Assessment of infection control protocols among dental graduates in chennai

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Mohammed Ahad,
Under Graduate Student
Saveetha dental college,
Saveetha institute of medical and technical science.
Chennai- 71.

Dr Revathy Gounder,
Asst professor,
Department of prosthodontics
Saveetha dental college,
Saveetha institute of medical and technical sciences,

Abstract:
Aim: To assess awareness toward disinfection in clinical practise among dental students.

Background: Dental clinic is an environment where disease transmission occurs easily. A high level of knowledge is necessitate on dental education about disinfection protocol. Disinfection and sterilization are essential for preventing transmission of infectious pathogens to patients , staffs and students. Infective hazards are present in dental practice because many infections can be transmitted by blood or saliva via direct or indirect contact, droplets, aerosols, or contaminated instruments and equipment.
Materials and methods: A questionnaire based study was conducted among dental students and interns. 23 questions were distributed among 150 students through surveyplanet.com

Results: majority of the students use gloves (81.3%) and wear protective eye wear (70%) during clinical practice. Sterilisation of handpiece burs and scalar tips were poorly maintained among students, which accounts for only 50-60%. Disinfection of impression rubber bowls and shade matching also reported less in frequency.

Conclusion: Proper sterilisation and disinfection protocol is necessary to prevent infection among dental students.

***Keywords*: infection, dental clinic, sterilisation, disinfection, clinical practise.**

Introduction:
Infection is a major issue for healthcare services in numerous countries.Individuals looking for dental care might be healthy or experiencing different irresistible ailments or might be transporters of infectious disease that can't be easily distinguished (1). The dental clinic is a domain where ailment transmission happens easily (2). Direct transmission of pathogens to host can happen during examination of the oral cavity with uncovered hands and when contact is made with blood/serum of contaminated patients. Indirect transmission can happen through contact with dental units, contaminated needle, surfaces, or improperly sterilised instruments. Transmission can likewise happen through blood, serum or airborne beads if defensive measures like wearing gloves, mask and protective eye wears are not embraced (3,4). The environment in dentistry practices and clinics is a long way from ideal (5). However, the adoption of infection control measures is a successful method to decrease occupational related hazard and the transmission of pathogens. These measures basically incorporate (I) cleaning, Sterilisation and disinfection; (II) the utilisation of personal equipment protection ; (III) immunisation; (IV) anticipation and right handling in occupational related mishaps which include introduction to blood and substantial fluids; and (V) antisepsis (6-8)
Graduates in dental education overall require a high level of training, clinical abilities and knowledge on infection control protocol (9). Therefore, it is suggested that the significance of infection control is explained fastidiously to students in their initial years in dental training. This is additionally viewed as basic for them to receive their scholarly states of mind and practices on infection control when they wind up noticeably proficient dental specialists (10). Albeit sufficient emphasis is placed on the significance of adherence to these protocols, studies have demonstrated that couple of dental practitioners actually adhere to the institutionalized infection control systems in their day to day practice (11-14). Wearing of gloves by dental faculty has been advised as a fundamental component concerning infection control in dental surgery (15,16). Hands are thought to be a noteworthy source of infection,(17) and possibly infected blood might be held underneath the fingernails for up to five days.(18) Fundamental to the counteractive action of infectious disease is the strict adherence to standard safety measures for all dental practitioners. This incorporates, however not restricted to, eye protection with parallel shields, facemask, and protective apparel (19).Several social healthcare bodies, offices, and dental affiliations like the Centers for Disease Control and Prevention (CDC), American Dental Association (ADA), Occupational Safety and Health Administration (OSHA), the National Institute of Health and Clinical Excellence(NICE),and others have released guidelines to manage disease control in the United States and other developing nations (20-25). In spite of extensive

instruction provided for dental specialists, staff and students with respect to the significance of adherence to infection control protocols, the nature of infection control has been reported to be poor even in developing nations (26-29).

Infection control practises in devloping nations have not been broadly documented. Most hospitals have no infection control programs because of the absence of attention to the issue or nonattendance of legitimately trained personnel (30). In most of the cases, investigators neglected to interface a particular lapse of disease counteractive action and control with a specific transmission. However, reported breakdowns in fundamental contamination aversion methodology included perilous injection practise, inability to heat sterilize dental handpieces amongst patients, and inability to monitor (e.g., conuct spore testing) autoclaves (31,32). These reports feature the requirement for thorough training to enhance comprehension of basic standards, recommended practises, their implementation, and the conditions that have to be met for diseases transmission (33). Sterilization is a process by which, complete destruction or killing of all microorganisms, including bacterial spores is achieved. Disinfection is a process by which, destruction or removal of all pathogenic organism or organisms capable of giving rise to infection (34).

The motivation behind infection control measures is to break the chain by reliably practising standard protocol which would prevent the contamination (35). Consequently, it is the earlier obligation of training and instructing institutions to make certain the safety of students. The weight of cross contamination can be reduced when a dental specialist working in a dental office is totally acknowledged to the current and universally acknowledged standard precautionary steps (36).The objective of this study was to assess third year's final years and interns with regard to the infection control protocols.

