ISSN-E: 2617-9563

“The role of sterilization in health centers and its impact on the nature of work”

Hanan alari mater alanazi , mohammed fahad w alkhatami , alnour theeb awad alruwaili , turki madallah atiah alruwaili , hudud afi alshukri alruwaili , maha dhib awwad alruwaili , hanan wanis nayir alanazi , hana ayed manzil alanazi , afaf faisal raja alanazi , latifah sahlan duhayman alruwaili ,yasamiyan qunayfith dhuwayhi alanazi , kefa aleri mater alenazi

ISSN-E: 2617-9563

Abstract

The objective of the study is to assess the efficacy of sterilization in health centres, specifically in relation to the utilization of modern equipment and the competence of individuals who have received training in sterilisation procedures. These individuals, whether from nursing or other related fields, are responsible for carrying out the sterilisation process. A survey was administered to a total of 650 individuals, comprising both males and females, in order to assess their perspectives and level of contentment about sterilisation services at their respective healthcare facilities. The survey yielded replies from a total of 600 individuals across all healthcare centres in the Mecca region.

Keywords: Sterilization, role, health centers, nature of work.

المستخلص:

الهدف من الدراسة هو تقييم مدى فعالية التعقيم في المراكز الصحية، وتحديداً فيما يتعلق باستخدام المعدات الحديثة وكفاءة الأفراد الذين تلقوا تدريباً على إجراءات التعقيم. هؤلاء الأفراد، سواء من التمريض أو المجالات الأخرى ذات الصلة، هم المسؤولون عن تنفيذ عملية التعقيم. تم إجراء استبيان على إجمالي ٦٥٠ فردًا، من الذكور والإناث، من أجل تقييم وجهات نظرهم ومستوى رضاهم عن خدمات التعقيم في مرافق الرعاية الصحية الخاصة بهم. وقد أسفر الاستطلاع عن إجابات من إجمالي ٦٠٠ فرد في جميع مراكز الرعاية الصحية في منطقة مكة المكرمة.

الكلمات المفتاحية: التعقيم، الدور، المراكز الصحية، طبيعة العمل.

1. Introduction:

Sterilisation refers to the worldwide eradication of germs and the removal of their components. It involves the use of antiseptic medications or liquids, or radiation for surgical instruments, to eliminate bacteria and viruses found on human skin or surgical tools. The World Health Organization defines it as "the act of eliminating or exterminating all forms of life and other organic substances, including prions and viruses, which are non-living but biological pathogens; encompassing infectious agents such as bacteria, fungi, viruses, prions, spores, and single-celled eukaryotes." Plasmodium, such as the one known as Plasmodium, can be found in specific locations, such as liquids, or within intricate structures like biological media (Who Glossary.2009; Frérot, M., et al.2018). The majority of medical and surgical instruments utilized in healthcare institutions are composed of heat-resistant materials and thus undergo sterilisation predominantly through the use of steam. Since 1950, there has been an increase in the use of medical systems and agents composed of materials such as plastics that necessitate sterilisation at low temperatures. Ethylene oxide gas has been utilised for sterilizing heat- and moisture-sensitive medical instruments since the 1950s. In the last 15 years, several innovative sterilisation technologies that operate at low temperatures, such as hydrogen peroxide gas plasma, peracetic acid immersion, and ozone, have undergone enhancements and are now employed for sterilising medical equipment. Sterilisation technologies are utilized in the healthcare industry for their exceptional performance in the sterilisation of medical instruments (CDC, A. 1985; Rutala, W. A. 1997; Association for the Advancement of Medical Instrumentation. 1993; AORN Recommended Practices Committee. 2006). A medical system that needs to interface with sterilized body tissues or fluids is considered a crucial component. It is important to sterilize these goods before using them, as any transmission of microbes could lead to the spread of illness. Examples of such objects comprise surgical instruments, biopsy forceps, and implanted medical devices. If these articles have low heat resistance, the recommended sterilisation procedure is steam sterilisation, as it offers the highest level of stability due to its fine quality, consistency, and effectiveness. Nevertheless, the reprocessing of heat- and moisture-sensitive materials necessitates the utilization of low-temperature sterilisation methods such as ethylene oxide, hydrogen peroxide gas plasma, and peracetic acid. The user's text is (Rutala, W. A., & Weber, D. J. 1998). The most commonly employed and very reliable method for sterilising various pathways is by the application of moist heat, namely saturated steam applied under pressure. Steam sterilisation is a safe and cost-effective method that quickly kills microorganisms, including spores (Adler, S. et al.1998). and efficiently heats and permeates materials. The user's text is enclosed in tags. Steam sterilisation, like other sterilisation methods, can have negative effects on certain materials, such as erosion (Block, S. S. (Ed.). 2001). Other types of sterilisation include Immediate-Use Steam Sterilisation (also known as 'Flash' steam sterilisation), ethylene oxide gas sterilisation, hydrogen peroxide gas plasma sterilisation, and vaporized hydrogen peroxide sterilisation. Please refer to Table No.1 for more information.

