Pharmacy Safety and Occupational Health: Quality Perspective

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ABSTRACT

Objectives: To explore quality management policy and procedures of the pharmacy occupational safety and health system in pharmacy practice as a new initiative in Saudi Arabia. **Methods:** It was a narrative review of the pharmacy occupational safety and health system and quality management policy and procedures in pharmacy practice. Literature searched various databases, including PubMed, Medline, and Google Scholar. The search period is from the 1960s until 06 December 2023. The term is in full-text English and includes Case Reports, Classical Articles, Clinical Conferences, Clinical Studies, Clinical Trials, Evaluation Studies, Government Publications, Guidelines, meta-analyses, Observational Studies, Practice Guidelines, Randomized Controlled Trials, Reviews, Systematic Reviews, with Humans subject. All hospital or community pharmacy services are included in a search term. Besides, the National and international guidelines of occupational safety and health in hospital practice. The committee of pharmacy occupational safety and health policy and procedures formulated and consisted of various expert members. That includes clinical pharmacists, occupational safety specialists, Crisis and Disaster Management, and fire safety experts. The guidelines of the policy draft by one member by the second member were reviewed and corrected. The third revision was by the occupational safety specialists. The topic emphasizes the occupational safety and health system and quality management policy and procedures. **Results:** The review for quality management of occupational safety and health system policy and procedures in pharmacy practice has consisted of pharmacy occupational safety and health auditing and quality management performance indicators. Besides, it discusses the techniques of conducting quality management systems for occupational safety and health programs in pharmacy practice. **Conclusion:** The quality management of occupational safety and health system policy and procedures in pharmacy practice demands keeping adherence to occupational safety health standards at an appropriate level, with unnecessary cost control. Besides, monitor key performance indicators of pharmacy occupational safety and health auditing system. Thus, quality management of occupational safety and health system policy and procedures is highly recommended for pharmacy career professionals worldwide.

Keywords: Occupational safety, Health, Policy, Pharmacy, quality management, Saudi Arabia.

INTRODUCTION

The pharmacy's total quality management is an essential specialty in practice.[1-6] This has assessed the pharmacy's implementation of local and pharmacy practice standards. Besides, follow up on the guidelines and regulations, including policy and procedures for implementing and improving to reach best practice and optimal outcomes.[1-5] TQM in pharmacy takes care of safety. Safety could be within the patient's life during drug treatment or any incident of drug-related problems.[7,8] Another face coin of safety is occupational safety, which includes a safe environment to protect pharmacy employees.[2,9-11] TQM pharmacy indicators should include medication and occupational safety (environmental safety).[2,6,11] The elements of occupational safety include the safety of handling hazardous substances, fire safety, pharmacy crisis and disaster, violence prevention, information on the Materials Safety Data Sheet, occupational safety education, and training.[2,11-14] The TQM pharmacy practice is well known in practice with a wide range of literature.[1-6] However, it is rare to find publications about pharmacy occupational safety and related total quality management or indicators. The authors are not familiar with pharmacy occupational safety policies and procedures. The current review explores suggested pharmacy occupational safety policies and procedures.

METHODS

It is a narrative review of pharmacy security and safety. The literature search was performed using various databases, including PubMed, Medline, and Google Scholar, about specific pharmacy practice occupational safety and health and financial system topics. The search period was from the 1960s until 15 May 2023. The searched terms were in full-text English. They included Full text, Case Reports, Classical Articles,

