

ORIGINAL RESEARCH ARTICLE

# KNOWLEDGE, ATTITUDE AND PRACTICES ABOUT APRON HYGIENE AMONG CLINICAL DENTAL STUDENTS IN A DENTAL COLLEGE IN KERALA - A CROSS SECTIONAL SURVEY

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ABSTRACT

**Background:** Healthcare-associated infections (HAIs), also known as nosocomial infections, constitute a significant hazard for patients and their families visiting a healthcare facility. In a dental setup, white coats are known to be potentially contaminated with pathogenic bacteria and there has been always a concern about the risk of transmitting pathogenic bacteria in clinical settings. Thus apron hygiene is a very important aspect of protective clothing. This study was undertaken with the objective of assessing the knowledge, attitude and practices regarding apron hygiene among clinical dental students and house surgeons in a dental college in Kerala.

**Methodology:** The study was a cross-sectional questionnaire based survey. The target population were the dental students and house surgeons. The questionnaire contained 20 questions to assess the knowledge, attitude and practice about apron hygiene. Results were expressed as a number and percentage of respondents for each question and were analyzed using Chi-square test.

**Results:** All the 106 respondents believed there was a necessity to wear aprons in clinic. About 89% opined that apron is worn for personal protection. About 45% are using the present apron since less than a year. About 83% of the respondents have 2 aprons or more. 78% prefer separate aprons for clinic and laboratories. 88% wore apron outside the clinic and laboratory premises among whom 95% wear it in canteen and over 50% wear it outside the college premises.

**Conclusion:** Although the knowledge and attitude regarding apron hygiene is good, the practice seems poor. A more serious approach towards inclusion and practice of apron hygiene in dental curriculum needs to be done.

**Key Words:** Apron hygiene, dental students, universal precaution, cross infection.

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## Introduction

Healthcare-associated infections (HAIs), also known as nosocomial infections, constitute a significant hazard for patients and their families visiting a healthcare facility. The World Health Organization (WHO) defines such an infection as an infection occurring in a patient in a Health care facility in whom the infection was not present or was incubating at the time of admission. This includes infections acquired in the hospital but appearing after discharge, and also occupational infections among staff of the facility.<sup>1</sup>

A white coat, apron or laboratory coat (abbreviated lab coat) is a knee-length overcoat or smock worn by professionals in the medical field or by those involved in laboratory work to protect their street clothes. The garment is made from white cotton or linen to allow it to be washed at high temperature and make it easy to see if it is clean.<sup>2</sup>

In a dental setup, the environment in the working area is contaminated due to the aerosols produced by high-speed hand-pieces and ultrasound scalers. Hence, these white coats are known to be potentially contaminated with pathogenic bacteria and there has been always a concern about the risk of transmitting pathogenic bacteria in clinical settings.

Thus apron hygiene is a very important aspect of protective clothing to avoid cross contamination and transmission of infection between patients, dentists and auxiliaries. However literature reveals less satisfactory results pertaining to knowledge, attitude and practice regarding apron hygiene among dental students.

Thus, this study was undertaken with the objective of assessing the knowledge, attitude and practices regarding apron hygiene among clinical dental students and house surgeons in a dental college in Kerala.

## Methodology

The study was a cross-sectional questionnaire based survey. The target population was the dental students and house surgeons of a dental college in Kothamangalam, Kerala. The study was conducted in the month of June 2015. A prefabricated validity tested questionnaire that was administered to the target population. The ethical approval was obtained from the Ethical Review Committee of the Institution. The questionnaire was divided into two parts. The first part consisted of questions on personal and professional data including age, gender, and year of study. The second part contained 20 questions on assessment of knowledge, attitude and practice regarding apron hygiene. All questions in the questionnaire were close-ended. The questionnaires were distributed by the House surgeons posted in the Public Health Dentistry Department. The respondents were asked to return the questionnaire immediately. All returned questionnaires were coded and analyzed. Results were expressed as a number and percentage of respondents for each question and were analyzed using the SPSS Version 17 software. Chi-square test was performed and the level of significance was set at  $p < 0.05$ .

## Results

Table 1 shows the profile of the respondents

	N	PERCENTAGE
<b>GENDER</b>		
MALES	12	11.33%
FEMALES	94	88.67%
<b>YEAR OF STUDY</b>		
III YEAR BDS	19	17.92%
FINAL YEAR BDS	51	48.12%
HOUSE SURGEONS	36	33.96%

Table 2 shows the response of the study subjects to questions assessing the knowledge, attitude and practices regarding apron hygiene. All the 106 respondents believed there was a necessity to wear aprons in clinic. About 89% opined that apron in worn for personal protection. Majority of the respondents preferred full sleeve aprons over half sleeve. Majority of interns preferred full sleeve over half sleeve. About 45% are using the present apron since less than a year. The third year students wore newer aprons compared to interns. About 83% of the respondents have 2 aprons or more. The observation is significantly different among males and females ( $p=0.001$ ) with almost 50% of the males owning just one apron. Almost 97% believe that contaminated aprons can act as a source of infection. The response showed a significant difference in relation to gender. ( $p=0.002$ ). About 56% believe doctors are at risk. Only 6.6% wash their aprons daily. Almost 80% of the participants clean their aprons with detergent and majority of them dry it under direct sunlight. About two thirds of the respondents believe lab procedures soil the apron the most and about 78% prefer separate aprons for clinic and laboratories. About 9% agreed that they had a habit of exchanging apron with others. Almost all the study participants had the habit of keeping things in the apron pockets and about 88% wore apron outside the clinic and laboratory premises among whom 95% wear it in canteen and over 50% wear it outside the college premises. More than half the number of respondents carries their apron back to hostel/home either wearing them. Very few carry it in their bags or along with instruments. About 54% were interested in gaining more knowledge about apron hygiene.

