MS32
Evaluation of the UICF implementation

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ACRONYMS

AMR	Antimicrobial Resistance
ASP	Antimicrobial Stewardship Program
CDH	Clinical Department Heads
ECDC	European Centre for Disease Prevention &
HA	Hospital Administrators
HAI	Healthcare Associated Infections
HH	Hand Hygiene
HCW	Healthcare Worker
IC	Infection Control
ICC	Infection Control Committee
ICP	Infection Control Programs
IPC	Infection Prevention & Control
MDROs	Multi-Drug-Resistant Organisms
PH	Public Health
PHA	Public Health Authorities
UICF	Universal Infection Control Framework
WHO	World Health Organization

1 BACKGROUND

Antimicrobial Resistance (AMR) poses an enduring threat to the global community and, in our days, a major public health risk to developed countries. The Control and Prevention of Healthcare Associated Infections (HAIs) is a key factor of limiting the horizontal spread of the Multi Drug Resistant Organisms (MDROs) within healthcare environment.

The implementation of a national strategy for the control of AMR and HAI prevention faces a lot of limitations related to the health system structure, its organization culture, and the available human & financial resources. Prevention is of great significance, not only for patient's safety, but also as it saves resources channelled into improving the performance of the health system. The key for an effective ICP implementation is to change the behavioural culture, yet time is required for such transformation, even in advanced healthcare systems.

2 PURPOSE OF UNIVERSAL INFECTION CONTROL FRAMEWORK

One of the main objectives of WP6.1, was to examine policies for preventing Health-Care Associated Infections (HCAIs) through the implementation of agreed infection control programs and institutional behavior change, using a top-down approach.

UNIVERSAL INFECTION CONTROL FRAMEWORK (UICF) was developed so as to be implemented in all healthcare settings regardless of the available resources or the specificities of each country's healthcare system. UICF is a set of practices and tools focused on improving the following key components:

Roles & Authorities of all interested parties in ICP implementation- Communication & Collaboration- Surveillance- Training & Awareness- Audit- Availability of Resources

The "Essential Activities" described in UICF, do not require any extra costs or resources, as their goal is to strengthen and improve the already IC implemented activities.

UICF can be implemented either on the whole or by using selected key components, depending on each healthcare setting's needs, while the activities matched to each

component can be adapted and customized according to the objective of each health care facility, as well as the indicators used to evaluate the effectiveness.

3   METHODOLOGY

At first, two separate surveys were conducted addressed to different target groups:

- ✓ **Survey A:** The goal was to to have a clear picture of the reality associated with the capability of each country to implement Infection Control policies in accordance with the most recent guidelines for the core components of infection prevention and control programs by WHO. The responders were Public Health Authorities, Infection Control Committees and Hospital Administrators.
- ✓ **Survey B:** The goal was to examine and analyse the facilitators and barriers linked to the institutional policy and behavioural culture for an effective implementation of an infection control program in clinical reality. The responders were Healthcare Workers, members of Infection Control Committees and Hospital Administrators.

The next step was to develop the draft version of **UNIVERSAL INFECTION CONTROL FRAMEWORK (UICF)**, using not only the results and the areas of improvement found on the two surveys, but also the key components of an Infection Control Program of WHO's most recent guidelines, the most accurate evidence- based practices.

The UICF was pilot implemented in healthcare settings in 4 counties: Austria, Greece, Portugal & Spain. Unfortunately, the pandemic COVID19 did not let healthcare professionals implement UICF in the extent it was initially planned, nevertheless, a review so as to evaluate the impact that UICF would have in their organization's culture was accomplished.

The leader's team of WP6 promoted a survey to the healthcare settings that participated in the UICF implementation asking for: the impact of the pandemic of COVID19 in Infection & Prevention of HAIs and what role UICF could have in the management of this crisis in the healthcare settings, as well as to evaluate the developed training tools and the Infection Control Gap Assessment.

Overall, from the 22 healthcare settings, more than 80% responded to this questionnaire either by each healthcare setting's team dedicated to WP6.1 *(1 by*

Austria, 7 by Greece, 2 by Spain) or by the national focal point for EUJAMRAI *(7 by Portugal).*

As we understand the amount of pressure the management of COVID19 brought on healthcare professionals, for reasons of convenience and time pressure, all the questions were either YES/NO or using a rating scale 1-5.

