



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

Tahar BAJJOU

Military Hospital Mohammed V
Mohammed V University of Rabat

Claudia GENTRY-WEEKS

Colorado State University

Yassine SEKHSOKH, Idriss LAHLOU AMINE

Mohammed V University of Rabat

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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***.

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Introduction and Background

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.

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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)

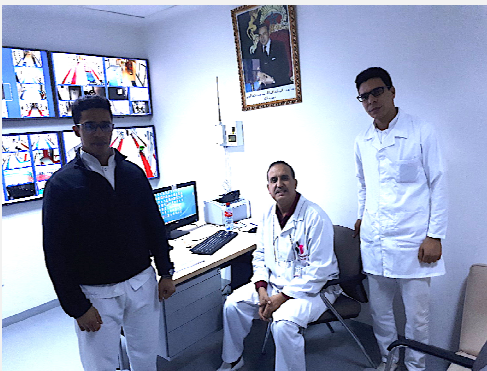
Methodology and Resources

- 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**



View of the corridor – Level 3 Unit



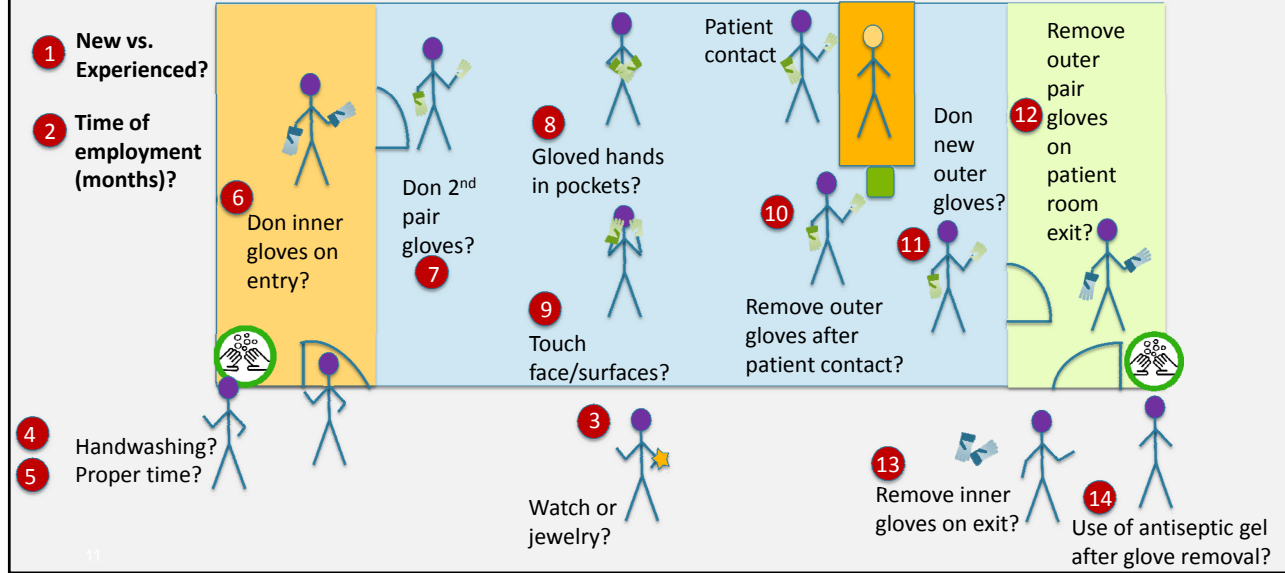
Methodology

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 2nd 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



Methodology and Resources

- **One observation = One entry**
- **A person can be observed several time**
- **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



A	B	C	D	E	F	G
Date	Serial	Bld number	New or Trained and Experienced worker New : 1, Tr & Ex : 0	Time (in months) of exercise in a biosafety unit	Wearing jewelry or watch Yes : 1, No : 0	Hand Washing Yes : 1, No : 0
1	1	1	1	0,5	1	0
2	11.12	1	N05	1	3	0
3	11.12	2	N07	1	3	1
4	11.12	3	N02	1	3	0
5	11.12	4	N07	1	3	0
6	11.12	5	E12	0	28	0
7	11.12	6	E08	0	32	1
8	11.12	7	E01	0	45	1
9	12.12	8	E07	0	18	0
10	12.12	9	N02	1	3	1
11	12.12	10	N04	1	4	1
12	12.12	11	E14	0	28	0
13	12.12	12	N01	1	3	1

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.



