

Nuclear Pharmacy Practice: New Initiatives in Saudi Arabia

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ABSTRACT

Objectives: To declare the nuclear pharmacy services in the Kingdom of Saudi Arabia. **Methods:** It is a new initiative project derived through the international nuclear pharmacy services guidelines. The project has been formulated from the global business model and pharmacy project guidelines of a new project. Various project management tools write the new project. It consists of the initial and planning phases, the execution phase, and the monitoring and controlling phase. **Results:** The project presents nuclear pharmacy services with a defined vision, mission, and goals. The nuclear pharmacy services showed various benefits, including clinical and economic benefits to the patient. The risk management model description assured the continuation of the project. Moreover, the monitoring and controlling of the services were explored. Finally, the transition to operation project through the closing project stage is explored in the analysis. **Conclusion:** The nuclear pharmacy services is a new initiative project in the Kingdom of Saudi Arabia. It includes a pharmacy strategy in Saudi Vision 2030. The nuclear pharmacy services required the pharmacy workforces, all requirements of basic nuclear pharmacy services foundations. Therefore, the implementation of nuclear clinical pharmacy services is highly suggested in Saudi Arabia.

Key words: Nuclear, Pharmacy, Practice, Services, Initiative, Saudi Arabia.

INTRODUCTION

Pharmacists conduct many activities in the field of pharmacy practice and had clinical benefits and financial outcomes. Nuclear medicine has developed from an obscure research tool to a mainstream medical diagnostic and therapeutic modality. Similarly, pharmacy exercise in nuclear medicine has also evolved. First, there was growth in the area of radioactive medicinal agents as known as radiopharmaceuticals. As a result, there was an urgent need for a specialized person working in a nuclear pharmacy to improve the services provided to the patients and achieve the Saudi Vision 2030 programs.^[1] More recently, nuclear pharmacy has often been prescribed for radiopharmacy. Nuclear pharmacy specializes in pharmacy occupation that focuses on appropriate radiopharmaceuticals during the therapeutic and diagnostic process. Radiopharmaceuticals represented a unique class of medications and required the standards for a nuclear pharmacy compounding practice. Thus, it will ensure the continued availability of compounded radiopharmaceuticals without compromising on the quality of patient safety at both reasonable costs. Moreover, the essence of nuclear pharmacy practice is to perform quality control tests to assure their identity, quantity, and purity before patient administration and provide professional advice on the safe and productive use of these agents.^[2] Nowadays, nuclear pharmacies have expanded to offer varied functions such as radiation safety and waste management. In addition, consultative and marketing activities are directed toward

nuclear medicine practitioners. Thus, the role of nuclear pharmacists is complementary to the many other professionals currently practicing in this specialty.

The nuclear pharmacist technician follows the recommendations and directions of the nuclear pharmacist. He also performs some steps for the prior preparation of packing, storing, and keeping the radioactive material safely, in addition to his role in preparing the prescription and mixing intravenous solutions under the supervision of the nuclear pharmacist.

The responsibility of a nuclear pharmacist is to obtain the radioactive materials from the manufacturer, apply radiation safety rules while preparing the radioactive products, and distribute them. They also ensure the purity of the radioactive compound and perform quality control tests before distributing it to the department of nuclear medicine in the hospital, where the dose is given to the patient. In addition, nuclear pharmacists are available to provide drug information to other health professionals, assist nuclear medicine staff in selecting products, and help interpret unusual studies.^[3]

The nuclear clinical pharmacist can pass on the information regarding radiopharmaceuticals to other healthcare professionals and assist the nuclear medicine staff in selecting products. Moreover, they help interpret unusual studies and ensure that all products endure excellent control tests and report effects manually as a section of the manufacturing process documentation.