The main objective of this review is to examine the healthcare professionals' experience not only regarding their overall participation so far in the project and the activities developed, but also regarding the introduction of the UCIF in their clinical practice even though a pilot implementation was not developed as initially planned.

We would like to thank all healthcare settings and their healthcare personnel for their support and continuous encouragement and collaboration in this challenging activity.

Healthcare Setting	Country
Vienna General Hospital	Austria
Rethymno General Hospital	Greece
Sismanogleio General Hospital	Greece
Agios Savvas Anti-Cancer Hospital	Greece
Thriasseio Western Attica General Hospita	Greece
Papageorgiou General Hospital	Greece
Serres General Hospital	Greece
Panagiotis & Aglaia Kyriakou Children's Hospital	Greece
Hospital Clínico Universitario Virgen de la Arrixaca	Spain
Hospital General Universitario Reina Sofia- Murcia	Spain
Centro Hospitalar Universitário de São João	Portugal
Hospitais da Universidade de Coimbra	Portugal
Centro Hospitalar Universitário de Lisboa Central	Portugal
Hospital do Litoral Alentejano	Portugal
Centro Hospitalar Universitário do Algarve	Portugal
Hospital do Divino Espírito Santo	Portugal
Hospital Dr. Nélio Mendonça	Portugal

4 RESULTS

As it was expected, the vast majority responded that the crisis of COVID19 affected the Infection Control in the healthcare settings (85%). Nevertheless, the good news is that in almost all healthcare settings (85%), the pandemic had a positive impact in a more effective implementation of standard precautious measures. Regarding AMR, more than half (54%) reported that COVID19 was an inhibitor to take actions regarding combatting AMR.

4.1 UNIVERSAL INFECTION CONTROL FRAMEWORK

The conclusion regarding the UICF as a tool is very positive as the following results show. More than half of the responders (69%) reported that the crisis of COVID19 prevented them from using the UICF but they also show it as an opportunity to implement some of the UICF's essential activities.

Overall, more than half of the responders (69%) have actually used UICF, despite the management of COVID19. Regarding the response of hospital's administration related to the participation in UICF pilot implementation, the satisfaction's score of the healthcare participants was only 3.7/5.0.

Almost all of the participants (92%) believe that UICF could have an impact in changing the behavioural culture of the healthcare setting.

The overall score of UICF is 3.9/5.0, while its usefulness is rated with an average score of 4.1/5.0 and its completeness with a score of 4.1/5.0. More results are at the Table 1.

Question	Score (max score 5.0)
Rate how possible it is to recommend the UICF to other healthcare settings	4.0
Rate the overall comprehension of the goals & essential activities described	3.9
Rate the overall experience when studying the UICF for the 1st time	3.9
Rate the overall possible effectiveness of UICF	3.8
Rate the completeness of the UICF regarding the domains described	3.8

Table 1: Evaluation of UICF

4.2 INFECTION CONTROL GAP ASSESSMENT

Infection Control Gap Assessment (ICGA) has also high potential in being a useful and effective tool for healthcare settings to improve organization's behavioural culture.

Almost all of the participants (92%) believe it could have an impact in changing the behavioural culture of the healthcare setting.

Healthcare participants gave an average score of 4.2/5.0 when asked about the usefulness of ICGA. When asked about the hospital administration, 69% of the responders reported that they have discussed the results from the Infection Control Gaps Assessment with them, while the response of hospital's administration regarding the results was scored 3.8/5.0.

4.3 1st KEY COMPONENT: INFECTION CONTROL POLICY/ INSTITUTIONAL BODIES

From those who have used the UICF, 85% have implemented some of the activities described in the domain "INFECTION CONTROL POLICY/ INSTITUTIONAL BODIES" as well as used some of the proposed tools described. Furthermore, its overall experience when implementing activities from this domain and its completeness of the rationale was scored 3.3/5.0 and 3.8/5.0 respectively.

The majority of the participants (77%) claim that they have seen a difference in organizational culture, even in the COVID19 era and they thought (69%) the crisis of COVID19 as an opportunity to strengthening this domain.

4.4 2nd KEY COMPONENT: COMMUNICATION & COOPERATION

The majority of those who have used the UICF (85%) have implemented some of the activities described in the domain "COMMUNICATION & COOPERATION" as well as used some of the proposed tools described (77%). Nevertheless, only 46% reported that they have seen a difference in behavioural culture, even though the majority thought (69%) the crisis of COVID19 as an opportunity to strengthening this domain.

