



Knowledge, Attitude and Practice (KAP) of undergraduate dental students about sterilization/ disinfection methods

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ABSTRACT:

The aim of the study was to assess the knowledge, attitude and practices of the dental undergraduate students in a dental college. A questionnaire method survey was done and the study included 80 undergraduate students. Data collected was based on knowledge pertaining to infection control procedures, sterilization, and disinfection of instruments, occupational hazards and immunization. The data collected from the respondents were tabulated and interpretation was done using percentages. The results of this study indicated that knowledge, attitude and practices of sterilization and disinfection of the undergraduates were adequate, but there is an evident need for motivation, for a more rigorous participation in enhancing and practicing the same.

KEY WORDS: Sterilization, infection control, undergraduates, dental college, knowledge, attitude, practices

I. INTRODUCTION:

Sterilization 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. Disinfection means the destruction or removal of all pathogens or organisms capable of producing infections. [1]

The medical device or the surgical instrument that comes in contact with the sterile tissue or the mucus membrane of the patient during the various processes is associated with increased risk of introduction of pathogens into the patient's body. Moreover, there is chance of transmission of infection from patient to patient; from patient or to health care personnel, and vice versa [e.g., hepatitis B virus (HBV)]; or from the environment to the patient (e.g., *Pseudomonas aeruginosa*, *Acinetobacter* spp.) through the improper sterilized or disinfected devices. A number of outbreaks and infections were reported in the hospital setup because of improperly sterilized devices. [2]

More than 30 years ago, Earle H. Spaulding devised a rational approach to disinfection and sterilization of patient-care items and equipment. This classification scheme is so clear and logical that it has been retained, refined, and successfully used by infection control professionals and others when planning methods for disinfection or sterilization. Spaulding believed the nature of disinfection could be understood readily if instruments and items for patient care were categorized as critical, semicritical, and noncritical according to the degree of risk for infection involved in use of the items. [3]

TABLE 1: Management of Equipment and Surfaces in Dentistry[4]

Recommendations for Management of equipment and surfaces in dentistry: by ID number and category.		
#	Recommendation	Category
1.a.	Dental instruments that penetrate soft tissue or bone (e.g., extraction forceps, scalpel blades, bone chisels, periodontal scalers, and surgical burs) are classified as critical and should be sterilized after each use or discarded. In addition, after each use, sterilize dental instruments that are not intended to penetrate oral soft tissue or bone (e.g., amalgam condensers, air-water syringes) but that might contact oral tissues and are heat-tolerant, although classified as semicritical. Clean and, at a minimum, high-level disinfect heat-sensitive semicritical items.	IA
1.b.	Noncritical clinical contact surfaces, such as uncovered operatory surfaces (e.g., countertops, switches, light handles), should be barrier-protected or disinfected between patients with an intermediate-disinfectant (i.e., EPA-registered hospital disinfectant with a tuberculocidal claim) or low-level disinfectant (i.e., EPA-registered hospital disinfectant with HIV and HBV claim).	IB
1.c.	Barrier protective coverings can be used for noncritical clinical contact surfaces that are touched II	II



Recommendations for Management of equipment and surfaces in dentistry: by ID number and category.		
#	Recommendation	Category
	frequently with gloved hands during the delivery of patient care, that are likely to become contaminated with blood or body substances, or that are difficult to clean. Change these coverings when they are visibly soiled, when they become damaged, and on a routine basis (e.g., between patients). Disinfect protected surfaces at the end of the day or if visibly soiled.	

Sterilization and disinfection in hospitals is a significant concern for both the medical and the general community. There is a lack of awareness and knowledge regarding sterilization protocols among dental students. Even many practicing dentists are ignorant about the importance of following sterilization protocols in their practice. Transmission of any infectious disease can be avoided.

With this background, the current study was carried out to assess the knowledge, attitudes, and practice of undergraduate dental students about sterilization/disinfection methods.

AIMS AND OBJECTIVES:

To evaluate the KAP of sterilization and infection control among undergraduates in Kusum Devi Sunderlal Dugar Jain Dental College and Hospital by questionnaire survey.

