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AWARENESS AND EXPERIENCE OF NEEDLE STICK INJURIES AMONG DENTAL STUDENTS AT THE UNIVERSITY OF NAIROBI, DENTAL HOSPITAL

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## AWARENESS AND EXPERIENCE OF NEEDLE STICK INJURIES AMONG DENTAL STUDENTS AT THE UNIVERSITY OF NAIROBI, DENTAL HOSPITAL

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### ABSTRACT

**Background:** Needle stick injuries (NSI) are the commonest route by which blood borne viruses and/or infections such as HIV, Hepatitis B and C are transmitted from patients to health care workers (HCW). Dental students are also at risk of such infections and injuries due to accidental contamination during their practical occupational exposure. There is hardly any information regarding the knowledge and experiences of NSI among dental students in Kenya.

**Objective:** To determine the knowledge and experiences of NSI among dental students at the University of Nairobi Dental Hospital (UONDH).

**Design:** Descriptive cross-sectional study.

**Setting:** University of Nairobi Dental Hospital premises. The population included undergraduate and postgraduate dental students pursuing their degrees at the university.

**Results:** Seventy two questionnaires were issued and a response rate of 62(81%) was achieved. The age of the respondents ranged from 21-35 years with a mean age of 24 years ( $SD \pm 4.7$ ) years. There were 33(53%) males and 29(47%) females. Most of the students were undergraduates (87%) while the rest were postgraduate students (13%). The majority (97%) of the respondents reported that NSI was a means of cross-infection. Only 29% of the respondents had suffered NSI. Of those who had suffered NSI, 36% of the incidents occurred when administering local anaesthesia, while 23% were during scaling, 18% when recapping needles, 18% while clearing up and 5% when suturing. Only seven of those who had suffered NSI (39%) had reported of NSI. The reasons for not reporting were: fear of stigmatisation (25%) or the fear of consequences of cross-infection (38%). All the respondents who had experienced NSI were undergraduates with no statistical significant difference between the undergraduate and postgraduate students ( $X^2=3.758$ ,  $p=0.052$ ). Among the respondents who had experienced NSI, nine were males and nine were females with no statistical significance between the two genders ( $X^2=0.106$ ,  $p=0.481$ ). All the respondents recorded inadequate knowledge on the modes of prevention of NSI. Less than half (27%) of the respondents had accurate knowledge on the procedure followed in case of NSI. Only 27% of the respondents had taken post-exposure prophylaxis (PEP) after suffering NSI with no statistically significant difference between males and females ( $X^2=44$ ,  $p=0.108$ ).

**Conclusion:** Although the level of knowledge on the risk of cross-infection from NSI was high, there was decreased awareness on the means of prevention and protocol.

### INTRODUCTION

Percutaneous injuries are defined as occupation-related, unintentional injuries that break the integrity of the skin and include needle stick injuries (NSI) (hollow or solid needles), incision object injuries including scalpels or any other sharp object injuries such as glass and empty ampoules (1). It is estimated that the risk of contracting hepatitis B infection

due to NSI is 100 times higher than contracting HIV. The prevalence of occupational HIV is 0.3% after parenteral exposure as to 0.09% after mucosal exposure (2). A study done in Tanzania on the knowledge of the human immunodeficiency virus (HIV) transmission and the occurrence of prick and splash incidents reported that the average health worker was pricked five times and splashed nine times per year. The annual occupational risk of

HIV transmission was estimated at 0.27% for health workers. Among surgeons, the risk was 0.7% (more than twice as high) if no special protective measures were taken (3). In Uganda anonymous questionnaires were given to nursing students and the results showed that 25.3% had suffered an NSI and 50% of the NSI cases were from potentially infective sources. The mechanism of injury in the cases of NSI were variable. Five (25%) of the NSI occurred in students not wearing gloves (4).

In South Africa, 82 percutaneous injuries occurred among doctors of whom only 39 (48%) of the incidents were reported while 44% of the respondents were aware of the correct reporting procedures. The reasons given for the non-reporting of these incidents were "too busy" (58.1%), "did not think it was serious (48.8%), and "was not aware of the reporting procedures" (7%) (5). In the same country a cross-sectional quantitative survey was conducted among nursing students while a significant proportion of the respondents rated the lack of knowledge about NSI (policies and protocol) at institutions of clinical training as an extremely high risk followed by the lack of accompaniment and in-service training. Only 16.0% of the respondents had suffered NSI and only 8.3% had reported the incident (6). There is a paucity of information regarding NSI in Kenya necessitating a survey among dental students enrolled at the University of Nairobi Hospital (UONDH) to determine their knowledge and the circumstances of NSI and how the risk of blood exposure is managed.