## Discussion

Wearing of aprons in dental colleges is mandatory as a universal precaution. Apron itself brings dignity to the profession. It helps for easy identification and made doctors look more professional. However, white coats have been shown to act as fomites and harbor potential contaminants.<sup>3</sup>

There has always been concern about the risk of transmitting the same in hospitals. The conclusion of many studies stated that white coats of doctors', nurses' uniform and other hospital garments, may play a part in the transmission of pathogenic bacteria in dental hospital settings. In case of dental healthcare professionals, the white coats are con-

taminated with splashes of blood, saliva and aerosols while providing the dental care which may be the important risk factor for infection with various organisms. There have also been several debates over whether doctors should be allowed or not to wear white coats in areas such as canteens, and libraries.<sup>4</sup> Hence, the knowledge, attitude and practices regarding proper apron hygiene is quintessential in serving its purpose. Hence this study was undertaken with the same objective.

All the 106 respondents believed there was a necessity to wear aprons in clinic. The institution rules mentioning the compulsory wearing of aprons as the protocol is reflected in this observation. In spite of this, it is noteworthy that less than 5% of the respondents only wore it out of compulsion.

An important finding is that about 16% managed with only one apron. This is in contrast to a study reported by Pydi et al. in Andhra Pradesh<sup>3</sup> where the corresponding value was 8%. Because of the high frequency of the patient contact in a busy college environment, it is reasonable to expect the white coats to become colonized with potentially pathogenic bacteria. It has been also seen that the coats become contaminated quickly once worn thereby demanding the use of more number of aprons. The significant difference between males and females in this regard could be due to the skewed gender distribution of the study subjects.

About 45% are using the present apron since less than a year. The third year students wore newer aprons compared to interns. This showed that most of the respondents were using the same aprons from the beginning of their clinical posting in third year till internship.

It's a noteworthy observation that almost 97% believe that contaminated aprons can act as a source of infection. Males had a significantly lower knowledge in this regard compared to females. The knowledge is greater in this regard in comparison to a study conducted among medical students in Shivamogga in Karnataka<sup>1</sup> where only 84% believed it could act as a source of infection. This observation may be due to the fact that the Shivamogga study was mainly done among 2nd year medical students.

It was observed that about 96% washed their apron in a frequency of one week or less. This is similar to the results of a study conducted in Manipal by Priya et al (2), Andhra Pradesh by Pydi et al.(3) and

