# Knowledge and Attitudes of Dental Patients toward Cross Infection Control Measures in Dental Clinics at Assiut University Hospital

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*Abstract:* The dental clinic is an environment where disease transmission occurs easily. Infections may be transmitted in the dental clinics to dental patients through several routes direct or indirect. The descriptive research design was on (386) dental patients using a systematic random sample technique. The study was conducted at dental out patients' clinics at Assiut University Hospitals. A structured interview questionnaire was used to collect data, it consists of two main parts the socio-demographic characteristics and dental patient level of knowledge in additions to likert scale to assess attitude. The main findings of this study were: mean age was 33.2 year. The great majority (94.9%) of dental patients who had low level of education had poor knowledge. While 4.9% of dental patients who had high level of education had good knowledge regarding cross- infection control measures and there was a statistically significant relation between educational level and total level of knowledge. 39.4% & 60.6% of male and female respectively had positive attitude and there is a statistically significant relation between sex, level of education and occupation and dental patient's attitude regarding infection control measures. This study recommend health education program by the Egyptian Ministry of Health and Population, aimed at promoting knowledge and attitude of dental patients toward cross infection control measures in dental clinics through mass media.
*Keywords:* Knowledge; Attitude; Cross-Infection Control; Dental Patients; Dental Clinics.

## INTRODUCTION

Every patient has the right to receive the best care and treatment whenever he/she comes to hospital regardless of his or her health status at the time of the hospital visit (Sharon et al., 2013). Cross-infection is defined as the transmission of infectious agents between patients and staff within a clinical environment (Malik, 2002). Transmission may result from person -to- person contact or via contaminated objects (Samarnayake et al, 2002). Cross-contamination may be via direct or indirect means (Darby and Walsh, 2003). Contaminated hands are a prime cause of cross- infection (Potter and Perry, 2001).

The dental clinic is an environment where disease transmission occurs easily (Australian Dental Association, 2012). Prevention of cross infection in the dental clinic is therefore a crucial aspect of community protection from infection, and dental clinic workers must adopt certain basic routines while practicing. Dental health care professionals are at risk of infections caused by various microorganisms such as hepatitis B virus (HBV) and hepatitis C viruses (HCV), mycobacterium tuberculosis, staphylococci, streptococci, herpes simplex virus types (1), human immunodeficiency virus (HIV), mumps, influenza, and rubella (Singh et al., 2011).

Infections may be transmitted in the dental clinics to dental patients through several routes, including direct contact with blood, oral fluids, or other secretions; indirect contact with contaminated instruments, operatory equipment, or environmental surfaces; or contact with airborne contaminants present in either droplet splatter or aerosols of oral and respiratory fluids. Infection via any of these routes requires that all three of the following conditions be present (commonly referred as the chain of infection): a susceptible host, a pathogen with sufficient infectivity and numbers to cause infection, and a portal through which the pathogen may enter the host. Effective infection control strategies are intended to break one or more of these links in the chain, thereby preventing infection (Cleveland et al., 2014).

Following a percutaneous exposure involving blood known to be infected by (HBV) and the presence of HBeAg, which has a high rate of viral replication and therefore a greater quantity of circulating virus, the risk of developing hepatitis B ranges from 22 to 31 percent (Machado-Carvalhais et al., 2007 ). The risk for (HCV) is approximately 1.8 percent, ranging from 0 to 7 percent. With AIDS, the risk is 0.3 percent in percutaneous injuries and less than 0.1 percent in mucous membrane injuries (Kohn et al., 2013 and Centers for Disease Control and Prevention, 2011). Because most injuries in dentistry are caused by small-gauge needles or compact instruments, dental professionals are exposed to a smaller volume of blood and, therefore, a lower risk. Exposure to infected blood can result in transmission from patient to dentist, from dentist to patient, and from one patient to another. The opportunity for transmission is greatest from patient to dentist, who frequently encounters patient blood and blood-contaminated saliva during dental procedures (Cleveland et al., 2002).

Paramount to the prevention of infectious disease is the strict adherence to standard precautions for all dentists. This includes, though not limited to, eye protection with lateral shields, facemask, and protective clothing. Despite the considerable emphasis placed on standardized infection control procedures, it appears that few dentists have adhered to these procedures in their clinical practice (Myers et al., 2008). Even in dental schools, future dentists have not always properly adhered to these procedures (Askarian and Assadian, 2009 and Henrique et al., 2009). Dental education

can play an important role in the training of dental health care providers, helping them to adopt adequate knowledge and attitude related to infection control measures (Singh et al., 2011).

