International Journal of Medical Science and Research
www.medicaljournals.in
Online ISSN: 2664-8768, Print ISSN: 2664-875X
Received: 04-01-2024, Accepted: 21-01-2024, Published: 06-02-2024
Volume 6, Issue 1, 2024, Page No. 3-7

Knowledge, attitudes and practices regarding sterilization protocol among undergraduate dental students in Chengalpet district: A questionnaire based study

Deepa R[1], K R Shakila[2], Thalamalai Saravanan[2], L P Raghupathy[3], Sowmiya J[4]
[1] CRRI, Department of Oral Medicine and Radiology, Karpaga Vinayaga Institute of Dental Sciences, Chinnakolambakam, Padalam, Tamilnadu, India
[2] MDS, Professor, Department of Oral Medicine and Radiology, Karpaga Vinayaga Institute of Dental Sciences, Chinnakolambakam, Padalam, Tamilnadu, India
[3] MDS, Reader, Department of Oral Medicine and Radiology, Karpaga Vinayaga Institute of Dental Sciences, Chinnakolambakam, Padalam, Tamilnadu, India
[4] Department of Oral Medicine and Radiology, Karpaga Vinayaga Institute of Dental Sciences, Chinnakolambakam, Padalam, Tamilnadu, India

Abstract
Aim: To assess the level of knowledge, attitudes and practices regarding sterilization protocol among undergraduate dental students of karpaga vinayaga institute dental sciences, chengalpet district
Materials and Methods: A total of 300 students from Karpaga Vinayaga Institute of Dental sciences participated in this study. It is a questionnaire survey comprising 23 questions regarding knowledge, attitudes and practices was completed by the participants.
Results: It was observed that most of the students participated in this study were highly concerned about the sterilization protocol. About 93.8% are aware that sterilization is more effective than disinfection while 86.9% students are aware that sterilization is necessary in dental clinics. About 84.4% are aware that color coding of dustbins is necessary to follow while disposing waste and 94.4% practices it. Use of face mask while examining patients was practised among 95.6%.
Conclusion: The level of knowledge and attitudes regarding sterilization protocol were good and acceptable and sterilization measures were regularly followed by the students. Although our observations suggest that furthermore awareness of sterilization measures is needed.

Keywords: Attitude, dental students, disinfection, knowledge, practices, sterilization

Introduction

In Dental institutions, students are not only involved in the academic activities, they are also involved in the management of patients. So that adequate knowledge and positive attitude is necessary among them for a good clinical practice in dental setting [1]. 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 [2]. Any surgical instruments that penetrate our bloodstream or skin must be sterilized before using. (Senthilnathan *et al*., 2016) [3] Cross-infections are responsible for hospitalization-related infections that were neither present nor incubated before the visit to any hospital or healthcare facility. There are two possible ways that the transmission could happen: inhalation, as in the case of infections spread by air, or vaccination made possible by accidents involving sharp objects or by preexisting wounds and injuries. Inadequately sterilised instruments and surfaces lead to cross-contamination and encourage cross-infections. The spread of HIV, hepatitis B and C viruses, Ebola, herpes simplex virus, coronavirus, streptococci, CMV is because of inadequate cross-infection control protocols. Therefore, it is crucial to control cross contamination in a dental practice [4]. There are several different types of sterilization methods which includes physical and chemical sterilization in which heat, incineration and flaming comes under physical type and ethylene oxide, formaldehyde and hydrogen peroxide comes under chemical type of sterilization (Lerouge and Simmons, 2012) [5]. The most commonly used sterilization is autoclave which is characterized under steam under pressure, the temperature of autoclave is 120°C and is checked by non toxigenic strains of Bacillus stearothermophilus which is a biological control (Jain, Jain and Jain, 2020) [6]. Another important type of sterilization is hot air oven which uses high temperatures for destruction of bacteria and bacterial spores (Alkadhim, 2018) [7]. The common types of sterilization methods used in dentistry are steam sterilization, Dry heat sterilization and chemical vapor sterilization (Custer, 1912) [8]. Dental health personnel including dental students are at high risk of exposure to cross-infection with blood-borne pathogens as they are continually exposed to blood and saliva mixed with blood, and may even suffer needle punctures [9]. Therefore, we believe that it is time for dentistry to acknowledge how important it is to maintain sterilization processes at the highest level possible in order to yield the greatest public benefit. The purpose of the current study was to evaluate knowledge, attitudes, and practices about sterilization protocol in undergraduate dental students.