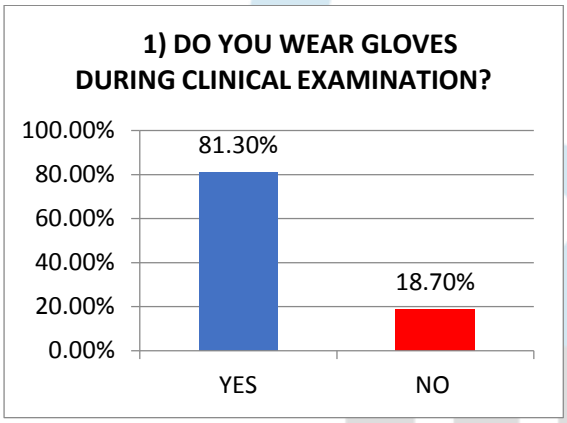
Materials and methods:

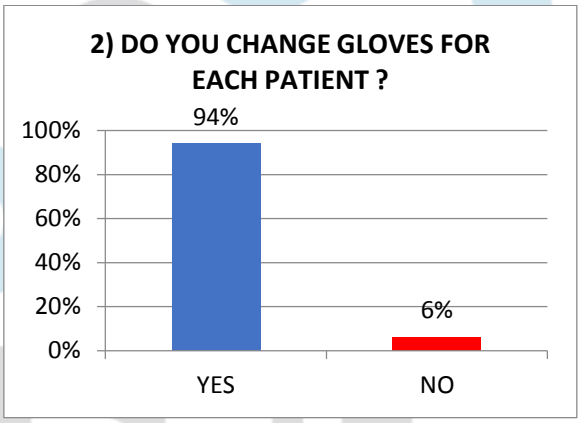
The study included 23 close ended questionnaires among 150 individuals which includes third years(50), final years(50) and interns(50) in December 2017. The questionnaire was sent through online survey.

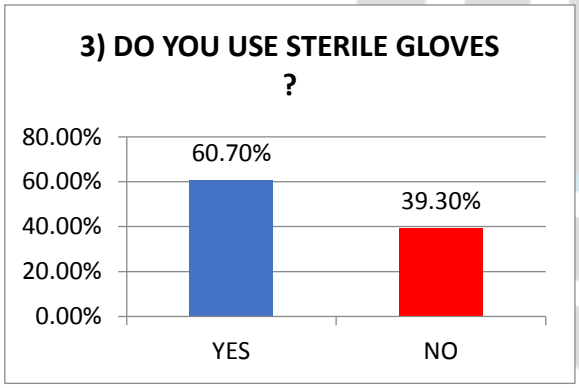
1) Do you wear gloves during examination
   a) Yes b) No
2) Do you change gloves for each patient
   a) Yes b) No
3) Do you use sterile gloves
   a) Yes b) No
4) How often you replace face mask
   a) After Every patient B) Once daily C) Once it gets wet
5) Do you change suction tip for every patient?
   a) Yes b) No
6) Do you wear protective eye wear
   a) Yes b) No
7) How do you sterilize your instrument
   a) Hot air Owen b) Boiling c) Autoclave
8) Do you use sterile burs for every patient
   a) Yes b) No
9) Do you sterilize your hand piece
   a) Yes b) No
10) Do you sterile your endodontics files
   a) Yes b) No
11) If yes, how do you sterilize endodontic files
   a) Glutaraldehyde b) Autoclave c) glass bead
12) Do you sterile your endo block after every treatment
   a) Yes b) No
13) Do you use sterile Cotton and gauze during extraction
   a) Yes b) No
14) Do you use sterile scalar tip for every patient
   a) Yes b) No
15) How often you disinfect suction unit
   a) Daily b) Once in three days c) Once in a week d) Once in a month
16) Do you disinfect impressions
   a) Yes b) No
17) If yes, then How do you disinfect your impression
   a) under running tap water b) with saline c) with sodium hypochlorite
18) Do you specify to laboratory technician about disinfecting impression before pouring
   a) Yes b) No
19) Do you disinfect your dental chair and it's surrounding
   a) Yes b) No
20) If yes then how often do you disinfect it.
   a) after every patient b) once in a day c) once in a week
21) Do you disinfect rubber bowls and shade matching between every patient
   a) Yes b) No
22) Do you wash your hands before and after treating every patient
   a) Yes b) No

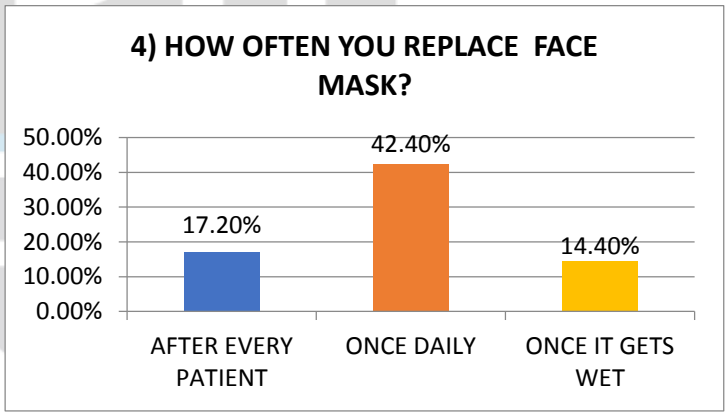
23) If yes, you wash your hand with?
   a) Liquid soap b) under running tap water c) sterilium