Community health nurse role varies according to each client's need and from setting to setting. But there are universal nursing interventions and roles that are required of virtually all nurses in almost all settings (MC Closkey and Bulecken, 2000).For example, infection control: minimizing the acquisition and transmission of infectious agents. In addition environmental managements (safety): monitoring and manipulation of the physical environment to promote safety (MC Ewen, 2002).The duties of the dental nurse range from assisting the dentist in clinical procedures to managing the practice (John et al, 2002). Control of infection is an important part of every action the nurse performs; the nurse's knowledge of infection, application of infection control principles and use of common sense help protect patients from infection. In many situations nurses are exposed to pathogenic microorganisms and should use both specialized and routine practices of cleanliness and disinfection to prevent the spread of infection. Many agencies employ nurses who are specially trained in infection control, and responsible of all procedure to control cross infection (Christensen and Kockrow, 2006).

*Significance of the study:*

The control of cross-infection in dental practice is the focus of continuing discussion and debate and, as a result, recommendations and guidelines to control are still researched among both patient and health care providers (Sharon et al., 2013). In Egypt patients with periodontal disease showed higher detectability rate of HBV and HCV (Farghaly et al., 1998). In additions it was found that dental treatment is a predominant risk factor for transmission of HBV as 96% of positive cases had received dental treatment in Egypt (Awadalla et al., 2011). Indeed, the epidemiological studies suggest that the prevalence of HIV infection is low in Egypt and there are few studies characterizing behaviors associated with transmission. HCV infection on the other hand is highly endemic in Egypt where 10%-15% of the population has evidence of chronic HCV infection (Frank et al., 2000). Chronic liver disease associated with HCV infection is one of the major causes of death in Egypt (Habib et al., 2001, and Medhat et al., 2002).With wide spread increase in infectious diseases all over the world, it becomes a compulsion to re-evaluate the knowledge and attitude of the dental patients about infection control protocol (Bhayya and Shyagali, 2011). Even though, there are many studies done with the intention of assessing dentist's knowledge towards barrier technique, very few studies have reported dental patient's awareness about infection control. For these reasons we felt that it's necessary to study that phenomenon in attempts to shed light on it; identifying the degree of awareness would help dental patients to judge and select appropriate dental treatment places. Therefore; the current study will provide information which will help to guide the design and implementation of appropriate program.

## AIM OF THE STUDY:

This study aims to assess knowledge and attitude of dental patients towards cross-infection control measures at dental clinics.

## SUBJECT AND METHODS:

*Research design:* The descriptive cross - sectional research design was used in this study.
*Study hypothesis:* The hypothesis posited to this study was: dental patients may have poor knowledge and negative attitude toward cross-infection control measures at dental clinics.
*Settings:* This study was conducted at dental out patients' clinics at Assiut University Hospitals.
*Sample:* Systematic random sample techniques was used in this study, after flow determination in the previous month to data collection, researchers take 10% from the follow. It includes all male and female adult dental patients affiliated to dental outpatient clinics at Assiut University Hospitals. The total number of the studied sample was (386) dental patients.

*Tools of the study:*
*Tool (1):* A structured interview questionnaire was used to collect data, it was developed by the researchersbased on a review of relevant literature to elicit the needed information. It consists of two main parts:
*Part I:* It includes items related to socio-demographic characteristics such as age, sex, level of education and occupations.
*Part II:* It includes items about patient level of knowledge about infection control and universal precaution such as definitions of cross- infection and infection control, occupational and infectious diseases that dental patients high risk for them, mode of transmission of the most important blood borne pathogens in dentistry as: AIDS, viral hepatitis B and C. Personal protective equipment that dentists should wear as gloves, gown, mask and goggle. Perceived reasons for using and changing cross- infection control measures in dental practice. Correct methods and necessity of instrument sterilization. Dental patients concern's regarding risk of contracting infection from dental clinic.