Materials and Methods

A cross-sectional questionnaire study was conducted among undergraduates and interns in Karpaga vinayaga institute of dental sciences. The study was approved by Institute Ethical Committee. The survey was conducted among 300 undergraduate dental students (including the third year, final

year, and interns). The data collection tool was a self-administered questionnaire which consisted of 23 questions. Data was collected using a self-administered questionnaire. The questions were designed to assess the knowledge, attitude, and practices regarding sterilization protocol.

Results

A total of 300 undergraduate dental students participated in the study. It was observed that most of the students participated in this study were highly concerned about the sterilization protocol. About 93.8% are aware that sterilization is more effective than disinfection while 86.9% students are aware that sterilization is necessary in dental clinics. About 84.4% are aware that color coding of dustbins is necessary to follow while disposing waste and 94.4% practices it. Use of face mask while examining patients was practised among 95.6%. Question-wise analysis has been represented in Charts 1-23.

Discussion

Any healthcare facility must establish and manage its own protocols to stop the spread of infectious and communicable diseases. To do this, it is crucial that medical personnel understand the risks and procedures associated with their practice. The aim of this study was to assess the level of knowledge, attitudes, and practices of undegraduate dental students regarding sterilization protocols.

Table 1: Showing response of participants regarding knowledge questionnaire

S. No	Question	Response		
1	Sterilization is more effective than disinfection	Yes	No	Don't know
2	Sterilization kill bacterial spores	Yes	No	Don't know
3	Chemical sterilization corrodes surface of instruments	Yes	No	Don't know
4	Instruments undergoing chemical sterilization can damage patient health	Yes	No	Don't know
5	Sterilization weakens the strength of the instrument	Yes	No	Don't know
6	Proper sterilization can be achieved through boilers	Yes	No	Don't know

Table 2: Showing response of participants regarding attitude questionnaire

S. No	Question	Response			
1	Sterilization is necessary in dental clinics	Strongly agree	Agree	Disagree	Strongly disagree
2	It is necessary to wash hands before wearing gloves	Strongly agree	Agree	Disagree	Strongly disagree
3	Wearing gloves is effective in preventing disease transmission during oral surgical procedure	Strongly agree	Agree	Disagree	Strongly disagree
4	. It is necessary to discard used needles and sharp objects into the designated sharps container	Strongly agree	Agree	Disagree	Strongly disagree
5	Isolation is an important method for infection control	Strongly agree	Agree	Disagree	Strongly disagree
6	It is necessary to follow colour coding of dustbins while disposing waste	Strongly agree	Agree	Disagree	Strongly disagree
6a	Infectious biodegradable waste (extracted tooth, human tissues, membranes, cotton dressing, suture material like black braided silk, vicryl etc.,) are disposed in?	Yellow	Red	Don't know	
6b	Infectious nonbiodegradable (gloves, IV set, syringes, nylon sutures, non resorbable GTR membranes etc.,) are 3disposed in?	Yellow	Red	Don't know	
6c	Glasswares and metallic body implants are disposed in?	White	Blue	Don't know	
6d	Infectious sharps and needles are disposed in?	White	Blue	Don't know	

Table 3: Showing response of participants regarding practice questionnaire

S. No	Question	Response	
1	Do you wear a head cap while dealing with your patient	Yes	No
2	Do you change your pair of gloves while treating each patient	Yes	No
3	Do you wear protective Eyewear while performing oral prophylaxis	Yes	No
4	Do you wear a facemask while examining any patient	Yes	No
5	Do you use sterilized sets of mouth mirror and probe while diagnosing each patient	Yes	No
6	Do you follow color coding of dustbin while disposing waste	Yes	No
7	Do you use sterilized patient drapes for every patient	Yes	No

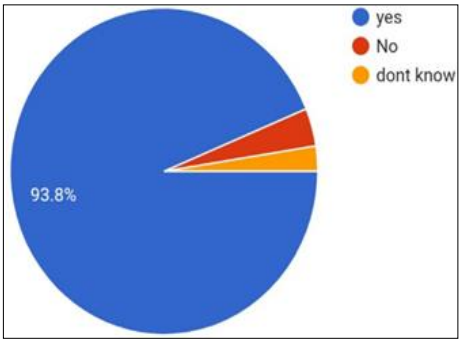

Chart 1: Question 1 analysis

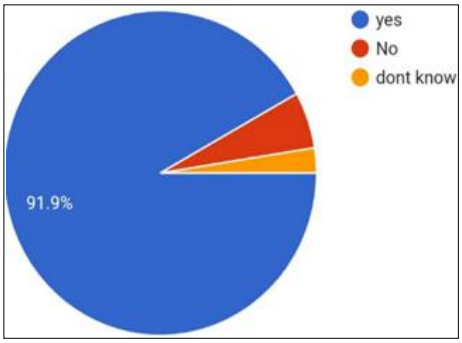

Chart 2: Question 2 analysis

In this study 93.8% of students was aware that Sterilization is more effective than disinfection, and 91.9% of students knows that Sterilization kills bacterial spores. The high percentage of correct answers to questions about sterilization revealed good knowledge.