Serial	Month	Date	BldNumber	NewTrained	TimeExec.	WeasJewelry	HandWash.	TimeHandWas	PutGloRoom
1	1	12-11-12	N05	1	0,5	1	0	0	1
2	2	12-11-12	N07	1	3,0	1	0	0	1
3	3	12-11-12	N02	1	3,0	0	1	0	1
4	4	12-11-12	N07	1	3,0	0	1	1	1
5	5	12-11-12	E12	0	28,0	0	1	0	1
6	6	12-11-12	E08	0	32,0	0	1	1	1
7	7	12-11-12	E01	0	45,0	1	1	1	1
8	8	12-12-12	E07	0	18,0	0	1	0	1
9	9	12-12-12	N02	1	3,0	1	0	0	0
10	10	12-12-12	N04	1	4,0	1	0	0	1
11	11	12-12-12	E14	0	28,0	0	1	1	1
12	12	12-12-12	N01	1	3,0	0	1	0	1
13	13	12-12-12	E15	0	26,0	0	1	0	1
14	14	12-12-12	N02	1	3,0	1	0	0	1
15	15	12-12-12	N14	1	5	1	1	0	0
16	16	12-13-12	E17	0	45,0	1	1	1	1
17	17	12-13-12	N03	1	5,0	1	1	0	1
18	18	12-13-12	E07	0	18,0	0	1	1	1

Results

Results

Participants:	No.	%
Experienced workers	17	54,8
New workers	14	45,2
Total	31	100

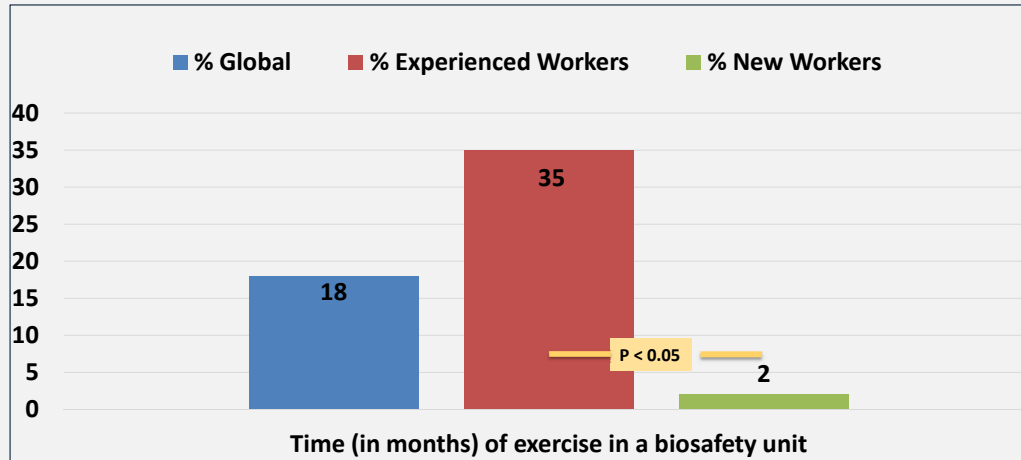
Patients in the unit:	No.	%
MERS-CoV Suspect	12	46
H1N1	3	11,5
MDR-TB	3	11,5
Dengue Suspect	1	3,8
Chikungunya suspect	1	3,8
Unknown (in investigation)	6	25
Total	26	100

Entries (Observations):	No. of Entries	%	Medium	Min No. of Entries	Max No. of Entries
Experienced workers	42	47,2	2,47	1	6
New workers	47	52,8	3,35	2	5
Total of entries	89	100	2,87	1	6

Comparison of average time of biosafety experience

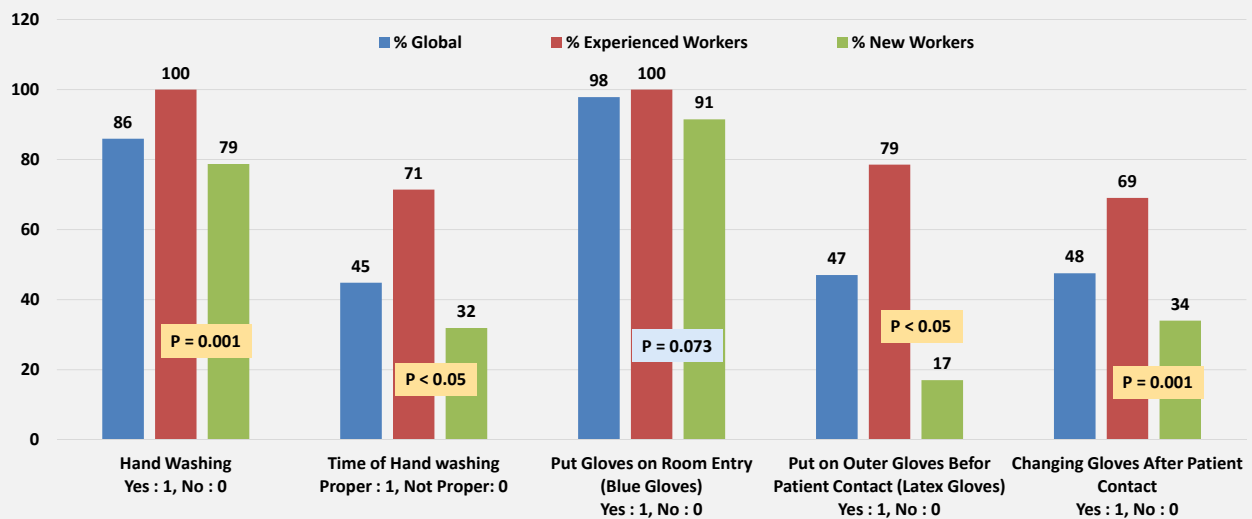
Time (in months) of experience in a biosafety unit:

