

Evaluating Opioid Dispensing Practices: Insights into the Knowledge, Attitudes, and Practices of Libyan Pharmacists at Sabratha Teaching Hospital

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Abstract

Background: Opioid analgesics are the most potent prescription analgesics. Although there is wide acceptance in prescribing narcotic analgesics for in-patients who have cancer, acceptance is not so universal in treating in-patients with pain from other causes. This study aimed to evaluate the availability of analgesic opioids in Sabratha Teaching Hospital and investigated Libyan pharmacists' knowledge, attitude, and practice towards dispensing these medications.

Materials and Methods: Quantitative data on opioid availability were obtained from the hospital pharmacy, while qualitative data were collected through a structured questionnaire distributed to 40 hospital pharmacists.

Results: Revealed inadequate availability and accessibility of opioid analgesics, with low dispensed amounts and frequent stock-outs due to import restrictions and difficulties in quantifying needs. All participants were familiar with the opioid dispensing process, but none had received in-service pain management training. Only 10% of pharmacists were responsible for narcotic drug dispensing, and a mere 5% discussed pain management strategies with physicians before prescribing, indicating poor interprofessional collaboration.

Conclusions: The study highlights the need for improved opioid availability and enhanced training for hospital pharmacists in pain management to ensure better patient care.

Keywords

Opioid, Analgesic, Pharmacist, Knowledge, Practice.

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Introduction

Pain affects everyone, from newborns to the elderly, and it is prevalent in almost every area of medicine, involving general medical practice, internal medicine, oncology, surgery, and palliative care. Analgesic opioids are required for the treatment of both acute and chronic pain. The WHO Model Lists of Essential Medicines involve oxycodone (for adults and children), morphine, methadone, hydromorphone, codeine, and fentanyl (for adults only).^{1,2} According to the International Single Convention on Narcotic Drugs, they are "controlled substances".^{3,4}

Over time, the use of medications that have the potential to be addictive, such as opioid analgesics, keeps rising. Numerous factors affect the rates of opioid analgesic use. First, the use of will rise

as a result of the increased emphasis on pain management; however, the adverse effects of narcotic analgesics, as well as the potential for addiction and misuse, will eventually lead to their usage decreasing over time.⁵ Better pain management is desirable, but it's important to be aware of the risks associated with abusing and misusing these potentially addictive drugs. Most nations' regulatory agencies are imposing additional restrictions due to concerns about abuse or dependence. Despite these precautions, misuse is known to happen.⁵

The goal of international regulations is to maintain a balance between preventing abuse and diversion and providing access to medical requirements; yet, countries with varying incomes have very different levels

of accessibility.⁶ According to earlier studies, only 17% of people worldwide used 92% of morphine in 2015, with the global north accounting for the majority of the total consumption.⁷ In 2019, 9200 defined daily doses of morphine were consumed for scientific and medical usage per million people in Western Europe, as compared to 90 in Africa.⁸ Of course, needs are high and thus not covered in Africa; for instance, in 2020, there were over 1.1 million cases of pain management in cancer and 700,000 deaths.⁹ A study by Jayawardana et al. revealed that rates of opioid consumption in low and middle-income countries have remained low and relatively stagnant over the period from 2009 to 2019.¹⁰

Laws and regulations controlling the use of opioid drugs vary by country. In Libya, the use and distribution of opioids and other narcotic drugs are regulated by the Ministry of Justice, which enacted Law Number 7 of 1990 on Narcotics and Psychotropic Drugs. The production, import, export, possession, and medical use of these substances are all fully covered by this national law.

Certain aspects of this law regulate the prescription and dispensing of certain medications in medical institutions such as pharmacies and hospitals. Since the pharmacist plays a central role in these procedures, they need to be sufficiently knowledgeable about these rules. Particularly in Libya, very little research has been done on the usage patterns of opioid analgesics.