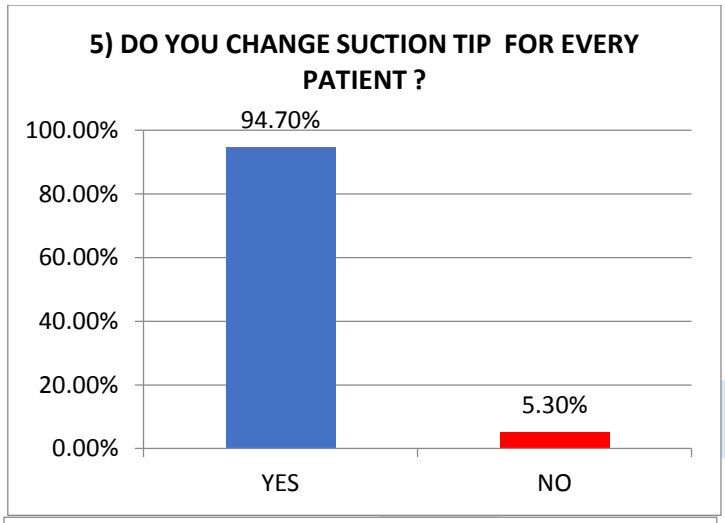
Results:
This study was conducted among 150 dental students in Chennai. Of 150 participants 34 were male and 116 were females. Among the student 81.3% of them use gloves during clinical examination and 94% of the students changes gloves after every patient, but suprisingly only 60.7% use sterile gloves. Of the participants 70% of them uses protective eye wear during clinical procedure this prevents infection through aerosol way. Only 14.40% changes their face mask after it gets wet while majority of them around 42.40% use face mask throughout the day while 17.20% changes mask after every patient. 94.7% changes suction tip for every patient and 54% of the students disinfect suction unit every day while rest disinfect it once in a week 32% or once in a month 14%. When asked about sterilisation of the hand instrument, majority of them around 86% responded they they use autoclave as sterilisation medium whereas rest of them use hot air Owen or boiling water to sterilise it. Among 150 students only 60% of them sterilise hand piece while only 49.3% sterilise burs after every use. Majority around 89.3% of them sterilise endodontic files of which 70.1% uses autoclave as sterilisation medium and the rest use either glutaraldehyde (20.2%) and only 9.1% uses glass beads for sterilisation of endodontic files. 71.3% of them sterilise endodontic blocks after every procedure. Using if sterile gauze and Cotton were practised by 88.7% while only 68% of students use sterile scalar tips for every patients.
Only 60% of the students disinfect their impression, the method of disinfection was mostly by tap water around 55.6% while the rest used sodium hypochlorite and 2% Glutaraldehyde as a source of disinfectant. When asked about specifying to laboratory technician about disinfecting impression before pouring cast, only 47.3% responded they do mention about it. 66.7% of students disinfect dental chair and surrounding, among them 47% disinfect daily and 28% of them disinfect after every patient. Asking about the disinfection of rubber bowl and shade matching between every patient revealed only 52% of the student made this process. Majority 88.7% of students wash their hand before and after every patient, among them 50.4% uses antiseptic solution as hand wash ,30 % uses sterilium , 15.1% of student wash their hands under running tap water and rest of them use more than 2 methods.