Moreover, its overall experience when implementing activities from this domain and its completeness of the rationale was scored 3.3/5.0 and 3.9/5.0 respectively.

4.5 3rd KEY COMPONENT: SURVEILLANCE

Surveillance is also a domain that healthcare professionals chose to implement the essential activities described in the UICF and use some of the proposed tools (77%). The majority of the participants (69%) reported they consider the crisis of COVID19 as an opportunity to strengthening this domain and also more than half (62%) reported they have seen some difference in behavioural culture. Finally, the completeness of the rationale was scored 4.1/5.0.

4.6 4th KEY COMPONENT: GUIDELINES-EDUCATION-TRAINING

The domain of Guidelines- Education- Training was chose from the responders to implement UICF's essential activities in a rate of 77%, while they used the proposed tools in a lower rate of 69%.

Nonetheless, its overall experience when implementing activities from this domain and its completeness of the rationale was scored 3.4/5.0 and 3.8/5.0 respectively.

The majority of the participants (69%) claim that they have seen a difference in organizational culture, even in the COVID19 era and they thought (77%) the crisis of COVID19 as an opportunity to strengthening this domain.

4.7 5th KEY COMPONENT: AUDIT

Audit, was one of the domains that scored the lowest, even though the results from the previous surveys depict that it is a domain that needs further strengthening. While the majority (54%) thought the crisis of COVID19 as an opportunity to strengthening this domain, less than half of the responders (46%) chose this domain to implement UICF's essential activities, or used any of the proposed tools. As a consequence, only 38% reported that they saw any difference in behavioural culture.

Finally, the completeness of the rationale was scored 3.9/5.0 while the overall experience 2.7/5.0.

4.8 TRAINING TOOLS

UICF was accompanied with 6 training tools and their goal was to (i) raise the awareness on Patient Safety & AMR/ HAIs, (ii) implement IPC effectively, (iii) train

healthcare settings on basic IC principles. They can be used by all IC hierarchy: Hospital Administration, Clinical Supervisors, HCWs & ICCs.

The training tools are the following:

1. HAIs & AMR: The Cornerstone of Patient Safety
2. HAIs Control & Prevention: Basic IC measures
3. Audit as a tool for behavioral change
4. Infection Control Program Implementation- Infection Control Gap Assessment
5. The Cost Effectiveness of Infection Control Program
6. Communication & Collaboration Tool

All the participants (100%) believe that using the training tools could improve the Infection Control in their hospital.

Most of them have used some of them (77%) while the score regarding the possibility to recommend them to other healthcare settings was 3.8/5.0. The other indicators regarding their evaluation also scored high, as it is depicted in the next Table.

Question	Score (max score 5.0)
Rate the overall comprehension of the training tools	**4.0**
Rate the usefulness of the training tools	**3.9**
Rate the completeness of the training tools	**3.9**

