

CHAPTER FIVE

5. DISCUSSION

5.1. Discussion

The overall assessment of samples from computer keyboards analyzed bacteriologically indicated high bacterial load. The range is between 30-787CFU/ml.

Of 131 bacterial isolates, 40 (30.5%) Gram-negative bacteria were potentially pathogen which was relatively low in comparison with Ashgar and EL-said, (2012). Of the 157 (53.5%) isolates, were potentially pathogenic Gram-negative bacteria like *Pseudomonas aeruginosa*. On the other hand, pathogen may be remain infectious on keyboards for week after the contamination event, depending on environmental factors such as a humid condition, which become actively colonize keyboard surface (Tagoe and Kumi-Ansah, 2010).

The presence of *E. coli* 6(15%) suggests faecal contamination of keyboards which can result in community-acquired infection and disease outbreaks. Similar research conducted in Ebonyi state reported that predominant bacteria were *E. coli* (47%) contaminated keyboards (Chimezie *et al.*, 2013). Another study conducted in Mecca, Saudi Arabia reported that 16% *E. coli*, isolated from different equipment include keyboards (Ashgar and EL-said, 2012). Incidence rate of current study was not compatible with above mentioned studies. The probable reason of variation may be due to seasonal variation, personal hygiene and life style of user to computer keyboards.

According to current study 27(67.5%) of *Pseudomonas* spp. were isolated from computer keyboards. The presence of this organism with high incidence could be due to resistant of this organism to environmental condition and other factors. Similar study in Baghdad Iraq showed that the overall *Pseudomonas* species was (16.95%) on computer keyboard (Ali *et al.*, 2013). Another study conducted in city of Jeddah, Saudi Arabia, 95.5% of total samples collected from keyboards were contaminated with mixed bacteria, out of it, *Pseudomonas* spp (AL-Ghamdi *et al.*, 2011). The incidence of conducted results of this study was high than above mentioned findings. The probable reason could be due to seasonal variation, continuous use of disinfectant, personal hygiene and life style of user to computer keyboards.

The study was also identified *Klebsiella* spp 7(17.5%) as a member of Enterobacteriaceae. However isolation of this organism from keyboard surface may be due to the organism that shed from body, clothing and carried in dust particles to keyboard surface. Similar study was conducted in Baghdad Iraq reported that (5.1%) of *Klebsiella* spp. Contaminated computer keyboard (Ali *et al.*, 2013).

5.2. Conclusion

It is concluded that from our study the contamination of computer keyboards in Khartoum state universities was very high, due to the very low level of hygienic practice was very low.

5.3. Recommendations

The users should be advised to clean their hand perfectly before and after the use of computer keyboards. The importance of cleaning keyboards surface using disinfectants is highly recommended to people involved in supervision of computers. Further studies are needed to cover large area in Khartoum state to validate the result of this study.