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Original Research Paper

Evaluation of infection control measures among dental Technicians In Benghazi City–Libya

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ABSTRACT:

Introduction: A cross infection is transfer of harmful microorganisms from susceptible host to reservoir these microorganisms. In general, dental technicians may be exposed to infection with non-disinfected items especially if are handled without gloves and masks wearing, to control these way of transmission it recommended focuses more on disinfection practice for them . The aim of this paper is to assess practice of routine infection control among dental technicians in dental laboratories. **Methods**: This was a secondary data study extracted from primary data through a cross-sectional study of a random sample of 100 dental technician at dental laboratories (private and public), Benghazi , Libya used a self-administrated questionnaire that designed to evaluate practice of infection control measures among them. The collected data were analysed using SPSS for Windows, version 16. The alpha value was 0.05 **Results**: a significantly higher proportion of males's dental technicians comparing to female 61.1% and38.9%respectively. Most the participants (94.1% and 88.2%) who work in both (private and public) washing their hands before and after using gloves and wear gloves during work respectively. statistically significant was observed in the categories age and practice .The technicians who their age 50 years and more had good practices than other groups. **Conclusion**: public and private laboratories must enforce the already existing Stander precaution , and all technicians should be made aware of this policy by continues education program about infection control and necessity involved during their study curriculum before work.

Keywords: dental technicians, dental laboratories, practice, infection control.

INTRODUCTION:

A cross infection is transfer of harmful microorganisms from susceptible host to reservoir these microorganisms may be bacteria, virus, fungi, and parasites the spread of infection can be occur between people by unsterile hazed medical equipment, human contact cough and sneezing. ([1]) Infections may be transmitted in the dental operatory through several routes, including direct contact or indirect with blood, oral fluids, or other secretions;.[(2,)]In the laboratory, technicians may be exposed to infection with non-disinfected items such as impressions especially if these impressions are handled without gloves and masks wearing, to control these way of transmission it recommended practice for dentists to status of impressions as "disinfected impressions" to the dental laboratory in order to protect the dimensional stability and the surface detail reproduction of the impressions. This practice can exclude possible uncertainty facing dental technicians when they receive the impressions and prevent repetitive disinfection[(3)] . In general, common disinfection procedures would not adversely affect the detail reproduction of the dental impressions. The wettability of the addition silicone impressions might be decreased after disinfection, while other impression materials are unaffected[(4)].American Dental Association (ADA) has recommended immersion with sodium hypochlorite of all impression materials for the manufacturer's recommended contact time (no more than 30 min) [(5)]. infection control policy in dental laboratories must be clearly written and displayed on the

wall in form of a poster or providing continues education to increase their awareness regarding infections control measures. It include :that all incoming cases should be disinfected as soon as they are received and all containers must be sterilized or disinfected after every use and packing materials should be discarded to avoid contamination [6] Work surfaces and equipment should be kept clean and disinfected daily. Further more all instruments, attachments, and materials to be used on new prostheses should be separated from those used on prostheses that have already been inserted in the mouth. [7] . Dental technician practices in impression disinfection was not satisfactory, therefore, education programs about impression disinfection are needed [8]. this study was designed and conducted to assess practice of routine infection control among dental technicians in dental laboratories.

MATERIALS AND METHODS:

Study Population:

The data used for this study was secondary data extracted from primary data that was collected through a cross-sectional study of a random sample of 100 dental technician at dental laboratories(private and public) , Benghazi , Libya Data collection extended over a period of three months from January 2022 to March 2022.

The purpose of study was to asses participants practice about infection control in their laboratory. Demographic statue such as gender, age, years of professional activity and workplace was recorded. The technicians were asked to complete a self-administrated questionnaire. The structure of the questionnaire was based on research literature and adapted to the objectives of the study [8,9] .

The questionnaire Designed to Evaluate Practice of Infection Control Measures: hand washing, use of gloves, protective eyeglasses, Wearing protective clothes during work ,receiving of impression in laboratory, disinfection of impression, etc. The technicians who could not understated the questionnaire were interviewed them. Details of the primary study have been reported by ELHDDAD etal[10].