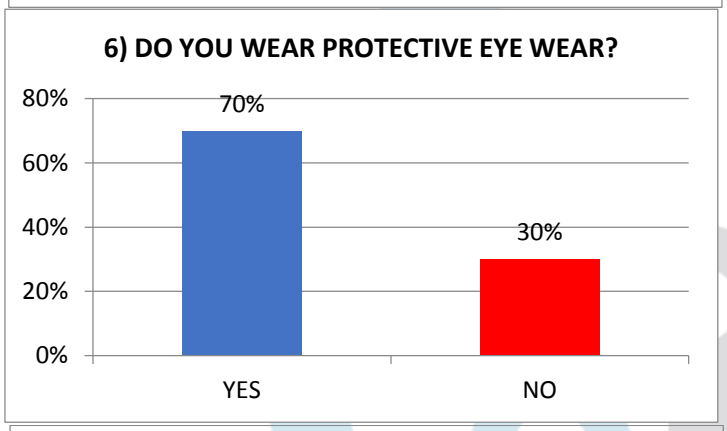


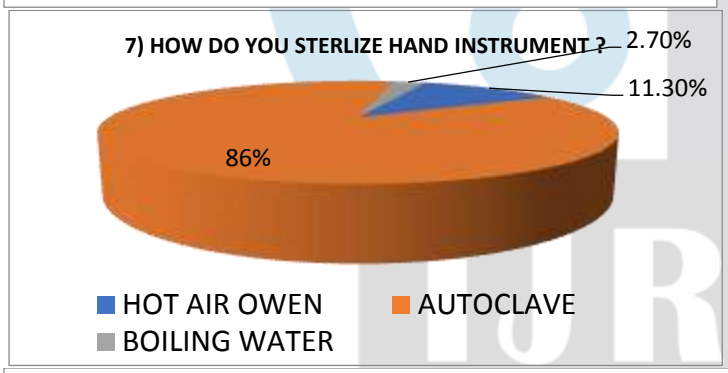


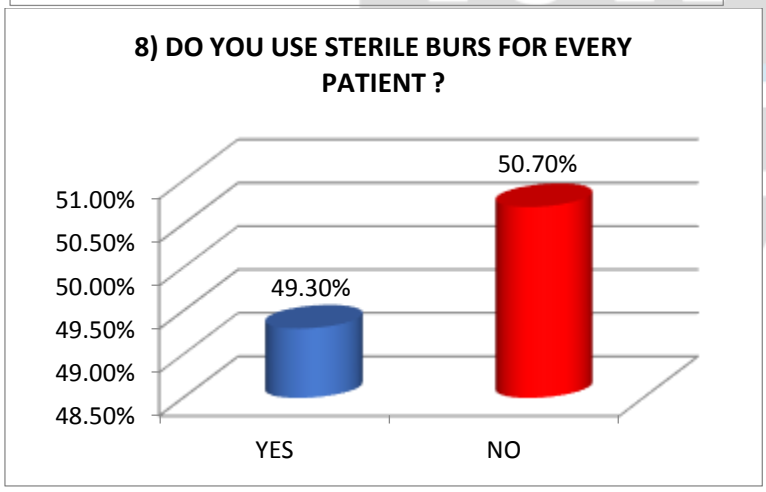


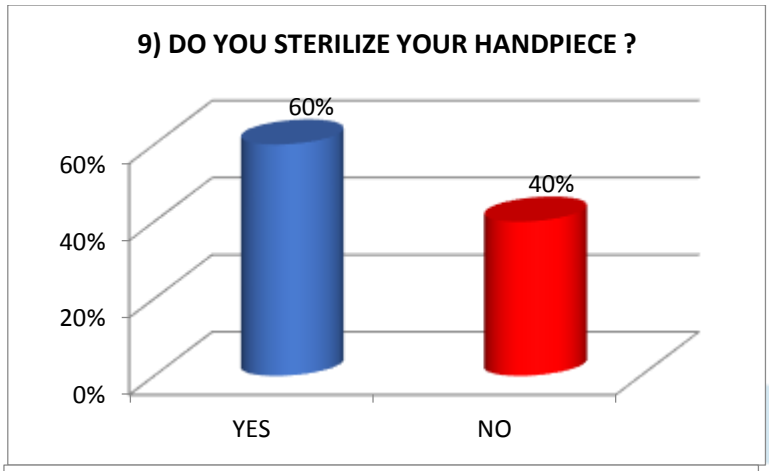


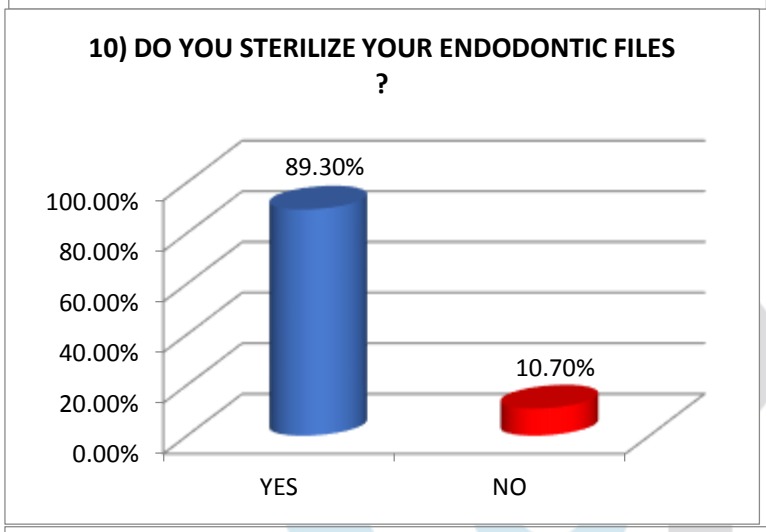

5) DO YOU CHANGE SUCTION TIP FOR EVERY PATIENT ?
100.00%
80.00%
60.00%
40.00%
20.00%
0.00%
94.70%
5.30%
YES
NO

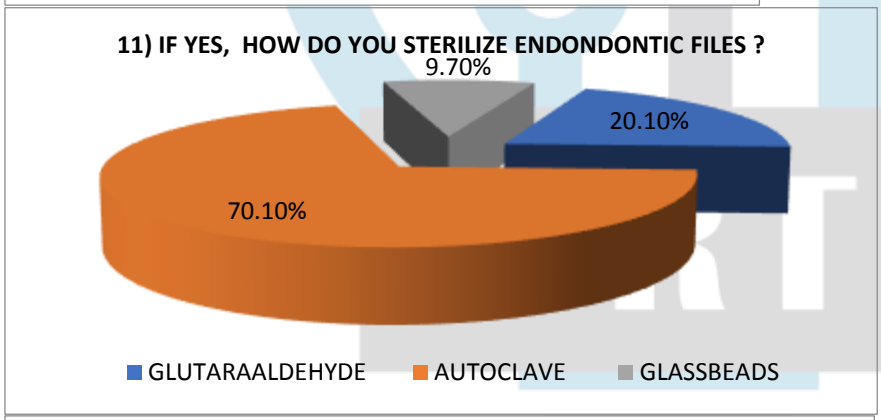

6) DO YOU WEAR PROTECTIVE EYE WEAR?
80%
60%
40%
20%
0%
70%
30%
YES
NO

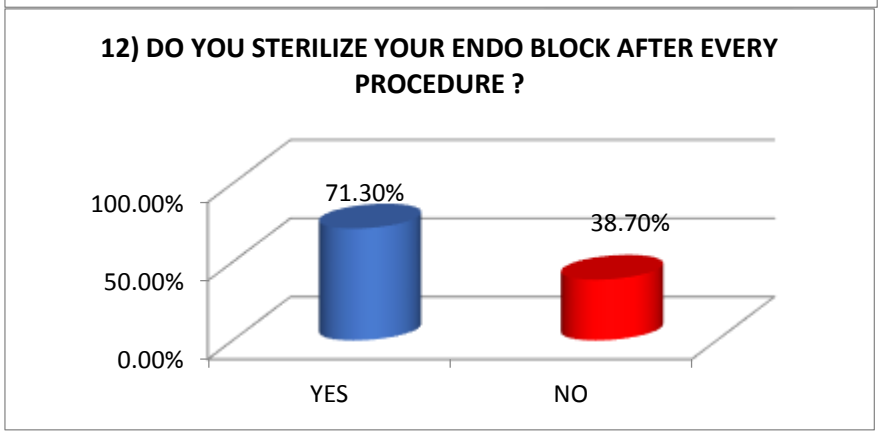

