

## *Comparative study of disinfectants' management in hospitals of Greece and Cyprus*

K. Ntelezos, M. Karavasili, G. Kyriakopoulou, D. Delitzakis, A. M. Giannakas, C. Vergadou

Health and Safety at Work Laboratory, Department of Public and Community Health, University of West Attica, Greece

### ABSTRACT

**Purpose:** This research focuses on the comparison of the handling and management of disinfectants, by nursing staff working in hospitals of Greece and Cyprus. In addition, the level of staff training by the hospitals' infection control committee, as well as the various mistakes that are made during the use of disinfectants in the emergency departments, are also investigated.

**Material-Methods:** The sample consisted of a total of 80 nurses, 40 from the Intermediate Care Unit (IMCU) of Cyprus and 40 from the IMCU of Greece, 18 of which were men and 62 were women, while the educational level of the 46.3% of the sample, were university graduates. An anonymous, written questionnaire with 12 closed-ended questions, was distributed to these participants. The data was processed, using the Microsoft Office Excel program, as well as the Statistical Package for the Social Sciences (SPSS).

**Results:** All the nurses (100%) in Cyprus, do not mix disinfectants, in contrast to Greece, where disinfectants' mixing is observed at a rate of 10%. As for the temperature used, in Cyprus, during the dissolution of disinfectants, 55% of the participants use lukewarm water, while in Greece, this percentage is formed at 60%. Similar percentages are present in both countries, where the 77% of the nursing staff in Cyprus and the 70% in Greece, during the removal of patients' body fluids, they first wipe them with paper and then they apply a disinfectant. Finally, in Cyprus, 40% of the nursing staff store the excess disinfectant solution and use it as a cleanser, while in Greece this happens at a rate of 25%.

**Conclusions:** This research, highlights various malfunctions in both countries, in terms of the implementation of the proposed guidelines-procedures by the hospitals' infection control committee, as well as the compliance in the rules about good hygiene practice. A lack of information on the use of disinfectants was observed in both countries. Also, wrong practices are adopted by workers in both countries, in terms of the amount of expired or left-over detergents. However, there is a major difference between the two countries in mixing the disinfectants with each other, as it is encouraging that in Cyprus no worker mixes disinfectants with each other, in contrast to Greece, where a 10% of the workers do so. Lastly, another difference between the two countries, is about the storage of expired disinfectants, since in Cyprus the 57.5% of the nursing staff store them, while in Greece, this happens at a much lower rate of 32.5%.

**Keywords:** disinfectants, hospitals, nursing staff, hospital infections, hygiene

*Citation*

**K. Ntelezos, M. Karavasili, G. Kyriakopoulou, D. Delitzakis, A. M. Giannakas, C. Vergadou. Comparative study of disinfectants' management in hospitals of Greece and Cyprus. Scientific Chronicles 2020; 25(2): 358-370**

## INTRODUCTION

The need for the implementation of the appropriate disinfection and sterilization procedures in hospitals, has been widely approved and documented in the literature. Wrong adherence to the proper disinfection practices, is considered a major factor for occupational accidents in healthcare professionals and an incidence of hospital infections [1,2]. In every hospital, there are guidelines about the practices of healthcare professionals, regarding the disinfection procedures, but there is inconsistency in their implementation. Several studies have evaluated the disinfection and sterilization procedures applied in hospitals, the knowledge and practices of hospitals' staff, as well as the compliance rate with precautionary practices [3,4].

A hospital (or nosocomial) infection, is considered an infection that occurs 48 to 72 hours, after the patient enters a hospital and has nothing to do with the incubation of a microorganism from its familiar environment. However, there are exceptions that occur beyond 48 hours, that are associated with interventions, such as heart and bladder catheterization. The term "hospital infections", refers to infections caused only by microorganisms (bacteria, fungi, viruses, parasites). The main types of these infections include lower respiratory tract infections,

urinary tract infections, surgical trauma infections and sepsis [5].

The main reason of controlling the spread of hospital infections, is to prevent their transmission to both patients and nursing staff. The Center for Disease Control (CDC), applies the two-level precautionary system, which includes the basic precautions applied to patients and the special precautions aiming for the avoidance of contact transmission, through droplets or airborne. Isolation is another method for avoiding the transmission of hospital infections, which depends on the transmission path(s) of a pathogen, as well as its incubation time [6].