*Tool (2):* It includes items related = dental patients attitude toward cross infection by using (5) point likert scale (Azodo et al., 2010). The scale was translated and modified by researchers to suit cultures. It consisted of (11) items about attitude that dentist should always wear gloves, replace gloves after receiving phone call, treat more than one patient with the same gloves, always wear face mask, reluctance to receive treatment from a dentist that not wearing gloves, reluctance to receive treatment from a dentist not wearing face mask, attitude that dentist should always wear eye goggles, bother about the sterilization of instrument asked dentist about the way they sterilize their instrument sterilization, receive treatment from a dentist that is not immunized against hepatitis B, catching infection during dental treatment. As regards the scoring system, each item was answered by selecting only one answer from five alternatives (strongly agree = 4, agree = 3), uncertain = 2, disagree = 1and strongly disagree = 0. But the negative questions were scored in reverse manner.

## METHODS

### A) Preparatory phase:

After preliminary construction of the questionnaire it was presented to three professors of Community Health Nursing (2) and Dental Medicine, to test content validity. An official approval letters were obtained from the Dean of Faculty of Nursing, Assiut University, to the chairmen of the Assiut University Hospital. This letter included the nature and purpose of the study, which were briefly explained through direct personal communication.

### B) Pilot study:

A pilot study was conducted to evaluate the applicability, clarity of the sheet and time needed to fulfill it. It was carried out on a sample of 10% of the sample. The necessary modifications were made and the questionnaire was reconstructed. The pilot results were not included in the sample, but were used to calculate the value of coefficient of internal consistency (Cornbrash's alpha test) which reached to 90%, indicating high degree of internal consistency between the questioners' question. Also the Pearson correlation coefficient was used in some key question, it was ranged between 0.78 and 0.85 indicating reliability and stability of the questionnaire.

### C) Field work:

The researchers started to collect data from May 2014 to July 2014. The researchers met the studied sample at dental clinics before the treatment. To give us the great chance to assess the level of knowledge and attitude before patients met the dental team. The aim and nature of the study were explained to every patient. The researchers explained the main parts of the questionnaire to every patient. The questionnaire took about (15-25) minutes depending on the persons response to the questions. The data was collected four days per week. Finally, the researcher thanked the patients' for their cooperation.

### D) Ethical consideration:

At the initial interview, each patient was informed of the purpose and nature of the study, and the researchers emphasized that participation would be voluntary; hence, every dental patient had the right to participate or refuses to be included in the work. The consent for participation was taken orally. In addition, the confidentiality of the data was maintained, explained and also printed in the questionnaire.

### E) Statistical analysis:

The obtained data was reviewed, prepared for computer processing, coded, analyzed and tabulated. Data entry was done using the computer software package, while statistical analysis was done using the SPSS version 20 statistical software package. Data was presented using descriptive statistics in the form of frequencies and percentages, means, standard deviations and using chi-square test. A statistical significance was considered at P- value <0.05. Regarding the scoring system each area of knowledge the score of items were summed up and the total was divided by the number of the items giving a mean score for the part these scores were converted into a percent then, mean and standard division were computed using score (poor = score <50%, satisfactory = score 50-70%, and good = score >70% (Shalkamy, 2012). While the attitude was scored as the following (negative= score <60% and >60% positive (Azodo et al., 2010).

## RESULTS

Table (1) shows the distribution of the studied dental patients regarding their socio-demographic characteristics, it was found that more than half (56.0%) aged from 20 to less than 40 years and the mean age was 33.2 year. More than half (58.5%) was females, about two fifths (40.7%) had low level of education, in additions about one quarter (24.6%) had low level of occupation.

Table (2) demonstrates the distribution of the studied dental patient's regarding perceived reasons for using cross-infection control measures in dental practice. More than half (53.6%) of dental patient's had incorrect perception regarding the reasons for hand washing. The majority (82.9%) had in correct perception regarding the reasons for history taking. On the other hands more than half (56.2%) had correct perception about the reasons for using gloves by dentists. The majority (89.9%) had in correct perception for the reasons of using the mask by dental health team. The great majority (97.2 % & 99.2% respectively) of dental patients had in correct perception regarding the exact causes for using gown and spectacles.

Table (3) pointed out to the perceived reasons for changing cross- infection control measures in dental clinics as mentioned by the studied dental patient's. Less than half (48.7% & 47.2 %) respectively of dental patient's perceived that the correct time for hand washing is after de-gloving and before gloving. The majority (79.0%) reported that dentist shoulduse new gloves for every patient. But only (15.8%) said that dentist should use new mask for every patient. The high percent 73.6% perceived that a new instrument should used for every patient.