7) HOW DO YOU STERLIZE HAND INSTRUMENT ?
2.70%
11.30%
86%
HOT AIR OWEN
AUTOCLAVE
BOILING WATER

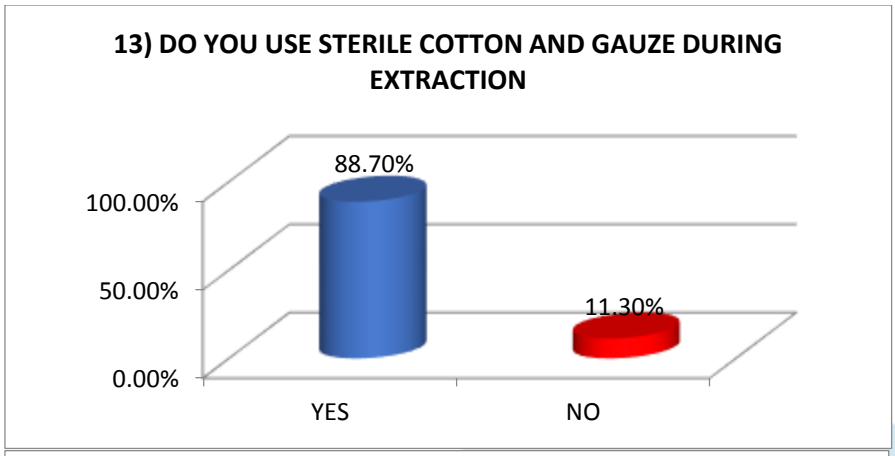

8) DO YOU USE STERILE BURS FOR EVERY PATIENT ?
51.00%
50.50%
50.00%
49.50%
49.00%
48.50%
49.30%
50.70%
YES
NO

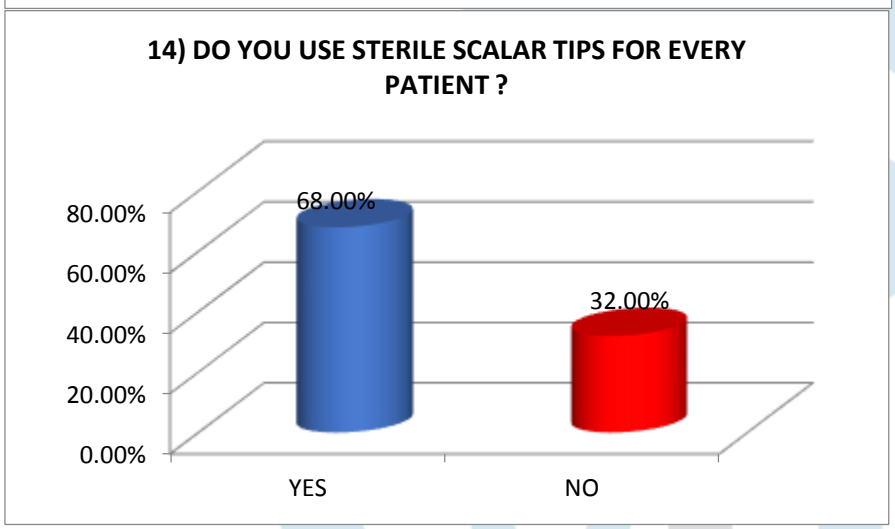

9) DO YOU STERILIZE YOUR HANDPIECE ?
60%
40%
60%
40%
20%
0%
YES
NO

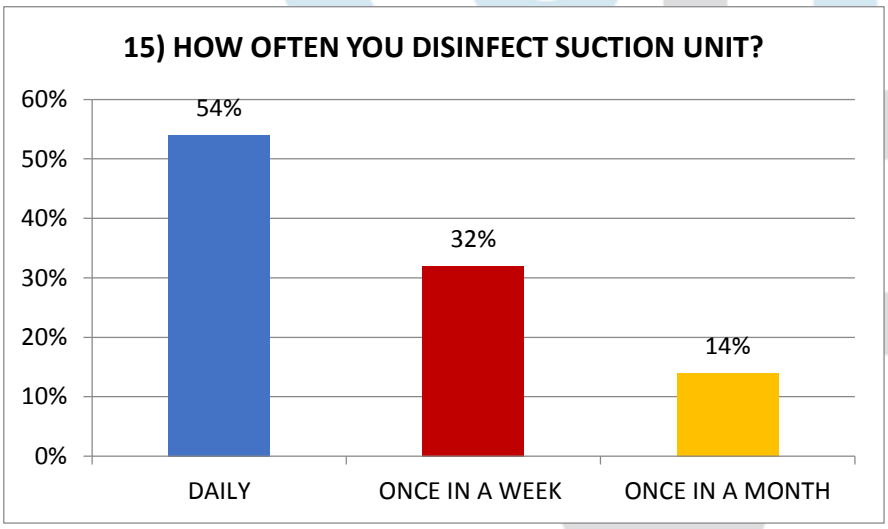

10) DO YOU STERILIZE YOUR ENDODONTIC FILES ?
89.30%
10.70%
100.00%