II. MATERIALS AND METHODS:

A self-administered questionnaire survey with closed-ended and few open ended questions were given to volunteering participants. The questionnaire collected data on knowledge pertaining to infection control procedure, sterilization, disinfection of instruments, occupational hazards and immunization. Study included 80 undergraduate students (final year and third year students) of the dental college. The information in the form of questionnaire containing information about their knowledge, practices and attitudes were evaluated. The data collected from the respondents were tabulated and interpretation was done using percentages.

III. RESULTS:

It was observed that 100% students were aware about sterilization, common equipment and methods. 23% knew about CSSD and its importance. Almost all students were aware about the autoclave and its principle. 100% were aware of the fact that infectious diseases could be transmitted when aseptic precautions are not taken. 84% of them could name those infectious diseases. The knowledge of ETO gas was known to 11% students. The knowledge of common equipments used in sterilization and the different methods was known to 100% students. 100% positive attitudes were observed towards the knowledge of sterilization protocol and towards the use of PPE and performing dental procedures under aseptic conditions. They also agreed on the need for a regular educational training on sterilization. 74% were aware of the methods of disinfection and biomedical waste management. 96% were aware of the proper handling of sterilization equipment. 73% were willing to treat HIV positive patients after using protective gear and taking universal precautions. 100% used sterile instruments, personal protective measures, and disposable needles and were vaccinated against hepatitis B virus. 94% used sterilization pouch for instruments packing after sterilization. 64% used hand sterilization agents after attempting patients and 18% performed hand scrubbing before attempting patients. 24% had observed or assisted sterilization process in the hospital. The results of this study have been tabulated in Table 2.

TABLE 2: RESULTS

Question for assessing knowledge (n=80)	YES	NO	NOT SURE
Do you know about sterilization	80(100%)	-	-



Do you know CSSD and its importance	23 (29%)	51(63%)	6(8%)
Do you know autoclave and its principle	79(99%)	-	1(1%)
Are you aware that infectious diseases can be transmitted when aseptic precautions are not taken?	80(100%)	-	-
Name those infectious diseases	67 (84%)	4(5%)	9(11%)
HIV	19		
Hepatitis B	7		
HIV &Hepatitis B	33		
Tuberculosis	7		
Others	1		
Do you know about ETO gas	11(14%)	49(62%)	20(24%)
Do you know the common equipment used for sterilization	80(100%)	-	-
Do u know different methods used in sterilization	80(100%)	-	-
Are you aware of the temperature for sterilization in autoclave?	48(60%)	5(7%)	27(33%)
Do you know when autoclave should be used/ should not be used	16(20%)	5(7%)	59(73%)

Are you aware of methods of disinfection and biomedical waste management?	59(74%)	4(5%)	17(21%)
Is there any sterilization protocol/policy in this hospital?	80(100%)	-	-



Is there a CSSD (Central Sterilization and Supply department) in this hospital?	-	80(100%)	-
Is there an Infection Control Committee in this hospital?	66(82%)	-	14(18%)
Do you know proper handling of sterilization equipment	77(96%)	-	3(4%)
Are Double wrapping of equipment is needed	46(58%)	1(1%)	33(41%)
Health staff should always put on PPE while handling blood/saliva/tissues etc. of patients	80(100%)	-	-
Health staff should always wash hands with antiseptic before and after handling patients	80(100%)	-	-
I am willing to treat HIV patients after using protective gear and taking universal precautions	58(73%)	-	22(27%)
There is a need to regularly train health staff on sterilization and disinfection procedures	80(100%)	-	-
Question for assessing practice(n=80)	YES	NO	NOT SURE
Do you use sterilized instruments for every patient?	80(100%)	-	-
Do you use sterilization pouch for instruments packing after sterilization?	75(94%)	5(6%)	-
Do you use hand sterilization agent sterilium after attempting the patient?	51(64%)	29(36%)	-



Do you scrub your hands before attempting the patient?	14(18%)	66(82%)	-
Do you use personal protective measures while handling patients/blood/tissues etc., for example, gloves, masks, glasses, caps, and apron?	80(100%)	-	-
Do you use disposable needles, intravenous sets, etc.?	80(100%)	-	-
Did you ever get needle injury?	7(9%)	73(91%)	-
Have you observed or assisted sterilization process in hospital?	19(24%)	61(76%)	-
Have you been trained to use autoclaved linen and instruments as per protocol?	80(100%)	-	-
Have you been vaccinated against hepatitis B	80(100%)	-	-

