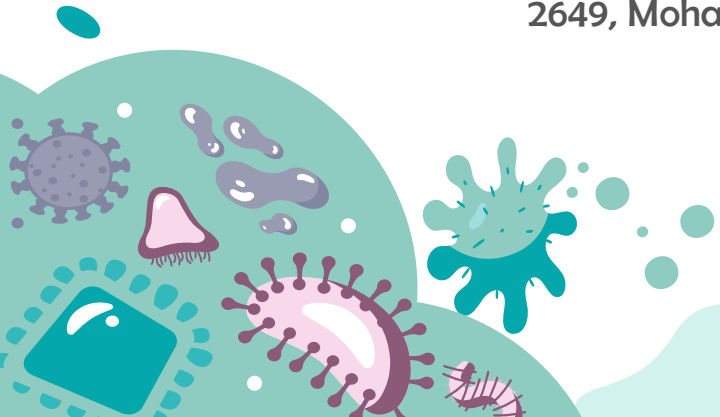




Bacterial contamination of cell phones of medical students at King Abdulaziz University, Jeddah, Saudi Arabia

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ILO'S



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Introduction



01. Introduction

Cell phones are commonly used in healthcare settings for communication within hospitals and for communication in daily life.

Medical conditions have been controlled after the innovations of mobile communications. These conditions include: diabetes and asthma, and an increased rate of vaccination by travelers reminded by short message service. However, one of the most concerns have been increased about the use of these devices in hospitals, as they can be used everywhere, even in toilets. Therefore, they can be vehicles for transmitting pathogens to patients.

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Contamination can spread from outside surfaces to > 80% of exposed hands. Moreover, a previous study reported that > 90% of cell phones of healthcare workers were contaminated with microorganisms and > 14% of them carried pathogenic bacteria that commonly cause nosocomial infections.

The aim of the study is to examine the presence of pathogenic bacteria on the surfaces of cell phones that are used frequently by preclinical medical students. This study identified both pathogenic and nonpathogenic bacteria on cell phones of 105 medical students at King Abdulaziz University, Jeddah, Saudi Arabia.

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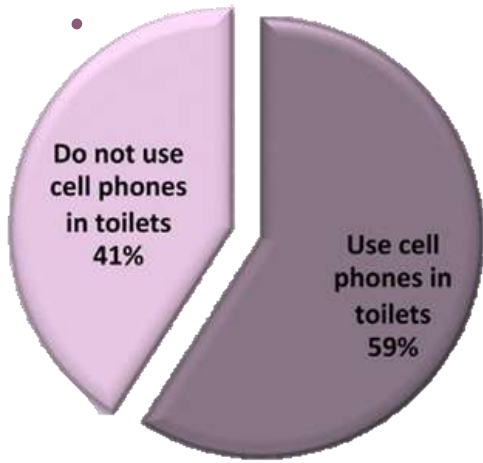
Methods



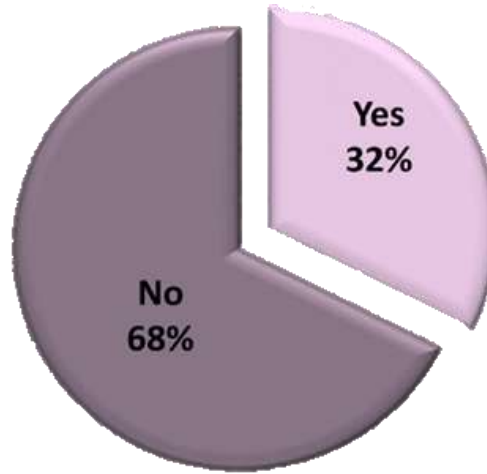
02. Methods

❖ Study design

A total of 105 samples were collected from the cell phones of 105 volunteer 2nd- and 3rd-year medical students who were asked to complete a written questionnaire for data collection. The questionnaire included variables such as the use of cell phones in toilets, the use of disinfectants to clean the surface of the cell phone, and the use of cell phones at work. Also, written informed consent was signed by the students prior to sample collection.