Clinical Conferences, Clinical Studies, Clinical Trials, Evaluation Studies, Government Publications, Guidelines, meta-analyses, Observational Studies, Practice Guidelines, Randomized Controlled Trials, Reviews, Systematic Reviews, Humans, in the English language. The pharmacy services included inpatient, outpatient, or ambulatory care pharmacy, satellite pharmacy, extemporaneous preparation, repackaging units, pharmacy store, drug information center, and clinical pharmacy services. Moreover, the national and international guidelines of general occupational safety and health practice emphasizing pharmacy and healthcare settings were used as guides for writing the review. That includes guidelines from the Ministry of Building,[15] the Ministry of Human Resources and Social Development,[16] the Ministry of Inferior (Civil of Defense),[17-20] General Organization for Social Insurance.[21,22] The Ministry of Labor (USA), National Fire Protection Association (USA),[12,23-27] Occupational Safety and Health Administration (USA),[28-31] The National Institute for Occupational Safety and Health (USA), and the Institution of Occupational Safety and Health (UK). Besides some local and international quality management standards from CBAHI and Joint Commission with emphasis on Facility and Management Safety (FMS).[1,32] The committee of pharmacy occupational safety and health policy and procedures formulated and consisted of various expert members. That includes clinical pharmacists, occupational safety specialists, Crisis and Disaster Management, and fire safety experts. The guidelines of the policy draft by one member by the second member were reviewed and corrected. The third revision was by the occupational safety specialists. The policy included the medication safety data sheet, pharmacy fire safety, monitoring equipment, narcotics and controlled medication security, quality of pharmacy Financial and occupational safety and health, pharmacy security and safety competency, and education and training in pharmacy security and safety. The current topic emphasizes the occupational safety and health system and quality management policy and procedures. The Standards for Reporting Qualitative Research guided the reporting of the results of this review.[33]

The search term methodology was done as follows:

Search: **(pharmacy[Title/Abstract]) AND (occupational safety[Title/Abstract])** Filters: **Full text, Case Reports, Classical Article, Clinical Conference, Clinical Study, Clinical Trial, Evaluation Study, Government Publication, Guideline, Meta-Analysis, Observational Study, Practice Guideline, Randomized Controlled Trial, Review, Systematic Review, Humans, English**

(("pharmacy"[Title/Abstract] AND "occupational safety"[Title/Abstract]) AND ((casereports[Filter] OR classicalarticle[Filter] OR clinicalconference[Filter] OR clinicalstudy[Filter] OR clinicaltrial[Filter] OR evaluationstudy[Filter] OR governmentpublication[Filter] OR guideline[Filter] OR meta-analysis[Filter] OR observationalstudy[Filter] OR practiceguideline[Filter] OR randomizedcontrolledtrial[Filter] OR review[Filter] OR systematicreview[Filter]) AND (fft[Filter]) AND (humans[Filter]) AND (english[Filter]))

Search: **(pharmacy[Text Word]) AND (occupational safety[Text Word])** Filters: **Full text, Case Reports, Classical Article, Clinical Conference, Clinical Study, Clinical Trial, Evaluation Study, Government Publication, Guideline, Meta-Analysis, Observational Study, Practice Guideline, Randomized Controlled Trial, Review, Systematic Review, Humans, English**

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Search: **(pharmacy[MeSH Terms]) AND (occupational safety[MeSH Terms])** Filters: **Full text, Case Reports, Classical Article, Clinical Conference, Clinical Study, Clinical Trial, Evaluation Study, Government Publication, Guideline, Meta-Analysis, Observational Study, Practice Guideline, Randomized Controlled Trial, Review, Systematic Review, Humans, English**

(("pharmacy"[MeSH Terms] OR "pharmacies"[MeSH Terms]) AND "occupational health"[MeSH Terms]) AND ((casereports[Filter] OR classicalarticle[Filter] OR clinicalconference[Filter] OR clinicalstudy[Filter] OR clinicaltrial[Filter] OR evaluationstudy[Filter] OR governmentpublication[Filter] OR guideline[Filter] OR meta-analysis[Filter] OR observationalstudy[Filter] OR practiceguideline[Filter] OR randomizedcontrolledtrial[Filter] OR review[Filter] OR systematicreview[Filter]) AND (fft[Filter]) AND (humans[Filter]) AND (english[Filter]))

Translations

pharmacy[MeSH Terms]: "pharmacy"[MeSH Terms] OR "pharmacies"[MeSH Terms]

occupational safety[MeSH Terms]: "occupational health"[MeSH Terms]

Search: **(pharmacist[Title/Abstract]) AND (occupational safety[Title/Abstract])** Filters: **Full text, Case Reports, Classical Article, Clinical Conference, Clinical Study, Clinical Trial, Evaluation Study, Government Publication, Guideline, Meta-Analysis, Observational Study, Practice Guideline, Randomized Controlled Trial, Review, Systematic Review, Humans, English**