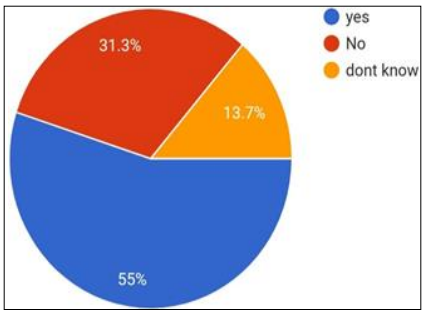

Chart 3: Question 3 analysis

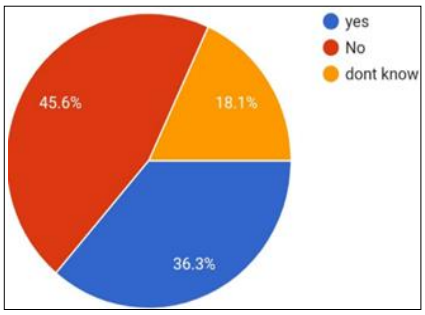

Chart 4: Question 4 analysis

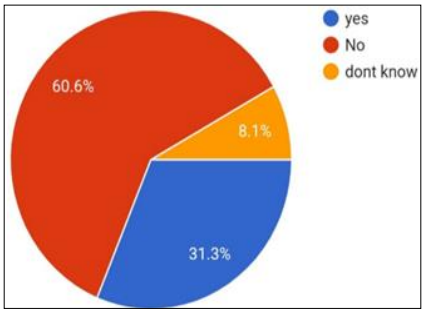

Chart 5: Question 5 analysis

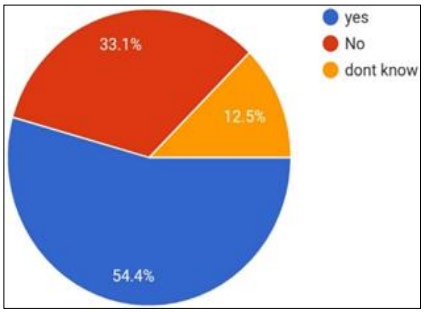

Chart 6: Question 6 analysis

About 55% of students think that chemical sterilization corrodes surface of instruments, and 45.6 % of students think that instruments undergoing chemical sterilization does not damage patient health. About 60.6% of students thinks that Sterilization weakens the strength of the instrument. And about 54.4% of students believes that proper sterilization could be achieved through boilers. But still, the knowledge acquired should be practically administered into daily dental practice.