Hand hygiene is considered the biggest factor in preventing the transmission of pathogens. Proper adherence to guidelines by health professionals, prevents the transmission of hospital infections. The first clinical observation of the effect of hand hygiene on the reduction of hospital infections, was made in 1847 by Semmelweis, at the General Hospital of Vienna, where the mortality rate of the postpartum fever in mothers, was significantly lower, when the medical staff sanitized their hands, rather when washed their hands with common soap and water [7,18,20].

The main factors affecting the action of a disinfectant, include the number and the location of germs, the inherent resistance of

microorganisms to a disinfectant, the concentration of the disinfectant, the exposure time, the physical and chemical properties and factors, its hardness, the temperature and the pH of water, the presence of organic matter, as well as various incompatibilities (e.g. some detergents that remain on the surfaces, can inactivate or reduce the effectiveness of disinfectants, presence of biofilms etc.) [8-11].

In every hospital, it is necessary to use disinfectants and antiseptics, in order to prevent and avoid hospital infections. The main substances used in hospitals, include alcohol, chlorine and its compounds, glutaraldehyde, iodine, phenol and phenol derivatives, quaternary ammonium derivatives, hydrogen peroxide and peroxide acid. Most of them, have a direct and perfect effect against HBV, HIV, HCV and are also bactericides, fungicides, tuberculocides and sporicides [8,19].

There are four risk categories, where proper handling should be applied, characterized as “high”, “medium”, “low” and “minimal”. Because not all disinfectant requirements are feasible by a single factor, the choice must be based on a specific use (e.g. equipment, surfaces, skin) [12].

The technical specifications for the selection of disinfectants in the hospitals of Greece, are made based on the provisions of Presidential Directive 118/2007. According to this directive, a disinfectant must be biodegradable, “CE” marked, licensed by the National Drug Organization (NDO) and approved with effectiveness studies in Greek

language. In addition, a disinfectant must be followed by a Greek Material Safety Data Sheet (MSDS), a certificate of chemical composition, as well as commercial brochures (prospectus, technical brochures) of the construction company and instructions for use in Greek [13].

Also, the offered products’ concentration in liquid form, must be indicated per liter, as well as in cases of a product (concentrated liquid, powder) that needs to be diluted, there must be a recommended dose for dissolution. Furthermore, on the label of the offered product, there must be a note for the dosage aids (pumps, jugs, sprayers), if they are provided free of charge. Finally, the label of a product, must mention the compatible materials and surfaces which are suitable for the intended application, as well as specific information, including the brand name and address of the manufacturer, the batch code or serial number, the chemical composition of the product, the container’s capacity, clear instructions for use in the Greek language and also the expiration date [13].

The technical specifications for the selection of disinfectants in the hospitals of Cyprus, are drafted, approved, and announced, by the Technical Specifications Writing Committee of the Ministry of Health. According to this, disinfectants must be approved by the NDO, accompanied by a chemical composition certificate. Also, disinfectants must have an effectiveness table based on literature, a wide antibacterial spectrum with irreversible energy, a fast action, a high degree of disinfection in as little time as possible and remain unaffected by the presence of organic

or inorganic substances. Moreover, disinfectants must have detergent properties, stability at both high and low temperatures and have a stable action in pH changes. In addition, disinfectants must ensure the preservation of the value of the disinfected objects, be non-toxic to humans, animals and the environment, as well as they must be non-flammable, odorless, or have a light pleasant odor [12,14].

Furthermore, according to the Technical Specifications Writing Committee of Cyprus, disinfectants must not develop any resistance to targeted germs, remain unaffected by natural factors (humidity, light, temperature), be soluble in cold water and leave a antimicrobial film on the surfaces applied. Finally, disinfectants must be kept in their original containers, where containers must include a dosing pump (where needed), instructions for use and precautions in Greek language and mention information such as the brand and address of the manufacturer, the batch code or the serial number, the chemical composition of the product, the container's capacity and expiration date [12,14].

## **MATERIAL AND METHODS**

This study is a descriptive qualitative study. The sample consists of a total of 80 nurses, 40 in the Cyprus Intermediate Care Team (ICT) and 40 in the Greek ICT, of which 18 were men (22.5%) and 62 were women (77.5%). Also, 37 people (46.3%) of the sample were university graduates.