The primary objectives of this study are: to assess the utilization of opioid analgesics: This involves determining how often opioids such as morphine, pethidine, fentanyl, pentazocine, alfentanil, and tramadol are used in patients hospitalized at Sabratha Teaching Hospital, as well as evaluating the availability of these analgesic opioids within the hospital.

MATERIALS AND METHODS

In this mixed-methods study, a descriptive survey regarding the accessibility of analgesic opioids was combined with a qualitative survey that used interviews and a brief questionnaire to learn more about the experiences and opinions of hospital pharmacists. The research was carried out between January and April 2024 at Sabratha Teaching Hospital, a public hospital established in 1982, located in Sabratha city in western Libya.

The quantitative data about how readily available analgesic opioids were obtained at hospital pharmacy from 2019 until 2023. The required data was taken from paper archives of narcotic analgesics, which included comprehensive information on the consumed amount, usage patterns, and procurement frequency of various opioid analgesics, including morphine,

pethidine, fentanyl, pentazocine, alfentanil, and tramadol.

Qualitative data were obtained from hospital pharmacists. At the start, a draft questionnaire was created in Arabic to ensure understanding. It was piloted on a convenient sample of 7 hospital pharmacists who are currently practicing at STH, to assess the questionnaire's length, question design, readability, comprehension, and clarity. The questionnaire was then used with some changes to increase clarity following the pilot study's results, and the final version of the questionnaire was then applied. The final questionnaire was presented to 40 hospital pharmacists. It included the following sections: First, there were questions about socio-demographic characteristics, such as gender, age, years of experience, and academic qualifications. Second, there were questions exploring whether they had received training related to these medications, as well as their attitudes towards opioid dispensing in the context of pain management and addiction concerns. Third, pharmacists were asked in a closed-ended question if their collaboration with physicians could improve patient outcomes related to narcotic drug use. Another question asked if they had discussed pain management techniques with physicians before prescribing narcotic drugs. The survey took approximately 5 minutes for participants to complete. In addition to pharmacists, the manager of the pharmacy department was interviewed, with a focus on opioid availability and use, as well as laws, regulations, and policies. The study was approved by the pharmacy and medical supply department of STH. No personal identifiers were entered into the databases.

RESULTS

In this study, we found that the lack of stock was common. Prescriptions for analgesic opioids were documented in just four hospital departments. The hospital procures analgesic opioids from the Libyan Ministry of Health and Alenmaa company except in rare cases of donations from international organizations. All suppliers must be approved by the Libyan Ministry of Health. When the data is being dispensed for narcotic analgesics, [table 1](#) presents data on the dosages and methods of administering parenteral analgesic opioids available at STH in the last 10 years.

[Table 2](#) shows the consumption amounts of parenteral analgesic opioids from 2019 to 2023 at STH. In 2019 and 2022, the most consumed opioid analgesic was fentanyl citrate which represents 765 ampoules and 225 ampoules, respectively. Whereas in 2020, 2021, and 2023, the most consumed analgesic opioids were tramadol hydrochloride which represents 750 ampoules, 615 ampoules, and 600 ampoules, respectively. On the other hand, pentazocine lactate and alfentanil were not available in the hospital during these years.

Table1. The dosage form and dose of parenteral analgesic opioids available at STH in the last 10 years.

Code number	Name of drug	Dose	Dosage form
0023.0120.0001	Alfentanyl	0.544 mg/2ml	ampoule
0023.0890.0001	Fentanyl citrate	50 mcg/ml 2 ml	ampoule
0023.0890.0002	Fentanyl citrate	50 mcg/ml 10 ml	vial
0023.1650.0002	Morphine sulfate	10 mg/ml	ampoule
0023.2340.0001	Pentazocine lactate	30 mg /ml	ampoule
0023.1830.0001	Pethidine hydrochloride	50 mg/ml 2ml	ampoule
0023.1830.0002	Pethidine hydrochloride	100 mg/ml 1ml	ampoule
0023.0371.0001	Tramadol hydrochloride	100 /2ml	ampoule

Table2. Parenteral opioid consumption amounts of analgesics from 2019 to 2023 at STH.

