

Full Length Research Paper

Infection control knowledge attitudes and practices of dental practitioners in Kampala

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Sterilization and personal protection procedures are extremely important in dental offices because infections such as hepatitis, HIV, tuberculosis can be passed on to the health care worker or the patient during treatment. Thus, sterilization and personal protection procedures are extremely important in dental offices. The aim of the present study was to evaluate awareness of infection control procedures among dental practitioners in Kampala. In this descriptive study, 50 dental practitioners working in clinics and public hospitals with in Kampala City Council Authority were selected. Data were collected by means of an interviewer-administered questionnaire, which included respondents' personal profile and questions on infection control and sterilization. There were no statistically significant differences in the level of knowledge between male and female care providers and between dental surgeons and public health dental officers. However, male care providers were more likely to take extra care when treating persons with HIV [difference 0.33; 95% confidence interval (CI):0.06 - 0.62 p=0.002]. Only 12% of respondents reported that all their staffs were vaccinated against HBV. Unfortunately fifty 50% of the subjects engaged in some form of needle recapping. The results of this study show that dental practitioners neglect the principles for personal protection and cross-infection control, whether this is due to lack of knowledge or unsupportive environment. Means must be designed so as to enforce knowledge attainment and practice.

Key words: Infection control, dentists knowledge attitudes, HBV, hospital infections, hand hygiene.

INTRODUCTION

Oral health care workers are particularly exposed to infectious material in the course of their routine service. The risk of infections varies from the innocuous common cold to life-threatening diseases such as tuberculosis, hepatitis and HIV/AIDS (Bellei et al., 2007;Kayanja et al., 2005; Alavian, Mahboobi and Mahboobi, 2011). A study from Brazil reported 10.8% sero-positivity among dentists for hepatitis B compared to 9.4% among blood donors from the same geographical area (Batista et al., 2006). The prevalence of hepatitis B infection is 9.5-11.1% in Ugandan population compared to 2.5-5% in a US population (Bwogi et al., 2009;Wasley et al., 2010). These infections are transmittable via blood, saliva and

aerosols. Additionally Uganda has a high prevalence of HIV and yet this drives tuberculosis infection (Kirenga et al., 2013), thus health care workers are most likely exposed to tuberculosis droplets in their day to day work. Dentistry is high risk given the high level of aerosols that are associated with dental rotary equipment and the limited working space that predisposes clinicians to percutaneous injuries (Gambhir et al., 2011; Leggat et al., 2007). Most studies have found percutaneous injuries as the greatest number of occupational accidents during dental procedures. These are mainly caused by rotary instruments; however, dental practitioners are at a higher risk of infection due to multiple encounters with patients who include unidentified carriers of hepatitis, tuberculosis and HIV (Gambhir et al., 2011;Leggat et al., 2007; Wang et al., 2003; Cadmus et al., 2010).

Therefore, dental practitioners and auxiliaries must gain and practice sound knowledge of infection control. The aim

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of the present study was to evaluate awareness of infection control procedures among dental practitioners in Kampala.

METHODS

For the purposes of this study, only participants regarded as qualified to offer dental clinical services were included. 'Dental clinical services' were considered to be tooth extractions, scaling and polishing, restoration and minor surgical procedures. Auxiliaries and nurses that clean between patients and administer drug other than local anesthetic were excluded. Therefore, dental surgeons, and public health dental officers (PHDOs) were chosen to complete the questionnaire. The dental surgeons eligible were of any grade from general practitioners to consultants. The public health dental officers are a category of practitioners that undergo a 3 year dental training program that enables them to carry out public health education, emergency extractions, scaling and polishing plus dental filling. We included recently graduated public health dental officers as well as senior public health dental officers. The study was carried out in the five divisions of Kampala that include Makidye, Nakawa, Lubaga, Kawempe and Central.

