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AWARENESS, KNOWLEDGE AND PERCEPTION ABOUT STERILIZATION OF GUTTA-PERCHA AND ITS IMPORTANCE AMONG DENTAL STUDENTS.

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ABSTRACT

INTRODUCTION:

Sterilization is an important procedure to make the instruments free from microbial infection. Gutta percha, one of the oldest and conventional endodontic filling materials used for root canal treatment. The current study focuses on understanding the need of sterilization practice in daily practice and it also aims at creating an awareness about the importance of this practice among dentists and dental students.

MATERIALS AND METHOD:

An online survey was conducted with a self structured questionnaire comprising 10 questions.The questionnaire was designed using the online survey platform google forms and

the link was circulated through the social networking platforms to the participants. The results were analysed and with the collected responses a descriptive statistical test and Chi square analysis were performed using the statistical software "SPSS version 22" and the result was represented in the form of pie chart and bar graphs.

RESULTS:
A 90% majority of patients believe that gutta percha points are pre sterilized. 98.18% of the respondents agree that the gutta percha points need to be sterilized prior to use. Most of the respondents were aware of the importance and the chemical agents used for disinfection of gutta percha. 97.27% of respondents practised disinfection of gutta percha in their clinical practice. Majority of the 3rd years responded with 5.25% sodium hypochlorite while the majority of 4th years responded with 2% chlorhexidine as the agent used for rapid chair side disinfection of gutta percha and this showed a significant association (p value=0.00).

CONCLUSION:
The present survey study within the limitations concludes that most of the respondents had a fair knowledge and awareness on the importance of disinfection or sterilization of gutta percha points.

KEYWORDS: Disinfection; Gutta percha; Sterilization; Survey,Innovative technology

RUNNING TITLE: Sterilization of gutta percha and its importance

INTRODUCTION:

Sterilization is an important procedure followed to make the instruments free from microbial infections (1).There are many methods of sterilization followed by dentists in daily routine but the most commonly used method includes soaking in disinfectant followed by manual cleaning or cleaning in ultrasonic bath and autoclaving (2,3). Sterilization method of dental instruments generally is done in many ways out of which the use of autoclave which empowers 15-20 lbs at 120 degree Celsius is reliable in the sterilization of instruments (4–6). Sterilization of dental instruments and material is of immense importance since the oral cavity is a region rich with pathogenic bacteria and pathogenic sporulating organisms (7,8). Chemical disinfectants, one of the methods of sterilization, is highly effective against non sporulating organisms (4,9,10). Sterilization is a necessary procedure to eliminate or kill the organisms like Bacillus and Clostridium that are involved in the formation of spores (endospores),which is more resistant to physical, chemical agents than other vegetative forms and represent a form of survival (11)

Gutta percha,one of the most oldest and conventional endodontic filling material used for root canal fillings contains 20% of matrix, 66% zinc oxide which acts as filler, 11% heavy metal sulfates and around 3% of waxes or resins (12,13). They can be contaminated by handling or aerosols and physical sources during the storage and treatment process. It is hence important to disinfect the gutta percha material before its intracanal placement to prevent further infection.

The study aims at understanding the need of sterilization practice in daily practice and it also aims at creating an awareness about the importance of this practice among dentists and dental students. This topic was done as a review previously but not many surveys have been done in this topic. Previously our department has published extensive research on various aspects concerned with endodontic dentistry, this vast research experience has inspired us to research about the sterilization practice of gutta percha among dental students (14). Our team has extensive knowledge and research experience that has translate into high quality publications(15–24),(25–28),(29–36)(37)

MATERIALS AND METHOD:

An online survey was conducted with a self- structured questionnaire with a sample size of 100 participants comprising dental students. The questionnaire consists of two parts, the first part consists of questions related to demographic details and the second part consists of questions related to fact, questions that help in analysing the awareness level and the importance of sterilization of gutta percha points at undergraduate level. The questionnaire was validated in the standard manner, the questionnaire was reviewed and approved by the Scientific Review Board, Saveetha Dental college and measures such as selection of participants randomly, placing restriction over the participant population and age groups were followed to minimise the sampling bias. The platform “google forms" and the link was circulated through the social media to the respondents. The responses were recorded and with the collected response descriptive analysis and chi-square test was performed. The level of significance was set at 0.05. The result of the analysis was presented in the form of pie charts and bar diagrams.

Table 1 : Showing responses to the questionnaire.