80.00%
60.00%
40.00%
20.00%
0.00%
YES
NO

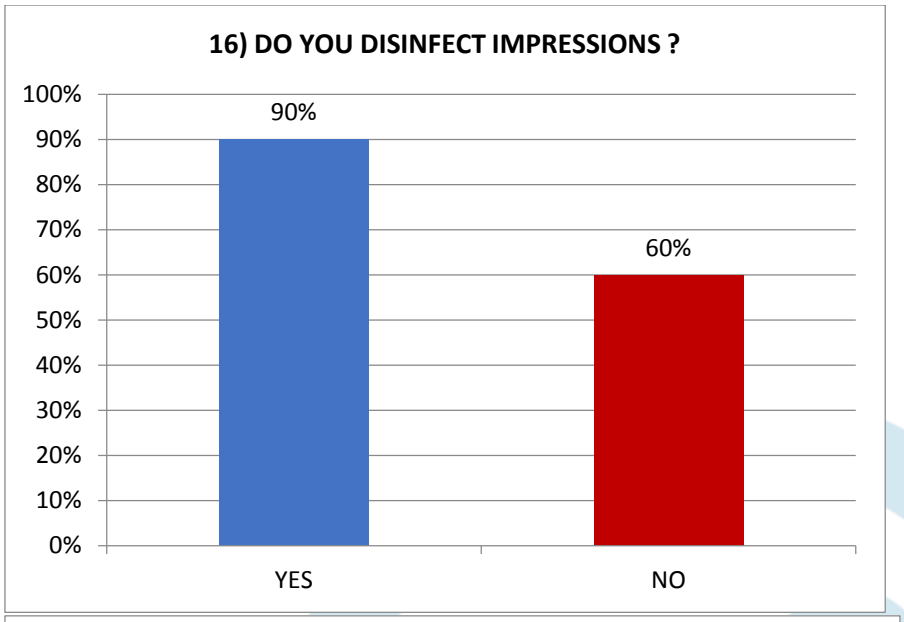

11) IF YES, HOW DO YOU STERILIZE ENDONDONTIC FILES ?
9.70%
20.10%
70.10%
GLUTARAALDEHYDE
AUTOCLAVE
GLASSBEADS

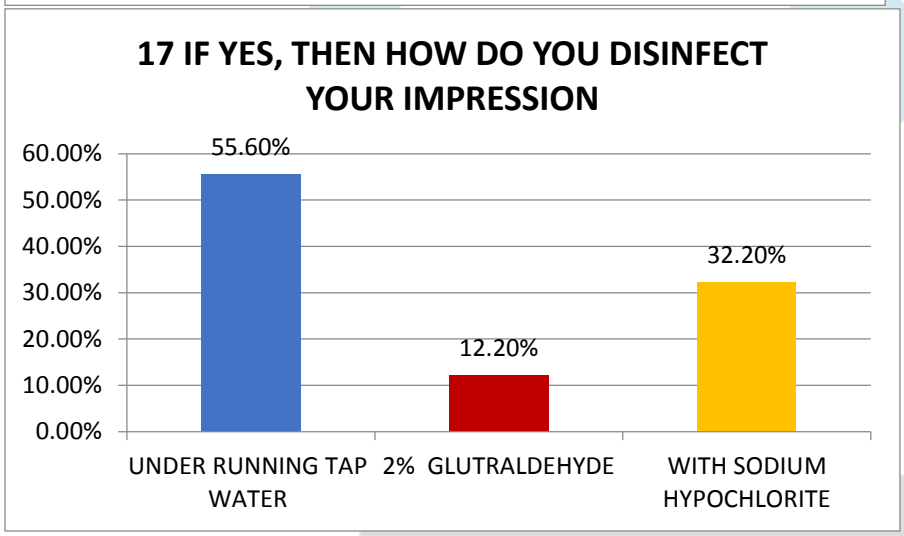

12) DO YOU STERILIZE YOUR ENDO BLOCK AFTER EVERY PROCEDURE ?
71.30%
38.70%
100.00%
50.00%
0.00%
YES
NO

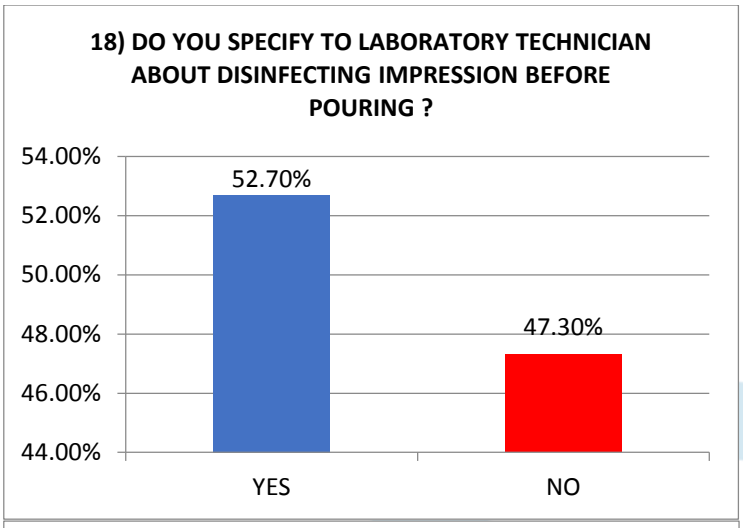

13) DO YOU USE STERILE COTTON AND GAUZE DURING EXTRACTION
100.00%
50.00%
0.00%
88.70%
