CHAPTER FIVE

5. DISCUSSION

5.1. Discussion

The result of the present study showed a low rate of bacterial contamination on mobile phones in Khartoum State which was only (17%) of tested mobile phones were contaminate. This result is lower than that reported in Nigeria (Akinyemi *et al.,* 2009) as (73%). This variation in the two studies may be attributed to environmental differences, improved personal hygiene and high level of healthcare education generally observed among the students and university staff. However, the high total mean of bacterial load of 11.78×10^{7}CFU/ml was higher than that 4.48×10^{2}CFU/ml reported by Kawo and Musa (2013) in a study among university students in Nigeria. The high number of bacterial count that present in our study has been attributed to the poor hygienic and sanitary practices of some students.

The results revealed that the rate of students' mobile phones contamination with Gram-negative bacteria was 23.5% which was almost similar to the result reported in Nigeria by Akinyemi *et al.,* (2009) as (21.1%). *Ps. aeruginosa* got the highest percentage (75%) of Gram-negative bacteria that present in mobile phones of students. This result is similar to finding reported in Nigeria (Famurewa and David, 2009) in which *Ps. aeruginosa* was the most bacterium of all isolated Gram-negative bacteria but with different percent (22.6%). This finding attributed to the fact that *Ps. aeruginosa* is an ubiquitous environmental bacterium with minimal requirements for survival and a remarkable ability to

adapt to a variety of environmental challenges (Blanc *et al.,* 2007). The organisms could have come in contact with the cell phones through soil, clothing, food and/or hands of the users (Kawo and Musa, 2013; Uabol-Egbenni, 2003).

The organisms recovered in the present study are all potential disease-causing agents. The presence of these microorganisms is a cause for serious concern mainly because these microorganisms are opportunistic human pathogens and even though may not infect healthy humans but may infect immunocompromised individuals. These microorganisms have been variously reported as responsible for respiratory and wound infections, meningitis, urinary tract infections and abscesses (Garba, 2002; Kawo *et al.,* 2012).

5.2. Conclusion

1- The study showed that the mobile phone contamination rate among students' universities in Khartoum State was low 34(17%), but with high number of bacterial load (11.78×10^7 CFU/ml).

2- Gram-negative bacteria isolated from students' mobile phones constituted 8(23.5%), of all bacterial isolates. The isolates were *Ps. aeruginosa* 6(75%), *K. pneumonae* 1(12.5%) and *P. stuartii* 1(12.5%). *Ps. aeruginosa* got the highest percentage (75%) of Gram-negative bacteria that present in mobile phones of students.

3- The organisms recovered in the present study are all potential disease-causing agents. Thus, mobile phones may serve as vehicles of transmission of

diseases such as urinary tract infections, pneumonia, wound infections and abscesses.

5.3. Recommendations

1- The load of bacterial contamination among students' universities in Khartoum State was high, so strategies for preventing disease transmission are needed, especially given the risk of continuing contamination through hand–to–cell phone contact. Such strategies should target behaviour controls of mobile phones users.

2- Frequent hand cleansing, especially with instant hand sanitizers is the most significant step to help prevent faeco-oral and droplet transmissions.

3- Mobile phones should be handled in a manner that does not get contaminated with dirt and/or disease-causing agents and should be regularly cleaned with relevant disinfectants.

4- Covering the mouth or nose when coughing or sneezing decreases droplet spread, but makes hand cleansing even more important.