Questions	Percentage
1. Year of study	
3rd year	69.09%
4th year	30.00%
Intern	0.91%
2. Gender	
Male	76.36%
Female	23.64%
3. Are gutta percha cones sterile or pre disinfected?	
Yes	90%
No	7.27%
Not sure	2.73%

4. Is it necessary to sterile or disinfect gutta percha cones	
Yes	98.18%
No	1.82%
5. Can you autoclave gutta percha cones	
Yes	87.27%
No	8.18%
Not sure	4.55%
6. Does disinfection of gutta percha have an effect on the prognosis of root canal treatment ?	
Yes	78.18%
No	20.00%
Maybe	1.82%
7. Can disinfection of gutta percha cones reduce the incidence of severity of postoperative pain	
Yes	75.45%
No	24.55%
8. Can disinfection of gutta percha cones reduce the incidence of flare up?	
Yes	48.18%
No	33.64%
Maybe	18.18%
9. Are you aware of rapid chair side chemical disinfection of gutta percha cones?	
Yes	95.45%
No	4.55%
10. What can be used for rapid chemical disinfection of gutta percha?	
5.25% sodium hypochlorite	53.64%
2% chlorhexidine	33.64%
Glutaraldehyde	12.73%

11 Is it necessary to rinse the gutta percha after chemical disinfection?	
Yes	64.55%
No	32.73%
Not sure	2.73%
12. Do you practice sterilization of gutta percha in your clinical practice	
Yes	97.27%
No	2.73%

RESULTS:

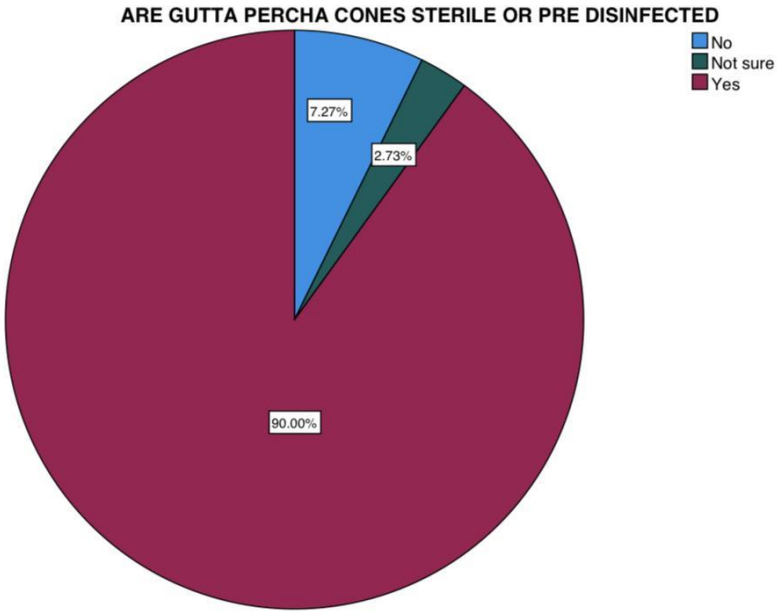

Figure 1: The pie chart depicts the perception of the participants on whether gutta percha points are sterile or pre disinfected. 90% of the respondents believe that gutta percha points are sterile (Pink), around 7.27% of the respondents believe they are not (Blue) and 2.73% of the respondents were not sure (Green).

