets transmitted by direct contact with the infected patients and indirect methods like patients touching the doorknob and other areas in and around<sup>13</sup>. The extent of practicing universal precaution varies from one health care worker to another. The difference in knowledge, awareness, and compliance among health care workers may be due to their variation in training.

So, the current situation needs such type of study which can help in improving awareness about universal precautions among Nurses and CRRI's, those who constitute a major role in controlling deadly infections.

## METHODOLOGY

A cross-sectional observational study was conducted among nurses of all departments and CRRI's between June & July 2020 in a teaching medical hospital near Kancheepuram. The study was conducted during the pandemic situation when the importance of universal precautions had a crucial role in controlling the current scenario. A total of 400 nurses who were deputed in various departments were requested to take part in the study. With the help of nursing in charge, the nurses' email was gathered and formal informed consent was sent along with the standard questionnaire. The questions were prepared in a simple language from a valid & reliable measure and were structured to observe the knowledge & practice towards universal precautions among staff nurses.

Understanding the current situation, the nurses were not compelled and a gentle reminder was given through an email to complete the study. Around 200 nurses participated in the study by filling the standard questionnaire.

The same questionnaire was sent to CRRI's of the same institution to compare the knowledge regarding universal precaution. The

same technique was followed and around 50 CRRIs participated in the study.

**Ethics**

The protocol was submitted to Institutional review board and the ethical clearance was obtained with the approval number SMCH/IEC/2020/03/266.

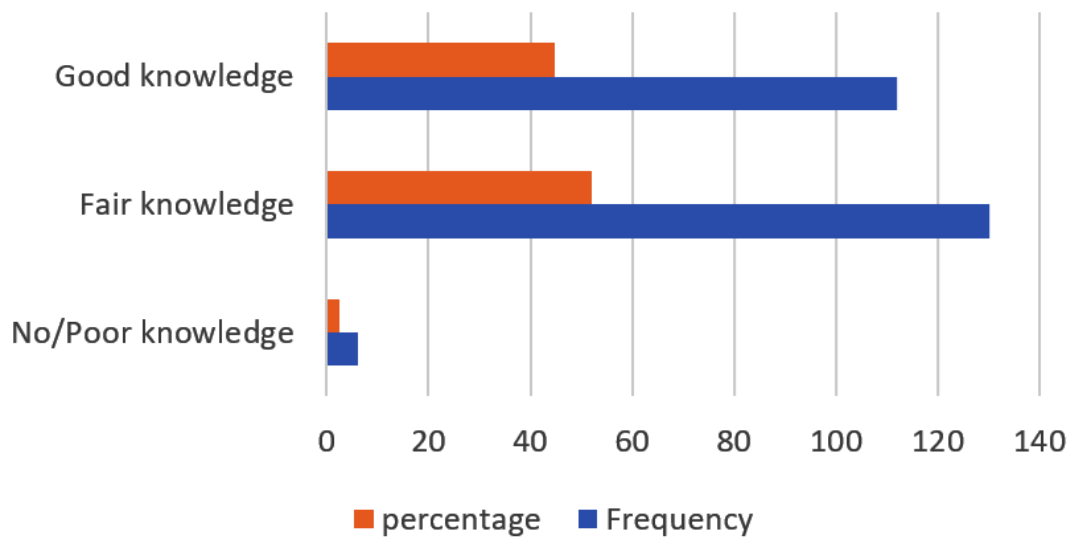
**Statistical Method**

Data from the questionnaire were entered and analysed by MS excel. The knowledge and the awareness among nurses and CRRIs in percentage