11.30%
YES
NO

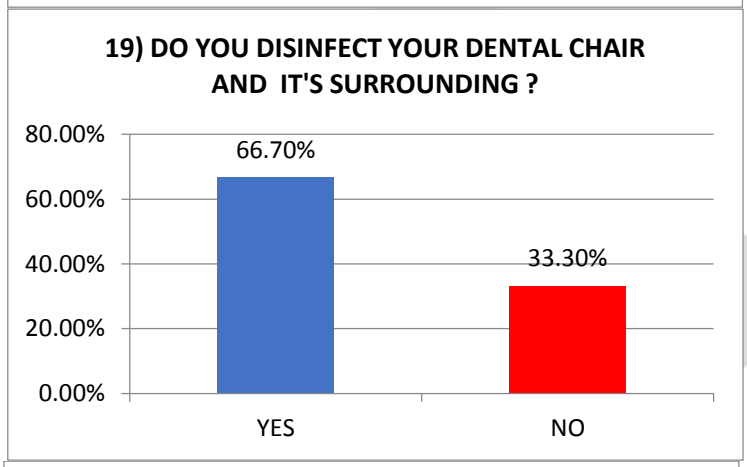

14) DO YOU USE STERILE SCALAR TIPS FOR EVERY PATIENT ?
80.00%
60.00%
40.00%
20.00%
0.00%
68.00%
32.00%
YES
NO

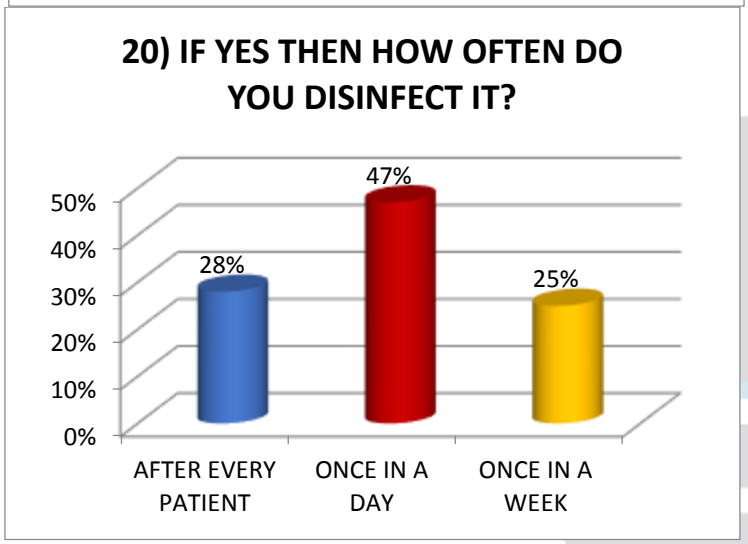

15) HOW OFTEN YOU DISINFECT SUCTION UNIT?
60%
50%
40%
30%
20%
10%
0%
54%
32%
14%
DAILY
ONCE IN A WEEK
ONCE IN A MONTH

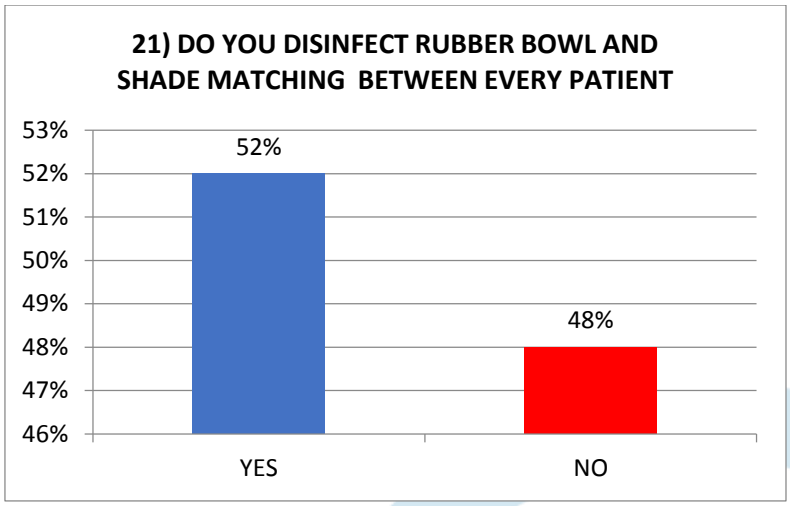

16) DO YOU DISINFECT IMPRESSIONS ?
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
90%
60%
YES
NO