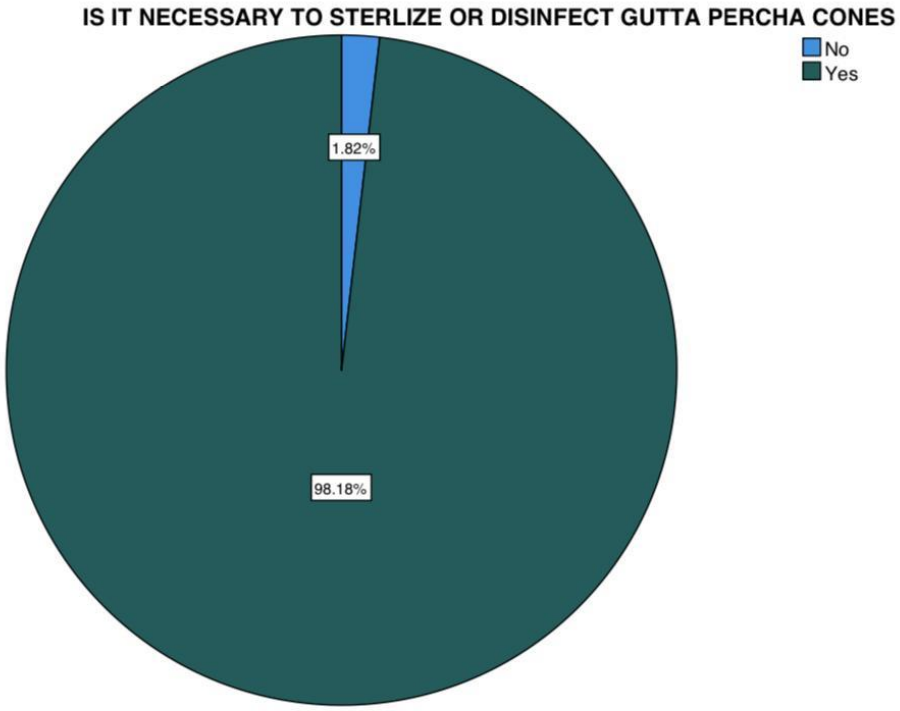

Figure 2: The pie chart depicts the perception of the participants on whether gutta percha points needs to be sterilised or disinfected. 98.18% of the respondents said yes (Green) while 1.82% said no (Blue)

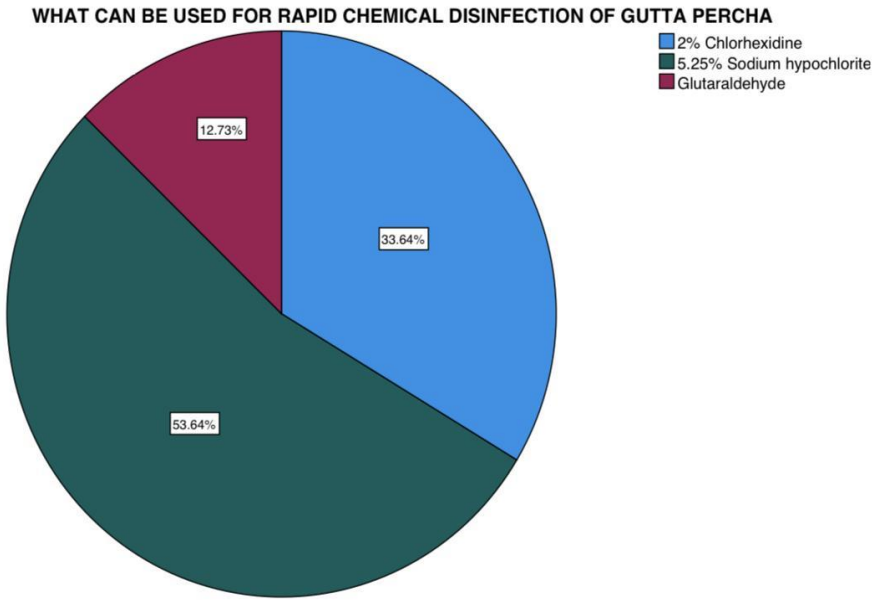

Figure 3: The pie chart depicts the awareness of the participants about materials used for rapid chemical disinfection of gutta percha. 53.64%of the participants believe 5.25% sodium hypochlorite to be effective (Green), around 33.64% of the respondents believe chlorhexidine to be effective (blue) and the rest 1.73% participants believe glutaraldehyde to be effective (Pink).

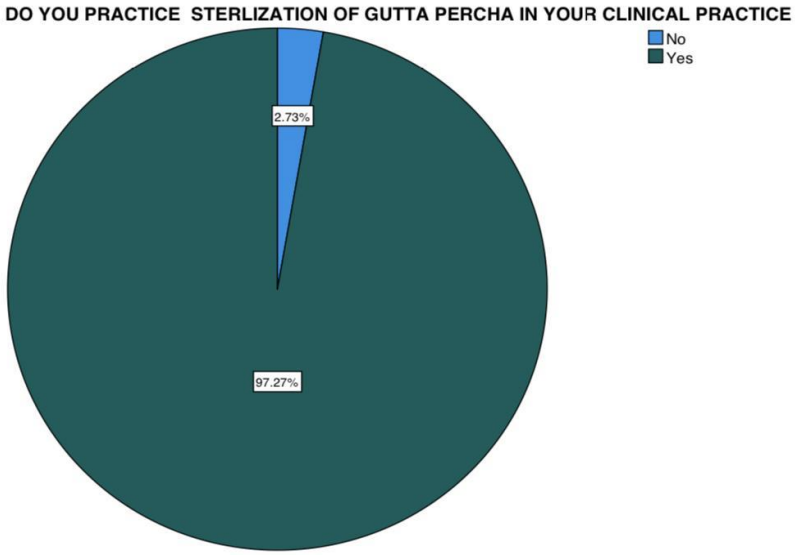

Figure 4: The pie chart depicts the percentage distribution of participants who practice disinfection or sterilization procedures in their clinical practice. 97.27% of the participants practice sterilization of gutta percha (Green) and around 2.73% do not practice any sterilization procedure (Blue).