To gather the information, nurses, and assistant nurses, who work in the emergency departments of Greece and Cyprus and are graduates of Public or Private Technical Vocational Schools of Nursing were visited. Nurses were asked orally if they wished to participate in the survey. Those nurses who agreed to participate in the survey, answered the questionnaires, which were filled by the researchers. Questionnaires were given only to ten people in the emergency department of each hospital and the average time it took for each nurse to complete the questionnaire, was about 5 minutes.

For the purposes of the research, an anonymous, written, self-report questionnaire was prepared, meeting the general principles and techniques, concerning the thematic content of the questionnaire, as well as the order and the type of questions. The method of questionnaires was chosen, because it is less expensive, it requires less time to complete and mostly because it provides full anonymity.

The questionnaires included questions related to the training of the nurses on the use of disinfectants, the order of the cleaning-disinfection procedures that they follow, the ways of use of the disinfectants (mixing, preparation, etc.), the water temperature used for the mix with detergents and disinfectants, the handling of patients' body fluids, the management of leftover or expired disinfectants, as well as the estimation of the training courses taken by the nurses, for the prevention of hospital infections.

The above was contained in 12 closed-ended questions, created by the researchers themselves, according to similar questionnaires reported in the international literature. Finally, the analysis of the results, was done with the use of the Microsoft Office Excel application, as well as the Statistical Package for the Social Sciences (SPSS).

## RESULTS

At first, we observed that in Cyprus, out of the 40 people in the nursing staff who participated in the research, 24 (60%) were women and 16 people (40%) were men. Respectively in Greece, out of the 40 people that participated, 38 (95%) were women and 2 (5%) were men. As a result, it is obvious that more women work in Greek hospitals than in Cyprus.

Also, when the participants were asked about whether they receive information, on the use of disinfectants by the hospitals' Infectious Diseases Control Committee, 31 people (77.5%) from Cyprus and 25 people (62.5%) from Greece replied "Yes", while 15 people (37.5%) from Greece and 9 people (22.5%) from Cyprus answered "No".

Then, answering the question about whether the participants use detergents to clean surfaces, 34 people (85%) from Greece and 16 people (40%) from Cyprus answered "Yes", while 24 people (60%) from Cyprus and 6 people (15%) from Greece answered "No".

In another question about whether the participants prepare the disinfectants for the surfaces themselves, 38 people (95%) from

Cyprus and 37 people (92.5%) from Greece answered "No", while 3 people (7.5%) from Greece and 2 people (5%) from Cyprus answered "Yes".

In addition, all 40 people of the nursing staff of Cyprus who took part in this research, do not seem to mix disinfectants with each other, compared to Greece, where a small percentage of 10% (4 people) mix the various disinfectants with each other.

Furthermore, answering the question about which procedure between cleaning and disinfection comes first, 37 people (92.5%) in Cyprus answered that cleaning comes first and then disinfection, compared to Greece, where 36 people (90%) answered the same. On the other hand, Greece has a percentage of 10% (4 people), while Cyprus has a percentage of 7.5% (3 people), who replied that disinfection comes prior to cleaning procedure.

In a question about the water temperature (hot, lukewarm, cold) used for surface cleaners, 25 people (62.5%) in Cyprus use lukewarm water, compared to Greece, where the percentage is 57.5% (23 people). However, in Greece, at a rate of 37.5% (15 people), cold water is used, in contrast to Cyprus, where its percentage is 10% (4 people). Among the two countries, the percentage of people in Cyprus that use hot water is 27.5% (11 people), while in Greece is 5% (2 people).

On the other hand, answering the question about the water temperature (hot, lukewarm, cold) used for disinfectants, the majority of nursing staff in Greece at a rate of 55% (22 people), use lukewarm water, compared to



**Table 1:** Correlation of variables between a) country and b) if the nursing staff uses detergents for cleaning.

x <sup>2</sup> Test	Result	Df = Degrees of freedom	p - value
Pearson x <sup>2</sup>	17.280 <sup>a</sup>	1	.000
Maximum Probability	18.192	1	.000
Total Individuals	80		

Cyprus, where its percentage is 60% (24 people). Between the two countries, cold water is used by nursing staff in Greece at a rate of 40% (16 people), while Cyprus has a percentage of 12.5% (5 people). Finally, Cyprus seems to be using more hot water at a rate of 27.5% (11 people), as opposed to Greece, where only 5% (2 people) use hot water.