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Translations

pharmacist[MeSH Terms]: "pharmacists"[MeSH Terms]

occupational safety[MeSH Terms]: "occupational health"[MeSH Terms]

Search: **(pharmaceutical care[Title/ Abstract]) AND (occupational safety[Title/ Abstract])** Filters: **Full text, Case Reports, Classical Article, Clinical Conference, Clinical Study, Clinical Trial, Evaluation Study, Government Publication, Guideline, Meta-Analysis, Observational Study, Practice Guideline, Randomized Controlled Trial, Review, Systematic Review, Humans, English**

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("pharmaceutical services"[MeSH Terms] AND "occupational health"[MeSH Terms]) AND ((casereports[Filter] OR classicalarticle[Filter] OR clinicalconference[Filter] OR clinicalstudy[Filter] OR clinicaltrial[Filter] OR evaluationstudy[Filter] OR governmentpublication[Filter] OR guideline[Filter] OR meta-analysis[Filter] OR observationalstudy[Filter] OR practiceguideline[Filter] OR randomizedc ontrolledtrial[Filter] OR review[Filter] OR systematicreview[Filter]) AND (fft[Filter]) AND (humans[Filter]) AND (english[Filter]))

Translations

pharmaceutical care[MeSH Terms]: "pharmaceutical services"[MeSH Terms]

occupational safety[MeSH Terms]: "occupational health"[MeSH Terms]

Search: **(pharmaceutical[Title/Abstract]) AND (occupational safety[Title/Abstract])** Filters: **Full text, Case Reports, Classical Article, Clinical Conference, Clinical Study, Clinical Trial, Evaluation Study, Government Publication, Guideline, Meta-Analysis, Observational Study, Practice Guideline, Randomized Controlled Trial, Review, Systematic Review, Humans, English**

("pharmaceutical"[Title/Abstract] AND "occupational safety"[Title/Abstract]) AND ((casereports[Filter] OR classicalarticle[Filter] OR clinicalconference[Filter] OR clinicalstudy[Filter] OR clinicaltrial[Filter] OR evaluationstudy[Filter] OR governmentpublication[Filter] OR guideline[Filter] OR meta-analysis[Filter] OR observationalstudy[Filter] OR practiceguideline[Filter] OR randomizedc ontrolledtrial[Filter] OR review[Filter] OR systematicreview[Filter]) AND (fft[Filter]) AND (humans[Filter]) AND (english[Filter]))

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("pharmaceutical"[Text Word] AND "occupational safety"[Text Word]) AND

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Search: **(pharmaceutical[MeSH Terms]) AND (occupational safety[MeSH Terms])** Filters: **Full text, Case Reports, Classical Article, Clinical Conference, Clinical Study, Clinical Trial, Evaluation Study, Government Publication, Guideline, Meta-Analysis, Observational Study, Practice Guideline, Randomized Controlled Trial, Review, Systematic Review, Humans, English**

("pharmaceutical preparations"[MeSH Terms] AND "occupational health"[MeSH Terms]) AND ((casereports[Filter] OR classicalarticle[Filter] OR clinicalconference[Filter] OR clinicalstudy[Filter] OR clinicaltrial[Filter] OR evaluationstudy[Filter] OR governmentpublication[Filter] OR guideline[Filter] OR meta-analysis[Filter] OR observationalstudy[Filter] OR practiceguideline[Filter] OR randomizedc ontrolledtrial[Filter] OR review[Filter] OR systematicreview[Filter]) AND (fft[Filter]) AND (humans[Filter]) AND (english[Filter]))

Translations

pharmaceutical[MeSH Terms]: "pharmaceutical preparations"[MeSH Terms]

occupational safety[MeSH Terms]: "occupational health"[MeSH Terms]

Search: **((pharmacy[Title/Abstract]) AND (occupational safety[Title/Abstract])) AND (Quality[Title/Abstract])** Filters: **Full text, Case Reports, Classical Article, Clinical Conference, Clinical Study, Clinical Trial, Evaluation Study, Government Publication, Guideline, Meta-Analysis, Observational Study, Practice Guideline, Randomized Controlled Trial, Review, Systematic Review, Humans, English**

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Translations

pharmacy[MeSH Terms]: "pharmacy"[MeSH Terms] OR "pharmacies"[MeSH Terms]

occupational safety[MeSH Terms]: "occupational health"[MeSH Terms]

Warnings

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Term not found: Quality.

