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Impact of replacing powdered gloves with powder-free gloves on hand-hygiene compliance among healthcare workers of an intensive care unit: a quasi-experimental study

Train the Trainers in Hand Hygiene

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Introduction

- Alcohol-based hand-rub (ABHR) has been listed since 2002 as a standard solution for hand hygiene for health care workers (HCW)
- ABHR is useful to improve compliance with hand hygiene since its use requires about one-third of the time to wash hands with soap and water.
- ABHR can be taken to the bedside, allowing workers to clean their hands while caring for patients.

Introduction

- It is recommended that HCW wear gloves to prevent that microorganisms that are either colonizing or temporarily present in their hand skin be transmitted to patients or from one patient to another
- After removing the gloves, the HCW should perform hand hygiene. Since powdered gloves preclude the use of an ABHR after their removal, using powder-free gloves should be encouraged, because they do not interfere with hand-hygiene using ABHR

Introduction

- The United States Food and Drug Administration (FDA) prohibits the sales of powdered surgical gloves
- Despite these data, in developing countries the use of powdered gloves is still a frequent practice, mainly due to the lower cost of these gloves. However, if the use of powdered gloves decreases compliance with hand hygiene.

Food and Drug Administration (FDA). Banned devices; ban powdered surgeon's gloves, powdered patient examination gloves, and absorbable powder for lubricating a surgeon's glove.



Objective

To evaluate the impact of replacing powdered gloves with powder-free gloves on the hand-hygiene compliance among HCW of an intensive care unit (ICU) in Brazil.

Methods

A quasi-experimental study in a general ICU of a tertiary-care university hospital, in Brazil, from June 1st to August 31, 2017.

The intervention consisted of replacing powdered latex gloves with nitrile powder-free gloves in all HCW clinical procedures, starting in July 15.

Hand hygiene compliance was evaluated through direct observation, according to the World Health Organization (WHO) Hand Hygiene guidelines. Figure 1.



Results

Overall, 40 HCW were assessed during the pre and the intervention phases, with 1114 and 1139 hand hygiene opportunities observed, respectively.

| Demographic feature (n = 40) | |
|---------------------------------------|------------|
| Age, years, mean (standard deviation) | 39.0 (9.2) |
| Sex, female, n (%) | 28 (70.0) |
| Profession, n (%) | |
| Auxiliary nurse | 28 (70.0) |
| Registered Nurse | 5 (12.5) |
| Medical Doctor | 4 (10.0) |
| Physiotherapist | 3 (7.5) |
| Working time, n (%) | |
| Full-time | 18 (45.0) |
| Part-time | 22 (55.0) |
| Working shift | |
| Day shift | 26 (65.0) |
| Night shift | 14 (35.0) |

Results

| Opportunity category | | Powdered latex gloves | Powder-free nitrile gloves |
|---|---------------------------------------|-----------------------|----------------------------|
| Before contact with patients (Moment 1) | Number of opportunities | 352 | 359 |
| | Use of Alcohol-based hand-rub, n (%) | 37 (10.5) | 87 (24.2) |
| | Use of water and antibacterial, n (%) | 28 (8.0) | 25 (7.0) |
| | Total compliance, n (%) | 65 (18.5) | 112 (31.2) |
| Before aseptic procedures (Moment 2) | Number of opportunities | 177 | 198 |
| | Use of Alcohol-based hand-rub, n (%) | 12 (7.0) | 64 (32.3) |
| | Use of water and antibacterial, n (%) | 77 (43.3) | 51 (25.8) |
| | Total compliance, n (%) | 92 (50.3) | 115 (58.1) |