Table (4) revealed the great majority (94.9%) of dental patients who had low level of education had poor knowledge. Moreover, (4.9%) of dental patients who had high level of education had good knowledge regarding cross- infection control measures and there was a statistically significant relation P (0.001) between educational level and total level of knowledge.

Table (5) shows (70.7%) of females dental patients very concerned regarding the risk of contracting infection from dental clinic, and there is a statistically significant relation P (0.030 , 0.003, 0.016) between sex, level of education & occupation respectively and the risk of contracting infection from dental clinic.

Table (6) demonstrates the dental patient's attitudes regarding cross- infection control measures, it was found that (39.4% & 60.6% ) of male and female respectively had positive attitude and there is a statistically significant relation between sex, level of education and occupation and dental patient's attitudes regarding infection control measures.

Table (1): Distribution of the studied dental patient's regarding their socio-demographic characteristics

| Socio -demographic characteristics | Dental patients (No.= 386) | |
|---|---|---|
| | No. | % |
| **Age/ years:** | | |
| <=20 | 56 | 14.5 |
| 20 - <40 | 216 | 56.0 |
| 40 - <60 | 96 | 24.9 |
| 60+ | 18 | 4.7 |
| **Mean ± SD** | 33.2 ± 12.4 | |
| **Sex:** | | |
| Male | 160 | 41.5 |
| Female | 226 | 58.5 |
| **Level of education:** | | |
| High | 82 | 21.2 |
| Medium | 147 | 38.1 |
| Low | 157 | 40.7 |
| **Level of occupation:** | | |
| High | 50 | 13.0 |
| Medium | 44 | 11.4 |
| Low | 292 | 75.6 |

Table (2): Distribution of the studied dental patient's regarding perceived reasons for using cross- infection control measures in dental clinics

| Variables | Correct | | In correct | | $X^2$ | P-value |
|---|---|---|---|---|---|---|
| | No. | % | No. | % | | |
| ▪ **Hand washing** | 179 | 46.4 | 207 | 53.6 | 4.0 | 0.045* |
| ▪ **History taking** | 66 | 17.1 | 320 | 82.9 | 334.2 | 0.001* |
| ▪ **Gloves** | 17 | 56.2 | 169 | 43.8 | 11.87 | 0.001* |
| ▪ **Mask** | 39 | 10.1 | 347 | 89.9 | 491.2 | 0.001* |
| ▪ **Gown** | 11 | 2.8 | 375 | 97.2 | 687.1 | 0.001* |
| ▪ **Spectacles** | 3 | 0.8 | 383 | 99.2 | 747.5 | 0.001* |

-(*) Significant at P< 0.05 $X^2$: Chi-Square test

Table (3): Distribution of the studied dental patient's regarding perceived reasons for changing cross- infection control measures in dental clinics

| #Perceived reasons | Dental patients (No.= 386) | |
|---|---|---|
| | No. | % |
| **Time for hand washing** | | |
| Before patients treatments | 68 | 17.6 |
| After patients treatments | 135 | 35.0 |
| Before gloving | 182 | 47.2 |
| After de-gloving | 188 | 48.7 |
| At any time when polluted | 68 | 17.6 |
| Don't know | 55 | 14.2 |
| **For changing gloves the dentist should :** | | |
| Use new gloves for every patient | 305 | 79.0 |
| Wash gloves between patients | 7 | 1.8 |
| Change gloves if necessary | 30 | 7.8 |
| Don't know | 44 | 11.4 |

Cont., table (3): Distribution of the studied dental patient's regarding perceived reasons for changing cross- infection control measures in dental clinics

| #Perceived reasons | Dental patients (No.= 386) | |
|---|---|---|
| | No. | % |
| **For changing mask the dentist should**: | | |
| Use new mask for every patient | 61 | 15.8 |
| Change it if visibly contaminated | 6 | 1.6 |
| Change it if necessary | 39 | 10.1 |
| Don't know | 22 | 5.7 |
| **For cleaning spectacles the dentist should**: | | |
| Wash spectaclesafter every patient | 11 | 2.8 |
| Wash spectacles if visibly contaminated | 2 | 0.5 |
| Wash spectacles if necessary | 16 | 4.1 |
| Don't know | 12 | 3.1 |
| **For changing dental instruments**: | | |
| Use new instruments for every patient | 284 | 73.6 |
| Change it if visibly contaminated | 16 | 4.1 |
| Change it if necessary | 29 | 7.5 |
| Don't know | 57 | 14.8 |