Narcotic analgesic	2019	2020	2021	2022	2023	Average amounts $\pm$ SD
Alfentanyl 0.544 mg/2 ml	0	0	0	0	0	0
Fentanyl citrate 0.05 mg/10 ml	130	170	210	210	220	191 $\pm$ 32
Fentanyl citrate 0.05 mg/2 ml	765	235	300	225	280	358 $\pm$ 162
Morphine sulfate 10 mg/ ml	86	40	40	29	6	40 $\pm$ 18
pentazocine lactate 30 mg/ml	0	0	0	0	0	0
Pethidine hydrochloride 50 mg/ml	220	120	200	90	80	142 $\pm$ 54
Pethidine hydrochloride 100 mg/ml	130	100	150	120	80	116 $\pm$ 20
Tramadol hydrochloride 100 mg /2 ml	485	750	615	190	600	825 $\pm$ 152

Figure 1 shows the consumed amounts of analgesic opioids from 1 January 2019 to 30 December 2019. As shown, tramadol 100 mg /2 ml (485 ampoules) and fentanyl citrate 0.05 mg/2 ml (765 ampoules) having the most amounts of use. On the other hand, pentazocine lactate and alfentanyl were not available in the hospital this year.

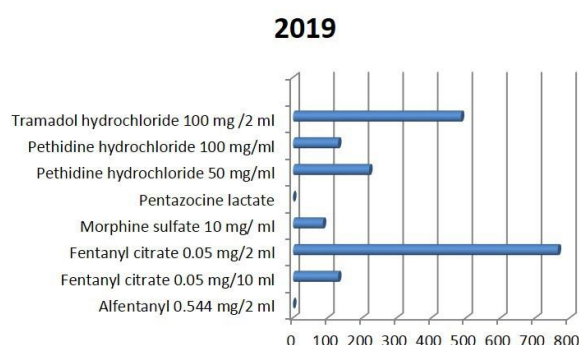
**Figure1.** The consumption amounts of analgesic opioids from 1 January 2020 to 30 December 2020 at STH.

Figure 2 shows the consumption amounts of analgesic opioids from 1 January 2020 to 30 December 2020. As shown, tramadol 100 mg /2 ml (750 ampoules) has the most amount of use. On the other hand, pentazocine lactate and alfentanyl were not available in the hospital this year.

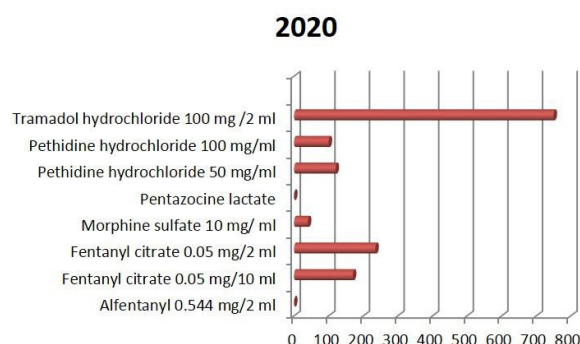
**Figure2.** The consumed amounts of analgesic opioids from 1 January 2020 to 30 December 2020 at STH.

Figure 3 shows the consumed amounts of analgesic opioids from 1 January 2021 to 30 December 2021. As shown, tramadol 100 mg /2 ml (615 ampoules) has the most amount of use. On the other hand, pentazocine lactate and alfentanil were not available in the hospital this year.