Moreover, in Cyprus as well as in Greece, the majority of the personnel, in cases of body fluid findings, they proceed to collect them with paper and then they apply disinfection. The percentages of the two countries are: Cyprus 77.5% (31 people) and Greece 70% (28 people). In Greece, no one responded that they first apply disinfection, compared to Cyprus where only 1 (2.5%) person was found to do so. In response to the fact that the cleaning process takes place first, the percentage of Greece is 30% (12 people), while that of Cyprus is 20% (8 people).

In Greece, when the personnel were asked if it is necessary to wash their hands before gloves' application, 34 people (85%) answered "Yes" and 6 people (15%) answered "No". In contrast to Cyprus, where 31 people

answered (77.5%) "Yes" and 9 people (22.5%) answered "No".

Also, in response to the question whether someone takes part in a training course on disinfection, 29 people (72.5%) in Greece and 23 people (57.5%) in Cyprus responded negatively. While "Yes", responded 17 people (42.5%) from Cyprus and 11 people (27.5%) from Greece.

Moving onto the question about the fate of a left-over disinfectant solution during use and after the disinfection action has passed, the answers included "mixing", "use", "storage" and "use as a cleaner". In Cyprus, 57.5% (23 people) store it, 32.5% (13 people) use it as a cleaner, 7.5% (3 people) use it while 2.5% (1 person) mixes it. In Greece, 40% (16 people) use it as a cleaner, 32.5% (13 people) store it, 25% (10 people) use it and 2.5% (1 person), the same percentage as Cyprus, mixes it.

Finally, as a response to the question about whether the nursing staff has attended courses for the prevention of hospital infections, 26 people (65%) from Cyprus and 14 people (35%) from Greece answered "Yes". On the other hand, 26 people (65%) from

**Table 2:** Correlation of variables between a) country and b) at which temperature surface cleaners are used.

x <sup>2</sup> Test	Result	Df = Degrees of freedom	p - value
Pearson x <sup>2</sup>	12.683 <sup>a</sup>	2	.002
Maximum Probability	13.726	2	.001
Total Individuals	80		

Greece and 14 people (35%) from Cyprus did not answer.

Afterwards, the research focused on a statistical significance control, between specific variables. As seen in Table 1, the p-value= 0.00 < 0.05 shows a statistically significant relation, between a) the country and b) whether detergents are used for cleaning or not. So, it seems that the way workers use detergents in the two countries differs.

Also, in Table 2, from the p-value= 0.002 < 0.05 we consider statistically significant, the relation between a) the country and b) the temperature at which surface cleaners are used. So, it seems that the temperature at

which the surface cleaners are used, varies between workers in both countries.

In addition, Table 3 suggests that from the p-value= 0.002 < 0.05 there is a statistically significant relation, between a) the country and b) the temperature at which the disinfectants are used. So, it seems that the temperature at which the disinfectants are used, varies between workers in both countries.

Finally, as seen in Table 4, the p-value= 0.00 < 0.05 shows a statistically significant relation, between a) the country and b) the way workers use the dosimeter. So, there's a difference in the way that the dosimeters are controlled, by the nursing staff in both countries.

**Table 3:** Correlation of variables between a) country and b) at what temperature disinfectants are used.

x <sup>2</sup> Test	Result	Df = Degrees of freedom	p - value
Pearson x <sup>2</sup>	12.080 <sup>a</sup>	2	.002
Maximum Probability	13.006	2	.001
Total Individuals	80		

**Table 4:** Correlation between a) country and b) how workers control the dosimeter.

x <sup>2</sup> Test	Result	Df = Degrees of freedom	p - value
Pearson x <sup>2</sup>	15.600 <sup>a</sup>	2	.000
Maximum Probability	20.292	2	.000
Total Individuals	80		

## DISCUSSION

In the survey conducted, less than half of the nursing staff in both countries (Greece and Cyprus), are informed about the use of disinfectants, by the Infectious Diseases Control Committee of the Hospital. This makes it difficult to apply disinfectants properly, as evidenced by the question of whether they take part in a training course on disinfection, where the largest percentage of the answers was “No”, with a ratio of 29 people (72.5%) for Greece and 23 people (57.5%) for Cyprus.