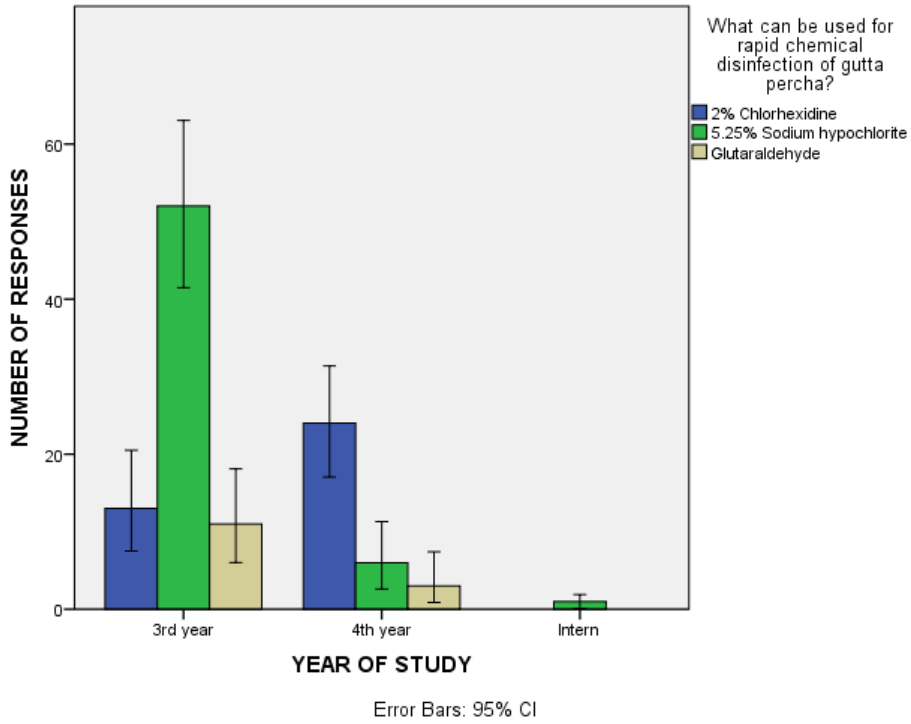

Figure 5: Bar graph representing the association of year of study and the material used for rapid chemical disinfection of gutta percha . X axis represents the year of study and Y axis represents the number of responses. Blue colour denotes 2% chlorhexidine, red colour denotes 5.25% sodium hypochlorite and green colour denotes glutaraldehyde. Majority of the 3rd years responded with 5.25% sodium hypochlorite while the majority of 4th years responded with 2% chlorhexidine. There was a significant association (Chi square test; p value=0.00<0.05 - Statistically significant).

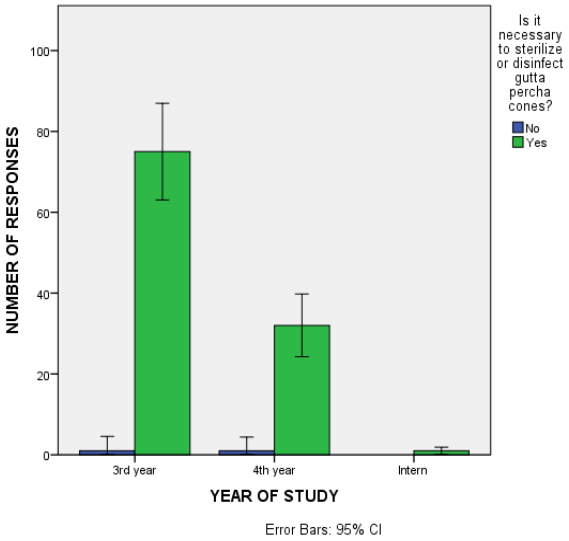

Figure 6: Bar graph representing the association of year of study and The necessity of sterilization or disinfection of gutta percha. X axis represents the year of study and Y axis represents the number of responses. Green colour denotes yes and Pink colour denotes no. Majority of the respondents in both 3rd and 4th year groups responded that it was necessary. However there was no significant association (Chi square test; p value=0.689<0.05 - Statistically not significant).