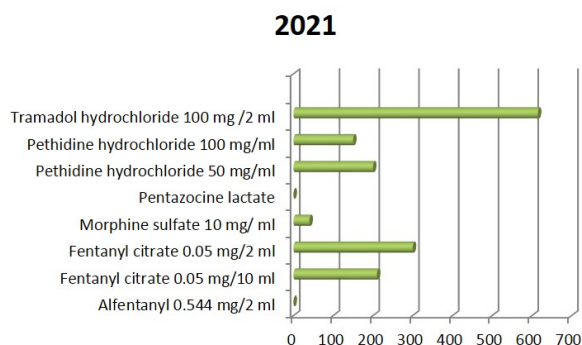


Figure 3. The consumed amounts of analgesic opioids from 1 January 2021 to 30 December 2021 at STH.

Figure 4 shows the consumed amounts of analgesic opioids from 1 January 2022 to 30 December 2022. As shown, fentanyl citrate 0.05 mg/2 ml (210 ampoules) and fentanyl citrate 0.05 mg/10 ml (225 vials) have the most amounts of use. On the other hand, pentazocine lactate and alfentanil were not available in the hospital this year.

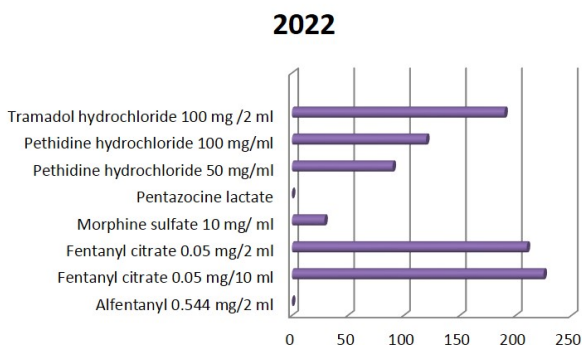


Figure 4. The the consumed amounts of analgesic opioids from 1 January 2022 to 30 December 2022 at STH.

Figure 5 shows the consumed amounts of analgesic opioids from 1 January 2023 to 30 December 2023. As shown, tramadol 100 mg /2 ml (600 ampoules) has the most amount of use. On the other hand, pentazocine lactate and alfentanil were not available in the hospital this year.

Table 3 and **Table 4** show the availability of narcotic analgesics in each department for 2022 and 2023, respectively.

As shown, all the consumed amounts of fentanyl citrate, morphine sulfate, and ketamine were only in the intensive care unit, operation, and anesthesia department.

Regarding the use of tramadol, the orthopedic surgery department, gynecology department, and general surgery department had the most amounts of use during 2022 and 2023.

Firstly, a short questionnaire was presented to 40 pharmacists. The interview explored some topics, including knowledge of analgesic opioids and perceptions related to their availability and use. For the hospital pharmacy manager, policies, rules, regulations, and the availability and use of opioids were the main topics of discussion.

According to **Table 5**, the majority (45%) had worked at the hospital for more than 20 years, followed by those who had been there for 10 to 20 years (25%), and roughly 12.5% had worked there for 5 to 10 years.

According to the demographic information provided by the responding pharmacists, young adults (those between the ages of 30 and 40) represent the majority of pharmacists (about 40%), with older age groups (those over 50) accounting for only 20%. Women represented around 65% of the pharmacists, whereas men accounted for approximately only about 35%.

Sixty-five percent were pharmacy assistants, and about 32.5% of the pharmacists held a bachelor's degree.

According to the STH pharmacy manager, there are regulations in Libya that govern the usage and distribution of narcotic medications. Narcotic analgesics can only be prescribed, dispensed, and used in hospital inpatient wards, according to Libyan legislation. For a maximum of 30 days, an exception permits the prescription and dispensing of narcotic medications (in tablet, capsule, and patch dosage forms) for patients who are not in the hospital. This exception applies to patients with cancer, those receiving therapy for severe pains, and patients recovering from major procedures under dosage recommendations made by their treating physicians, who may be consultants or specialists in their respective fields.