## MATERIALS AND METHODS

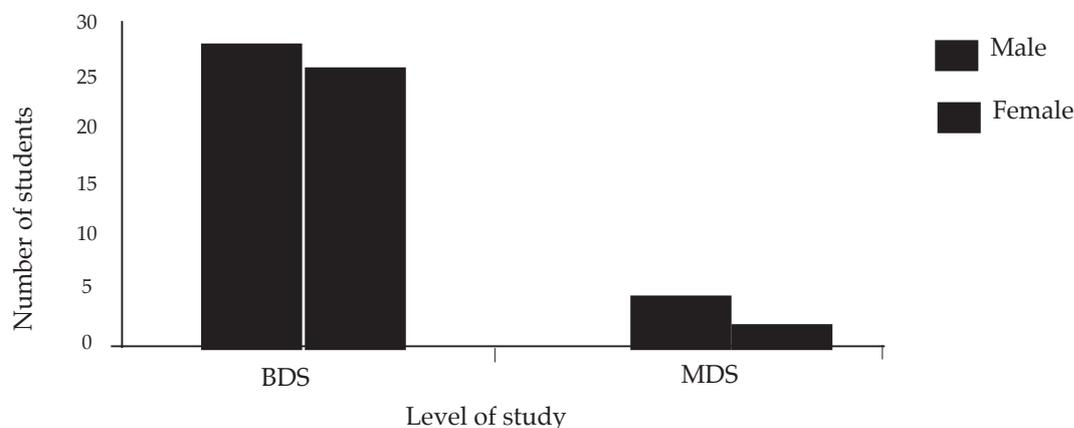
The study was conducted at the UONDH premises including both undergraduate and postgraduate dental

students. It was a descriptive cross-sectional study. The sample size was calculated at 62 using Fisher's formula. Convenient random sampling was used to select the study population. Self administered questionnaires were used to collect data. The data collected were analysed using SPSS (Statistical Package for Social Sciences) and MS- Excel computer programmes. The study was approved by the Ethics and Research Committee of the Kenyatta National Hospital and the University of Nairobi (approval No. UP223/7/2009). An informed consent was obtained from all participants after providing them with sufficient information on the benefits and purpose of the study.

## RESULTS

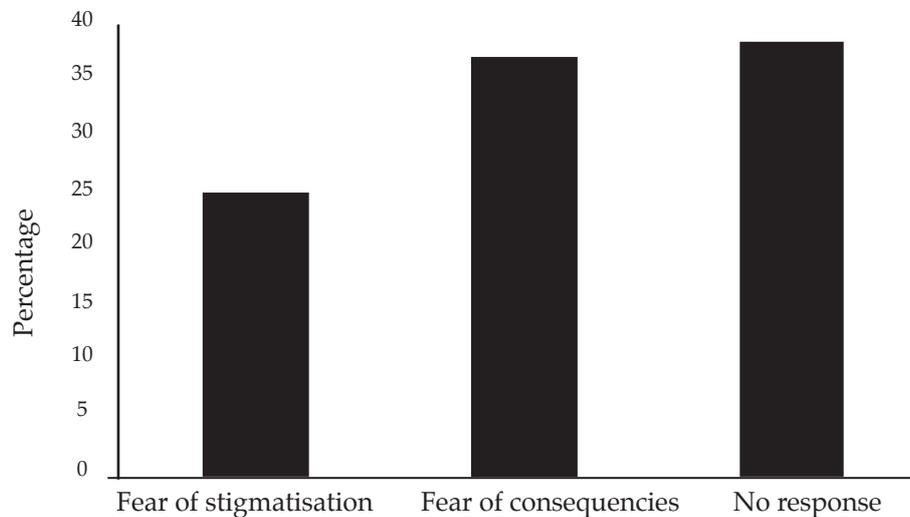
Seventy two questionnaires were issued and a response rate of 62(87%) was achieved. The age of the respondents ranged from 21-35 years with a mean age of 24(SD± 4.1) years. There were 33(53%) males and 29(47%) females. Most of the students 54(87%) were undergraduates while eight (13%) were postgraduate students (Figure 1). The majority 60(97%) of the respondents reported that NSI was a means of cross-infection. Only 29% of the respondents had suffered NSI. Of those who had suffered NSI, 36% of the incidents occurred when administering local anaesthesia, 23% during scaling, 18% while recapping needles, 18% when clearing up and 5% during suturing. Only seven (39%) of those who had suffered NSI had reported the incidences. The reasons for not reporting were: fear of stigmatisation (25%) or the fear of the consequences of cross-infection (38%) (Figure 2).