Regarding the use of detergents for cleaning surfaces, it seems that a large percentage of nursing staff in Greece use them at a rate of 85% (34 people) compared to Cyprus, where only a 40% (16 people) use them. It is positive that the majority of nursing staff in Cyprus, does not mix disinfectants with each other, in relation to Greece, where even a percentage of 10% (4 people) mix them.

In addition, an important factor for the success of disinfection is the water temperature used, during the cleaning and disinfection of surfaces, as well as the dosage of the disinfectant used. In Cyprus, with a

rate of 62.5%, nursing staff uses lukewarm water for both methods, while in Greece the same method is used by the 57.5% of the staff. The difference between the two countries in the above procedure, seems to be in the use of cold water, where Greece with a percentage of 37.5%, prevails over Cyprus, where cold water is used at a rate of 10%. In addition, the use of a special dosimeter, both in Cyprus and in Greece, seems to prevail at a rate of 50%, while the pump is used at a rate of 35%. Only a very small percentage of 15%, use something else to check the dosage of a disinfectant.

Another key difference between the two countries, based on this research, is the process followed in a disinfectant, when the time of its disinfectant action passes. The survey shows that the largest percentage of nursing staff in Cyprus, i.e. 57.5% (23 people), store it, compared to Greece, where the percentage is 32.5%. In Greece, the largest percentage of nursing staff, i.e. 40% (16 people), use it as a cleaner, while in Cyprus the percentage is 32.5% (13 people). Nursing staff in both countries, mixes disinfectants when their time of disinfectant action passes, at a rate of 2.5%. Regarding the use of a



disinfectant after its expiration, 25% is observed in Greece and 7.5% in Cyprus.

Through the research conducted between Greece and Cyprus on the use of disinfectants in hospitals, the differences observed are small. The main difference between the two countries, is the legislation that defines the process of obtaining and applying disinfectants in each hospital. For Greece, in order to provide services to the cleaning department, the hospital is announcing a tender. Each hospital, each year appoints a contractor, who undertakes disinfection and cleaning 24 hours a day. In relation to Cyprus, where the law stipulates the recruitment of cleaning staff through contracts, which are renewed approximately every year, based on the needs of each hospital.

Greece receives guidelines from KEELPNO in collaboration with the Ministry of Health and the Hospital Infections Control Committee. In Cyprus, the guidelines are issued only by the Ministry of Health in collaboration with the Hospital Infections Control Committee.

In terms of cleaning, the only difference is in the method of wiping, where Greece uses soaked floor and surface cloths, while Cyprus uses a special broom for dry cleaning, specially made from cotton cloth, in order to attract and remove dust, or vacuum cleaners. No difference was observed, in all other disinfection and cleaning methods. Therefore, the conclusion that emerges from the current study, is that both in Greece and in Cyprus, the same disinfection and cleaning procedures are followed.

Furthermore, the emerged correlations of this research are statistically significant, where the country is the main variable compared to other variables. At first, the way of detergents used for surface cleaning, by the nursing staff of the two countries, seems to differ. Hospital floors are contaminated by the settlement of airborne bacteria, due to contact with shoes, wheelchairs and other solid objects and occasionally due to the spillage of urine, pus, sputum, and other body fluids. Pathogens that are commonly present on the hospital floors, include *Staphylococcus aureus*, which is spread by patients and staff, as well as (in much smaller numbers) Gram-negative bacteria, such as *Pseudomonas aeruginosa*. *Clostridium* spores, are also present on the floors, possibly deposited in larger numbers by shoes and wheelchairs, rather by air deposition. Some of the bacteria are kept loose in powder form, while others are rooted on the surfaces and between cracks.

In a study conducted at a Birmingham hospital, detergent cleaning alone was not sufficient to remove or kill *Staphylococcus aureus*. The most active agents tested, caused a reduce, by more than 99% and all disinfectants included in the study, had a significantly greater effect than soap and water [11].