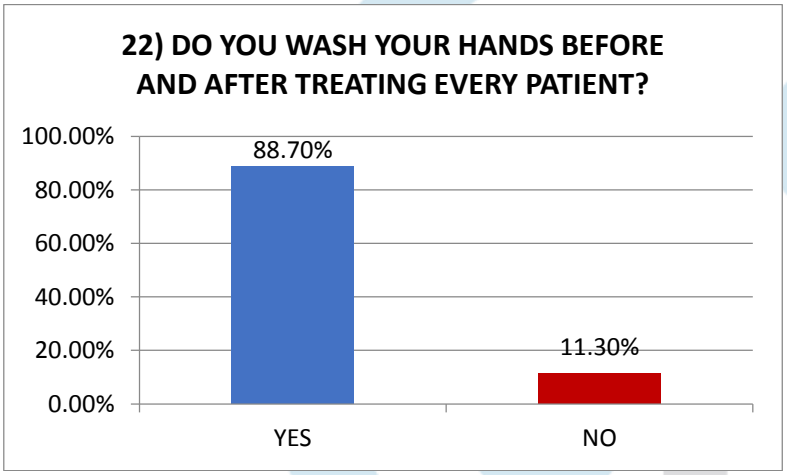

17 IF YES, THEN HOW DO YOU DISINFECT YOUR IMPRESSION
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
55.60%
12.20%
32.20%
UNDER RUNNING TAP WATER
2% GLUTRALDEHYDE
WITH SODIUM HYPOCHLORITE

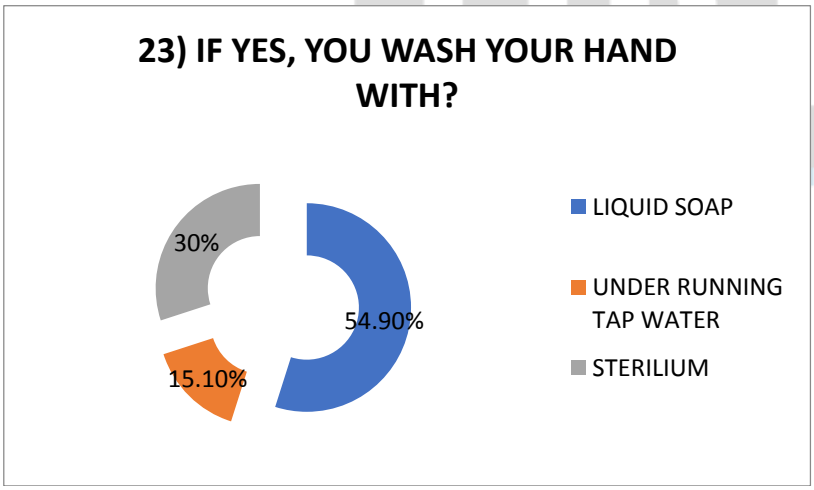

18) DO YOU SPECIFY TO LABORATORY TECHNICIAN ABOUT DISINFECTING IMPRESSION BEFORE POURING ?
54.00%
52.00%
50.00%
48.00%
46.00%
44.00%
52.70%
47.30%
YES
NO


19) DO YOU DISINFECT YOUR DENTAL CHAIR AND IT'S SURROUNDING ?
80.00%
60.00%
40.00%
20.00%
0.00%
66.70%
33.30%
YES
NO


20) IF YES THEN HOW OFTEN DO YOU DISINFECT IT?
50%
40%
30%
20%
10%
0%
28%
47%
25%
AFTER EVERY PATIENT
ONCE IN A DAY
ONCE IN A WEEK







Discussion:

Almost two-thirds of the respondents were females. This high percentage of female respondents was due to the large number of female dental students and interns compared to the males. In our study almost 81.3% use gloves during clinical examination which is similar to study conducted by raj et al (37) who reported 78% uses gloves but our results shows poor response when compared kumar et al (38) who had highest level of compliance with 99.3%. 70% of students use protective eye wear to prevent accidentally entry of blood or foreign particals which was reported high when compared to the humayun et al (39) who reported 1.% only, but study done by robyn et al (40) stated around 58% of them use protective eye wear.

The commonest method for sterilisation of instrument was done through autoclave by 86% which is less when compared to Humayun et al(39) they reported 93.2% use autoclave as sterilisation medium. Sterilisation of handpiece was done by 60% of students in present study population than among Saudi Arabia dentists, who reported that only 27.14% of population sterilise it.(41). Suprisingly, sterilisation of burs and its replacement between each patient was done by only 49.3% which is relatively very less when compared by qudiemat et al who conducted study among Jordan population has reported a majority of 96% follows those protocols. In this study, students with hand hygiene procedures was very satisfactory , as majority 89.3% of our students reported washing their hands before and after each patients which is high when compared to study by Santhosh (35)..

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Only 52% of students disinfect rubber bowls and shade matching which is almost similar to studies conducted by ibraheem (43) who has reported around 62-8-68.65%. Disinfection of impression was done by 60% of student which is positively high when compared to study done by yengopal et al (53.7%) and omari et al (18.1%) (44,45).

Conclusion:

This study concludes lack of education among undergraduates regarding sterilisation and disinfection methods for impression, prosthetic instruments and instruments like burs handpiece etc which can be main source of infection and carries pathogens from dentist – patient or either dentist to laboratory technician. Hence importance of sterilisation and disinfection methods as infection control protocol should be implemented in dental curriculum.

Conflicts of Interest:

The authors declare that there are no conflicts of interest regarding the publication of this paper.

Source of funding:

Nil

Ethical clearance:

Nil

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