- Mean : 18 (+/- 18.6) months
- Min: 0.5, Max: 52



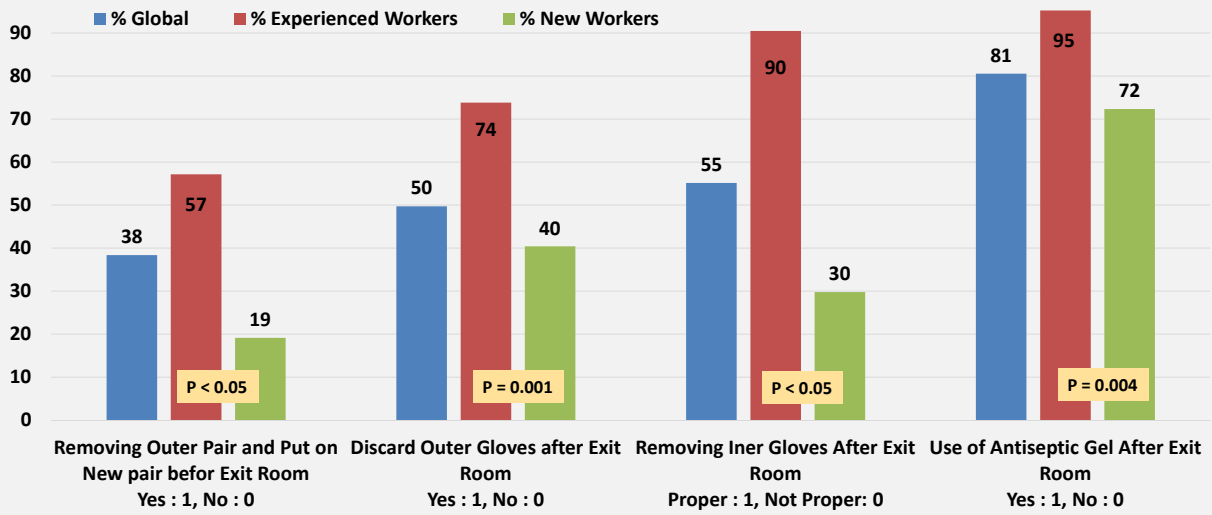
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Comparison of behaviors when entering the patient's room



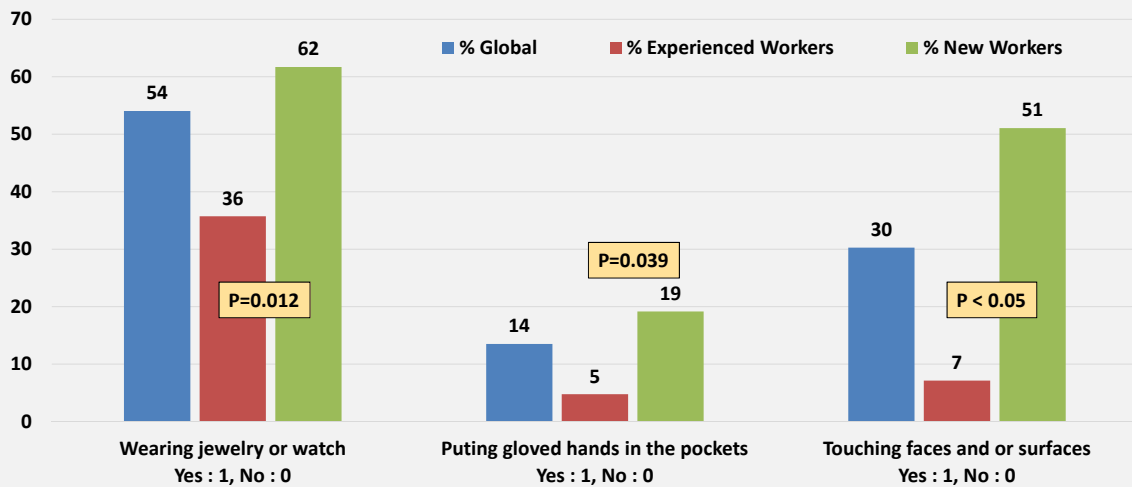
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Comparison of behaviors when exiting the patient's room



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Comparison of risky behaviors



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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**.

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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**.

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