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Translations

pharmacist[MeSH Terms]: "pharmacists"[MeSH Terms]

occupational safety[MeSH Terms]: "occupational health"[MeSH Terms]

Warnings

((pharmacist[MeSH Terms]) AND (occupational safety[MeSH Terms])) AND (**Quality**[MeSH Terms])

Term not found: Quality.

Search: **((pharmaceutical care[Title/Abstract]) AND (occupational safety[Title/Abstract])) AND (Quality[Title/Abstract])** Filters: **Full text, Case Reports, Classical Article, Clinical Conference, Clinical Study, Clinical Trial, Evaluation Study, Government Publication, Guideline, Meta-Analysis, Observational Study, Practice Guideline, Randomized Controlled Trial, Review, Systematic Review, Humans, English**

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Translations

pharmaceutical care[MeSH Terms]: "pharmaceutical services"[MeSH Terms]

occupational safety[MeSH Terms]: "occupational health"[MeSH Terms]

Warnings

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Translations

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Warnings

((pharmaceutical[MeSH Terms]) AND (occupational safety[MeSH Terms])) AND (**Quality**[MeSH Terms])

Term not found: Quality.

RESULTS

The pharmacy services suggested implementing the following policies and procedures for quality management in the occupational safety and health of pharmacy practice.

✓ The pharmacy should strengthen first-class occupational safety and health systems through manual and electronic documentation.

✓ The excellent requirements enhance the overall performance and things to do in pharmacy services.

✓ The pharmacy departments assign the duty of pharmacy accountant or designate occupational safety and health to manage pharmacist or expert accountant.

✓ The occupational safety and health management pharmacist or expert accountant sets up the strategic sketch of good enhancement for a pharmacy's occupational safety and health system.

✓ The occupational safety and health management pharmacist or expert accountant sets up the critical overall pharmacy occupational safety and health performance indicators for any input of medications or supply or processes receiving or dispensing and output medications or supply of pharmacy services through pharmacy occupational safety and health competency.

✓ The occupational safety and health management pharmacist or expert occupational safety and health set up the measurements of KPI primarily based on percentages and achieved documentation as appropriate and in compliance with local and international standards (Table 1).

✓ The occupational safety and health management pharmacist or talented accountant sets the timetable. The

frequency of measuring KPI month-to-month or quarterly (Table 1).

✓ The occupational safety and health management pharmacist or expert occupational safety and health formats the datasheet of KPI in contrast to the preceding reports.

✓ The occupational safety and health management pharmacist or talented occupational safety and health mentioned the file with the pharmacy occupational safety and health administration.

✓ The pharmacy occupational safety and health management unit analyzed the pleasant administration record and mentioned it quarterly with the pharmacy team of workers.

✓ The occupational safety and health management pharmacist or expert occupational safety and health make a Roadmap graph that will set up for fantastic enhancement of the pharmacy occupational safety and health system.

✓ The occupational safety and health management pharmacist or talented occupational safety and health monitor the roadmap through internal auditing at all pharmacy carriers and alternates and enhances the pharmacy occupational safety and health system.

✓ The occupational safety and health management pharmacist or expert occupational safety and health periodically utilized an external auditor for the pharmacy occupational safety and health system.

✓ The occupational safety and health management pharmacist or talented occupational safety and health Checks the preceding and the modern repute and modifications in the pharmacy practice accordingly.

✓ The occupational safety and health management pharmacist or expert occupational safety and health writes the final record of the pharmacy occupational safety and health system high-quality enhancement based totally on the global requirements or guidelines. The remaining document may want to be a precis or particular description of the problem, troubles outlines, measures key for progress, and the approach of gathering information, analysis, and interpretation of the data. Besides modification strategies, altering effects, future steps.

TQM Pharmacist and fire inspections

The pharmacist represented their pharmaceutical care department at a hospital or community. pharmacy that should investigate entirely to evaluate the root analysis of the accident as part of quality management pharmacy services.