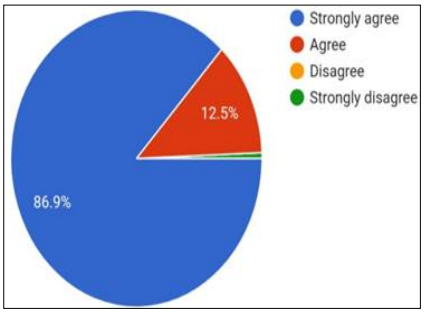

Chart 7: Question 1 analysis

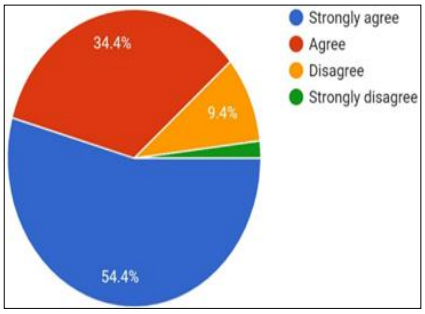

Chart 8: Question 2 analysis

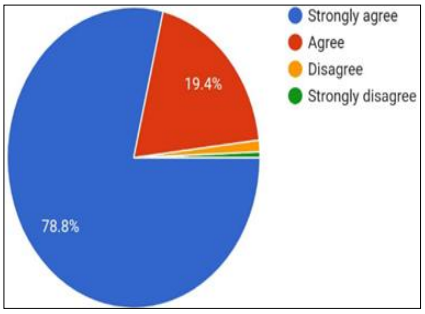

Chart 9: Question 3 analysis

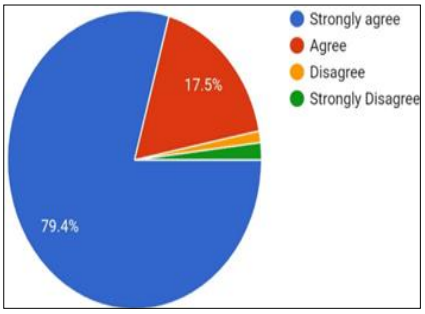

Chart 10: Question 4 analysis

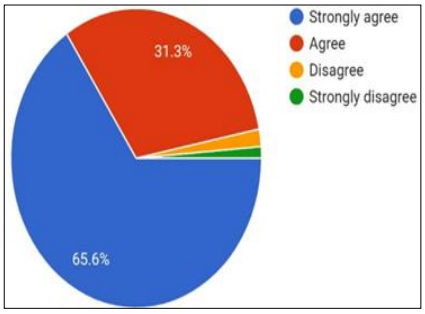

Chart 11: Question 5 analysis

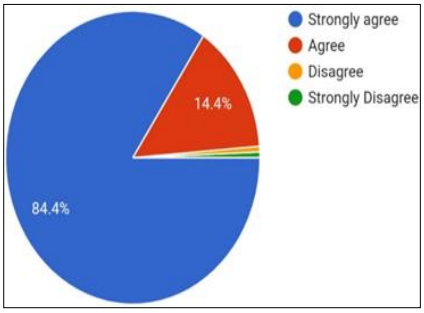

Chart 12: Question 6 analysis

About 86.9% students strongly agrees that sterilization is necessary in dental clinics and 54.4% of students strongly agrees that it is necessary to wash hands before wearing gloves. About 78.8% of students strongly agrees that wearing gloves is effective in preventing disease transmission during oral surgical procedure and 79.4% of students strongly agrees that it is necessary to discard used needles and sharp objects into the designated sharps

container. And about 65.6% strongly agrees that isolation is an important method for sterilization control and 84.4% strongly agrees that it is necessary to follow color coding of dustbins while disposing waste. In response to attitude questionnaire, majority of participants showed 'positive' attitude regarding infection control and sterilization measures.