In addition, a statistically significant correlation found in this research, has to do with the temperature at which surface cleaners and disinfectants, are used in both countries. It is worth mentioning that a hospital study in Italy, found that temperature, significantly affected *Legionella's* growth and survival in the hospital. Hot

water is the most common source of shock or outbreak in a hospital, where patients may be at a greater risk for a serious infection [12].

Finally, another statistically significant correlation found in the current study, is about checking the use of dosimeter dispensers. It is worth noting that a study conducted at a hospital in Kiev, Ukraine, found that more than 90% of nursing staff use hand sanitizers, not with a suitable dosimeter, as prescribed by the Ukrainian Ministry of Health, but depending on how it serves them

at the appropriate time. The main problem is the non-compliance of the staff, with the guidelines on hand hygiene. The requirements for the maintenance of dosing dispensers, suggest that they should not be incompletely replenished with sanitary products, the dosimeter dispensers for hand sanitary products must be thoroughly cleaned and disinfected before each filling, the bottles for hand care products should only be refilled after they are completely empty and in aseptic conditions and finally the use of disposable containers is also recommended [13].

---

## ΒΙΒΛΙΟΓΡΑΦΙΑ

1. Angelillo IF, Villari P, D'Errico MM, Grasso GM, Ricciardi G, Pavia M. Dentists and Aids: a survey of knowledge, attitudes and behavior in Italy. *J Public Health Dent.* 1994;54:145-152.
2. Houang ETS and Hurley R. Anonymous questionnaire survey on the knowledge and practices of hospital staff in infection control. *J Hosp Infect.* 1997;35:301-316.
3. O'Boyle Williams C, Campbell S, Henry K, Collier P. Variables influencing worker compliance with universal precautions in the emergency department. *Am J Infect Control.* 1994;22:138-148.
4. Rutala WA, Clontz EP, Weber DJ, Hoffmann KK. Disinfection practices for endoscopes and other semicritical items. *Infect Control Hosp Epidemiol.* 1991;12:282-288.
5. Prokroystis. Action plan for the treatment of infections from multidrug-resistant gram-negative pathogens in Health Services. E.O.D.Y. (former KE.EL.P.NO). 2010. Available from: <https://eody.gov.gr/mikroviaki-antochi-kai-loimoxeis-poy-syndeontai-me-choroys-parochis-ygeias/choroi-parochis-ygeias-nosokomeia/schedio-drasis-prokroystis/> [Accessed 14th June 2020].
6. Lelekis M. Health and Safety in the Hospital, Biological Hazards, Patient and Employee Protection Measures. B' pathological department of G.N. Melission A. Fleming.
7. Semmelweis I, Carter KC (ed.). Etiology, concept and prophylaxis of childbed fever. Madison WI: The University of Wisconsin Press; 1983.
8. Xirouchaki EH. Hygiene and epidemiology in the field of hospital. Athens: Symmetria publications; 2000.
9. Datsis AX, Polka V, Zervas G. Management of hazardous medical waste in the hospitals of the prefecture of Etoloakarnania. *Medicine.* 2013;102(2):136-145.