# More than one answer was allowed and the percentage calculated from those mentioned yes

Table (4): Relation between educational level and total level of knowledge about cross- infection control measures

| Knowledge level | Educational level | | | | | | | | $X^2$ | P-value |
|---|---|---|---|---|---|---|---|---|---|---|
| | High | | Medium | | Low | | Total | | | |
| | No. | % | No. | % | No. | % | No. | % | | |
| - Poor | 61 | 74.4 | 136 | 92.5 | 149 | 94.9 | 346 | 89.6 | | |
| - Satisfactory | 17 | 20.7 | 11 | 7.5 | 8 | 5.1 | 34 | 9.3 | 32.6 | 0.001* |
| - Good | 4 | 4.9 | 0 | 0.0 | 0 | 0.0 | 6 | 1.1 | | |

-(*) Significant at P< 0.05          $X^2$: Chi-Square test

Table (5):  Dental patients concern's regarding risk of contracting infection from dental clinic according   to sex, level of education and occupation

| Variables | Very concerned | | Somewhat concerned | | Not concerned | | $X^2$ | P-value |
|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | | |
| **Sex :** | | | | | | | | |
| • Male | 22 | 29.3 | 92 | 42.6 | 45 | 49.5 | 7.04 | 0.030* |
| • Female | 53 | 70.7 | 124 | 57.4 | 46 | 50.5 | | |
| **Level of education:** | | | | | | | | |
| ▪ High | 30 | 40.0 | 45 | 20.8 | 15 | 16.5 | | |
| ▪ Medium | 26 | 34.7 | 79 | 36.6 | 35 | 38.5 | 6.59 | 0.003* |
| ▪ Low | 19 | 25.3 | 92 | 42.6 | 41 | 45.1 | | |
| **Level of occupation:** | | | | | | | | |
| ▪ High | 12 | 26.1 | 31 | 67.4 | 3 | 6.5 | | |
| ▪ Medium | 13 | 27.7 | 19 | 40.4 | 15 | 31.9 | 15.6 | 0.008* |
| ▪ Low | 50 | 17.3 | 166 | 57.4 | 73 | 25.3 | | |

Table (6):  Dental patient's  attitudes  regarding  cross- infection control measures  according  to sex , level of education and occupation

| Variables | Positive attitude | | Negatives attitude | |
|---|---|---|---|---|
| | No. | % | No. | % |
| **Sex:** | | | | |
| ▪ Male | 95 | 39.4 | 65 | 44.8 |
| ▪ Female | 146 | 60.6 | 80 | 55.2 |
| **P. value** | 21.7(0.001*) | | 3.14(0.072) | |
| **Level of education:** | | | | |
| ▪ High | 56 | 23.2 | 26 | 17.9 |
| ▪ Medium | 104 | 43.2 | 43 | 29.7 |
| ▪ Low | 81 | 33.6 | 76 | 52.4 |
| **P. value** | 21.7(0.001*) | | 40.12(0.001*) | |
| **Level of occupation:** | | | | |
| ▪ High | 33 | 13.7 | 17 | 11.7 |
| ▪ Medium | 33 | 13.7 | 11 | 7.6 |
| ▪ Low | 175 | 72.6 | 117 | 80.7 |
| **P. value** | 250.8(0.001*) | | 220.1(0.001*) | |
| **Total attitudes:** | 241 | 62.4% | 145 | 37.6% |

with dental treatment.