Sl. No.	QUESTION	RESPONSE	RESPONSE n (%)	p value (assessed by chi square test)
1	Do you think it is necessary to wear aprons in clinic?	Yes	106 (100%)	
		No	0	
2	What do you think is the relevance of wearing aprons in clinic?	Personal protection	95 (89.62%)	Gender: p= 0.76 (NS) Year: p= 0.278 (NS)
		Uniformity	13 (12.24%)	
		Sign of profession	39 (36.79%)	
		Compulsory	06 (5.66%)	
3	What do you prefer wearing?	Half sleeve cotton	11 (10.37%)	Gender: p= 0.77 (NS) Year: p=0.002
		Full sleeve cotton	34 (32.07%)	
		Half sleeve polyester	28 (26.41%)	
		Full sleeve polyester	32 (30.20%)	
4	Since how many years are you using the present apron?	< 1 year	45 (42.5%)	Gender: p=0.06 (NS) Year: p= 0.001
		1-2 year	31 (29.3%)	
		2-4 years	17 (16.1%)	
		>4 years	13 (12.3%)	
5	How many aprons do you own?	1	16 (15.1%)	Gender: p= 0.001 Year: p= 0.056 (NS)
		2	73 (68.9%)	
		3	13 (12.3%)	
		4 or more	04 (3.7%)	
6	Do you think contaminated aprons can act as a source of infection?	Yes	103 (97.2%)	Gender: p= 0.002 Year: p= 0.679 (NS)
		No	03 (2.8%)	
7	Whom do you think are most affected by contaminated apron?	Doctors	60 (56.6%)	Gender: p=0.707 (NS) Year: p= 0.062 (NS)
		Patients	41 (38.7%)	
		Chair side Asst	45 (42.1%)	
		Others	35 (33.2%)	
8	How often do you wash your aprons?	Daily	07 (6.6%)	Gender: p=0.010 Year: p= 0.475 (NS)
		Twice a week	58 (54.7%)	
		Weekly	36 (34%)	
		When it is soiled	04 (3.8%)	
		More than a week	00	
9	How do you clean your aprons	Detergent	84 (79.2%)	Gender: p= 0.001 Year: p=0.797 (NS)
		Drycleaning	22 (20.8%)	
		Disinfectant	00	
		Others	00	
11	How do you dry your aprons after washing	Direct sunlight	76 (71.7%)	Gender: p=0.01 Year: p=0.306 (NS)
		Indirect sunlight	16 (15.1%)	
		Under fan	13 (12.3%)	
		Using iron box	01 (0.9%)	
12	What makes your apron soiled the most?	Lab procedures	77 (72.7%)	Gender: p=0.964 (NS) Year: p= 0.057 (NS)
		Treatment procedures	40 (37.8%)	
		Assistance	37 (35%)	
		Handling of instruments	29 (27.4%)	
13	Do you think it is necessary to wear separate aprons for clinics and laboratories?	Yes	82 (77.4%)	Gender: p=0.641 (NS) Year: p=0.078 (NS)
		No	24 (22.6%)	
14	Do you exchange your apron with others?	Yes	9 (8.5%)	Gender: p=0.001 Year: p= 0.851
		No	97 (91.5%)	
15	Do you have the habit of keeping things in apron pockets?	Yes	104 (98.1%)	Gender: p=0.610(NS) Year: p= 0.394(NS)
		No	02 (1.9%)	
16	Do you wear aprons outside the clinic/lab	Yes	93 (87.8%)	Gender: p=0.153 (NS) Year: p=0.001
		No	13 (12.2%)	
17.	If yes where?	Canteen	89 (95.7%)	Gender: p=0.219(NS) Year: p= 0.670(NS)
		Outside campus	48 (51.6%)	
		Lectures	93 (100%)	
		Hostel	25 (26.9%)	
		Bathrooms	33 (35.5%)	
		Library	63 (67.8%)	
18	How do you carry your aprons back to home/hostel	In hands/wearing	56 (52.9%)	Gender: p=0.410 (NS) Year: p=0.767 (NS)
		With books in bag	18 (17%)	
		With instruments	7 (6.6%)	
		Leave in the department	24 (22.7%)	
19	Do you think it is necessary to change colour of apron?	Yes	13 (12.2%)	Gender: p=0.001 Year: p=0.237 (NS)
		No	93 (87.8%)	
20	Do you require any more knowledge about apron hygiene?	Yes	57 (53.4%)	Gender: p=0.919 (NS) Year: p=0.001
		No	49 (46.6%)	

Table 2:  
Response to questions assessing the knowledge, attitude and practices regarding apron hygiene

Pune by Saxena R. K et al (5), where the corresponding figure was 94%, 95% and 99% respectively.

Almost 80% of the participants clean their aprons with detergent and majority of them dry it under direct sunlight. However 20% dry it under indirect sunlight or fan, methods, not indicated for drying the aprons.

About two thirds of the respondents believe lab procedures soil the apron the most and about 78% prefer separate aprons for clinic and laboratories. As dental students, there is a significant amount of laboratory work in various departments. Although the amount of microbial contamination is lesser in laboratories compared to clinical environment, visible soiling and dirtying of aprons occur most commonly in laboratory settings. Hence separate lab coats for laboratories and aprons for clinical environments can be recommended owing to different nature of work and also to prevent cross contamination. About 9% agreed that they had a habit of exchanging apron with others. The observation is in contrast with the Manipal study<sup>2</sup> where there was no exchange of aprons reported among under graduates. In the Andhra Pradesh study<sup>3</sup>, however it was reported at 28% and in the Pune study 7%<sup>5</sup>.

Yet another significant observation was that 88% wore apron outside the clinic and laboratory premises. This is in contrast with the Andhra Pradesh Study<sup>3</sup>, where majority (80%) of the study participants wore their white coat only before entering the respective department or laboratory. Among them about 50% wore aprons outside college premises. This practice is more detrimental in maintenance of proper apron hygiene. In the study conducted at Shivamogga only 8% wore it outside college premises. However in this study, about 95% wore it to canteen and 35% to bathrooms. In the study conducted in Pune, 71% reported to wearing aprons while eating food<sup>5</sup>. All these practices can potentially be responsible for cross contamination and infections - a matter of concern. About 54% were interested in gaining more knowledge about apron hygiene.

Although significant difference in knowledge attitude and practice was observed in the study among males and females, a discussion in this regard might not be valid as the distribution of the study subjects in relation to gender is highly skewed.

## Conclusion

The study portrays the knowledge, attitude and prac-

tices towards apron hygiene among clinical dental students and house surgeons in a dental college in Kerala. Although the knowledge and attitude regarding apron hygiene is good, the practice seems poor. A more serious approach towards inclusion and practice of apron hygiene in dental curriculum needs to be done. Hence to reduce bacterial contamination carried by dental healthcare professionals' aprons, there should be a ban on wearing of aprons in nonclinical areas such as canteen, classroom and library. It is recommended that guidelines should be there for handling and washing procedures of aprons. Further microbial studies on nature of organisms colonising the aprons are recommended.

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