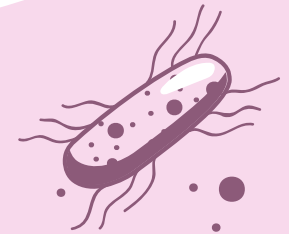
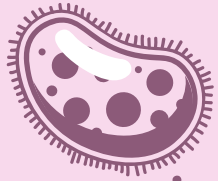
Cell phone use in toilets



Use of disinfectant to clean cell phone



Applying restrictions on cell phones use in clinics





❖ **Sample collection**

- Samples were obtained from cell phones of all participants using sterile cotton swabs. Prior to sample collection, swabs were moistened in sterile water and were rotated over the front screen and the back of the cell phones. All swabs were immediately inoculated into Amies transport media and processed within 1 hour. Swabs were then inoculated onto fresh brain–heart infusion broth and incubated overnight at 37°C with aeration at 190 rpm. A subsequent culture was carried out on blood and MacConkey agar plates, and incubated aerobically at 37°C for 18hours.






❖ Bacterial identification and antibiotic susceptibility

Single colonies grown on both blood and MacConkey agar plates were tested using standard microbiological methods. Gram stain and catalase test. was used to differentiate Staphylococcus aureus from other coagulase negative staphylococci. Further antimicrobial susceptibility tests were carried out for Saureus isolates to test their methicillin susceptibility, using 18 oxacillin and 30s cefoxitin (Oxoid, Basingstoke. Hants.

❖ Statistical analysis

Statistical data analysis was carried out using SPSS version (SPSS Inc, Chicago, IL, USA). Using one-way analysis of variance, the means of all bacterial isolates were compared to determine the significant abundance of each organism. Grouping included in the questionnaire, and the type of organisms found of results was based on variables.



03

Results



03. Results

One hundred and five samples were obtained from the surface of the cell phones of 105 volunteer preclinical medical students at the Faculty of Medicine, KAU. Sixty-two whereas the remaining 43 (59%) participants used their cell phones in the toilets, (41%) participants did not.

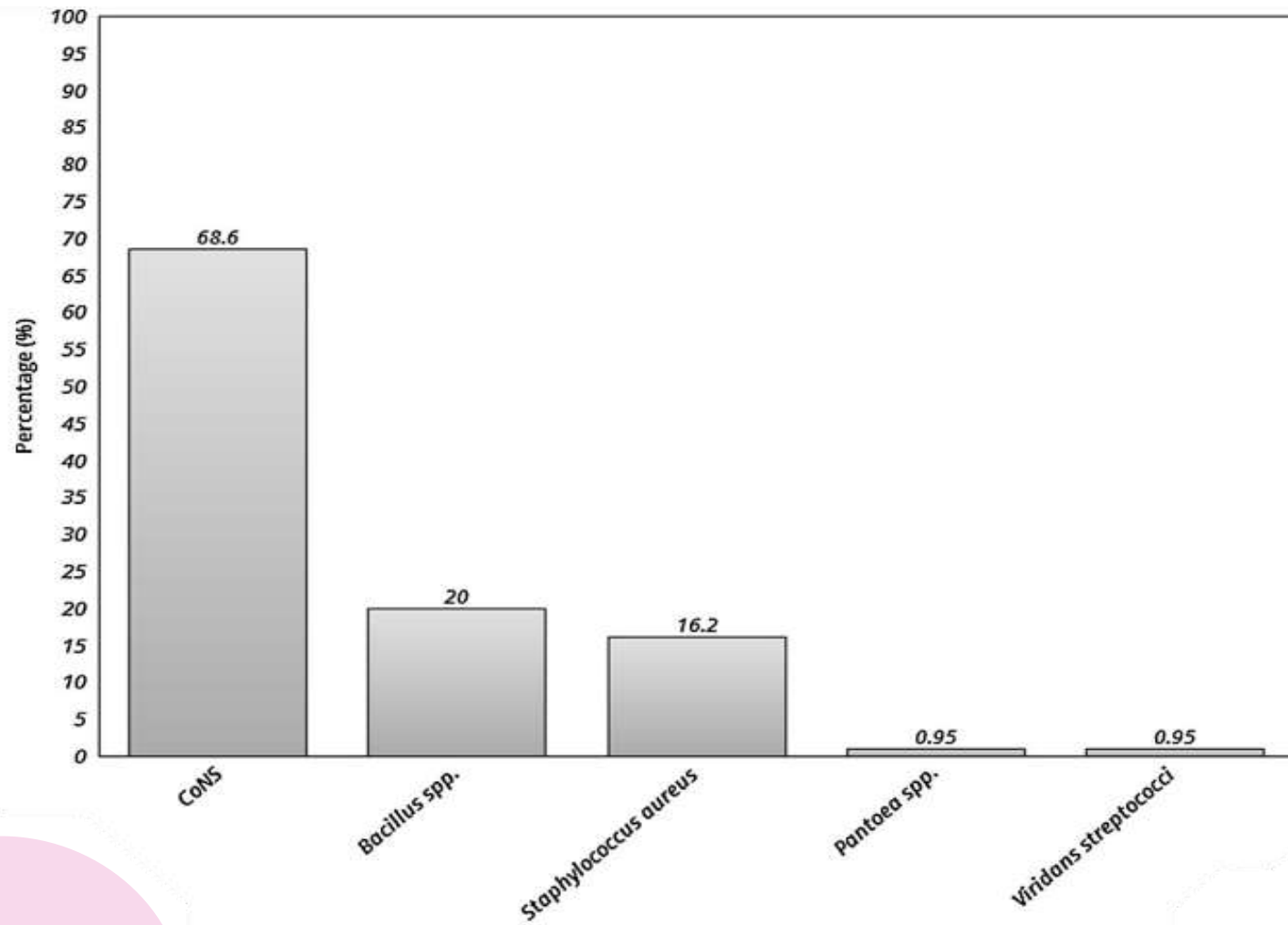
The questionnaire also revealed that all participants used their cell phones at work at least once a day, and 71 (67.6% admitted that their cell phones had never been cleaned. The percentage of bacterial contamination on the tested cell phones was 96.2%, of which the most abundant isolates were coagulase-negative staphylococci, which accounted for > 68% of the total samples. *S. aureus* was isolated from samples. Gram-positive bacilli were isolated (16.2%) 17 from 20 (19%) samples. Viridans streptococci and *Pantoea* species were also isolated but at lower levels (Figure 2) Although most cell phones tested were contaminated with one or more microorganisms, contamination with *S. aureus* was found in 17 cell phones.