• The pharmacist should be aware knowledge of general science, building instructions, human behavior, forensic pharmacy, and law.

• The pharmacist should follow NPFA 1033 standards qualification of fire investigation.

• The pharmacist should receive education and training about fire investigation and better to get a certificate on that.

• The fire investigator fire pharmacist should follow their law limitations.

• The fire investigation should have tool bags such as respiratory masks, glass masks, hummer, and plastic bag.

• The fire investigator must have additional equipment such as a high-resolution camera, flashlight, measuring tape, unique safety clothes, and equipment.

• The pharmacist should report the fire invitation to the incident command in the pharmacy according to internal policy and procedures.

• The TQM pharmacist must assist the site safety to provide a safe working environment without personal disturbances and to focus on the original causes of the fire.

• The pharmacist should take care of hazardous materials or electricity and poorly lighting areas, entrance of air quality.

• TQM pharmacists should be aware of unique clothes based on biological or radioactive substances with physical protective equipment as national and international guidelines recommend.

• The pharmacist must be aware of atmospheric monitoring devices and respiratory protection after the fire is finished.

• Before a fire investigation, the pharmacist must know diamond-shaped signs and placards for transporting hazardous materials.

• The pharmacist must be aware of the material safety data sheet, which was implemented before the fire occurred.

• The pharmacist should take care of the following: broken glasses, damaged structural material, electrical wiring, and falling debris.

• The pharmacist should be familiar with all types of fire classes A to D and K and the sequence of end products for each class.

• The pharmacist should be aware of factors associated with fire development such as fuel types and materials, place geometry, ventilation changes, thermal properties of the material, and factors conditions such as humidity, additional temperature, and atmospheric tension.

• The TQM pharmacist should be aware of physical and chemical problems of all materials that are damaged and product of combustion by fire and review the safety material data sheet.

• The pharmacist must evaluate whether or not the pharmacy building is fire-resistant. It should be at least one hour and above as essential requirements of structural integrity.

• The pharmacist should differentiate between all structural integrity of the pharmacy, such as wood, concrete, steel, cast iron, aluminum, glasses, plastic, and gypsum, during fire accidents and the end product after fire suppression.

• The pharmacist should be aware of pharmacy and related store building types, such as building structures I to IV, and the properties for each building before a fire accident.

• The pharmacist should use emergency response guidebooks to be familiar with all pharmacy materials and related properties and response management before and during the fire incident.

• The pharmacist might search for fire accidents around 150 Meters apart from the central Origen fire.

• The pharmacist should follow scientific guidelines for fire investigation, such as determining the needs, defining the problem, collecting and analyzing the evidence, developing a hypothesis, testing the theory, and choosing the appropriate hypothesis.

• The pharmacist must collect all reasonable evidence and protect from contamination problems.

• The pharmacist can interview any witnesses. The pharmacist should prepare for interviews and should follow the guidelines of interview witnesses during fire inspections.

• The pharmacist must cooperate with all fire investigators from any department, police officers, civil health insurance representatives, and others, and disclose between them the information.

• The pharmacist should document all necessary information found during the investigation. The report should include the date of investigation, date of the fire

incident, description of the incident, the outcome of the fire incident, the layout of the incident place, location of the fire incident, any witnesses, pictures of the fire incident, hypothesis of senatorial history, estimate economic outcome of fire investigation, the suggested solutions and recommendations protective measures to avoid future fire hazard incidents.

- The pharmacist should write the report as a quality management report comparing key performance indicators and related annual quality goals and objectives. Besides, the risk assessment plan and update all relevant quality management and risk management indicators.

- The pharmacist should report the higher administration TQM department and occupational safety departments, not report anything to the media.

CONCLUSION

The pharmacy quality management of occupational safety and health system policy and procedures is a new institute project for a professional pharmacy career. It is required for occupational safety and health to be implemented in pharmaceutical care services. It is the basis of evaluation and dimension of a fine of occupational safety and health and financial activities in pharmacy practice. The pharmacy quality management of the occupational safety and health system is required to ensure environmental safety and related cost control, enhance adherence, manage the outcome, and avoid any useless occupational burden on the pharmacy system. Therefore, the satisfactory requirements of pharmacy quality management of occupational safety and health system policy and procedures emphasizing coverage and processes are noticeably encouraged to be enforced in Saudi Arabia.