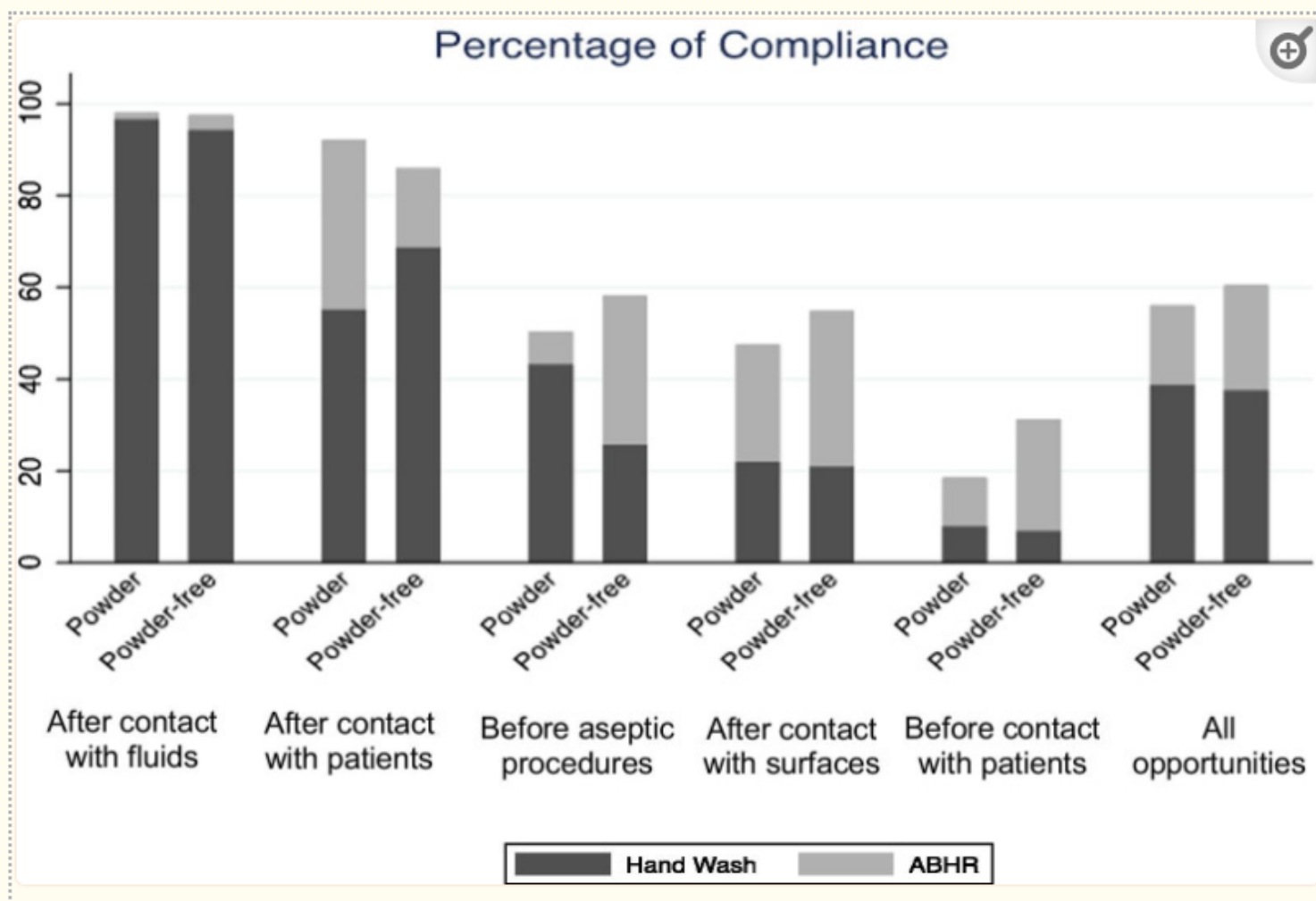
Results

| Opportunity category | | Powdered latex gloves | Powder-free nitrile gloves |
|--|---------------------------------------|-----------------------|----------------------------|
| After contact with fluids (Moment 3) | Number of opportunities | 153 | 162 |
| | Use of Alcohol-based hand-rub, n (%) | 2 (1.3) | 5 (3.1) |
| | Use of water and antibacterial, n (%) | 148 (96.7) | 153 (94.4) |
| | Total compliance, n (%) | 150 (98.0) | 158 (97.5) |
| After contact with patients (Moment 4) | Number of opportunities | 255 | 234 |
| | Use of Alcohol-based hand-rub, n (%) | 94 (36.8) | 40 (17.1) |
| | Use of water and antibacterial, n (%) | 141 (55.3) | 161 (68.8) |
| | Total compliance, n (%) | 235 (92.1) | 201 (85.9) |

Results

| Opportunity category | | Powdered latex gloves | Powder-free nitrile gloves |
|--|---------------------------------------|-----------------------|----------------------------|
| After contact with surfaces (Moment 5) | Number of opportunities | 177 | 186 |
| | Use of Alcohol-based hand-rub, n (%) | 45 (25.5) | 63 (33.8) |
| | Use of water and antibacterial, n (%) | 39 (22.0) | 39 (21.0) |
| | Total compliance, n (%) | 84 (47.5) | 102 (54.8) |
| All opportunities | Number of opportunities | 1114 | 1139 |
| | Use of Alcohol-based hand-rub, n (%) | 190 (17.1) | 259 (22.7) |
| | Use of water and antibacterial, n (%) | 433 (38.9) | 429 (37.7) |
| | Total compliance, n (%) | 623 (55.9) | 688 (60.4) |