Kampala City Council Authority health center IVs of Kilundu, Kawempe, Kiswa and Mulago hospital were included because they are public health care facilities that mainly cater for low income earners. Health center IVs are health facility that serve a county or a parliamentary constituency. They are mini hospital that offer basic health care, but additionally are equipped with admission facilities. They are supposed to be manned by a senior medical officer and another doctor as well as be equipped with a theatre for carrying out emergency operations. The dental facilities at public hospitals and health center IVs, totalled 11. Thirty five randomly selected private clinics were invited to participate but only 30 accepted. We chose the private clinics using a non proportional quota sampling technique, that is; one dental clinic from a hospital facility to five from private dental clinics in each division, totaling to thirty five dental clinics. The private dental clinics were drawn from the register of the Uganda Medical and Dental Practitioners' Council (UMPDC) and the Allied Health Practitioners Council (AHPC) that had a total of 140 facilities that offered dental services within Kampala. The UMPDC registers medical facilities that are under clinically focused medical and dental degrees while AHPC caters for public health dental officers, dental technicians/denturists. A pilot study was carried out on fourth and fifth Bachelor of Dental Surgery Degree students (BDS), of Makerere University College of Health Sciences, within Mulago hospital. The content of the questionnaire was based loosely upon the one used by Mahdipour et al. (2007), with further appropriate questions relevant to the everyday practice of

dental clinicians. Two research assistants (PHDO background) with experience and skill in conducting data interviews, collection and management were recruited and trained. They were explained the objectives of the study and were trained on how to collect data for this particular study. The final questionnaire comprised 17 questions, mostly consisting of fixed-choice items in the form of a Likert scale, multiple choice questions. Some open-ended questions were included, allowing for exploration of possible issues arising from a question querying the practice of a particular dental care provider. The information collected included age, gender, training background, grade and practice, attitudes towards infection control and their reported practice, history of occupational exposure, and knowledge of HBV, HIV and tuberculosis transmission.

A comparative analysis was carried out between the dental surgeons and dental officers, allowing us to identify differences between and within the two groups. Statistical analysis was performed using SPSS Version 15 obtaining frequencies, confidence intervals, Chi-squared (χ^2) test with Yates' correction.

RESULTS

We had a total 50 respondents of which 74% were male, 46% dental surgeons, 38% PHDOs and 8% had both training backgrounds the rest being specialists. In this study 62.5% had been in practice for ≤ 5 years. The respondents ranged from 22-61 years with a mean age of 32.6 ± 9.0 .

Significantly fewer females [difference 0.22; 95% confidence interval (CI): 0.03 - 0.47 $p=0.02$] reported that they felt they had received sufficient formal infection control training during staff trainings. Additionally more males reported taking extra care when treating people with HIV [difference 0.33; 95% confidence interval (CI): 0.06 - 0.62 $p=0.002$]

Sixty-four percent (32/50) of all respondents reported getting hepatitis B vaccine and there was no significant statistical difference between gender, training and work experience groupings. However, only 12% of respondents reported that all their staffs were vaccinated against HBV. All these except one were private practitioners.

In the present study there were no statistically significant differences in infection control knowledge between male and female respondents ($\chi^2=1.30$ $z=0.254$ $df=1$). In terms of knowledge there was no difference between those who graduated within the last five years and those who had over five years of work experience ($0.291 \chi^2=0.29$ $z=0.590$ $df=1$).

In general, the highest knowledge of respondents was on the infectivity of HBV compared to HIV (96%) and most of them (82%) felt that the supervisors did not encourage employees to obtain training in occupational

Table 1. Shows the general response to questions posed with answers based on a likert scale.

	Encouragement to obtain occupational health and safety training	Sufficient infection control during training	Sufficient infection training staff	Necessary training to protect myself from communicable respiratory diseases such as Tuberculosis.	Proper training, including how to fit-check before using N95 mask, so that I can protect myself from communicable respiratory diseases such as tuberculosis
Strongly agree	2	8	16	12	12
Agree	6	14	14	14	10
Neither agree nor disagree	20	4	6	6	8
Disagree	34	31	32	32	34
Strongly disagree	48	43	32	32	36
Total	100	100	100	100	100

health and safety issues, such as safe patient-handling techniques as shown in Table 1. Up to 24% of the respondents felt that the working environment did not support any of the four questions posed in table 1.

Ninety two percent of the subjects in this study used gloves routinely while 84% used masks in all interactions with patients. Seventy eight percent of the practitioners said they always washed hands in between patients. Unfortunately fifty percent of the subjects engaged in some form of needle recapping before disposing of these sharps. Only one respondent had access to an auto needle destruction facility. Forty four percent of respondents always used gloves masks and eye protection while 36% used at least two of these protective gears always. However, there were no statistically significant differences between the gender, training background and years in practice.

DISCUSSION

In this study we relied on convenience sampling of the respondents i.e. the clinicians who were at the chosen sites on the visit days answered the questionnaire. Additionally they had the choice to opt out thus; responses were received from only a small proportion of the targeted staff.

