

# Assessment of the level of knowledge, attitudes and practices regarding sterilisation/infection control measures among undergraduate dental students in Jammu City, Jammu and Kashmir: A cross-sectional study

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## Abstract

**Background:** Sterilisation has always been a clinically important matter of study but is often overlooked by dental students as well as clinicians. This study aim to assess the level of knowledge, attitudes and practices regarding sterilisation/infection control measures among undergraduate dental students.

**Methods:** A cross-sectional study was conducted using a self-administered questionnaire among 235 undergraduates and interns pursuing Bachelors of Dental Surgery from Institute of Dental Sciences Jammu, Jammu and Kashmir. A questionnaire survey comprising 30 questions regarding knowledge, attitudes and practices was completed by the participants

**Results:** It was observed that a majority of the students were highly concerned regarding the sterilisation and infection control protocol. 96.9% of students dispose of their gloves after use. About 92% of the students were aware of diseases caused through unsterilised instruments. All (100%) students were aware of the exact specifications of sterilisation through autoclave. The use of mouth masks and head caps as effective infection control measures was practiced among 93.62% students, while 93.62% of them were aware about waste disposal protocol in clinical departments.

**Conclusions:** The level of knowledge and attitude of sterilisation measures were good and followed meticulously by dental students. Our observations suggest that need was felt by the student fraternity for inclusion of sterilisation awareness as a part of curriculum, webinars and workshops.

**Keywords:** Attitude, dental students, infection control, knowledge, practice, sterilisation

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## INTRODUCTION

Sterilisation is defined as the process by which an article, surface, or medium is made free of all microorganisms either in the vegetative or spore state.<sup>[1]</sup> Disinfection

means the destruction or removal of all pathogens or organisms capable of producing infections. Barrier protection of personnel using masks, protective eyewear,

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gloves and gowns, instrument sterilisation and methods of avoiding direct contact with various surfaces are mandatory.<sup>[2]</sup> Dental health personnel are at high risk of exposure to crossinfection with bloodborne pathogens such as hepatitis B virus, other viruses and bacteria that colonise the oral cavity and the upper respiratory tract.<sup>[3]</sup> As most instruments directly contact mucosa or penetrate oral tissues, it is essential that contaminated reusable instruments be cleaned and sterilised thoroughly by using accepted methods that can be tested and monitored routinely. Rotary and ultrasonic instrumentation can expose personnel to heavy spatter of >50 µm particles and mists. Aerosol particles of <5 µm remain suspended and can reach the alveoli if not stopped by a barrier.<sup>[2]</sup> According to the Centers of Disease Control, USA, dental instruments can be classified into three categories depending on the risk of transmission of infection as critical, semi-critical and noncritical.<sup>[4]</sup>

The most commonly employed method of sterilisation in the dental office is by autoclave. The principle of an autoclave is similar to that of a pressure cooker. Sterilisation specifications are 121°C temperature, 15 lbs pressure and a holding time of 15 min. Dental health personnel including dental students are at high risk of exposure to cross-infection with bloodborne pathogens as they are continually exposed to blood and saliva mixed with blood, and may even suffer needle punctures.<sup>[5]</sup> There is a lack of awareness and knowledge regarding sterilisation protocols among dental students. The students of today are practitioners of tomorrow. With this background, the current study was carried out to assess the knowledge, attitudes and practice regarding infection control measures among undergraduate dental students and interns.

## MATERIAL AND METHODS

A cross-sectional questionnaire study was conducted among undergraduates and interns in Institute of Dental Sciences Jammu, Jammu and Kashmir between February and March 2021. The study was approved by Institute Ethical Committee. The data were collected through a primary, closed-ended, structured, self-administered questionnaire.

All the undergraduates and interns from the institute with the essential qualification of BDS students who were present on the particular day of investigation, and who gave informed consent were included in the study. The purpose of the study was explained to the study participants and informed consent was obtained from them during the study. The dental students were given the questionnaire in

their respective classrooms and were asked to fill it on their own. The interns were given the same questionnaire in their respective clinical posting departments. The questions were designed to assess the knowledge, attitude, and practice of infection control.

Data were collected using a pretested, self-administered structured questionnaire.

## Statistical analysis

Descriptive statistics were performed. The collected data were analysed using the Statistical Package of Social Sciences 22 version statistical package (IBM SPSS Statistics, Chicago, IL, USA).

## RESULTS

A total of 235 students participated in the study out of which 195 were females (82.98%). All (100%) students believed that sterilisation was necessary for starting any dental procedure. Of the students studied, 91.5% were aware about diseases caused through unsterilised instruments. It was observed that 82.4% of students sanitise their operative chairs before use while 80.9% sterilise patient drapes every time before working on new patient. Majority of the students (93.6%) use head cap while dealing with patients while 72.3% use protective eyewear while working on patients. As far as awareness of waste disposal management was concerned, it was observed that all (100%) students knew about the same while only 93.6% of them knew about the meaning color coding of dustbins while disposing waste. The responses to the structured questionnaire are shown in Tables 1 and 2.