No	Topic	Activity	Note	Target
Table 1: Pharmacy Occupational safety and health and total Quality management.				
1	Pharmacy and warehouse building	Self-assessment of pharmacy occupational safety and health.	Section of Pharmacy and warehouse building four times annually.	70-100%
		Risk assessment	Section of Pharmacy and warehouse building four times annually.	Documentations
		Risk management	Section of Pharmacy and warehouse building four times annually.	Documentations
		Occupational safety incidents	Electronic documentation of platform occupational incidents.	Reports
		Estimated Occupational safety incidents cost.	Complete documentation of platform occupational incidents.	Reports
2	Pharmacy Safety Practice	Self-assessment of pharmacy occupational safety and health.	Section of Pharmacy Safety Practice four times annually.	70-100%
		Risk assessment	Section of Pharmacy Safety Practice four times annually.	Documentations
		Risk management	Section of Pharmacy Safety Practice four times annually.	Documentations
		Occupational safety incidents.	Electronic documentation of platform occupational incidents.	Reports
		Estimated Occupational safety incidents cost.	Complete documentation of platform occupational incidents.	Reports
3	Fire Safety	Self-assessment of pharmacy occupational safety and health.	Section of Fire Safety four times annually.	100%
		Risk assessment	Section of Fire Safety four times annually.	Documentations
		Risk management	Section of Fire Safety four times annually.	Documentations
		Fire drill	Section of Fire Safety two times annually.	Documentations
		Occupational safety incidents.	Electronic documentation of platform occupational incidents.	Reports
		Estimated Occupational safety incidents cost.	Complete documentation of platform occupational incidents.	Reports
		Daily Fire safety surveillance and monitoring.	Complete documentation of platform occupational incidents.	Reports
		Weekly Fire safety surveillance and monitoring.	Complete documentation of platform occupational incidents.	Reports
		Monthly Fire safety surveillance and monitoring.	Complete documentation of platform occupational incidents.	Reports

4	Crises and Disaster Management	Self-assessment of pharmacy occupational safety and health.	Section of Crises and Disaster Management two times annually.	100%
		Risk assessment	Section of Crises and Disaster Management two times annually	Documentations
		Risk management	Section of Crises and Disaster Management two times annually.	Documentations
5	Medication Information	Self-assessment of pharmacy occupational safety and health.	Section of Medication Information four times annually.	100%
		Risk assessment	Section of Medication Information four times annually.	Documentations
		Risk management	Section of Medication Information four times annually.	Documentations
		Occupational safety incidents.	Electronic documentation of platform occupational incidents.	Reports
		Estimated Occupational safety incidents cost.	Complete documentation of platform occupational incidents.	Reports
6	Patient/Family Education	Self-assessment of pharmacy occupational safety and health.	Section of Patient/Family Education four times annually.	70-100%
		Risk assessment	Section of Patient/Family Education four times annually.	Documentations
		Risk management	Section of Patient/Family Education four times annually.	Documentations
		Occupational safety incidents.	Electronic documentation of platform occupational incidents	Reports
		Estimated Occupational safety incidents cost.	Complete documentation of platform occupational incidents.	Reports

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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Consent for Publications

It does not apply to this review

Ethical Approval

This research is exempted from research and ethical committee or an Institutional Review Board (IRB) approval.

https://www.hhs.gov/ohrp/regulations-and-policy/decision-charts-2018/index.html

ABBREVIATIONS

MOH: Ministry of Health; **KSA:** Kingdom of Saudi Arabia; **ASHP:** American Society of Health-System Pharmacists; **CBAHI:** Saudi Central Board for Accreditation of Healthcare Institutions; **FMS:** Facility and Management Safety; **NFA:** National Fire Protection Association; **OSHA:** Occupational Safety and Health Administration; **NIOSH:** The National Institute for Occupational Safety and Health; **IOSH:** The Institution of Occupational Safety and Health.

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