Given the approach of only administering the questionnaire to those who were ready to fill and return it immediately, we are not able to come up with response rates, however, this style of sampling bias may have affected our results. Although we did look at compliance by observing the dental practitioners, we didn't analyze the data since we felt the Hawthorne effect(Gale, 2004) would have greatly affected the results. The way to go may be hidden cameras and then questionnaires directed

to those who were secretly observed. This would raise a lot of ethical challenges and implementing it in private practices would be impossible. However, a report of the discrepancy on hand hygiene practice and knowledge (Jenner et al., 2006) leaves no doubt that our respondents could easily have said something different yet never put it to practice.

Our study demonstrates considerable scope for improvement in work place support and training in infection control, as shown in table 1, most of the respondents felt there was hardly support for them when it comes to these critical infection control knowledge acquisition. It has been shown that an infection control plan and staff training are essential if standards are to be met (Report, May, & Health, 2012). Therefore the fact that the practitioners felt that support was not that good in terms of training, there is dire need to add infection control to continuing dental education (CDE) requirements as part of the yearly licensing process. Modern means can be used to ensure that some form of compulsory infection control training is done on a yearly basis with the councils using a computer based questionnaire to check and award CDE hours. A similar approach has been shown to enhance infection control knowledge and willingness to practice established guidelines(Yassi, Bryce, Maultsaid, Lauscher, & Zhao, 2009). In some centers integrating infection control occupational health has proven effective in enhancing knowledge and practice (Yassi et al., 2011) and it may be a cost effective way of utilizing occupational health staff. However, this may be applicable for public health care facilities but not small private practices since they usually don't have occupational health units.

The respondents to our questionnaire exhibited substantial knowledge concerning transmission risks of HBV and HIV. This may be due to numerous trainings

that have been carried out within different HIV/AIDS projects aimed at making health care workers comfortable with handling HIV positive patients and people living with the virus (EngenderHealth 2011). However, the fact that males reported higher likelihood of taking extra care when handling people living with HIV shows deficiency in knowledge since all patients should be handled as potentially infectious and the extra care taken may discourage patients from revealing their status. In any case the risk of infection may be higher for those whose status is not known since they are most likely not on HAART. A study from Nigeria reported up to 91% of health care workers felt that they needed to be informed of the patient's HIV status so as to take extra care while administering treatment (Reis et al., 2005). This may be the same attitude that many of the dental health providers have and as such we need to educate them about the need to handle all patients as potentially infectious to ensure that glaring differences in the way patients are handled given their HIV status are avoided.

The 72% respondents who reported washing hands routinely between patients collaborates with a finding from Birmingham doctors. Glove use was the most commonly given reason for not washing hands. This differed with results of previous studies that reported time constraint as the major excuse (Stein et al., 2003). It is unfortunate that gloves are thought to obviate the need for hand washing since they only reduce the amount of contamination on the hands but do not eliminate it since fluids still get through microscopic holes in the gloves (Girou et al., 2004).

Up to 46% of the respondents re-sheathed needles manually. This was worse than a study conducted in the UK and USA (Stein et al., 2003; Gershon et al., 1998). This study showed the need for continuous training on sharps handling. We ought to increase the effort we put in during the training years.

In this study only 44% used all protective gears such as masks gloves and eye wear routinely. This was lower than that reported by a study from Kuwait (Morris et al., 1996). This may be due to availability and costs given the relatively scarce resources in Uganda compared to Kuwait.

This study illustrates the need to improve infection control practices in dental practices within Kampala and Uganda at large. The possible explanations for poor compliance with known recommended practices may be multifaceted ranging from training, scarcity, costs and attitudes. Previous research suggests that compliant HCWs are more likely to have knowledge than their non-compliant colleagues (Gershon et al., 1995), (Gershon et al., 1998). Therefore non compliance such as needle re-sheathing may be a reflection of the fact that a significantly higher number of respondents were not satisfied with the level of support they get from their work places when it comes to getting infection control related training. It could prove greatly beneficial for all dental

care providers to receive formal training as part of their yearly work place trainings.

Perhaps, the practitioner's councils could come up with some form of yearly evaluation of infection control knowledge emphasizing current advances as a requirement for license renewal. Additionally disciplinary measures could be introduced to catch the workplaces found not to meet the minimum infection control practices during the on-spot inspection by the practitioners' councils and KCCA health inspectors. This would encourage dental care facilities to avail necessary infection control equipment such as sinks, gloves, and sharps containers thus removing the excuse of lacking.

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