

Mobile Phones as Silent Reservoirs of Infection in a Tertiary Care Hospital: A Pilot Study Among Health Care Workers

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ABSTRACT

Background: Aim: To assess bacterial contamination of mobile phones used by health care workers in a tertiary care hospital. **Objectives:** To determine microbial contamination on mobile phones of HCWs. To identify common microorganisms isolated from mobile phones. To assess awareness and disinfection practices among HCWs. **Materials and Methods:** A cross-sectional pilot study was conducted among 30 health care workers in a tertiary care teaching hospital. Sterile swabs were collected from the surfaces of mobile phones and cultured on blood agar and MacConkey agar. Organisms were identified using Gram staining and standard biochemical tests. Data regarding phone usage and cleaning practices were collected using a structured questionnaire. **Results:** Bacterial contamination was detected in the majority of mobile phones. The most commonly isolated organisms were coagulase-negative Staphylococci (40%), Staphylococcus aureus (26.7%), and gram-negative bacilli (13.3%). A significant proportion of participants reported infrequent disinfection of their mobile phones. **Conclusion:** Mobile phones used by health care workers can act as reservoirs for potentially pathogenic microorganisms. Regular disinfection practices and awareness programs are necessary to reduce the risk of hospital-acquired infections.

Keywords: Mobile phones, Health care workers, Hospital-acquired infections, Bacterial contamination, Fomites

INTRODUCTION

Hospital-acquired infections (HAIs) are a major global health problem and significantly contribute to increased morbidity, mortality, and health care costs. The World Health Organization estimates that approximately 5–10% of hospitalized patients develop infections during hospital stay, particularly in developing countries where infection control measures may be inadequate [1].

Health care workers frequently use mobile phones during routine clinical duties for communication, accessing medical information, and documentation. Although strict infection control protocols exist for medical instruments and hospital surfaces, mobile phones are often overlooked. Continuous handling with contaminated hands and frequent contact with the face and clinical environments make them potential reservoirs of pathogenic microorganisms [2].

Several studies have demonstrated that mobile phones used in hospital settings harbor a wide range of microorganisms including Staphylococcus aureus, coagulase-negative Staphylococci, Escherichia coli,

and Pseudomonas aeruginosa. These organisms can survive on mobile phone surfaces and may contribute to cross-transmission of infections between patients and health care workers [3].

Despite their frequent use in clinical settings, mobile phones are rarely disinfected by health care workers. Awareness regarding the role of mobile phones in infection transmission remains limited. Therefore, the present pilot study was conducted to assess microbial contamination of mobile phones among health care staff in a tertiary care hospital and to generate baseline data for future large-scale studies.

Aim and Objectives

Aim

To evaluate mobile phones as potential reservoirs of infection among health care workers in a tertiary care hospital.

Objectives

To assess microbial contamination on mobile phones of health care workers.

To identify the types of microorganisms isolated from mobile phones.

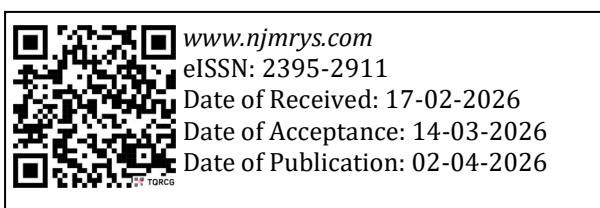
To evaluate mobile phone cleaning practices and awareness regarding infection transmission.

MATERIALS AND METHODS

Study Design

Cross-sectional pilot study.

Study Setting



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The study was conducted in a tertiary care teaching hospital.

Study Population

Health care workers including doctors, nurses, laboratory technicians, and interns working in different hospital departments.

Sample Size

Thirty health care workers participated in the study.

Inclusion Criteria

Health care workers using mobile phones during hospital duty.

Participants willing to provide informed consent.

Exclusion Criteria

Mobile phones disinfected within the previous 24 hours.

Damaged phones that prevented proper swab collection.

Sample Collection

Sterile cotton swabs moistened with sterile normal saline were used for sample collection. Swabs were taken from the following areas of the mobile phone:

- Touch screen surface
- Sides of the phone
- Back surface of the phone

The collected samples were immediately transported to the microbiology laboratory for processing.