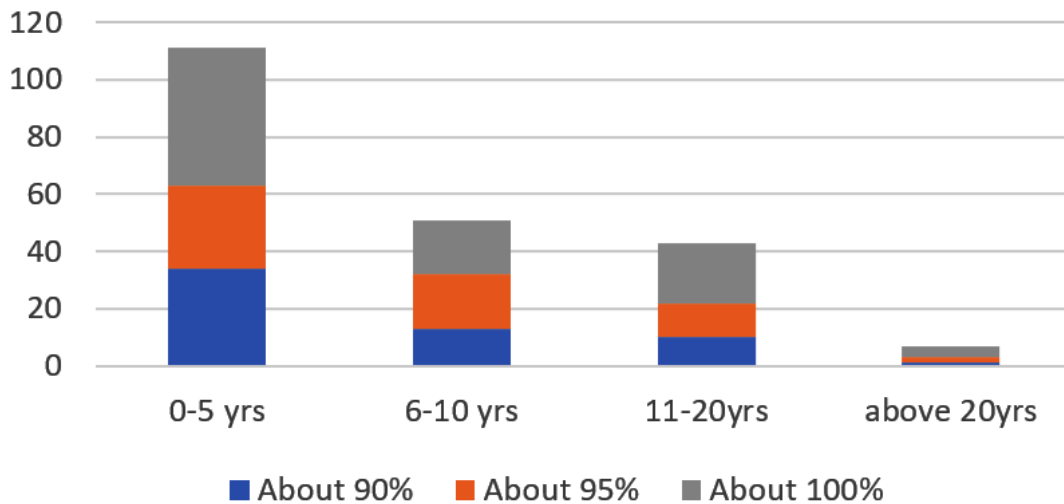
are represented as histogram. A chi-square test was used to test the association between the proportions.

**RESULTS**

A chi square test is carried to test the association between the proportions among the Nurses and CRRIs with the individual questions in questionnaire regarding the universal precaution. The p value is 0.52 and is not statistically significant when the significance level was 0.1.



**Fig. 1.** Knowledge among Nurses and CRRIs



**Fig. 2.** Awareness Regarding Universal Precaution in Nurses

## DISCUSSION

A survey by World Health Organization (WHO) has revealed approximately 5% of new HIV infections in developing and transitional countries are due to hazardous health care injections, risky blood, and occupational exposure<sup>14</sup>. The chances of these exposures vary region wise and these can be controlled by integrating the practice of universal precautions among the health care workers by hospital administrators. Universal standard precautions are the guidelines structured to prevent the transmission of infections through blood or body fluids<sup>15</sup>. Among the health care workers, nurses are front-line workers who handle the

patients initially. Therefore, it is necessary to impart knowledge and practice of standard precautions among nurses during routine clinical procedures. The American Nurses Association's code of ethics (2015) emphasized the definite professional conduct norms for the nursing field. Clause 2 of this code specifies that 'sole responsibility of the nurse is toward the patient'. Clause 5 of the code specifies that nurses have the same obligation to themselves and others<sup>16</sup>.

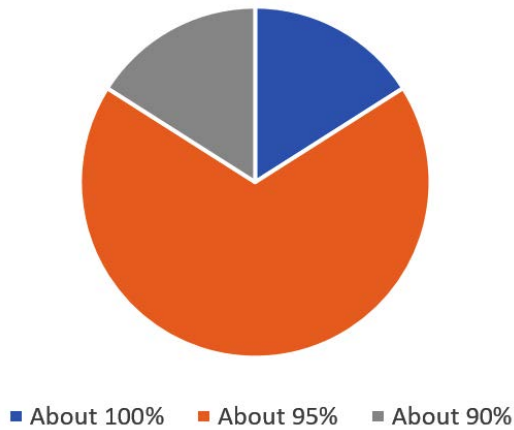
The present study was conducted in a teaching hospital to analyze the knowledge and awareness among the nurses and CRRIs, where an infectious committee was already framed and the nurses and compulsory rotatory residential