The Libyan Ministry of Health's particular narcotic prescriptions and the country's authorized laws and regulations regarding the use, distribution, and dispensing of narcotic pharmaceuticals must be followed while prescribing these medications. More than three days after the prescription date, pharmacists are not permitted to fill narcotic prescriptions. After signing and stamping the prescription, the pharmacist must promptly enter it in the appropriate narcotic registration book and maintain it at the pharmacy for at least 10 years.

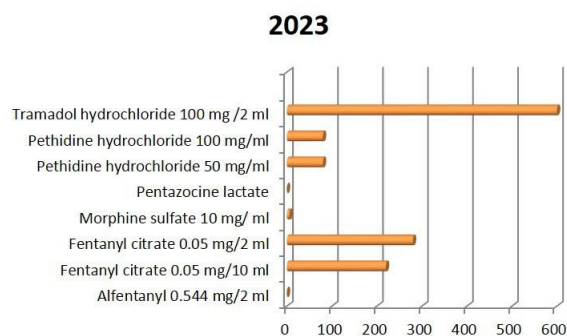


Figure 5. The consumed amounts of analgesic opioids between 1 January 2023 and 30 December 2023 at STH.

DISCUSSION

Analgesic opioids are indispensable for the treatment of pain caused by conditions such as cancer, cardiovascular disease, chronic respiratory disease, diabetes, childbirth, surgery, injuries, and other situations. Narcotic opioid analgesics in injectable form, such as morphine sulfate, fentanyl citrate, pethidine hydrochloride, alfentanil, pentazocin, and tramadol, are listed as essential medicines at STH. The Libyan Authority for Pharmaceutical Regulation regulates analgesic opioids, exactly as they regulate other medications. They are classified as controlled substances and are subject to specific legislation.

Table 3. The consumed amounts of parenteral analgesic opioids in different wards of STH in 2022.

Medicine	Intensive care unit, Operation and anesthesia	Orthopedic surgery	General surgery	Obstetrics and Gynecology
Alfentanil 0.544 mg/2 ml	0	0	0	0
Fentanyl citrate 0.05 mg/2 ml	210	0	0	0
Fentanyl citrate 0.05 mg/10 ml	225	0	0	0
Morphine sulfate 10 mg/ ml	29	0	0	0
Pethidine hydrochloride 50 mg /ml	10	0	20	60
Pethidine hydrochloride 100 mg/ml	0	70	0	50
Tramadol hydrochloride 100 mg / 2 ml	10	30	90	60

Table 4. The consumed amounts of parenteral analgesic opioids in different wards of STH in 2023.

Medicine	Intensive care unit, Operation and anesthesia	Orthopedic surgery	General surgery	Obstetrics and Gynecology
Alfentanil 0.544 mg/2 ml	0	0	0	0
Fentanyl citrate 0.05 mg/2 ml	280	0	0	0
Fentanyl citrate 0.05 mg/10 ml	220	0	0	0
Morphine sulfate 10 mg/ ml	6	0	0	0
Pethidine hydrochloride 50 mg /ml	50	30	0	0
Pethidine hydrochloride 100 mg/ml	30	20	20	10
Tramadol hydrochloride 100 mg / 2 ml	10	280	250	60

This study was conducted to assess the availability of analgesic opioids at STH and to examine the knowledge, attitude, and practice of Libyan pharmacists regarding the dispensing of these medications.

The consumption amounts of analgesic opioids reflect their availability in the hospital pharmacy and each department. Our results showed that prescribed opioids are frequently lacking at the hospital pharmacy. The hospital typically procures analgesic opioids through the Libyan Ministry of Health and Alenmaa company, with rare exceptions involving donations from international organizations. All suppliers must be approved by the Libyan Ministry of Health.

According to our investigation, the hospital pharmacy had access to prescription records and stock data. However, the Ministry of Health's delayed supplies and lack of regular monitoring could make the exacerbation of needs worse. For opioids, which are governed by special laws, the low stock is especially concerning. A pharmacy manager claims that stock-outs of analgesic opioids occur frequently, mostly as a result of limited national supply brought on by import restrictions, laborious processes, and the challenge of properly expecting demand.