Microbiological Methods

The swabs were inoculated onto:

- Blood agar
- MacConkey agar

The inoculated plates were incubated at 37°C for 24–48 hours. Identification of bacterial isolates was performed using:

- Colony morphology
- Gram staining
- Standard biochemical tests

Data Collection

A structured questionnaire was used to collect information regarding:

- Frequency of mobile phone usage during duty
- Frequency of cleaning or disinfection of mobile phones
- Awareness regarding infection transmission through mobile phones

STATISTICAL ANALYSIS

Data were entered into Microsoft Excel and analyzed using descriptive statistics. Results were expressed as frequencies and percentages. Since this was a pilot study with a small sample size, inferential statistical tests were not applied.

RESULTS

Table 1: Distribution of Study Participants According to Profession Among Health Care Workers (n = 30)

Profession	Number of Participants	Percentage (%)
Doctors	10	33.3
Nurses	8	26.7
Laboratory Technicians	6	20.0
Interns	6	20.0
Total	30	100

This table shows the distribution of different categories of health care workers who participated in the study

Table 2: Prevalence of Bacterial Contamination on Mobile Phones of Health Care Workers (n = 30)

Bacterial Growth	Number of Mobile Phones	Percentage (%)
Growth detected	24	80.0
No growth	6	20.0
Total	30	100

The table demonstrates that the majority of mobile phones used by health care workers showed bacterial contamination.

Table 3: Types of Microorganisms Isolated from Mobile Phones of Health Care Workers (n = 30)

Microorganism Isolated	Number of Isolates	Percentage (%)
Coagulase-negative Staphylococci	12	40.0
Staphylococcus aureus	8	26.7
S Gram-negative bacilli	4	13.3
No bacterial growth	6	20.0

This table shows the distribution of bacterial isolates obtained from mobile phone swab cultures.

Table 4: Mobile Phone Cleaning Practices Among Health Care Workers (n = 30)

Frequency of Mobile Phone Cleaning	Number of Participants	Percentage (%)
Regular cleaning	6	20.0
Occasional cleaning	8	26.7
Never cleaned	16	53.3
Total	30	100

The table indicates that more than half of the participants reported never cleaning their mobile phones.

DISCUSSION

Mobile phones have become indispensable tools for health care workers in clinical settings. However, their frequent handling and lack of regular disinfection make them potential reservoirs for pathogenic microorganisms. In the present study, bacterial contamination was detected in 80% of mobile phones used by health care workers.

These findings are consistent with the study conducted by Ulger et al., which reported bacterial contamination in 94.5% of mobile phones used by health care workers⁴. Similarly, Brady et al. reported that mobile phones in hospital settings frequently harbor potentially pathogenic bacteria and may contribute to cross-transmission of infections [5].

The most commonly isolated organisms in the present study were coagulase-negative Staphylococci and Staphylococcus aureus. These organisms are commonly found on human skin and can easily contaminate frequently handled objects such as mobile phones. Similar findings were reported in studies by Badr et al. and Jeske et al., where Staphylococcus

species were the predominant isolates [6,7].

The study also revealed poor mobile phone hygiene practices among health care workers. More than half of the participants reported never cleaning their mobile phones. This observation highlights the need for awareness programs and implementation of infection control measures targeting mobile phone hygiene. [8,9].

Although this study involved a small sample size, it provides preliminary evidence that mobile phones may act as reservoirs of infection in hospital environments. Incorporating mobile phone disinfection into hospital infection control policies may help reduce the risk of hospital-acquired infections. [10].

Limitations of the Study

- Small sample size.
- Conducted in a single tertiary care hospital.
- Antibiotic sensitivity testing of isolates was not performed.

CONCLUSIONS

Mobile phones used by health care workers in hospital environments can harbor potentially pathogenic microorganisms and act as silent reservoirs of infection. Regular disinfection of mobile phones and increased awareness among health care workers are essential measures to reduce the risk of hospital-acquired infections. Further large-scale studies are required to evaluate the extent of microbial contamination and effectiveness of preventive strategies.

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