**Table 1.** Knowledge Regarding Universal Precaution in Nurses and CRRIs in Percentage

Questionnaire	Nurses Always	CRRIs Always	Nurses Often	CRRIs Often
Do you sanitize your hands in between treating different patients?	60	52	34	44
Do you sanitize your hands after taking off your gloves?	35	56	42	23
Do you sanitize your hands immediately after Blood collection	83	83	13	15
Do you sanitize your hands immediately after procedures involving the possibility of touching urine or feces	37	52	10	12
Do you sanitize your hands immediately after procedures involving the possibility of touching a patient's non-intact skin	89	90	10	5
Do you sanitize your hands immediately after procedures involving the possibility of touching a patient's mucous membrane	74	58	24	37
Do you sanitize your hands immediately after Intramuscular or subcutaneous injections	79	69	16	25
Do you sanitize your hands immediately after dressing of wounds	74	96	13	1
Do you sanitize your hands immediately after cleaning for blood removal	26	27	12	15
Do you sanitize your hands immediately after venepunctures	30	65	41	27
Do you sanitize your hands immediately after contact with blood samples	61	58	19	12
Wears a protection mask when there is a possibility of touching drops of blood, bodily fluids, discharges.	24	44	13	12
Wear's protection glasses when there is a possibility of touching drops of blood, bodily fluids, or discharges.	77	69	16	21
Wears a protection apron when there is a possibility of touching drops of blood, bodily fluids, or discharges.	29	50	22	13
Wears disposable caps and shoe covers when there is a possibility of touching drops of blood, bodily fluids, or discharges	26	37	12	23
Doesn't recap used needles or uses the one-hand recapping method.	27	33	24	21
Dispose needles, blades, and other sharp materials in containers that are specific for that purpose.	28	35	25	13
After workplace accidents with potentially contaminated sharp materials, immediately squeezes the affected part, washes it, disinfects it, and dresses the wound.	82	67	12	15

internships were educated regularly about the importance of standard precautions. A similar study was conducted in western Algeria which observed a lack of adherence to standard precautions due to lack of knowledge<sup>17</sup>. Another study among the nurses in a public hospital in Brazil identified that 11% of the nurses acknowledged that standard precautions are protective measures for professionals only<sup>18</sup>. A study conducted among nurses in the United Arab Emirates identified that 58.2% of the nurses considered the standard precautions as a protection tool for health care workers from getting infected from patients and about 23% of the nurses considered in a reverse manner<sup>19</sup>. The knowledge and the practice of universal standard precautions were not uniform among the nurses. The current statement was proved in a study which showed 61% of staff nurses had good knowledge and nearly 35% had excellent knowledge. The study also showed an association between age and knowledge among nurses<sup>20</sup>. The

present study confirmed that CRRIs and the nurses were aware [Fig 2 and 3] and practiced the standard precautions [Table 1]. The study also revealed that the nurses and compulsory rotatory residential internships show moderate levels in following sanitation methods [ Table 2] and in compliance with safety measures like wearing a face mask, PPE, and gloves [Table 3]. The overall knowledge and practice of safety measures is about 60% in both nurses and compulsory rotatory residential internships [ Table 4]. Around 83% of compulsory rotatory residential internships were aware and practiced hand sanitization immediately after blood collection and 90% followed the standard precautions after touching patients' non-intact skin and also around 96% sanitized their hands after dressing the wounds which were slightly higher than nurses. A cross-sectional study conducted among first-year medical students about universal precautions identified about 83% of them had the opinion that the standard precautions are only for the health care workers and 23% felt that it was used only in patients diagnosed with infection and 97% had the idea about the hand hygiene which is followed while providing care to the patients and 14% assumed that PPE can be shared and 57% were aware of the recapping of the needle after injections<sup>21</sup>. A study conducted by Sangeetha *et al* showed the practice of using gloves, goggles, and apron were not by their knowledge<sup>22</sup>.



**Fig. 3.** Awareness Regarding Universal Precaution in CRRIs

**Table 3.** Compliance towards safety measures

Compliance of the health care workers towards safety measures (Score out of 85)	Frequency	Percentage
Good practise (80-85)	50	20
Moderate practise(60-79)	173	69.2
Poor Practise (<60)	27	10.8

**Table 2.** Sanitization Methods

Sanitization methods (Total score-15)	Frequency	%
Perfect sanitization(Score-15)	55	22
Moderate sanitization(Score-14-11)	184	73.6
Poor sanitization(Score <=10)	11	4.4

**Table 4.** The overall knowledge and practise of Universal safety measures

Overall score of 116	Frequency	Percentage
Excellent (116/116)	2	0.8
Good (100-115)	76	30.4
Moderate (85-99)	152	60.8
Poor (<85)	20	8

## CONCLUSION

Awareness and knowledge of universal standard precautions play a significant role in reducing the infection mainly during pandemic situations. The current study findings assure that the nurses and CRRIs were aware and are knowledgeable about the standard precautions and their importance in reducing infections. The present result shows the infectious committee has a great role in educating the health care workers and provide a better environment for serving the patients.

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### Disclosure

There is no conflict of interest in this study.

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