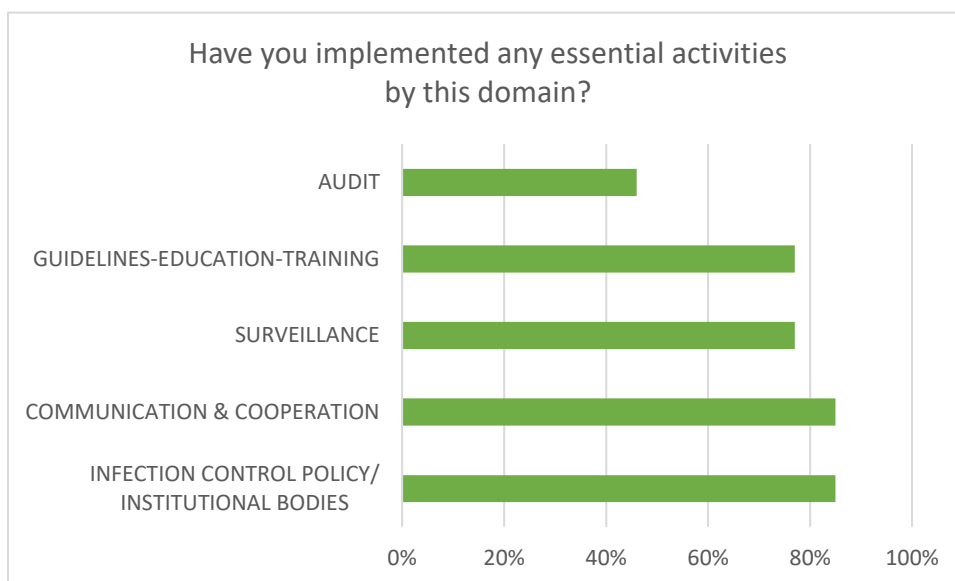Table 2: Evaluation of training tools

When asked about the most useful tools, the majority of the participants chose *"HAIs & AMR: The Cornerstone of Patient Safety"* and *"Infection Control Program Implementation- Infection Control Gap Assessment*. The most unconventional tool, according to the responders was *"The Cost Effectiveness of Infection Control Program"*.
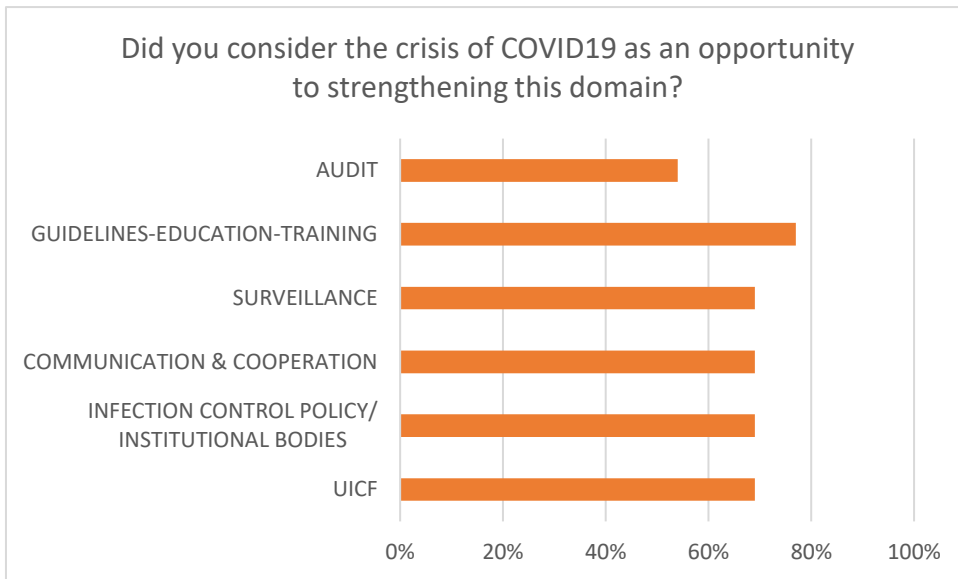
5 DISCUSSION

As the results have shown, Universal Infection Control Framework is a tool that can have an impact in changing the behavioural culture of the healthcare setting.
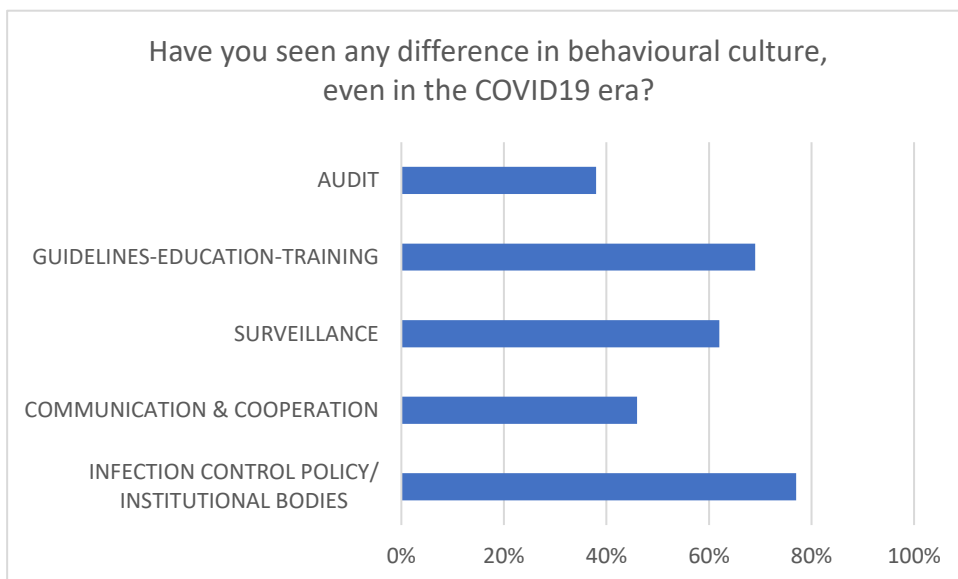
The crisis of COVID19 affected the Infection Control in the healthcare settings but also it had a positive impact in a more effective implementation of standard precautious measures, as healthcare professionals took advantage of this opportunity to use the Universal Infection Control Framework and implement some of its essential activities.