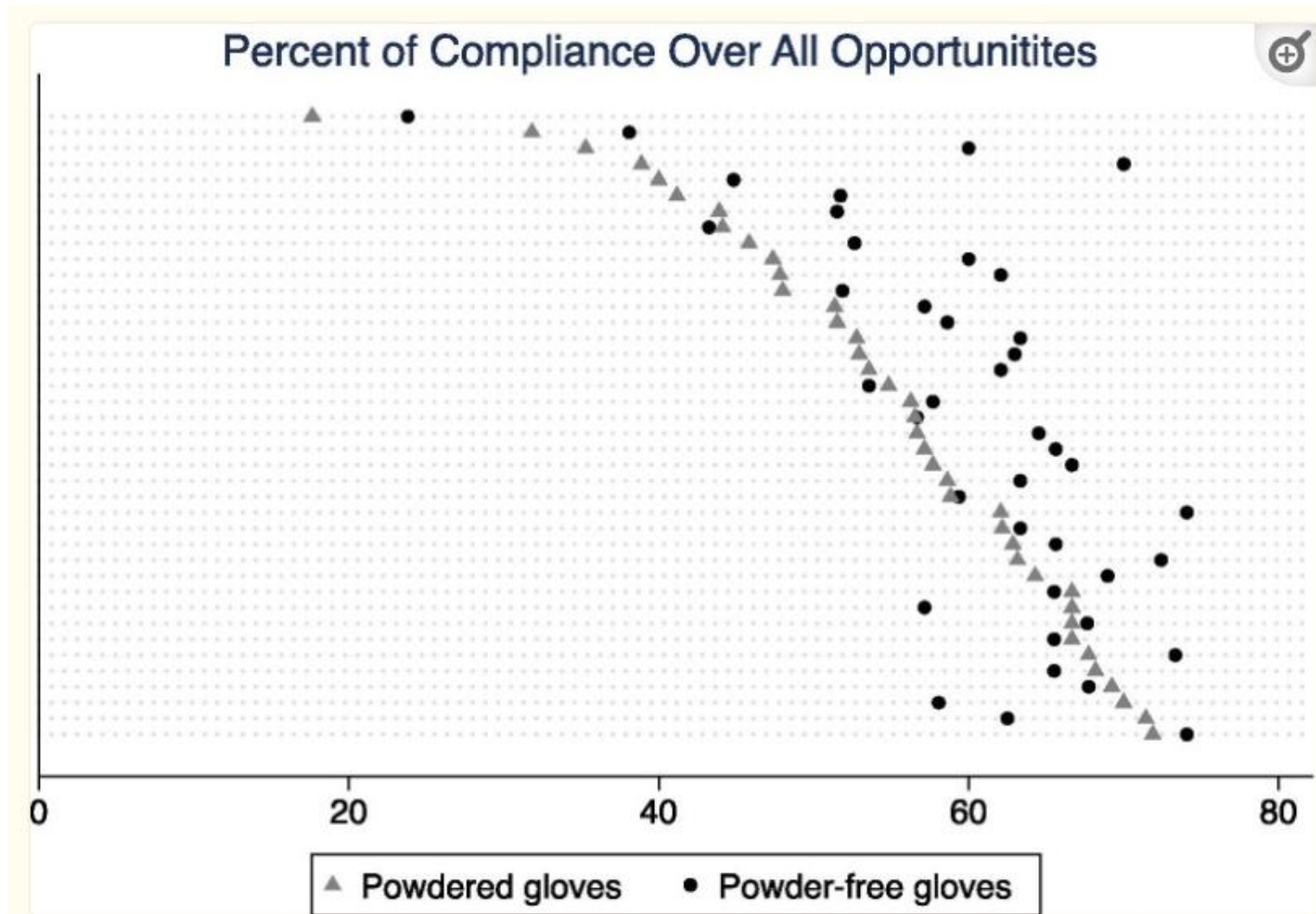
Results



[Fig. 1](#)

Percentages of compliance with hand hygiene practices while in used of powdered or powder-free gloves, overall and by type of opportunity

Results



[Fig. 2](#)

Compliance with hand hygiene for each studied healthcare workers, wearing each type of gloves

Discussion

- Increase in ABHR use before contact with patients
- This fact can be explained considering that a professional when examining the patient can easily remove powder-free gloves, use the ABHR and examine another patient
- With powdered gloves, he would need to wash his hands with soap and water, which would take more time and considering the countless opportunities for hand hygiene that occur in the ICU, it could not be feasible

Discussion

- Increase in ABHR use before aseptic procedures
- Many patients are under contact precautions and, normally, HCW come into a general contact with them using gloves and, after that, should change gloves and perform hand hygiene before an aseptic task.
- That indication is truly facilitated by the application of ABHR rather than the traditional handwashing, which could not happen if the HCW was using powdered gloves.

Conclusion

Data indicate that replacing powdered gloves with powder-free gloves had a positive influence on hand-hygiene compliance among the HCW in the studied intensive care unit.

Questions ???