IV. DISCUSSION:

The rate of awareness of sterilization, common techniques in our study was 100%, knowledge about autoclave and its principle was 99%, whereas 60% knew the temperature for sterilization in autoclave. Study by Suklecha et al reported that 82.3% health-care staffs were aware of sterilization, 68.5% knew techniques of sterilization, 51.9% knew common sterilization methods such as autoclaving, and 36.6% knew temperature for autoclaving. Our study included final year and third year dental undergraduate students whereas, their study participants included the final-year medical students, intern doctors, nursing staff, laboratory technicians, ward boys, and sanitation staff working in the institute who deal with patients. [5]

The awareness of hand hygiene in our study and the knowledge and use of Personal

Protective Equipment in our study was 100% whereas in the study conducted by Shenoy et al it was observed that among 384 dentists, 294 (76.6%) were aware of the hand hygiene methods, 372 dentists (96.9%) were aware of the Personal Protective Equipment (PPE). [6]

100% were aware in our study that infectious diseases can be transmitted when aseptic precautions are not taken and 84% could name the Infectious Diseases. Similar studies were done by G Ogden et al at a hospital in United Kingdom [7], and by N Mahboobi [8],

The study carried out by Razak and Linda in Malaysia concluded that about 83.0% of dentists wear a face mask. [9] In our study, 100% used personal protective measures like gloves, masks, glasses, caps, and apron. In a study by Sofola et al in Nigeria, 70.6% of the dentists always wore gloves when treating patients, whereas 29.4%



sometimes did. Regarding facemasks, 45.9% always wore them, 52.7% sometimes wore them, and 1.4% never wore them. Protective eye wear was always worn by 4.8% of the dentists, sometimes worn by 52.7%, and never worn by 42.5%. [10] In our study 100% were vaccinated against Hepatitis B and in the study by Sofola et al approximately half (50.7%) of the respondents had received hepatitis B vaccination. [10]

In a study conducted by Siddiqui et al in Pakistan, 41.2% washed their hands once only whereas 42.6% respondents washed their hands twice, 14.8% washed their hand more than four times, and 1.4% did not feel the need of washing their hands, whereas in our study although everyone donned gloves but, 64% used sterilium before attempting a patient and only 18% scrubbed hands before attempting a patient. In our study 74% were aware of methods of disinfection and biomedical waste management, whereas in a study by Siddiqui et al, 70.6% had an idea of waste management. [11]

Henrique et al conducted a 10-year study in Brazil, to assess attitudes and behaviour of dental students concerning infection control rules. In 1995, most students used an autoclave to sterilize instruments (83.8%), and this percentage subsequently rose in the year 2005 (95.9%). No student could describe the correct temperature and sterilization time in either 1995 or 2005. [12] However, in our study, 99% students knew about the autoclave and its principle, 60% could answer correctly about the temperature of the autoclave. A similar cross-sectional was conducted by Askarian et al, on 152 Iranian dental professionals in Shiraz University of Medical Sciences, Iran and concluded that Practice of standard isolation precautions is poor among dental professionals. [13]

To improve overall knowledge, attitude and practice related to sterilization strict implementation of sterilization protocols and practices in the hospital and dental clinics should be made compulsory. A 100% positive attitude towards use of Personal Protective Equipment and performing dental procedure under strict aseptic precautions has to be inculcated. Health-care personnel should be made aware and trained from accredited training centers, on a regular basis. Regular inspections and monitoring should also be done so as to keep a check on its proper implementation.

LIMITATIONS:

- LIMITED SAMPLE SIZE

- UNICENTRIC STUDY
- COMPLETE KNOWLEDGE CANNOT BE ASSESSED

V. CONCLUSION:

The results of this study indicated that knowledge, attitude and practice of sterilization and disinfection of the undergraduates of the college under study was adequate, but there is an evident need for motivation, for a more rigorous participation in enhancing and practicing the same. There is a need for a continuous in-service training to improve, supplement and update knowledge about sterilization and disinfection. An infection control committee has to be set up to look into this matter. A proper step-wise planned approach is required to train the healthcare staff through regular lectures, workshops and hands-on training. Also orientation programs have to be implemented for the newly acquired staff.

CONFLICTS OF INTEREST:

None

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