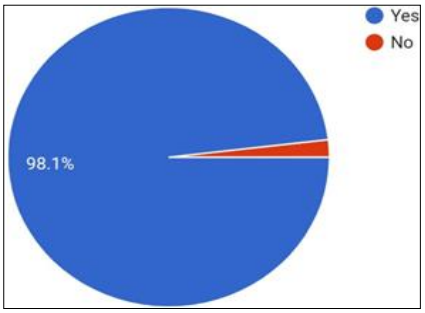

Chart 17: Question 1 analysis

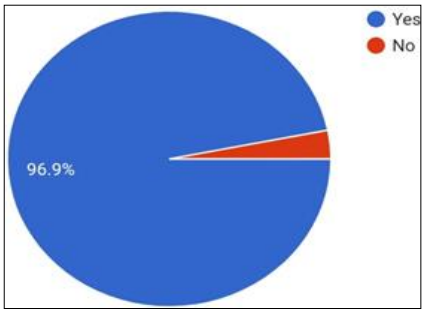

Chart 18: Question 2 analysis

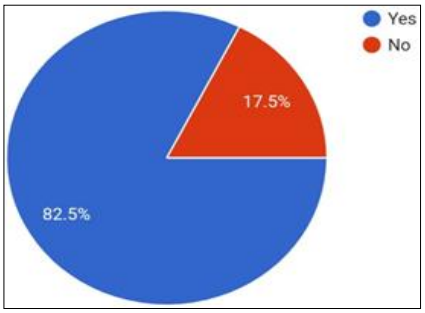

Chart 19: Question 3 analysis

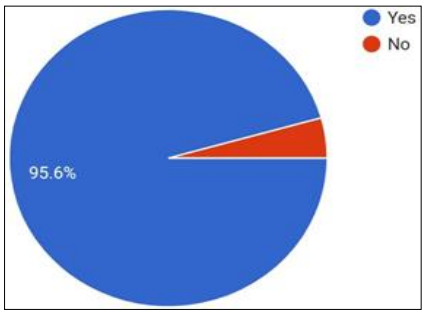

Chart 20: Question 4 analysis

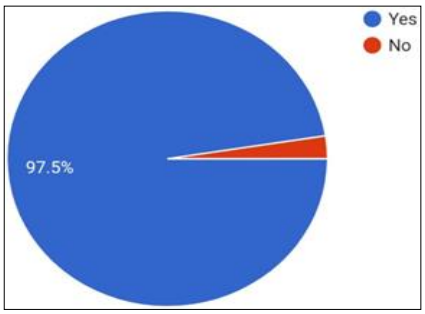

Chart 21: Question 5 analysis

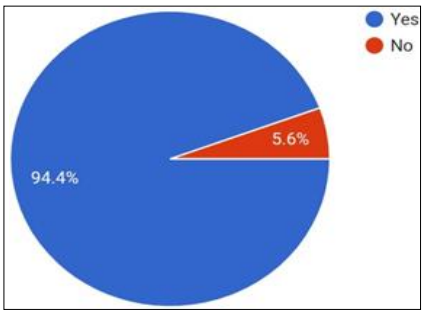

Chart 22: Question 6 analysis

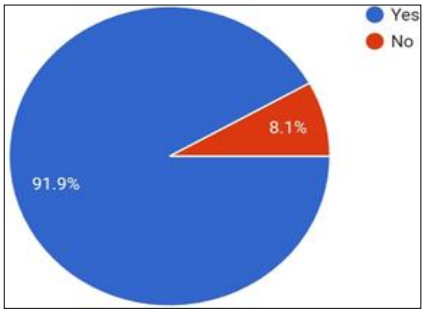

Chart 23: Question 6 analysis

In response to practice questionnaire, majority of participants showed 'positive' resu3lts regarding infection control. Dental students in this study displayed a positive level of knowledge regarding sterilization and infection control practices. But still,the knowledge acquired must be practically administered regularly into daily dental practice. Compliance can be improved by upgrading students.

Conclusion

The level of knowledge and attitude of sterilization measures were good among undergraduate dental students. However, there were minimal number of students showing negative attitude as well, which could be reflected in their practice. Although our observations suggest that furthermore awareness of sterilization measures is needed. By increasing students awareness of the different health risks that Could arise and improving their understanding through educational programs, compliance can be increased, subsequent to sterilization and infection control malpractice.

Conflicts of Interest

There are no conflicts of interest.

References

1. Acharya P, Baral R, Shrestha S, Baral D. Knowledge and Attitude Regarding Infection Control among Undergraduate Dental Students at a Tertiary Care Hospital. J Nepal Soc Perio Oral Implantol,2022:6(11):29-35.
2. Ananthanarayan. Paniker's Textbook of Microbiology, Seventh Edition, Chapter - 3: Sterilization and Disinfection.
3. Senthilnathan JD, *et al*. 'Knowledge of Sterlisation Protocol in Dental Office among Dental Practioners', Journal of Medical Science and clinical Research [Preprint], 2016. doi:10.18535/jmscr/v4i8.41.
4. Thillaikkarasi Viswapurna, Sudha RajMohan, Rajmohan Sivamani Chidambaram, Viswapurna Senguttuvan. Evaluation of knowledge, attitude and practice of dental patients attending Oman Dental College towards cross-infection control during the pandemic: A crosssectional survey. Journal of Population Therapeutics and Clinical Pharmacology,2023:30(2):25–34. https://doi.org/10.47750/jptcp.2023.101.

5. Lerouge S, Simmons A. Sterilisation of Biomaterials and Medical Devices. Elsevier, 2012.
6. Jain A, Jain R, Jain S. 'Autoclave', Basic Techniques in Biochemistry, Microbiology and Molecular Biology, 2020, 9–10. doi:10.1007/978-1-4939-9861-6_4.
7. Alkadhim SAS. 'Hot Air Oven for Sterilization: Definition & Working Principle', SSRN Electronic Journal [Preprint], 2018. doi:10.2139/ssrn.3340325.
8. Custer LE. 'Sterilization in Dental Practice', The Dental register,1912:66(4):187–191.
9. Sachdeva A, Sharma A, Bhateja S, Arora G. Knowledge, attitudes, and practices regarding sterilization protocol among undergraduate dental students in Faridabad City: A questionnaire-based study. J Indian Acad Oral Med Radiol,2019:31:4-10.
10. Singh M, Sahota J, Singh P, Sharma T, Gupta S, Mahajan T, *et al*. Assessment of the level of knowledge, attitudes and practices regarding sterilisation/infection control measures among undergraduate dental students in Jammu City, Jammu and Kashmir: Across-sectional study. J Clin Sci Res,2022:11:13-6.
11. Shilpa Merlyn Jose, Dr. Hima Sandeep. Knowledge, attitudes and practice on sterilization among dental college students- A survey. Journal of Pharmaceutical Negative Results, 2022, 1239-1245.