## DISCUSSION

The dental team has ethical and legal professional responsibility for implementing infection control measures for elimination of the spread of infection (Samarnayake et al, 2002). To the best of our knowledge this is the first published study conducted for assessing knowledge and attitude of dental patients towards cross-infection control measures at Assiut City. Our study indicatedthe great majority of dental patients who had low level of education had poor knowledge. While 4.9% of dental patients who had high level of education had good knowledge regarding cross- infection control measures and there was a statistically significant relation between educational level and total level of knowledge. Mousa et al ., (1997) support our findings who study knowledge and attitudes of dental patients towards cross-infection control measures in dental practice. This findings may be attributed to the fact that more educated personnel are more knowledgeable and had the capability to attain and remain this knowledge. As well, may be due to their familiarity with previous experience

The current study mentioned that 39.4% & 60.6% of male and female respectively had positive attitude and there is a statistically significant relation between sex, level of education and occupation and dental patient's attitude regarding infection control measures. Our finding with agreement of previous studies reported that the educational attainment, gender, geographic location, language and dental visiting pattern (Mousa et al., 1997 &Sofola et al., 2005), plus age (Otuyemi et al., 2001), were the factors affected knowledge and attitude of dental patients towards infection control measures in dentistry.

These findings could be explained and demonstrated by the fact that dental practice has changed its attitude considerably towards the cross infection measures. A decade ago wearing gloves was considered necessary for the selected procedure, but with the increase in the incidence of the spreadable of infectious diseases dental community has changed it's attitude towards cross contamination measures (Burke et al, 1992).   In additions, barrier techniques as mouth mask,

gloves, protective eyewear, and protective clothing were recommended to protect both the operator and the patient from cross-infection during routine examination, as well as during dental treatment procedures, apart from providing patient with the sense of security and trust towards the dental health care team. Moreover; many authorities as Centers for Disease Control and British Dental Association have recommended the comprehensive guidelines for the cross infection control and usage of gloves as one of the measures to reduce the risk of infection, because hands are the major source of infection especially the nail folds (Al-Moherat et al, 2008).

## CONCLUSION

This study concluded that dental patients at Assiut City need to be equipped with adequate knowledge about cross infection control at dental clinics thus education reinforcement is imperative.

## RECOMMENDATIONS

Based on the results of this study the following recommendations are suggested:
Health education program by the Egyptian Ministry of Health and Population, aimed at promoting knowledge and attitude of dental patients toward cross infection control measures in dental clinics, through mass media, such as television, radio, newspaper and magazines. This will probably be an additional driving force in changing the behaviors of dental team and reducing infective hazards; so that dental patients can compare and select dental clinic which implement the strict measures of infection control. In additions every dental clinic should have a written infection control policy posted outside the clinic.

## REFERENCE

[1]. Al-Moherat FH, Karam H, Shagra A: Children's attitude to the use of gloves by dentists. Pakistan Oral & Dental Journal, 2008; 28(2): 301-303.

[2]. Askarian M, Assadian O: Infection control practices among dental professionals in Shiraz dentistry school, Iran. Archives of Iranian Medicine, 2009; 12 (1): 48-51.

[3]. Australian Dental Association, ADA (2012): Guidelines for Infection Control, Second Edition. Authorized by FS Fryer, Federal President, Australian Dental Association Inc. Available at : www.ada.org.au

[4]. Awadalla, H. I., Ragab, M. H., Osman, M. A. and Nassar, N. A.( 2011): Risk Factors of Viral Hepatitis B among Egyptian Blood Donors, British Journal of Medicine & Medical Research, 1(1): 7-13.

[5]. Azodo CC., Umoh A., Ehizele., A. O. (2010): Nigerian patients' perception of infection control measures in dentistry. International Journal of Biomedical and Health Sciences, 6(4): 508-516

[6]. Bhayya, D.P., andShyagali, T. R. (2011): Parental Attitude and Knowledge towards the Usage of Barrier Techniques by Pediatric Dentist. People's Journal of Scientific Research, 4(2):29-33.

[7]. Burke FJT, Wilson NHF, Shaw WC, Cheung SW: Glove use by orthodontists: results of a survey in England and Wales. European Journal of Orthodontics, 1992; 14(3): 246-251.

[8]. Centers for Disease Control and Prevention. Updated U.S. Public Health Service guidelines for the management of occupational exposures to HBV, HCV, and HIV and recommendations for post exposure prophylaxis. MMWR2011; 50:1

[9]. Christensen, B.L and Kockrow, E.O. (2006): Foundation Of Nursing, Medical /Surgical Asepsis and infection control, Chapter 12, 5th ed, Mosby Elsevire, United States of America .Pp. 270- 314.