Method of the project

It is a new initiative project derived through the international and national nuclear pharmacy practice guidelines.^[1-2,4-17] The task force team of nuclear pharmacy practice services formulated consisted of the author's expertise in the pharmacy administration and clinical pharmacy practitioner. The committee unitized and drove the international literature on outsourcing pharmaceutical care services from the nuclear pharmacy practice guidelines. It was written by utilizing the global business model, pharmacy project guidelines, and project management institution guidelines of a new project.^[18-21] The nuclear pharmacy practice services were adjusted based on the types of nuclear pharmacy practice, general regulations, and the transformation to the nuclear pharmacy practice. Various project management professionals tools to conduct the project. The project included multiple sections such as the initial phase, the planning phase, the execution phase, and the monitoring and controlling phase.

SWOT analysis

Nuclear pharmacy practice may be classified based on its strengths, weaknesses, and opportunities. The strength points included ensuring the development and training of healthcare practitioners in the field of nuclear pharmacy. In addition, the existing knowledge of practitioners of radioactive drug regulations, guidelines, and strategies presented the correct awareness and communication to patients. Moreover, the work reinforces the professional relationships between healthcare practitioners in various ways. On the contrary, the project's weak points included the risk of radioactive substances to human life and the availability of a limited number of specialist pharmacists when needed. Besides, the absence of academic courses in pharmacy school, inappropriate use of radioactive drugs, and vague references. The opportunity points included the education ending with nuclear pharmacy training and the development of a strategic plan for applying nuclear pharmacy. As a result, it can improve the quality and effectiveness of workers, adhere to nuclear pharmacy guidelines, and providing designated places for preparing radioactive drugs. The threat points include the unavailability of the pharmacy strategic plan and the non-inclusion of the project in the institutions' budget.

Market Analysis

There are various pharmaceutical care services offered to patients in the Kingdom of Saudi Arabia. Moreover, pharmacy services are

expanding over the years. However, nuclear pharmacy services are missed at most healthcare institutions. Most of the existing services were nuclear medicine—the number of pharmacists working in that field was very few. Nuclear medicine, including nuclear pharmacy, has been well established for the past 40 years at a famous hospital in Saudi Arabia. The services related to nuclear medicine are expanding at local healthcare institutions. However, the number of pharmacists who participated was small at governmental or non-governmental healthcare organizations and private sectors. As a result, the healthcare market was highly demanding nuclear pharmacy services.

Planning phase Scope of the project

The project nuclear pharmacy services include all requirements of the radiopharmacy jobs. For instance, implantation of Standard Guidelines USP 785 for the safe handling of radiopharmaceutical materials. However, it does not include the procurement, storing, preparation, dispensing, and monitoring radiopharmaceutical products to inpatient and outpatient services.

Vision, Missions, and Goals

The project's vision is to provide the best nuclear pharmacy services, and the mission is to deliver nuclear pharmaceutical care to all patients and pharmacy services. This project aims to establish nuclear pharmacy services, support the nuclear medicine services at various healthcare organizations, and implement a radiopharmaceutical safety system. An additional goal is to prevent any radiopharmaceutical-related problems during pharmacy activities and avoid further unnecessary and other costs on the pharmacy and healthcare system through cost-effective nuclear pharmacy systems.

Project description

The following policies and procedures were put in place for every pharmacy staff and other healthcare individuals:

- The nuclear pharmacy services should be implemented at appropriate healthcare organizations when required.
- The nuclear pharmacy services committee should consist of the director of the pharmacy, head of each pharmacy unit, pharmacy quality management, medications safety pharmacist, clinical pharmacist, physician handling nuclear medicine, and a representative nurse.

- The nuclear pharmacy services committee implements the standards of the nuclear pharmacy services and updates at least annually.
- The committee should take care of the education and training sessions of the nuclear pharmacy services for all pharmacy and healthcare providers.
- The policies and procedures of the nuclear pharmacy services should be distributed to healthcare sectors at the organization.
- The physician handling the nuclear medicine writes the prescription based on the nuclear pharmacy system.
- The prescription should be sent to the pharmacy and inpatient or outpatient pharmacist, and the pharmacy technician should prepare it based on the nuclear pharmacy services system.
- The nuclear pharmacy staff sends the medications to the ambulatory care patients or nursing department. The nuclear nurse administers the radiopharmaceutical product based on the nuclear pharmacy services guidelines and regulations.
- The pharmaceutical care services should measure the clinical outcome of the nuclear pharmacy services.
- The pharmaceutical care services should calculate the economic result of nuclear pharmacy services.