The domains that the majority of healthcare settings preferred to focus on and implement some of the essential activities were *"Infection Control Policy/ Institutional Bodies"* and *"Communication & Collaboration",* while the domain that COVID19 was an opportunity to strengthen was the *"Guidelines- Education- Training",* as the next two charts depict.

Did you consider the crisis of COVID19 as an opportunity to strengthening this domain?

Domain	Value
AUDIT	~54%
GUIDELINES-EDUCATION-TRAINING	~77%
SURVEILLANCE	~69%
COMMUNICATION & COOPERATION	~69%
INFECTION CONTROL POLICY/ INSTITUTIONAL BODIES	~69%
UICF	~69%

After the pilot implementation of the UICF, the healthcare professionals reported that the domain with the most difference in behavioral culture, even during the pandemic of COVID19 was the *"Infection Control Policy/ Institutional Bodies"* and *"Guidelines- Education- Training"*, while *"Audit"* scored the lowest.

Have you seen any difference in behavioural culture, even in the COVID19 era?

Domain	Value
AUDIT	~38%
GUIDELINES-EDUCATION-TRAINING	~69%
SURVEILLANCE	~62%
COMMUNICATION & COOPERATION	~46%
INFECTION CONTROL POLICY/ INSTITUTIONAL BODIES	~77%

Therefore, we believe that the Universal Infection Control Framework is a tool that the healthcare settings should have access to, as it provides tools, the necessary indicators and the essential activities required to improve the behavioral culture of the organization, without any additional costs or resources. We suggest its promotion to other healthcare settings at an EU level, as it is of highly importance to have more concrete and measurable results.

Furthermore, the results of all activities of WP6.1, show that a significant percentage of healthcare professionals do not consider themselves trained adequately so as to implement precautions measures, thus considering this domain to strengthen due to COVID19. Therefore, we also suggest the collaboration with scientific organizations and societies at a European level, with the purpose of improving the already developed training tools, as well as advocating for their establishment to the Healthcare workers' curriculum will result in the sustainability of the actions.

We would like to thank all the healthcare professionals and national focal points

of the project that participated in the pilot implementation of UICF.

Their belief, continuous support and contribution were significant & fundamental,

especially during this pandemic era of COVID19.

We hope these tools will help them to their daily clinical routine

to combat the battle with AMR.

6 APENDIX I: UICF Review Questionnaire

1. Please state your country
2. Please state your healthcare setting

COVID19 related Questions

3. Has the crisis of COVID19 affected the IC in your healthcare setting?
4. Has the crisis of COVID19 a positive impact in a more effective implementation of standard precautious measures?
5. Has the crisis of COVID19 precented you from taking actions regarding combatting AMR?

UICF General Questions

6. Rate the overall experience when studying the UICF for the 1st time
7. Rate the overall experience using the UICF
8. Rate the usefulness of a tool like UICF
9. Have you used the UICF?
10. Has the crisis of COVID19 prevented you from using the UICF?
11. Did you consider the crisis of COVID19 as an opportunity to implement some of the UICF's essential activities?
12. Rate the response of hospital's administration regarding the participation in UICF pilot implementation
13. Rate the completeness of the UICF regarding the domains described
14. Rate the overall comprehension of the goals & essential activities described
15. Rate the completeness of the overall rationale of UICF
16. Rate the overall possible effectiveness of UICF
17. Do you believe it could have an impact in changing the behavioral culture of the healthcare setting?
18. Rate how possible it is to recommend the UICF to other healthcare settings
    Infection Control Gap Assessment
19. Rate the usefulness of the Infection Control Gaps Assessment
20. Have you discussed the results from the Infection Control Gaps Assessment with the hospital's administration?
21. Rate the response of hospital's administration regarding the results of Infection Control Gaps Assessment
22. Do you believe it could have an impact in changing the behavioral culture of the healthcare setting?
23. How possible it is to recommend the Infection Control Gaps Assessment to other healthcare settings