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This represents a high percentage of contamination with this pathogenic organism that is commonly found in toilets [12]. , there was no correlation between the use of cell phones in toilets and the presence of S. Aureus studies revealed that ~20% of cell phones belonging to doctors and nurses are contaminated with pathogenic bacteria Given that medical students are present in healthcare settings, mobile devices (15-13) belonging to this group may act as vehicles for transmission of infection to patients if these The concern about cell phone contamination in medical settings is increased due to the possibility of cross-contamination of these devices

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That act as an environmental reservoir and source of bacterial cross contamination, particularly in the most sensitive clinical areas such as operating theaters, intensive care units and burn units A crucial part of patient safety is reduction of the bio-transfer potential of these objects, especially to susceptible patients Thus, we suggest involving medical students at an early stage in training programs in patient before they begin clinical work.

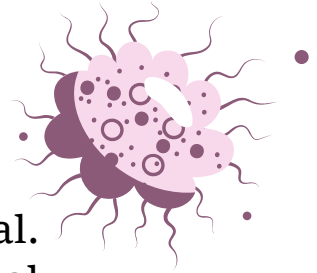




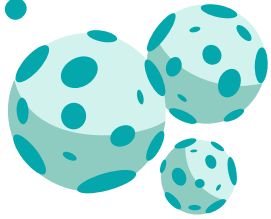
04. Conclusion

- ❑ Cell phones are commonly used almost everywhere in the community and in healthcare environments.
- ❑ The phones used by medical students can act as transmission vehicles for both pathogenic and nonpathogenic organisms.
- ❑ we suggest offering training programs at an early stage in medical schools on guidelines about restricting the use of cell phones in clinical environments, and increasing awareness of hand hygiene and frequent decontamination of mobile devices, to decrease the risk of cross-contamination by these devices in clinical settings.
- ❑ More studies are required to assess the efficacy of the above strategies in decreasing bacterial contamination and limiting infection transmission caused by the use of cell phones.

References



Zakai, S., Mashat, A., Abumohssin, A., Samarkandi, A., et al. (2016) Bacterial contamination of cell phones of medical students at King Abdulaziz University, Jeddah, Saudi Arabia. Journal of Microscopy and Ultrastructure.



Thanks!