**Figure 1**  
*Distribution of participants according to gender and level of education of study*



**Figure 2**

*Distribution of the respondents who experienced NSI according to the reason for failure to report*



All the respondents who had experienced NSI were undergraduates in equal gender proportions. They indicated they had inadequate knowledge on the prevention of NSI. Less than half (17 cases) of the respondents had accurate knowledge on the procedure followed in case of NSI. Only 27% of the respondents had taken PEP after suffering NSI with no statistically significant difference between the two genders ( $X^2=4.44$ ,  $p=0.108$ ).

## DISCUSSION

Our results show that most of the respondents had a very good appreciation of the risk posed by NSI in the transmission of blood-borne infections which was similar to a Tanzanian study among health care workers (3). The incidence of NSI was 27% which was slightly higher than that in a South African nursing school (16%). Administering of local anaesthesia had the highest incidence of NSI that involved 36% of the respondents. This was in contrast to nursing students in the aforementioned study where needle recapping was the leading cause of NSI (6). This can be explained by the fact that nursing students hardly use local anaesthesia whereas dental students engage in more invasive procedures at a much higher frequency which involve the use of sharp instruments. Procedures such as tooth extraction, tissue biopsies, restorative treatment and scaling which involve the use of injecting needles, scaler tips as well as suturing needles. The number of unreported cases of NSI was 39% compared to 8.3% among South African nurses and doctors (41.6%) with fear as a major factor for failure to report (5,6). According to the World Health

Organisation (WHO) the factors that discourage reporting of occupational exposure include ignoring that PEP is available and efficient, fear of reprimand, uncertainty regarding the confidentiality of the results, lack of awareness that a protocol exists for managing occupational exposure and a lack of support and encouragement to report. Fear of testing may also play an important role in the underreporting of occupational exposure (7).

In settings with a high prevalence of HIV infection, workers may not report exposure because they do not want to know their HIV status and are thus reluctant to take a screening test (7). The level of education was not a determining factor to the incidence of NSI in this study ( $p=0.052$ ) with no incidence of NSI reported among the postgraduate students. These findings may be attributed to fewer postgraduate students involved in the study population (13%) and these incidences might have increased if more had participated in the study. All respondents recorded inadequate knowledge of the means of preventing NSI with a similar observation made among health care workers in Tanzania (3). The lack of experience and knowledge about the procedure and lack of in service education and accompaniment were cited by nursing students as having been associated with incidences of NSI (6). These factors and others may have probably contributed to the reduced levels of knowledge on NSI preventive measures among dental students as well. Against this background, concerted efforts are needed to improve the knowledge and practices of dental students on personal protective measures against NSI.

In conclusion, although the level of knowledge on the risk of cross-infection from NSI was high; there was decreased awareness on the means of prevention and protocol.

#### ACKNOWLEDGEMENTS

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#### REFERENCES

1. Greene, E.S., Berry, A.J., Arnold, W.P. and Jagger, J. Percutaneous injuries in anesthesia personnel. *Anesth. Analg.* 1996; **83**: 273-278.
2. Joint WHO/ILO Guidelines on health services and HIV/AIDS: June 2005. Available at: [www.who.int/hiv/pub/guidelines\\_ru.pdf](http://www.who.int/hiv/pub/guidelines_ru.pdf).
3. Gumodoka, F., I., Berege, Z.A., and Dolmans, W.M.V. Dolmans occupational exposure to the risk of HIV infection among health care workers in Mwanza Region, Rural and Remote Health 9: 1185 United Republic of Tanzania Bulletin of the World Health Organization ©. *World Hlth Org.* 1997; **75**: 133-140.
4. Hulme, P. Incidence of needlestick injuries among Ugandan student nurses in a rural hospital. *The International Electronic Journal of Rural and Remote Health Research, Education. Practice and Policy.* Available from: <http://www.rrh.org.au> ISSN 1445-6354.
5. Du Toit, M., Claassen, D., Le Roux, A., et al. Percutaneous injuries in doctors in the School of Medicine, University of the Free State: incidence, reporting and adherence to precautionary and management procedures. *SA Fam. Pract.* 2009; **131**: 128-131.
6. Zungu, U., Sengane, M.L. and Setswe, K.G. Knowledge and experiences of needle prick injuries (NPI) among nursing students at a university in Gauteng, South Africa. *SA Fam. Pract.* 2005; **50**: 48a-4Sc.
7. Joint WHO/ILO guidelines on post-exposure prophylaxis (PEP) to prevent HIV infection ISBN 978 92 4 1596374 (NLM classification: WC 503.6©. *World Health.* 2007:1-4.