1st KEY COMPONENT: INFECTION CONTROL POLICY/ INSTITUTIONAL BODIES

24. Have you implemented any essential activities by this domain?
25. Did you consider the crisis of COVID19 as an opportunity to strengthening this domain?
26. Rate the overall experience implementing the essential activities described in this domain
27. Rate the completeness of the rationale described in this domain
28. Have you used any of the proposed tools (NOT training tools) described in this domain?
29. Have you seen any difference in organizational culture, even in the COVID19 era?

2nd KEY COMPONENT: COMMUNICATION & COOPERATION

30. Have you implemented any essential activities by this domain?
31. Did you consider the crisis of COVID19 as an opportunity to strengthening this domain?
32. Rate the overall experience implementing the essential activities described in this domain
33. Rate the completeness of the rationale described in this domain
34. Have you used any of the proposed tools (NOT training tools) described in this domain?
35. Have you seen any difference in organizational culture, even in the COVID19 era?

3rd KEY COMPONENT: SURVEILLANCE

36. Have you implemented any essential activities by this domain?
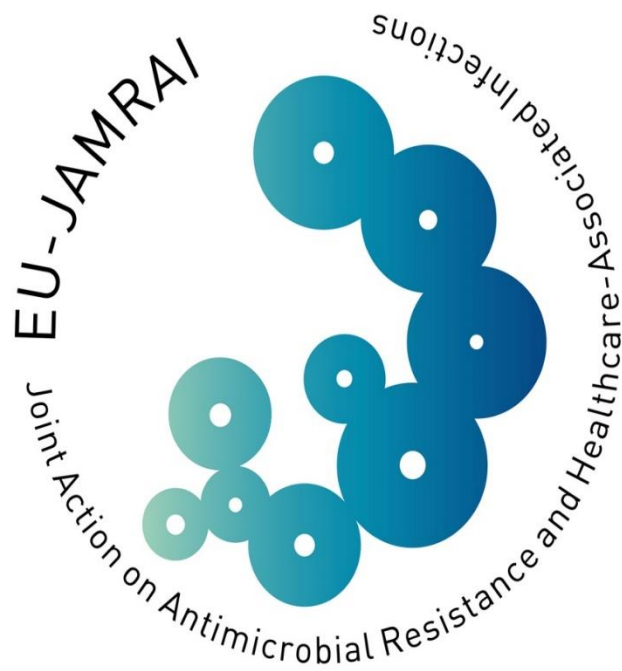37. Did you consider the crisis of COVID19 as an opportunity to strengthening this domain?
38. Rate the overall experience implementing the essential activities described in this domain
39. Rate the completeness of the rationale described in this domain
40. Have you used any of the proposed tools (NOT training tools) described in this domain?
41. Have you seen any difference in organizational culture, even in the COVID19 era?

4th KEY COMPONENT: GUIDELINES-EDUCATION-TRAINING

42. Have you implemented any essential activities by this domain?
43. Did you consider the crisis of COVID19 as an opportunity to strengthening this domain?

44. Rate the overall experience implementing the essential activities described in this domain
45. Rate the completeness of the rationale described in this domain
46. Have you used any of the proposed tools (NOT training tools) described in this domain?
47. Have you seen any difference in organizational culture, even in the COVID19 era?

5th KEY COMPONENT: AUDIT

48. Have you implemented any essential activities by this domain?
49. Did you consider the crisis of COVID19 as an opportunity to strengthening this domain?
50. Rate the overall experience implementing the essential activities described in this domain
51. Rate the completeness of the rationale described in this domain
52. Have you used any of the proposed tools (NOT training tools) described in this domain?
53. Have you seen any difference in organizational culture, even in the COVID19 era?

TRAINING TOOLS

54. Rate the usefulness of the training tools
55. Rate the overall experience using the training tools
56. How possible it is to recommend the training tools to other healthcare settings
57. Do you believe that using the training tools could improve the Infection Control in your hospital?
58. Have you used any training tools?
59. According to your opinion, which training tool is the most useful?
60. According to your opinion, which training tool is the most unconventional?
61. Rate the completeness of the training tools
62. Rate the overall comprehension of the training tools