Approvals and Ethical Considerations:

A formal letter obtained from the Faculty of Medical Technical College, it was directed to the Specialized Oral and Dental Education Center, and Faculty of Dentistry university of Benghazi. The researchers first introduced themself to explained the purpose of study to technicians in order to ensure their cooperation to achieve the task.

Pilot study: The questionnaire was pilot-tested by distributing it randomize to twenty dental technicians who work in laboratories(public and private) .Responses from the pilot test were analyzed to assess the clarity and relevance of the questions, and some modifications were made.

Statistical Analysis:

Each questionnaire received an individual identification number to permit checking for any inconsistent responses. The statistical package for Social Science version 16 (SPSS Inc. Chicago, IL, USA) was used for statistical analysis of the results. Descriptive statistics were displayed as percentages for qualitative and quantitative variables.

The practice scores were in an interval scale ranged from (0 to 10), the total number of acceptable answers given by the subjects were summed Practice scores were regrouped into 3 categories: good, moderate and poor practice. The scores above 6 were regarded as good level of practice, from 5 – 7 were regarded fair level of practice, while 4 and below were regarded as poor level of practice. practice scores were represented as mean + standard deviation , Kruskal Walli test ,Chi square and P value were used for comparing data as appropriate. The level of significance was set at P value equal to or less than 0.05.

RESULTS:

According to demographic data collected questionnaire (Table 1), a significantly higher proportion of males's dental technicians comparing to female 61.1% and38.9%respectively. sixty-four of the technicians had experience 10 years or less than , twenty had experience from 11 to20 years, Only six of participants reported that they had experience more than 20 years. About 43.3% of sample were practicing in public dental laboratories sector, while 37.8% of them were practicing in private dental laboratories and 18.9% of them were in both (public and private) Most the participants (94.1% and 88.2%) who work in both (private and public) washing their hands before and after using gloves and wear gloves during work respectively(Table 2) . the majority (89.7%) of private group reported that change gloves if torn during work. while 50. 8% with significant different . regarding wearing goggles to protect the eyes from injury and infection during procedures The percentage of dental technicians who work in both sector was highest 94.1% compering with others participants. More over ,the participant who work in both laboratories (88.2 %) had the highest percentage according to wear protective clothes during work In addition. the most of

dental technicians who work at public only and both sector were Changing their coat when visibly contaminated (88.2%) While 69.2% of study sample from private sector did it .almost of private group (94.4%) had insignificant highest rate regarding to clean and disinfect surface before and after the work in the lab . The finding reported that a significant relations between age group and work places. The technicians who their age 50 years and more had good practices than other groups (Table 3).

Table (1) : Percentage of study sample according to gender, age and Work place

Variables		N	(%)
Gender	Male	55	61.1%
	Female	35	38.9%
Age (years)	from 20 - 30	37	41.1%
	31 - 40	38	42.2%
	41 - 50	11	12.2%
	more than 50	4	4.4%
Years of work	<= 10 years	64	71.1%
	11 - 20 year	20	22.2%
	> 20 year	6	6.7%
Work place	Public	34	37.8%
	private	39	43.3%
	both	17	18.9%

Table (2): infection control practice among dental technicians

practice questions	Public		privet		Both		Chi - square	P - value
	yes	no	Yes	no	yes	no		
washing hands before and after using gloves	73.5%	26.5%	82.1%	17.9%	94.1%	5.9%	3.175	0.204
wearing gloves during work	70.6%	29.4%	79.5%	20.5%	88.2%	11.8%	2.158	0.340
changing torn gloves during work	50. 8%	46.2%	89.7%	10.3%	88.2%	11.8%	11.777	0.019**
Wearing goggles to protect the eyes	38.2%	62.8%	82.1%	17.9%	94.1%	5.9%	7.747	0.021**

from injury and infection during procedures								
Wearing a surgical mask to protect nose and mouth during procedures	73.5%	26.5%	89.7%	10.3%	88.2%	11.8%	3.801	0.150
Wearing protective clothes during work	79.4%	20.6%	82.1%	17.9%	88.2%	11.8%	0.605	0.739
Changing your coat when visibly contaminated	88.2%	11.8%	69.2%	30.8%	88.2%	11.8%	4.989	0.083
keep the sterile instruments in pouches until usage	73.5%	26.5%	71.8%	28.2%	82.4%	17.6%	0.718	0.698
Clean and disinfect surfaces before and after the work in the lab	88.2%	11.8%	94.9%	5.1%	94.1%	5.9%	1.220	0.543
keeping dental materials away from the patients items	82.4%	17.6%	79.5%	20.5%	100%	0%	3.974	0.137

Table (3):The mean value of overall scores of good practice among dental technicians.