10. Tseroni M. Newer Data in Sterilization-Antiseptic-Disinfection. Presentation of the Centers for Disease Control Prevention of Y.Y.K.A. Available from: <http://www.nos.teilam.gr/docs/imerides/diimerida21102005/mera2/aposteirwsi%20-%20apolymans.pdf> [Accessed 15th June 2020].
11. Papadogeorgaki E. Sterilization-Antiseptic-Disinfection-Antiseptics-Disinfectants. Infoderma. Available from: [http://www.iatrikionline.gr/derma\\_83/3.pdf](http://www.iatrikionline.gr/derma_83/3.pdf) [Accessed 16th June 2020].
12. MERCER. Actuarial study of Cyprus National Health Expenditure and National health system. Cyprus Ministry of Health Publications. 2013:1-65. Available from: [https://www.moh.gov.cy/moh/moh.nsf/page09\\_en/page09\\_en?OpenDocument](https://www.moh.gov.cy/moh/moh.nsf/page09_en/page09_en?OpenDocument) [Accessed 17<sup>th</sup> June 2020].
13. KE.EL.P.NO. Guidelines for the diagnosis and empirical treatment of infections. Athens: Focus on Health Ltd; 2007.
14. Ministry of Health of Cyprus. Offer for the supply of disinfectant liquids for surfaces and antiseptic products to cover the needs of the state Hospitals. Competition number: S.Y. 9/14 and GT 130/14. Available from: [https://www.moh.gov.cy/moh/moh.nsf/index\\_gr/index\\_gr?OpenDocument](https://www.moh.gov.cy/moh/moh.nsf/index_gr/index_gr?OpenDocument) [Accessed 18th June 2020].
15. Ayliffe GA, Collins BJ, Lowbury EJ. Cleaning and disinfection of hospital floors. *Br Med J*. 1996;2(5511):442-445.
16. Borella P, Montagna TM, Romano-Spica V, Stampi S, Stancanelli G, Triassi M, et al. Legionella infection risk from domestic hot water. *Emerg Infect Dis*. 2004;10(3):457-464.
17. [Klymenko I](#), [Kampf G](#). Systemic mistakes in hand hygiene practice in Ukraine: detection, consequences and ways of elimination. *GMS Hyg Infect Control*. 2015;10(1):1-9.
18. Sproat LJ, Inglis TJJ. A multicentre survey of hand hygiene practice in intensive care units. *J Hosp Infect*. 1994;26:137-148.
19. Zaidi M, Angulo M, Sifuentes-Osornio J. Disinfection and sterilization practices in Mexico. *J Hosp Infect*. 1995;31:25-32.
20. Pittet D. Improving compliance with hand hygiene in hospitals. *Infect Control Hosp Epidemiol*. 2000;21:381-386.
21. Stein AD, Makarawo TP, Ahmad MF. A survey of doctors' and nurses' knowledge, attitudes and compliance with infection control guidelines in Birmingham teaching hospitals. *J Hosp Infect*. 2003;54:68-73

## Συγκριτική μελέτη διαχείρισης απολυμαντικών σε νοσοκομεία Ελλάδας και Κύπρου

Κ. Ντελέζος<sup>1</sup>, Μ. Καραβασιλή<sup>2</sup>, Γ. Κυριακοπούλου<sup>3</sup>, Δ. Δελητζάκης<sup>4</sup>, Α. Μ. Γιαννακάς<sup>5</sup>, Χ. Βεργάδου<sup>6</sup>

<sup>1,2,3,4,5,6</sup> Εργαστήριο Υγιεινής και Ασφάλειας της Εργασίας, τμήμα Δημόσιας και Κοινοτικής Υγείας, Πανεπιστήμιο Δυτικής Αττικής, Ελλάδα, <sup>1</sup> Υγιεινολόγος - Επόπτης Δημόσιας Υγείας M.Sc. Ph.D.c. και Λέκτορας Εφαρμογών, Εργαστήριο Υγιεινής και Ασφάλειας της Εργασίας, τμήμα Δημόσιας και Κοινοτικής Υγείας, Πανεπιστήμιο Δυτικής Αττικής, Ελλάδα, <sup>4</sup> Υγιεινολόγος - Επόπτης Δημόσιας Υγείας M.Sc., <sup>2,3,5,6</sup> Υγιεινολόγος - Επόπτης Δημόσιας Υγείας

### ΠΕΡΙΛΗΨΗ

**Σκοπός:** Η παρούσα έρευνα, επικεντρώνεται στη σύγκριση του χειρισμού και της διαχείρισης των απολυμαντικών, από το νοσηλευτικό προσωπικό που εργάζεται σε νοσοκομεία της Ελλάδας και της Κύπρου. Επιπλέον, διερευνάται το επίπεδο εκπαίδευσης του προσωπικού, που λαμβάνει από την εκάστοτε επιτροπή ενδονοσοκομειακών λοιμώξεων των νοσοκομείων, καθώς και τα διάφορα λάθη που παρατηρούνται κατά τη χρήση απολυμαντικών, στα τμήματα επειγόντων περιστατικών (ΤΕΠ).