Between 2019 and 2022, the most consumed analgesic opioids were fentanyl citrate which represents 765 ampoules and 225 ampoules, respectively. Whereas

Table 5. Displays the comprehensive demographic data.

Parameter	(%)
Age:	
20-30	20 %
30-40	40 %
40-50	20 %
More than 50	20 %
Gender:	
Male	35 %
Female	65 %
Qualification:	
Pharmacy Assistant	65 %
Bachelor	32.5 %
Master	0 %
PhD	2.5 %
Experiences:	
Less than 5 years	17.5 %
5-10	12.5 %
10-20	25 %
More than 20 years	45 %

in 2020, 2021, and 2023, the most consumed analgesic opioids were tramadol hydrochloride which represents 750 ampoules, 615 ampoules, and 600 ampoules, respectively. On the other hand, pentazocin and alfentanil were not available in the hospital at these years. Reflecting the variability in the supply of these medications. Using medical records of narcotic medicines, the amount of drug use in various hospital wards was compared.

Our result showed that all the consumed amounts of fentanyl citrate, morphine sulfate, and ketamine were only in the intensive care unit, operation, and anesthesia department.

The use of fentanyl in intensive care units, operation, and anesthesia departments is not only due to its potent analgesic effect but also due to other indications such as anesthesia adjunct, regional anesthesia adjunct, and general anesthesia. Regarding tramadol use, the orthopedic surgery, gynecology, and general surgery departments had the highest usage in 2022 and 2023. The widespread use of tramadol in these departments suggests that it may be preferred due to its perceived lower risk of dependency and less stringent regulatory control.

The need to effectively manage postoperative pain in surgical patients may be the reason for the increased use of analgesic opioids in surgical wards. This is because effective pain management following surgery is crucial to preventing adverse outcomes such as tachycardia, hypertension, myocardial ischemia, decreased alveolar ventilation, and poor wound healing.¹¹ However, many patients still suffer severe discomfort following surgery, even with more focus on pain management programs and the development of new guidelines.¹²

The use of drugs is governed by laws and regulations in every country. Law Number 7 of 1990 concerning Narcotics and Psychotropic substances governs the use and distribution of drugs in Libya. The production, import, export, possession, and other acts related to these medicines are all governed by this national law of the "State of Libya." The prescription and dispensing of these medications in hospitals, pharmacies, and other healthcare institutions are governed by certain provisions of the legislation. Although the pharmacist plays a vital role in these procedures, they should be sufficiently knowledgeable about and aware of these laws.

According to our findings, none of the hospital's pharmacists had any in-service training in pain management or instruction in the use of narcotic analgesics. Inadequate medical usage of opioid analgesics may be a result of hospital pharmacists' lack of training. The pharmacy manager additionally highlighted the importance of adequate regulation to ensure the availability of opioids and focused training in their use for pain management.

The pharmacy manager also recognized important weaknesses in the processes of needs quantification, stock management, planning, and supply. Regarding the practice of keeping a prescription of dispensed opioid analgesics, all pharmacists confirmed that these prescriptions of dispensed must be kept in the pharmacy. The study reveals that opioid dispensing in the hospital is documented solely using paper records, with internal and external logs maintained depending on the dispensing location. Although the pharmacists demonstrated compliance with regulatory requirements by maintaining comprehensive records of opioid prescriptions, the reliance on paper-based systems poses several challenges, including risks of errors, difficulty in tracking and auditing, and reduced data security.

Transitioning to electronic record-keeping systems would significantly improve the accuracy and efficiency of opioid management. Digital systems can facilitate better

Table 6. Knowledge, Attitudes, and Practices of Libyan Pharmacists at Sabratha Teaching Hospital.