Table 1: Summary of advantages and disadvantages of commonly used sterilization technologies [4].

Sterilization Method	Advantages	Disadvantages
Steam	Nonharmful to patients, staff, and the environment. The cycle is easily manageable and can be closely monitored. Highly effective against microorganisms and minimally influenced by organic or inorganic substances.	Harmful for equipment that are sensitive to heat Microsurgical equipment have been rendered unusable due to frequent and repetitive exposure.

Hydrogen Peroxide Gas Plasma	Environmentally friendly Does not leave any harmful residues The cycle time ranges from 28 to 75 minutes, depending on the model type. Aeration is not required. Applicable for goods that are sensitive to heat and moisture, since the process temperature does not exceed 50 °C. Effortless to run and install (208 V)	Cellulose (paper), linens, and liquids are not able to undergo processing. The sterilisation chamber has a total volume ranging from 1.8 to 9.4 ft3, which may vary depending on the model type. However, it is important to note that certain endoscopes or medical equipment with lengthy or narrow lumens cannot currently be processed in the United States.
100% Ethylene Oxide (ETO) ETO Mixtures 8.6% ETO/91.4% HCFC 10% ETO/90% HCFC	Permeates package materials and device lumens. The use of a single-dose cartridge and a negative-pressure chamber reduces the risk of gas leakage and exposure to ethylene oxide (ETO). Easy to use and oversee Compatible with the majority of medical Permeates medical packaging and various plastics Capable of being used with a wide range of medicinal materials The cycle is easily manageable and observable.	Aeration time is necessary to eliminate ethylene oxide (ETO) residue. The overall volume of the sterilisation chamber ranges from 4.0 to 7.9 cubic feet, depending on the model type. ETO is a substance that is highly hazardous, known to cause cancer, and has the ability to catch fire easily. Some states, such as CA, NY, and MI, have regulations in place to control ETO emissions. These regulations demand a decrease of 90-99.9% in CFC emissions, which is an inert gas used to eradicate ETO.
Peracetic Acid	Short duration (30-45 minutes) Liquid immersion sterilisation at a low temperature of 50-55 °C. Eco-friendly byproducts The endoscope allows for the passage of a sterilising agent, which effectively eliminates salt, protein, and microbes.	Point-of-use system without sterile storage. Biological indicators may not be appropriate for regular monitoring purposes. Intended exclusively for submersible instrumentation. There is a lack of compatibility between certain materials.

2. Material and Methods:

The study was initiated in Mecca, a city located in the country of Saudi Arabia. The research and questionnaire development commenced in July 2022, and data gathering concluded in December 2022. The researcher employed a descriptive analytical approach, utilizing either quantitative or qualitative methods to describe the social phenomena of the function of sterilisation in health centres and its impact on the character of work. This type of study is characterized by the use of analysis, logical thinking, objectivity, and empirical evidence. It focuses on individuals and communities, examining the factors that contribute to their well-being and the impact of these factors on the health of individuals, society, and consumers. It also investigates the occurrence of illnesses and their associations with demographic variables such as age, gender, nationality, and marital status (Alserahy & Hassan, Awad. 2008). The user's text describes the use of the Office Group 2010 histogram in Excel to arrange the outcomes by dragging them on the statistical software, based on the individual's status, occupation, and usage (Al Zoghbi Muhammad& Al-Talvah Abas. 2000).

3. Results and Discussion:

Questionnaires are a serious and useful tool for gathering massive amounts of data, but researchers couldn't interview online survey participants one-on-one because of social distance regulations put in place to prevent the spread of infection between researchers and participants (not that coronavirus participation went away entirely, though). Because there were eleven closed-ended questions on the form, he could only respond electronically. Online methods have also been employed to collect valid samples in related studies conducted in Saudi Arabia and other locations (Al-Hanawi, M. K., et al.2020). The first inquiry pertained to the following: Are you familiar with the process, instruments, and procedures of sterilisation? Every single one of them said yes. Regarding the second issue, were you instructed in the proper methods of sterilisation? Eighty

percent did, whereas twenty percent did not. As for the third question, have you taken any classes on sterilisation? Eighty percent of respondents said yes, while twenty percent said no. The topic of whether you possess credentials in sterilisation from institutions, colleges, or centres that specialize in this area was covered in the sixth question. Eighty percent did, whereas twenty percent did not. Are you content with the degree of sterilisation at your workplace? This brings us to our sixth question. Just 40% were in favour and 60% were against. Is sterilisation a crucial aspect of your job? That was the question number seven. The ninth question concerned whether or not the centre had a sterilisation apparatus, and all of the participants responded affirmatively. On the other hand, 40% said no and 60% said yes. Do you know how the sterilizer works properly? was the tenth inquiry. Among those who took the survey, 40% said yes and 60% said no. Is the sterilisation device being operated by you or by someone else in the centre? That was the ninth question. A hundred percent of those who took part said "no." "Do you have innovative or new information about the sterilisation process recently?" is the final inquiry. Twenty percent said "yes," whereas eighty percent said "no." (Table No.2)