Planning cost management

Each new project (nuclear pharmacy services) requires the management team to Figure out the project's financial budget, which includes the cost of nuclear pharmacy services educational courses, the value of the management team meeting, and the price of updated references of the nuclear pharmacy services. The budget must be followed up with close monitoring of the cost management plan until the project is finished and switched to the operating system.

Execution phase Management team

Project management tools had various steps. One of the critical steps is the execution phase. A team led this phase from the beginning of the program until becoming one of the operating systems at the healthcare organization. The group consisted of several members, the Director of Pharmacy, including the nuclear clinical pharmacists, nuclear distributive pharmacists, nuclear pharmacy technician experts in nuclear pharmacy services, nuclear medicine physicians and nurses, pharmacy quality management, and medications safety

officer. The team must implement and follow up on the new nuclear pharmacy services and regularly update and increase the number of nuclear services provided. In addition, the team should educate and train the pharmacy and nuclear healthcare staff about the new nuclear pharmacy services and measure the clinical and economic impact of the project.

Education and training

Each new project related to nuclear pharmacy services requires special education and training for the concerned people. This new project demands education and training for the pharmacy staff, including clinical pharmacists, pharmacists, and pharmacy technicians. Healthcare professionals, including physicians and nurses, need another special nuclear pharmacy services education and training program. In addition, the team management needs nuclear pharmacy orientation education about the project for all healthcare professionals. Any new staff healthcare providers joined should be given orientation about the healthcare institutions.

Project total quality management

There are multiple tools for managing total quantity with the current new project nuclear pharmacy services during the implementation phase; the balance scored cards are among them.^[22] The monitoring tools consisted of the customer, finance, internal process, education, and innovation. The assessment of healthcare services of nuclear pharmacy services was an example of an internal process type. The clinical outcome of nuclear pharmacy services might reflect the competency of nuclear clinical pharmacists, nuclear distributive pharmacists, and nuclear pharmacy technicians as an example of the education type. The financial type had another example of measuring the cost avoidance of the nuclear pharmacy services. The fourth type was the customer-type measuring the patient satisfaction with healthcare providers, including healthcare professionals and pharmacists, and pharmacy technicians of nuclear pharmacy services satisfaction in Saudi Arabia.

Risk Management

The project is mainly exposed to risks such as personnel, budget, technical, and quality risks. There are multiple risks: schedule, budget, personal, technological, and quality risks.^[23,24] The nuclear pharmacy services project may suffer from personnel threats such as untrained nuclear healthcare professionals or insufficient

pharmacists and pharmacy technicians. The budget risk includes not covering the expenses for providing education and training courses related to the nuclear pharmacy services for the pharmacy staff and healthcare professionals. Technical risk includes staff exposure to the technology limited to electronic recourses, and nuclear pharmacy services were not friendly to the use of reporting system pharmacy practice. Finally, the project might be exposed to quality risks such as not implementing safety tools.

Closing of the project

The nuclear pharmacy services of all healthcare institutions of governmental and private sectors are required to prevent radiopharmaceutical-related errors and death and implement nuclear medicine and nuclear pharmacy standards and regulations. Moreover, it is vital to avoid the economic burden on the nuclear pharmacy and healthcare system in Saudi Arabia. The project should continue at the nuclear pharmacy services at each pharmacy unit and supervise through related committees. The education and training should be provided accordingly. The nuclear pharmacy services should regularly update and expand the number of pharmacy services recommended in the future. The annual celebration of all nuclear pharmacy services pharmacy staff, including pharmacists and pharmacy technicians, is highly recommended in Saudi Arabia.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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Consent for Publications

Informed consent was obtained from all the participants

Ethical Approval

This research was 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

KSA: Kingdom of Saudi Arabia; **SWOT:** Strengths, Weaknesses, Opportunities and Threats; **BSC:** Balance Scored Cards.

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