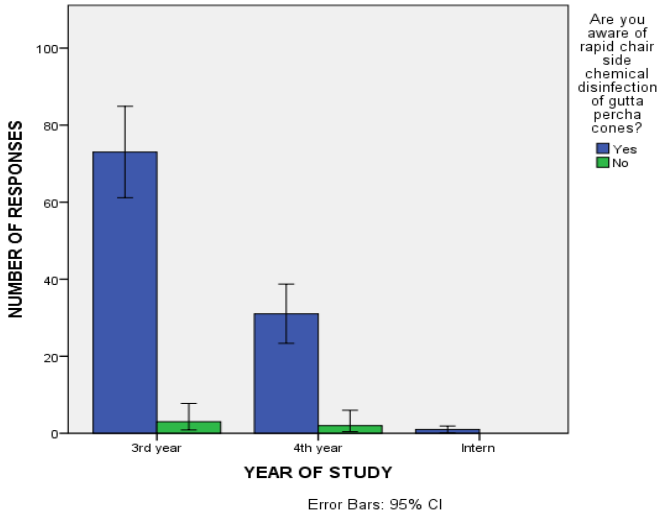

Figure 7: Bar graph representing the association of year of study and awareness on rapid chair side chemical disinfection of gutta percha. X axis represents the year of study and Y axis represents the number of responses. Red colour denotes yes and Blue colour denotes no. Majority of the respondents in both 3rd and 4th year groups responded with a yes. There was a significant association (Chi square test; p value=0.008<0.05 - Statistically significant).

DISCUSSION:

The results of **Figure 1** depicts the perception among the participants regarding whether gutta percha points are sterile or pre disinfected, 90% of the respondents believe that gutta percha are sterile,around 7.27% of the respondents are not aware. **Figure 2** depicts the importance of sterilising gutta percha cones, 98.18% of the respondents consider sterilising gutta percha cones to be a necessary step and the remaining disagree with it. The results of **Table 1** depict the correlation between disinfection of gutta percha and the root canal treatment,78.18%of the respondents have answered that disinfection of gutta percha poses an effect on the root canal treatment,around 20% of respondents disagree and the necessity to rinse the gutta percha after chemical disinfection.The **Figure 3** depicts the awareness level among the participants about various effective chemical disinfection of gutta percha,53.64%of the participants believe 5.25% sodium hypochlorite to be effective, around 33.64% of the respondents believe chlorhexidine to be effective and the other participants believe glutaraldehyde to be effective.The pie chart data of **Figure 4** depicts the ratio of participants who practice disinfection or sterilization procedure in their daily practice,97.27% of the participants practice sterilization of gutta percha and around 2.73% do not practice any sterilization procedure. The **Figure 5** of the current study represents the association by chi square test between the year of study on the role of chemical disinfection on gutta percha.The **Figure 6** of the current study represents the association by chi square test between the year of study on the importance of sterilization. **Figure 7** of the current study representing the association by chi square test between the year of study on the awareness of rapid side chemical disinfection of gutta percha.

In the previous study an online survey was conducted to analyse whether the dental students in clinical years practice sterilization of gutta percha points and found that around 75% of the respondents did not practice any disinfection protocols whereas only 25% of the respondents followed disinfection of gutta percha cones. While comparing with the findings of the previous study, the percentage of dental students practising sterilization of gutta percha or the awareness among dental students regarding the importance of sterilization has improved in the course of time and the current study findings of **Figure 4** records that around 97.2% of the participants practice sterilization or disinfection protocols in their daily practice (38).

The findings of **Figure 5** of the current study shows clearly that the majority of the respondents believe sodium hypochlorite to be an effective disinfectant for gutta percha. The findings of previous in vitro studies validated the current study findings (39)

In the previous study performed to analyse the basic principle of minimizing the endodontic microbial load and contamination discovered that the microbial load in the root canal is reduced when the infected canals are filled with sterilised gutta percha points.The findings of the previous study match with the findings of the present study (40).

So, the knowledge and awareness on the importance of sterilization protocol among dental students is specifically demonstrated in the current study. The present study possesses limitations such as the small sample size, homogeneous population and the study deals only with one particular parameter. Further studies with a large sample size, focus on detail concerned with many parameters should be done to significantly demonstrate the importance of disinfection of gutta percha among dental students.

CONCLUSION:

The present survey study within the limitations concludes that most of the respondents had a fair knowledge and awareness on the importance of disinfection or sterilization of gutta percha points.

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CONFLICT OF INTEREST:

All the authors declare no conflict of interest in the study.

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