[10]. Cleveland , J. L., Barker L., Brown.G., Lenfeste., N., Lux L, Corley, T. J. and Bonito, A. J.(2014): Advancing infection control in dental care for Disease Control and Prevention implementation of guidelines from the Centers settings: Factors associated with dentists', JADA;143(10):1127-1138.

[11]. Darby, M.L and Walsh, M.M.(2003): Dental Hygiene Theory and practice, Infection control ,2nd, Saunders, USA, pp.76-108.

[12]. Farghaly, A.G, Mansour GA, Mahdy NH, Yousri A. Hepatitis B and C virus infections among patients with gingivitis and adult periodontitis: sero prevalence and public health importance. Egypt Public Health Assoc.1998;73 (5-6):707-35.

[13]. Frank C et al. The role of parenteral anti -schistosomal therapy 8. in the spread of hepatitis C virus in Egypt. Lancet, 2000, 11:887–91.

[14]. Habib M et al. Hepatitis C virus infection in a community in 9. the Nile Delta: risk factors for seropositivity. Hepatology, 2001, 33:248–53.

[15]. John, J. H, Thomas, D., Richards, D., and Evans, C. (2002): Regulating dental nursing in the UK, British Dental Journal; 193(4): 207-209.

[16]. Kohn WG, Collins AS, Cleveland JL, Harte JÁ, Eklund KJ, Malvitz DM. Guidelines for infection control in dental health care settings. MMWR Recommendations Rep2013; 52(17):1–61

[17]. Machado-Carvalhais HP, Martins TCPM, Ramos-Jorge ML, Magela-Machado D, Paiva SM, Pordeus IA. Management of occupational bloodborne exposure in a dental teaching environment. J Dent Educ2007;71(12):1348–55.

[18]. MC Closkey, J.C and Bulechek, G.M (2000): Nursing intervention classification (NIC)(3rd). St. Louis: Mosby.

[19]. MC Ewen, M.(2002): Community based Nursing an introduction, Role and Intervention in Community - Based Nursing Practices, 2nd, Saunders, Philadelphia, London .P.20.

[20]. Medhat A et al. Hepatitis C in a community in Upper Egypt: risk 10. factors for infection. American journal of tropical medicine and hygiene, 2002, 66:633–8

[21]. Mousa, A. A., Mahmoud, N.M., Tag El-Din, A.M. (1997): Knowledge and attitudes of dental patients towards cross-infection control measures in dental practice, Eastern Mediterranean Health Journal, 3(2):263-273.

[22]. Myers R, Larson E, Cheng B, Schwartz A, Da Silva K, Kunzel C. Hand hygiene among general practice dentists: a survey of knowledge, attitudes, and practices. J Am Dent Assoc2008;139:948–57.

[23]. Otuyemi, O.D, Oginni, A.O, Ogunbodede, E.O, Oginni,F.O, and Olusile, A.O.( 2001): Patients' attitudes to wearing of gloves by dentists in Nigeria. East East African Med J.;78:220–2.

[24]. Potter, P.A, and Perry, A.G. (2001): Fundamental of Nursing, Infection Control, Infection control, chapter 33, 5th edition, Mosby, Philadelphia, London .pp .835-882.

[25]. Samarnayake, L.P, Jones, B.M, and Scally, C. (2002): Essential Microbiology for Dentistry, principles of infection control, 2nd ed, Churchill Livingstone, Edinburgh London, Pp.255-271.

[26]. Shalkamy, F., R. (2012):Knowledge and Attitude of Assiut University Dorms Students about Consanguinity Marriage. Unpublished Master. Thesis in Community Health Nursing, Faculty of Nursing, Assiut University.

[27]. Sharon, K. Dickinson, CDA, CDPMA, RDA; Richard D. and Bebermeyer, D.D.S (2013): Guidelines for Infection Control in Dental Health Care Settings, Continuing Education, American Dental Assistants Association available at: www.dentalassistant.org.

[28]. Singh A., PurohitB. M., Bhambal, A. Saxena, S ., Singh, A and Gupta A. (2011 ):Knowledge, Attitudes and Practice Regarding Infection Control Measures Among Dental Students in Central India Journal of Dental Education,. 75( 3): 421-427.

[29]. Sofola, O.O, Uti, O.G, andOnigbinde, O.O.( 2005): Public perception of cross-infection control in dentistry in Nigeria. Int Dent J.;55:383–7.