A Pilot Study to Demonstrate the Need for Biosafety Training at the Institute of Sanitary Careers

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Introduction and Background

• In Morocco, laboratory technicians and nursing students do not receive biosafety training as part of their coursework.

• Upon graduation, students are assigned to different institutions for work.
Introduction and Background

• Those assigned to institutions handling tick-borne pathogens and patient high containment units for patients requiring special knowledge in biosafety, new graduates appear insufficiently trained.

• As a result, they can cause very serious incidents and accidents.

Project Justification

The demonstration of discrepancies between biosafety behaviors of new versus experienced, trained workers will provide evidence (argument) for the need for global biosafety training at the university or the institut level.
Goals and Objectives

• **Goal:** Compare biosafety practices and knowledge of new graduates with experienced workers.

• **Objectives:** Measure the biosafety knowledge and behavior of new graduates as compared to trained and experienced workers by quantifying the differences in biosafety practices between the 2 groups.

• This insufficiency will be manifested by the frequency of errors and risky behavior.

Methodology and Resources

• **Type of study:** cross-sectional, prospective, comparative analysis,

• **Site:** Center of Virology and Tropical Infectious Diseases, Military Teaching Hospital Mohammed V, Rabat, Morocco,

• **Period:** 1st Dec 2017 to 28th Feb 2018 (3 months)

• **Population:**
  ⇒Group I: **Recently graduated** from National Nursing Institute of Rabat- Morocco (<5 months)
  ⇒Group II: **Experienced nurses** with biosafety training (>6months)
Methodology and Resources

- Met with Director of Center and Heads of Labs
- Project authorized
- Met with nurses and lab technicians to describe project

Met with engineer and video technician to
- obtain access to videos,
- learn to manipulate videos, view the recordings…
- Locate cameras and viewing angles
Methodology

Procedure: **Direct** (in-person) or **indirect** (videotaped) observation.

**Data Collected:** Compliance with biosafety procedures and donning and doffing PPE when entering and leaving the room of a patient with an illness with a risk group 2 or 3 pathogen.

- ‘New’ or ‘Trained and experienced worker’
- Time (in months) of employment in a high containment unit
- Wearing jewelry or watch
- Hand washing
- Time of hand washing
- Donning gloves on room entry (blue gloves)
- Donning 2\textsuperscript{nd} pair of gloves before patient contact (latex gloves)
- Changing gloves after patient contact
- Putting gloved hands in pockets
- Touching face and or/surfaces
- Removing outer pair and putting on new pair of gloves before exiting room
- Discarding outer gloves after exiting room
- Removing inner gloves after exiting room
- Use of antiseptic gel after exiting room
Methodology and Resources

A new graduate exiting the patient room

- 1. New vs. Experienced?
- 2. Time of employment (months)?
- 3. Handwashing? Proper time?
- 4. Don inner gloves on entry?
- 5. Don 2nd pair gloves?
- 6. Gloved hands in pockets?
- 7. Touch face/surfaces?
- 8. Patient contact
- 9. Remove outer gloves after patient contact?
- 10. Don new outer gloves?
- 11. Remove outer pair gloves on patient room exit?
- 12. Watch or jewelry?
- 13. Remove inner gloves on exit?
- 14. Use of antiseptic gel after glove removal?
**Methodology and Resources**

- **One observation = One entry**
- **A person can be observed several times**
- **Observation**: practices and behaviors observed on the recorded Videos or directly at the sight of eye.

- Data was collected on an **Excel file**, 

- **Graded observations**
  - 1 indicated a correct response / behavior
  - 0 indicated an incorrect response / behavior

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**Methodology and Resources**

**Data was analyzed using SPSS® version 17.0 software**

Data was described using frequencies and percentage. The differences between proportions according to studied characteristics were tested using chi-square test.

A p value of less than .05 was considered statistically significant.
## Results

<table>
<thead>
<tr>
<th>Participants:</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experienced workers</td>
<td>17</td>
<td>54,8</td>
</tr>
<tr>
<td>New workers</td>
<td>14</td>
<td>45,2</td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Patients in the unit:</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>MERS-CoV Suspect</td>
<td>12</td>
<td>46</td>
</tr>
<tr>
<td>H1N1</td>
<td>3</td>
<td>11,5</td>
</tr>
<tr>
<td>MDR-TB</td>
<td>3</td>
<td>11,5</td>
</tr>
<tr>
<td>Dengue Suspect</td>
<td>1</td>
<td>3,8</td>
</tr>
<tr>
<td>Chikungunya suspect</td>
<td>1</td>
<td>3,8</td>
</tr>
<tr>
<td>Unknown (in investigation)</td>
<td>6</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Entries (Observations):</th>
<th>No. of Entries</th>
<th>%</th>
<th>Medium</th>
<th>Min No. of Entries</th>
<th>Max No. of Entries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experienced workers</td>
<td>42</td>
<td>47,2</td>
<td>2,47</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>New workers</td>
<td>47</td>
<td>52,8</td>
<td>3,35</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Total of entries</td>
<td>89</td>
<td>100</td>
<td>2,87</td>
<td>1</td>
<td>6</td>
</tr>
</tbody>
</table>
Comparison of average time of biosafety experience

Time (in months) of experience in a biosafety unit:
- Mean: 18 (+/- 18.6) months
- Min: 0.5, Max: 52

Comparison of behaviors when entering the patient’s room
Comparison of behaviors when exiting the patient's room

Comparison of risky behaviors
Conclusions

• There was a significant difference in biosafety practices between new and experienced and trained nurses.

• Few practices were performed similarly between the two groups.

• The new ones make two to three times more mistakes and adhere 4 to 5 times less to biosecurity practices.

• Rigorous biosafety learning is required to upgrade the new graduates.

• New graduates must only work in lower containment areas of the institution until they are trained and qualified in biosafety practices.

• The administration authorities must be informed of this research in order to take the necessary measures.

Conclusions

• Safety training should begin early in the training curriculum with theoretical and practical courses and awareness sessions.

• It must be introduced into the general biosafety policy as a positive attitude and working culture.

• The seriousness of biosafety and the learning strategy should be discussed and enforced at all levels.

• Biosafety should also be integrated into conferences, seminars, audio-visual presentations, poster sessions, laboratory exercises and other aspects of the academic experience.
Lessons Learned

• **Biosafety knowledge of new graduates is below standard and they need to be trained before beginning work** in a high containment units.

• **The new graduates copy the practices of the experienced nurses without understanding the principle** behind their actions. This situation forced termination of data collection (bias).

• **If one wishes to evaluate the new graduates for their qualification for working in a health facility, they must be evaluated separately and before they begin working** alongside the experienced nurses.

• **The camera visualization works perfectly in the hallway, but is of no help in the patient’s room.**

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• **ABDELJALIL**: Video surveillance Engineer ant his assistant
• Nurses of the center : **KHALID, DRISS, BRAHIM...**

Many thanks to .......

“**When you plant a seed once, you get a single harvest. When you teach people, you get a hundred**” **By Confucius, Philosophe**