Question	Details
Pharmacists' Responses (Questions 5-11)	All pharmacists answered questions about dispensing narcotic medicine.
Have you ever dispensed narcotic drugs within the hospital?	Only 10% (4 pharmacists) declared responsibility for dispensing narcotic drugs.
Have you received training on how to dispense narcotic drugs?	All pharmacists reported a lack of training in managing pain with opioids.
What happens to the prescription containing narcotic drugs?	All pharmacists confirmed that prescriptions for dispensed opioid analgesics must be kept in the pharmacy.
The method do you use to record the dispensed narcotic drugs?	- Opioid analgesics are registered only in paper records. - Hospital pharmacists must sign, stamp, and record prescriptions in internal/external special registration books.
The type of information do you record after dispensing the medication?	- Patient information: Full name, gender, and age. - Drug information: Scientific name, dosage form, and strength. - Prescriber information. - Prescription information.
Collaboration with Physicians	- 100% agreed that enhancing collaboration with physicians improves patient outcomes. - Only 5% discussed pain management strategies with physicians before prescribing narcotics.

tracking of prescriptions, reduce human error, and provide real-time access to data for audits and regulatory compliance. Moreover, electronic records can support data analysis to identify trends in opioid use, detect potential misuse, and guide policy-making to improve safe prescribing practices.

Our study found that only four pharmacists (10 %) reported that they were responsible for dispensing narcotic drugs. Legally, only a registered pharmacist is allowed to dispense analgesic opioids in Libya. This responsibility is not delegated, it's an inherent role defined by law.

While all pharmacists agreed that enhancing collaboration with physicians could positively impact patient outcomes related to narcotic drug use, only a small proportion (5%) reported discussing pain management strategies with physicians before prescribing opioids. This lack of interprofessional communication may be attributed to the absence of structured education, as reflected by the fact that only 5% of pharmacists reported participating in such discussions.

This gap underscores the need for targeted training and continuing education programs that focus on opioid pharmacology, safe prescribing practices, pain management,

and addiction risk management. Such programs would empower pharmacists to take on more proactive roles in opioid stewardship, enhance their confidence in communicating with prescribers, and ultimately improve patient care outcomes.

These results show how urgently interprofessional teamwork and communication need to be improved. One of the most crucial strategies in prescription opioid evaluation, according to an Australian study, is prescription authentication by communication with the prescriber.¹³ Prescribers and pharmacists must have a way to communicate to ensure that opioids are used appropriately. Several studies demonstrate the benefits of collaborative care, such as medication reviews, detecting prescription errors, as well as dealing with opioid abuse worldwide.^{14,15}

Overall, these comments highlight the significant potential for pharmacists to contribute more actively to patient care through enhanced communication with prescribers, greater involvement in medication management, and a stronger role in public and professional education.

The requirement for hospital pharmacies to submit quarterly reports to the Ministry of Health reflects a critical component of national opioid stewardship efforts. Regular reporting ensures that the Ministry has timely access to data on the movement and usage of narcotic drugs, which is vital for monitoring trends, identifying potential abuse or misuse, and ensuring that controlled substances are used appropriately within healthcare settings.

However, the study reveals that all narcotic records are currently maintained in paper format, which may complicate the reporting process. The manual compilation of quarterly reports from paper records can be time-consuming, labor-intensive, and prone to human error, potentially leading to delays or inaccuracies in reporting. Transitioning to an electronic data management system could streamline the reporting process, reduce errors, and ensure more timely and accurate submission of required data to the Ministry of Health.

Additionally, the hospital pharmacies must provide a quarterly report to the Ministry of Health detailing the availability of these medications through their Supplies and Stores Department.

CONCLUSION

In conclusion, our study assessed the availability of analgesic opioids for pain management in STH. This study has highlighted those opioids were inadequately available and inaccessible to those in need. Our results showed that all pharmacists in the hospital have some knowledge about the analgesic opioid dispensing process but they lacked any in-service pain management training.

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