Table 2: Opinions, attitudes and impressions of the participants about sterilization in health centers

Questions	Yes	No
Do you know about sterilization and methods?	100%	0%
Did you receive training courses on sterilization?	80%	20%
Did you receive training courses on sterilization?	80%	20%
Do you have certificates in the field of sterilization from institutes, colleges, or centers specialized in this field	80%	20%
Are you satisfied with the level of sterilization in your workplace?	40%	60%
Whether sterilization is an essential part of your work?	100%	0%
Do you have knowledge of how the sterilizer works properly?	60%	40%
Are you the person in charge of the sterilization device, or are there others in the center?	100%	0%
Do you have innovative or new information about the sterilization process recently?	20%	80%

Given the significance of sterilisation and the public's curiosity about their procedures, she made an announcement across various platforms, including the Saudi Commission's website and her Twitter page dedicated to health specialties. In collaboration with the Health Academy of the Saudi Commission for Health Specialties, she declared the commencement of the enrollment and registration process for the medical sterilisation programme. To submit an application using the hyperlink (Saudi Commission for Health Specialties, 2022).

4. Conclusion:

The Ministry of Health, representing the state, places significant importance on the matter of sterilisation in healthcare facilities. This is because sterilisation plays a crucial role in combating microbes and viruses, particularly the Coronavirus. Sterilisation effectively eradicates all epidemics and serves as a vital measure in safeguarding the lives of both citizens and residents. Its primary responsibility is to train and certify those who are employed in the healthcare industry, ensuring their correct qualification and competence in this field.

5. Acknowledgment:

Firstly, I would want to express my gratitude to Dr. Anas S. Dablool, an esteemed scholar from Umm Al-Qura University in Mecca, Saudi Arabia, and also offer my praise to God. Furthermore, the researchers responsible for unveiling the initiative emerge.

6. References:

1. Alserahy & Hassan, Awad. (2008). The thinking and scientific research, Scientific Publishing Center, King Abdul-Aziz University in Jeddah, the first edition.
2. Al Zoghbi Muhammad& Al-Talvah Abas. (2000). Statistical system understanding and analysis of statistical data, first edition, Jordon- Amman.
3. Al-Hanawi, M. K., Angawi, K., Alshareef, N., Qattan, A. M., Helmy, H. Z., Abudawood, Y., ... & Alsharqi, O. (2020). Knowledge, attitude and practice toward COVID-19 among the public in the Kingdom of Saudi Arabia: a cross-sectional study. Frontiers in public health, 8, 217.
4. AlAhdal, A. M. (2022). Knowledge of the Dental Healthcare Workers Regarding the Maintenance of Sterilization Integrity of Autoclaved Dental Instruments (Doctoral dissertation, Alfaisal University (Saudi Arabia)).
5. Rutala, W. A., & Weber, D. J. (2015). Disinfection, sterilization, and control of hospital waste. Mandell, Douglas, and Bennett's principles and practice of infectious diseases, 3294.
6. Who Glossary, Archived copy, May 11, 2009 AD, on the Wayback Machine website. (Accessed on 30/12/2022AD)
7. Frérot, M., Lefebvre, A., Aho, S., Callier, P., Astruc, K., & Aho Glélé, L. S. (2018). What is epidemiology? Changing definitions of epidemiology 1978-2017. PloS one, 13(12), e0208442.
8. CDC, A. (1985). Guideline for handwashing and hospital environmental control, 1985. Centers for Disease Control, US Department of Health and Human Services, Washington, DC. NTIS PB85-923404.
9. Rutala, W. A. (1997). Disinfection, sterilization and waste disposal. Prevention and control of nosocomial infections, 2, 460-95.
10. Association for the Advancement of Medical Instrumentation. (1993). Good hospital practice: Steam sterilization and sterility assurance. ANSI/AAMI ST46.
11. AORN Recommended Practices Committee. (2006). Recommended practices for sterilization in the perioperative practice setting. AORN journal, 83(3), 700.
12. Rutala, W. A., & Weber, D. J. (1998). Clinical effectiveness of low-temperature sterilization technologies. Infection Control & Hospital Epidemiology, 19(10), 798-804.
13. Adler, S., Scherrer, M., & Daschner, F. D. (1998). Costs of low-temperature plasma sterilization compared with other sterilization methods. Journal of hospital infection, 40(2), 125-134.
14. Block, S. S. (Ed.). (2001). Disinfection, sterilization, and preservation. Lippincott Williams & Wilkins.
15. Saudi Commission for Health Specialties (https://ha.edu.sa/ar/career on June 15, 2022 AD) Accessed on 30/12/2022AD.