	Years of work			Kruskal Wallis Chi-Square	P - value	Work place			Kruskal Wallis Chi-Square	P – value
	<= 10 years	11 - 20 year	> 20 year			Public	private	both		
	Mean Rank					Mean Rank				
practice	45.50	42.68	54.92	1.123	.570	37.69	45.03	62.2	11.082	.004**

DISCUSSION:

Infection control with standard precautions, in dental office and laboratories should be applied to prevent potential risks of cross-contamination. [11] Infection control practice of dental technicians is very important promote healthy system in dental laboratories and decrease risk for any diseases transmission between patients and all dental health worker. [12,13]. The present study assessed practices of dental technicians from Benghazi City regarding Infection control in dental laboratories using ended self –administered questionnaire. Among the limitations encountered by the investigator was receiving in completed data sheets, which was mainly due to insufficiency time. This was expressed by number of participants who were frustrated as they felt that filling in questions would interfere with their work time . Response rate was 90 %, which was greater than study conduct among dental technicians in Jordan[8]. Male dental technicians more than femal This is same the findings of Noor Al et al [8]who reported only 2.4% were femal. It is assumed that the low prevalence level in present study might be natural of the work. The use of protective measures is important to prevent cross of infection. [14] Therefore, while working in the dental laboratory, a dental technician/ technologist should always use personal protective equipment such as gloves, masks, goggles and lab coats. [15] Results of this study, report that almost of the technicians (84.6%) who work in private laboratories are aware of wearing PPE being mandatory for all laboratory tasks. This rate is greater than percentage reported in a study of Riyadh (42%)[16]. This can be due to lack of their knowledge regarding important of wearing protective equipment in controlling the infection during dental practices.

Wearing gloves, surgical masks, protective eyewear, and protective clothing in specified circumstances to reduce the risk of exposure to saliva/blood borne pathogens were mandated by OSHA. [17] In the current research ,about 70.6% of dental technicians who work in public lab wear gloves during work ,this percentages is higher than Jordan technicians (10%) who just wore gloves when receiving clinical items from clinics. While, the findings reported in dental colleges of North India which it was 73.7%. Where about 79.5% of participants who work in private lab ,this rate is greater than rate that

it was in Iasi result (47%). However the data reported for UK technicians from which 90% wore gloves when handling dental items. [18] However , only 3% of participants in Jordan (commercial lab) wear gloves regularly during work .[19] This is can be due to lack of awareness about impact of protective equipment as gloves , goggles and facial shields in reduce the risk of contamination during work. Centre for Disease Control and Prevention (CDC) suggested that work surfaces and equipment should be cleaned and decontaminated with a suitable liquid chemical germicide following accomplishment of work activities. [20] .In the current research, about 88% of technician often clean and disinfect surface before and after the work in the lab. On the other hand the rate in South Africa was 33.33% of the respondents cleaned and disinfected their dental laboratories daily, 13.33% did it twice a week and monthly while 40% cleaned and disinfected weekly. [21] This is a worrying practice that may be due to reduction in awareness level about the impact of cleaning and disinfection in killing the almost pathogenic microorganism and they should be disinfect laboratories daily.

CONCLUSION:

From this study concluded, almost of participants (private group) changed their gloves if torn during wok in comparison to public group were less than them. The Percentages of technicians who were wear goggles during work in public laboratories were low. group above 50 years and more had significant the highest level practices than other groups Where technicians who had experience more than 20 years and work in both(public and private laboratories) had the highest level of good practice.

RECOMMENDATIONS:

1- public and private laboratories must enforce the already existing
Stander precaution , should be all technicians made aware of this policy.
2- Education infection control necessity involved in their study curriculum.

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