**Υλικό-Μέθοδοι:** Το δείγμα αποτελούνταν από συνολικά 80 νοσηλευτές/τριες, 40 από το ΤΕΠ νοσοκομείου της Κύπρου και 40 από το ΤΕΠ νοσοκομείου της Ελλάδας, 18 από τους οποίους ήταν άνδρες και 62 ήταν γυναίκες, ενώ το εκπαιδευτικό επίπεδο του 46,3% του δείγματος, ήταν απόφοιτοι πανεπιστημίου. Ένα ανώνυμο, γραπτό ερωτηματολόγιο με 12 ερωτήσεις κλειστού τύπου, διανεμήθηκε στους συμμετέχοντες. Τα δεδομένα υποβλήθηκαν σε επεξεργασία, χρησιμοποιώντας το πρόγραμμα Microsoft Office Excel, καθώς και το Στατιστικό Πακέτο SPSS.

**Αποτελέσματα:** Το σύνολο (100%) των νοσηλευτών/τριών στην Κύπρο, δεν αναμιγνύουν τα απολυμαντικά μεταξύ τους, σε αντίθεση με την Ελλάδα, όπου η ανάμιξη απολυμαντικών παρατηρείται σε ποσοστό 10%. Στην Κύπρο, κατά τη διάλυση των απολυμαντικών, το 55% των συμμετεχόντων χρησιμοποιούν χλιαρό νερό, ενώ στην Ελλάδα, το ποσοστό αυτό διαμορφώνεται στο 60%. Παρόμοια ποσοστά παρατηρούνται και στις δύο χώρες, όπου το 77% του νοσηλευτικού προσωπικού στην Κύπρο και το 70% στην Ελλάδα, απομακρύνουν τα σωματικά υγρά των ασθενών, πρώτα με χαρτί και μετά εφαρμόζουν απολυμαντικό. Τέλος, στην Κύπρο το 40% του νοσηλευτικού προσωπικού, αποθηκεύει την περίσσεια απολυμαντικού διαλύματος και το χρησιμοποιεί ως καθαριστικό, ενώ στην Ελλάδα αυτό συμβαίνει σε ποσοστό 25%.

**Συμπεράσματα:** Η έρευνα, αναδεικνύει διάφορες δυσλειτουργίες και στις δύο χώρες, τόσο κατά την εφαρμογή των προτεινόμενων οδηγιών-διαδικασιών από τις επιτροπές ενδονοσοκομειακών λοιμώξεων, όσο και στην τήρηση των κανόνων ορθής υγιεινής πρακτικής. Ακόμη, παρατηρήθηκε ελλιπής ενημέρωση, σχετικά με τη χρήση των απολυμαντικών σκευασμάτων και στις δύο χώρες. Επίσης, λανθασμένες πρακτικές υιοθετούνται από τους εργαζόμενους και των δύο χωρών, όσον αφορά την ποσότητα των απορρυπαντικών σκευασμάτων, που περισσεύουν ή έχουν λήξει. Ωστόσο, υπάρχει μια σημαντική διαφορά μεταξύ των δύο

χωρών, στην ανάμιξη των απολυμαντικών μεταξύ τους, καθώς είναι ενθαρρυντικό το γεγονός ότι στην Κύπρο, κανένας εργαζόμενος δεν αναμιγνύει τα απολυμαντικά μεταξύ τους, σε αντίθεση με την Ελλάδα, όπου αυτό γίνεται από το 10% των εργαζομένων. Τέλος, μια ακόμη διαφορά μεταξύ των δύο χωρών, αφορά την αποθήκευση των απολυμαντικών που έχουν λήξει, καθώς στην Κύπρο το 57,5% του νοσηλευτικού προσωπικού τα αποθηκεύει, ενώ στην Ελλάδα, αυτό συμβαίνει σε αρκετά χαμηλότερο ποσοστό του 32,5%.

*Λέξεις ευρετηρίου:* απολυμαντικά, νοσοκομεία, νοσηλευτικό προσωπικό, νοσοκομειακές λοιμώξεις, υγιεινή

#### *Παραπομπή*

**Κ. Ντελέζος, Μ. Καραβασίλη, Γ. Κυριακοπούλου, Δ. Δελητζάκης, Α. Μ. Γιαννακάς, Χ. Βεργάδου. Συγκριτική μελέτη διαχείρισης απολυμαντικών σε νοσοκομεία Ελλάδας και Κύπρου. Επιστημονικά Χρονικά 2020; 25(2): 358-370**