## DISCUSSION

It is of utmost importance for any healthcare centre to set up and govern its own measures to prevent the spread of infectious and communicable diseases. To achieve this, it is important that health care professionals be aware of the protocols and risks involved in the practice. The aim of this study was to assess the level of knowledge, attitudes and practices of dental students regarding sterilisation and infection control protocols. In our study, all (100%) of the students answered correctly about temperature and sterilisation time. The high percentage of correct answers to questions about sterilisation procedure revealed good knowledge. It was surprising to note that despite being aware of the importance of sterilisation in the dental profession, certain drawbacks regarding practices of the same were observed. The attitude toward infectious control measures was positive, but greater compliance with clinical practice was needed. Rigorous infection control training for

**Table 1: Responses to questionnaire**

Question	Yes No. (%)	No No. (%)
Do you think sterilisation is must for starting any dental treatment?	235 (100)	0
Do you think certain diseases like AIDS, hepatitis can be transferred through unsterilised instruments?	215 (91.5)	20 (8.5)
Do you think patients are aware about sterilisation of instruments?	105 (44.7)	130 (53.3)
Do you think surgery with proper sterilised instruments makes the wound healing better?	235 (100)	0
Do you think dental surgeons can get infected with the use of unsterilised instruments?	225 (95.8)	10 (4.3)
Do you think single use syringes can be used again after sterilisation with any means?	15 (6.4)	220 (93.6)
Do you think sterilisation weakens the strength of instruments?	40 (17.1)	195 (83.0)
Do you think all surgical or dental instruments is must to be sterilised with autoclave?	190 (80.9)	45 (19.2)
Do you think courses and conferences are to be conducted for demonstrating proper methods of sterilisation?	220 (93.6)	15 (6.4)
Do you think single use instruments must be used for HIV and hepatitis suspected patients?	220 (93.6)	15 (6.4)
Do you sterilise your operative chair before starting a new patient?	210 (82.4)	25 (10.6)
Do you always wear a head cap while dealing with your patient?	220 (93.6)	15 (6.4)
Do you wear protective eyewear while performing oral prophylaxis?	170 (72.3)	65 (27.7)
Do you touch a pen or any other object with gloved hands?	20 (8.5)	215 (91.5)
Do you use sterilised patient drapes for every new patient?	190 (80.9)	45 (19.2)
Can proper sterilisation be achieved through boilers?	35 (14.9)	200 (85.1)
Do you use sterilised sets of mouth mirror and probe while diagnosing each patient in the OPD?	215 (91.5)	20 (8.5)
Do you sterilise your ultrasonic scaler tips, handpieces, burs, files?	220 (93.6)	15 (6.4)
Do you know about waste disposal?	235 (100)	15 (6.4)
Do you follow color coding of dustbins while disposing waste?	220 (93.6)	0

OPD=Outpatient department

**Table 2: Responses to questionnaire from among choice provided**

Question	Response No. (%)
With what do you clean your hands after treatment?	
Plain tap water	15 (6.4)
Soap/liquid handwash	150 (63.8)
Disinfectant solution	70 (29.8)
What do you use to pick up sterilised instruments to keep them in your tray?	
Chelate forceps	170 (72.3)
Hands	35 (14.9)
Tweezer	30 (12.8)
Which of the following has highest rate of transmission via saliva?	
Hepatitis B	115 (48.9)
Acquired immunodeficiency syndrome	25 (10.6)
Tuberculosis	95 (40.4)
What should ideally be done with rusted instruments?	
Use them	10 (4.2)
Discard them	205 (87.2)
Clean with sandpaper and reuse	20 (8.5)
Sterilisation via autoclave is an example of?	
Dry heat sterilisation	5 (2.1)
Moist heat sterilisation	225 (95.8)
Chemical methods of sterilisation	5 (2.1)
What is the ideal temperature/time of an autoclave?	
10 °C for 15 min	0
121 °C for 15 min	235 (100)
125 °C for 15 min	0
How do you wash your instruments after use?	
Using hand and water	75 (31.9)
Using brush and water	50 (21.3)
Using ultrasonic washer	110 (46.8)
How did you sterilise your ultrasonic scaler tips?	
Washing with water 12.57%	20 (8.5)
Dipping in ethyl alcohol	135 (57.5)
Autoclave	80 (34.0)
How did your working room area sterilised?	
Cleaning the floor with phenyl 5.71%	70 (29.8)
Fumigation of room	145 (61.7)
No idea	20 (8.5)
What do you do with used pair of gloves?	
Dispose them	225 (95.8)
Reuse after washing	10 (4.3)
Reuse after sterilisation	0

students before graduation is also highly recommended. The findings in this study should alert dental educators in various dental colleges about the importance of educating their students clearly and comprehensively about infection control measures which should be strictly followed. One of the limitations that we found to our study was the method for assessment. We could not supervise the responders' actual practice and, therefore, had to rely on their self-assessment. Therefore, the responses might have not accurately reflected the true knowledge and attitude in practice. Students are more likely to comply with an infection control program only if they understand the basic motive behind it.

Dental students in this study displayed a positive level of knowledge regarding sterilisation and infection control practices. However, the knowledge acquired must be practically administered into daily practice. Compliance can be improved by upgrading students' knowledge through educational programs and making them aware of the various health hazards that can occur following malpractice of sterilisation and infection control measures. The level of knowledge and attitude of sterilisation measures were good and followed

meticulously by dental students a need was felt by student fraternity for inclusion of sterilisation awareness as a part of curriculum, webinars and workshops by governing bodies.

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#### **Conflicts of interest**

There are no conflicts of interest.

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